

RECLAMATION

Managing Water in the West

Environmental Assessment 14-24-MP

Firebaugh Canal Water District 2nd Lift Canal Modernization and Lining Project Phase 4 – Washoe to Douglas Avenue

**Bureau of Reclamation – Natural Resources Conservation Service
Water Use Efficiency Grant No. R14AS00020
Mid-Pacific Region, Sacramento, California**



**U.S. Department of the Interior
Bureau of Reclamation**

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Mission Statements

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

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

List of Acronyms and Abbreviations

afy	acre-feet per year
APE	area of potential effect
CAAQS	California Ambient Air Quality Standards
CCID	Central California Irrigation District
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	Carbon monoxide
DMC	Delta-Mendota Canal
EA	Environmental Assessment
FCWD	Firebaugh Canal Water District
GBP	Grassland Bypass Project
GGS	giant garter snake
GHG	greenhouse gas
ITA	Indian Trust Assets
NAAQS	National Ambient Air Quality Standards
NHPA	National Historic Preservation Act
NO ₂	Nitrogen dioxide
NO _x	Nitrous oxides
NRHP	National Register of Historic Places
O ₃	Ozone
PM ₁₀	Particulate matter between 2.5 and 10 microns in diameter
PM _{2.5}	Particulate matter less than 2.5 microns in diameter
Project	2 nd Lift Canal Modernization and Lining Project Phase 4 Washoe to Douglas Avenue
PS 109	Pump Station 109
Reclamation	Bureau of Reclamation
ROG	reactive organic gases
Service	U.S. Fish and Wildlife Service
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SJKF	San Joaquin kit fox
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO ₂	Sulfur dioxide
VOC	volatile organic compounds

Section 1 Introduction

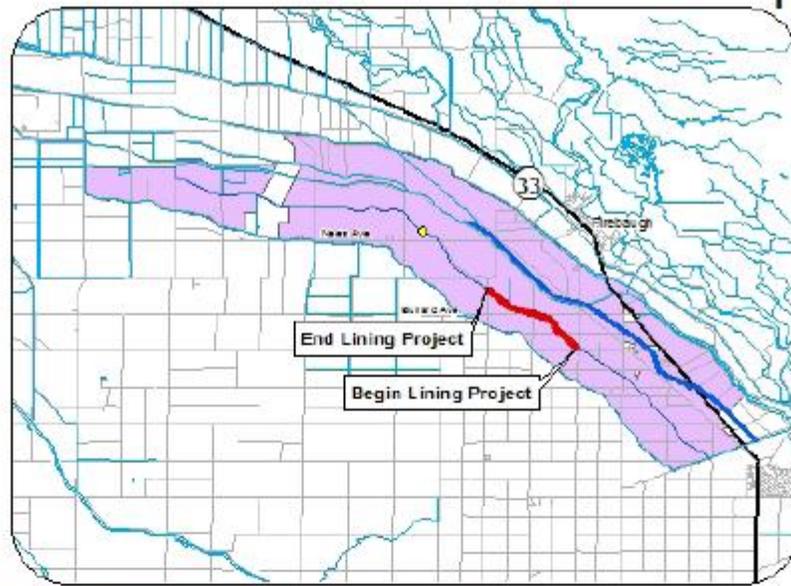
This Environmental Assessment (EA) has been prepared by the Bureau of Reclamation (Reclamation) to examine the potential direct, indirect, and cumulative impacts to the affected environment associated with providing federal grant funding to Firebaugh Canal Water District (FCWD) for its 2nd Lift Canal Modernization and Lining Project Phase 4 – Washoe to Douglas Avenue (Project). The Project is located approximately one mile southwest of the City of Firebaugh, within FCWD's service area boundary in Fresno County, California (see Figures 1 & 2).

1.1 Need for the Proposal

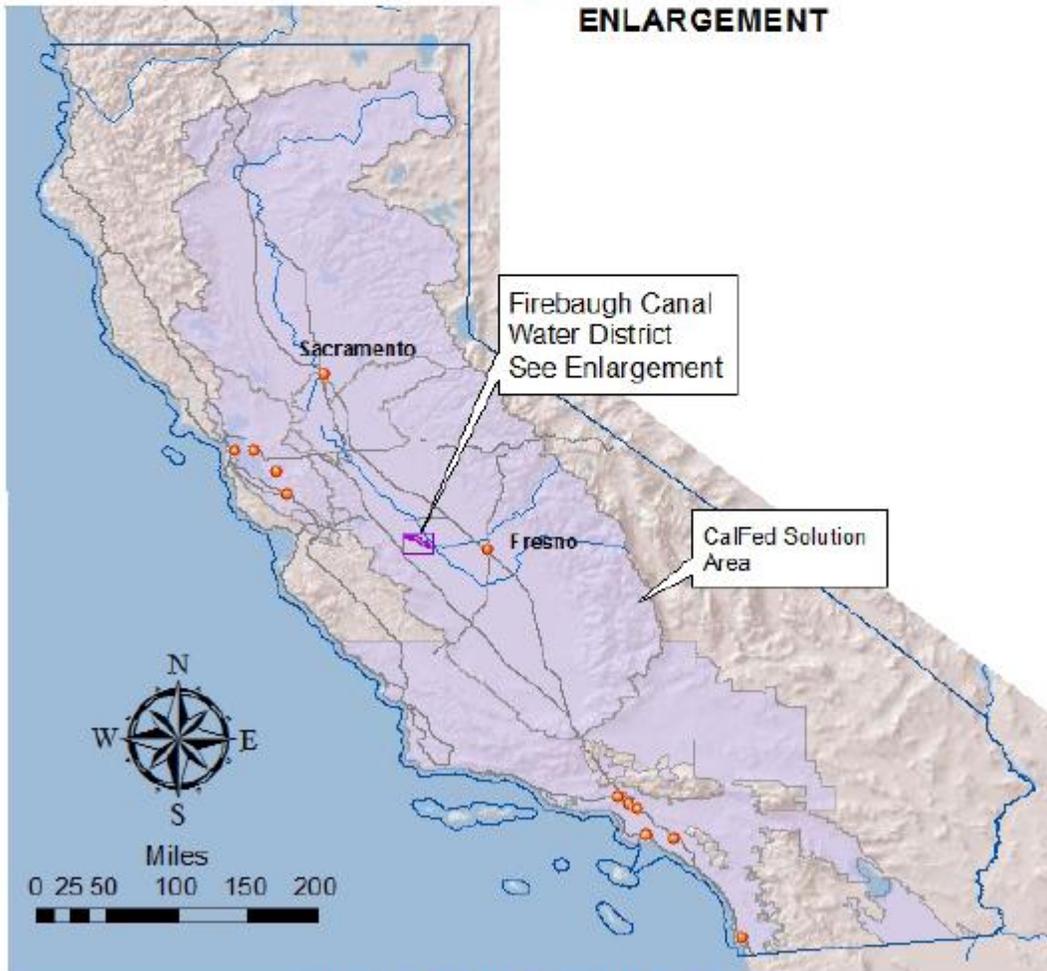
FCWD needs to reduce seepage losses and improve its water management capabilities in order to make the conversion to high efficiency irrigation systems more feasible for the District's growers. FCWD lies within the Grassland Drainage Area (GDA) and is a participating agency in the Grassland Bypass Project (GBP), through which subsurface drain water generated within the region is discharged to the San Joaquin River. To manage these discharges, FCWD participated in the development of an In-Valley Drainage Solution such that no subsurface drain water leaves the Grassland Drainage Area boundary. The GBP operates under a Waste Discharge permit, which regulates the load of selenium that can be discharged by the GBP. Implementation of the Proposed Action would reduce seepage losses by approximately 336 acre-feet per year (afy), which results in a reduction of an estimated 55 pounds of selenium, 5,500 pounds of boron, and 1,700 tons of salt discharged to the San Joaquin River and Bay-Delta each year. FCWD needs to reduce its contribution to the local perched water table and subsurface drainage as a source control action in line with the In-Valley Drainage Solution as well.

Upgrading turnout structures and Pump Station 109 (PS 109) would also prevent backflows into the Delta-Mendota Canal (DMC) and provide accurate real time metering and operation flexibility to better manage an average of 25,500 afy of water deliveries through the 2nd Lift Canal.

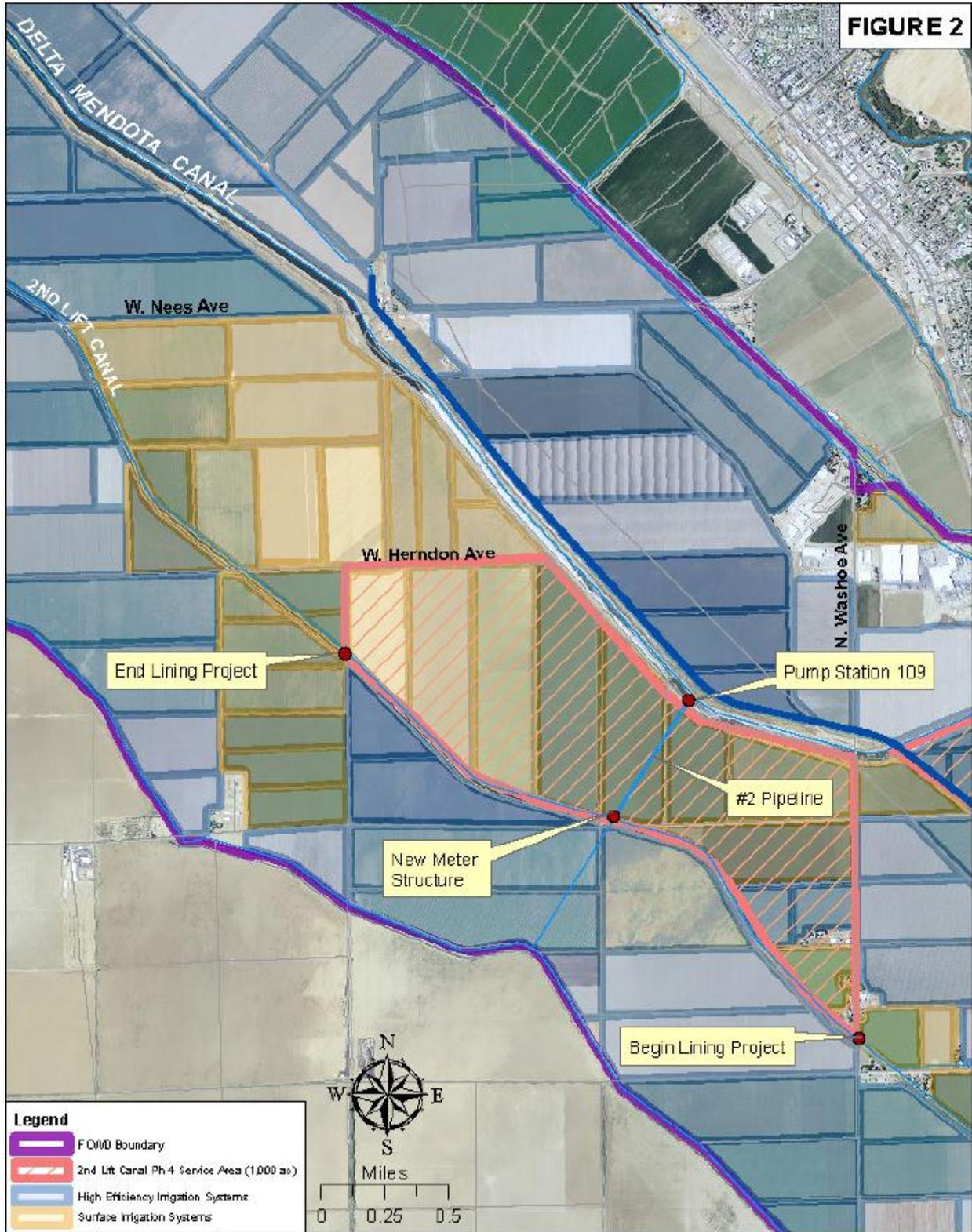
Figure 1



ENLARGEMENT



**Firebaugh Canal Water District
Location Map - 2nd Lift Canal Lining Project
Phase 4: Washoe Avenue to Douglas Avenue**



**Firebaugh Canal Water District - 2nd Lift Canal Lining Project
Phase 4 - Project Service Area**

1.2 Resources Analyzed in Detail

The range of potential impacts assesses whether lining 2.6 miles of the 2nd Lift Canal and upgrading turnout structures and PS 109 might cause potentially adverse effects on the human environment. This EA will analyze the affected environment of the Proposed Action and No Action Alternative in order to determine the potential impacts and cumulative effects to the following environmental resources:

- Water Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Cumulative Impacts

Impacts to the following resources were considered and found to be minor or absent. Brief explanations for their elimination from further consideration are provided below:

- Indian Sacred Sites: The Proposed Action is not on federal lands, and will not affect or prohibit access to and ceremonial use of Indian sacred sites.
- Indian Trust Assets (ITA): The Proposed Action does not have the potential to affect ITA (see Appendix A).
- Environmental Justice: No significant changes in agricultural communities or practices would result from the Proposed Action, other than potential changes to individual irrigation systems. These changes are not likely to have effects to any individuals or populations within the action area. Accordingly, the Proposed Action would not have disproportionately negative impacts on low-income or minority populations within the Project area.

Section 2 Proposed Action and Alternatives

2.1 No Action Alternative

The No Action Alternative would consist of Reclamation not providing grant funding to facilitate water conservation measures at FCWD. Although it is possible that FCWD may find alternative sources of funding for the Proposed Action, for the purposes of this EA, the consequence of Reclamation not funding

the Proposed Action would be no construction of the Proposed Action. The irrigation system currently in place would continue to operate. FCWD would continue to provide irrigation service to the FCWD and its users via the partially lined 2nd Lift Canal. Seepage to the groundwater basin and loading of selenium, boron, and salts to the San Joaquin River via the GBP would continue at current levels.

2.2 Proposed Action

Reclamation proposes to award a Department of the Interior CalFed Natural Resources Conservation Sciences grant to the FCWD to fund a portion of the Project. The Project would involve lining 2.6 miles of FCWD’s unlined, earthen 2nd Lift Canal with concrete from near Washoe Avenue to Douglas Avenue. The Project would also involve upgrading of 15 turnout connections and the PS 109 meter structure at the discharge pipeline and its controls. The Proposed Action would not result in a change to the acreage served by the FCWD facilities nor would the system’s capacity be increased.



Construction Activities would include:

Canal Lining:

1. Pre-Project Work: Prior to canal lining installation, the existing canal will be dewatered, and dredged under normal operation and maintenance. This is a maintenance activity which would occur even without the Project. However, it is necessary to remove the accumulated silt well before the start of construction so that it can dry out. This work will be performed with up to three excavators and one grader, and will take approximately three weeks. This work will be separate from the Project. Construction stakes will be placed along the alignment. Additionally, approximately 15 turnout headgates will be removed prior to placement of lining.
2. Compacted Embankment: The existing canal will be backfilled and compacted to the final design grade according to the drawings. Backfill material will be obtained from the existing canal bank, adjacent drainage bank, and drainage bank south of the canal with an excavator. Backfill and compaction will be performed in lifts to ensure proper soil density and moisture levels. Surveyed construction stakes will be placed along the Project alignment and final grade will be checked against those stakes. The total compacted embankment placed is estimated to be in the vicinity of 20,000 cubic yards. Three excavators, one grader, one sheep's foot roller, and one water truck will be used for this activity. High groundwater conditions are more prevalent further north, but in the unlikely event where high groundwater conditions inhibit proper grading and compaction in the canal invert, a dewatering interceptor line or soil conditioning (such as lime treating) may be used. The dewatering interceptor line would be installed in the middle of the canal alignment two feet below the design invert and would end in a small sump hole where the collected water would be pumped. Once the groundwater is in a managed condition, the interceptor would be abandoned in place and backfilled. Soil conditioning involved excavating the wet solid, placing it in a mixer using a lime treatment that forms a weak cement, and then placing it back into the subgrade. Both activities would occur within the canal and canal road footprint.
3. Canal Prism Excavation: The canal prism will be excavated with one trencher and one grader to approximately 10 feet bottom-width and 6 feet deep with 1 ½ : 1 side slopes, giving it a total width of 28 feet. Excavated material will be deposited on the canal banks and graded to form the canal road. A water truck will also be used to maintain soil moisture during this process.
4. Placement of Concrete Lining: Once the canal prism has been trimmed to design cross-section and grade with 1 ½ : 1 slopes, concrete lining will be

placed along the alignment. A slip-form sled built to match the design cross-section will be dragged along the alignment by a tractor and will be fed concrete from two ready-mix trucks which follow on both sides. The sled spreads the concrete to a uniform thickness and provides rough finish to the lining. A crew of laborers follows the sled and use trowels and floats to produce a smoother final finish. Prism excavation and lining placement may be done in sections to prevent the excavated prism from drying out or becoming oversaturated due to rain.

5. Transition Lining: Approximately 10 feet upstream and downstream of each road crossing, 4-inch-thick hand placed concrete lining will be used to transition from the design canal prism to the crossing structure. This lining will be field-fit according to the geometry and alignment of the crossing compared to the canal design prism. An excavator will be used to shape and compact the transition area and concrete lining will be hand placed by three to five laborers.
6. Turnout Connections: Approximately 15 irrigation turnout connections will be installed according to the drawings. This will involve cutting and removal of the existing lining, excavation of the turnout site with an excavator, and placement of pre-cast concrete turnout structures. Once placed, new lining will be poured to transition to the rest of the canal lining.
7. PS 109 Meter Structure: The meter structure for PS 109 at the outlet of the discharge pipeline into the 2nd Lift Canal will be a long crested weir sized to a capacity of 100 cubic feet per second (cfs), as a cast-in-place concrete structure. This will involve excavation and grading of the site, construction of forms and reinforcement and placement of concrete. Transition lining will be required to connect the unreinforced concrete canal lining to the new meter structure at the PS 109 discharge.
8. PS 109 Driver Upgrade: A variable frequency drive will be installed in the existing PS 109, located near the inlet of the discharge pipeline from the DMC, to allow District Staff to more precisely match the station flow rate with actual irrigation demands. Controls for the variable frequency drive will be integrated into the existing Supervisory Control Data and Acquisitions system. This activity involves hand tools with no ground disturbance.
9. Site Cleanup: The canal road banks will be graded to the final design, ready for use, and all construction related debris will be removed from the site. This will be done with a grader.

Ground disturbance for installation of the concrete lining, replaced turnouts, and modernized PS 109 meter structure would be limited to the canal prism. All of

the work involved with the Project would be performed in previously disturbed contexts, regularly-maintained canal infrastructure, or concrete structures. Construction activities would take a total of approximately three months, starting January 2015. If all Project activities cannot be completed by February 28, 2014, then in order to avoid the migratory bird and raptor nesting season from March 1 – August 31 Project activities will resume between October 2015 and February 2016. If the Project is segmented into two working seasons of January – February 2015 and October 2015 – February 2016, the canal lining from the crossing of Bullard Avenue to Douglas Avenue and PS 109 meter structure and driver modernization will occur in the first work season. The remaining portion of 2nd Lift Canal from Washoe Avenue to the crossing at Bullard Avenue will be lined and turnout structures updated in the second work season starting in the fall of 2015.

Section 3 Affected Environment and Environmental Consequences

3.1 No Action Alternative

The No Action Alternative would consist of Reclamation not providing grant funding to facilitate water conservation measures at FCWD. The irrigation system currently in place would continue to operate. FCWD would continue to provide irrigation service to the FCWD and its users via the partially lined 2nd Lift Canal.

3.2 Proposed Action

3.2.1 Water Resources

The FCWD's water supply is almost entirely surface water from the Delta via the DMC and Mendota Pool. The existing channel is a primary lift canal for FCWD with a capacity of 120 cfs for this reach of canal. Full water allocation is 85,000 afy in a non-critical water year and 58,000 afy in a critical (drought) year. The canal's operating season is approximately 340 days, supplying water for agricultural irrigation needs.

FCWD lies within the Grassland Drainage Area of the CalFed Solution Area, most of which is underlain with a perched saline water table. This shallow water table is managed through on-farm subsurface tile drainage systems and regional deep drains that intercept seepage from irrigation and unlined canal systems. The tile systems within the District contribute an average 4,000 AF of saline subsurface drain water to the GBP annually. According to a seepage study performed in 2012 on the FCWD's 2nd Lift Canal, the unlined portion of this

canal loses approximately 336 afy through seepage to the perched saline sink, which is high in salts, boron, and selenium, all of which are considered constituents of concern by the Central Valley Regional Water Quality Control Board. This water is not only unusable for irrigation, but also contributes to the discharge of saline subsurface drain water to the San Joaquin River system and eventually to the Sacramento – San Joaquin River Delta (Delta) through the Grassland Bypass Project (GBP).

The lining of 2.6 miles of earthen canal with concrete would reduce canal seepage by 336 afy and discourage aquatic vegetation growth, which would make the conversion to high-efficiency irrigation systems more feasible. The water conserved amounts to approximately six percent of the water conveyed by this segment of the 2nd Lift Canal, one percent of the water conveyed by the entire 2nd Lift Canal, and 0.4 percent of the District’s total annual water supply. The total 336 afy conserved will be made available to market through long standing agreements with Federal water districts and private water users within the Central Valley Project. The reduction in the amount of seepage to the local perched water table would reduce the production of subsurface drain water, and ultimately the discharge of selenium by 55 pounds per year, 1,700 tons of salt per year, and 5,500 pounds of boron per year to the Delta.

In addition, upgrading the turnout connections and the PS 109 meter structure and driver would allow for accurate measurement and improved pump operation, which would improve FCWD’s ability to manage water deliveries for the entire 2nd Lift Canal (approximately 14 miles), affecting an average of 25,500 afy (30 percent of allocation during a non-critical year). Improved water management and reduced aquatic growth in a concrete-lined canal could lead to the conversion to high-efficiency irrigation systems for FCWD’s growers.

3.2.2 Air Quality

Section 176(c) of the Clean Air Act (42 U.S.C. 7506(c)) requires that any entity of the federal government that engages in, supports, or in any way provided financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan (SIP) required under Section 110(a) of the Clean Air Act (42 U.S.C. 7401(a)) before the action is otherwise approved. In this context, conformity means that such federal actions must be consistent with a SIP’s purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants 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.

The Proposed Action lies within the San Joaquin Valley Air Basin (SJVAB), the second largest air basin in the State. Air basins share a common “air shed”, the boundaries of which are defined by surrounding topography and meteorology.

Although mixing between adjacent air basins inevitably occurs, air quality conditions are relatively uniform within a given air basin. The SJVAB experiences episodes of poor atmospheric mixing caused by inversion layers formed when temperature increases with elevation above ground, or when a mass of warm, dry air settles over a mass of cooler air near the ground.

The SJVAB lies within the management area of the San Joaquin Valley Air Pollution Control District (SJVAPCD) responsible for developing a local plan with control measures to meet or maintain the NAAQS/CAAQS. Despite years of improvements, the SJVAB does not meet all State and Federal health-based air quality standards. NAAQS and California Ambient Air Quality Standards (CAAQS) have been established for the following criteria pollutants, below which the air is considered healthy to breathe: carbon monoxide (CO), ozone (O₃), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), inhalable particulate matter between 2.5 and 10 microns in diameter (PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), and lead. The CAAQS also set standards for sulfates, hydrogen sulfide and visibility.

The SJVAB has reached NAAQS and CAAQS attainment status for all criteria pollutants except for O₃, PM₁₀ (CAAQS only), and PM_{2.5}. As a result, the emissions of most concern are O₃ (which includes precursors such as volatile organic compounds [VOC] and nitrogen oxides ([NO_x]), PM₁₀ and PM_{2.5}. Table 1 below shows the attainment status and *de minimis* threshold for general conformity for the criteria pollutants of most concern. The *de minimis* threshold is the minimum threshold for which a conformity determination must be performed, for various criteria pollutants in various areas. All Federal actions that are taken in designated nonattainment or maintenance areas are subject to the General Conformity Regulations except for those that are covered by the transportation conformity rule, associated with emissions below *de minimis* levels, and are either exempt or presumed to conform.

Table 1. SJVAB Attainment Status and *De Minimis* Thresholds for Federal Conformity Determinations

Pollutant	Attainment Status ^a	(tons/year)
VOC (as ozone precursor)	Nonattainment – Extreme	10 ^b
NO _x (as an ozone precursor)	Nonattainment – Extreme	10 ^b
PM ₁₀	Nonattainment - (CAAQS)	15 ^c
PM _{2.5}	Nonattainment	100 ^b

^a Source: <http://www.arb.ca.gov/desig/adm/adm.htm>
^b 40 CFR 93.153 ^c SJVAPCD Threshold: <http://www.valleyair.org/transportation/ceqaanalysislevels.htm>

Construction emissions would vary from day to day and by activity, depending on the timing and intensity of construction, and wind speed and direction. Generally, air quality impacts from the Proposed Action would be localized in nature and decrease with distance. Ground disturbing activities would result in the temporary emissions of fugitive dust and vehicle combustion pollutants during earthwork activities and construction equipment and haul truck engine emissions.

Standard best management practices, such as road-watering, pavement dust cleaning, and vehicle maintenance will be employed to minimize these impacts. All construction work will occur within the existing canal prism between canal roads which are surrounded by irrigated agriculture. Calculated emissions from the Proposed Action were estimated using the 2013 CalEEMOD software (version 2013.2.1), which incorporates emission factors for reactive organic gases (ROG), NO_x, CO, SO₂, and both fugitive and exhaust PM₁₀, and PM_{2.5}. Total Project emissions are presented in Table 1 below.

Table 2. Estimated Project Emissions^a

Pollutant	Construction (tons/year)
ROG/VOC	0.14
NO _x	1.35
PM ₁₀	0.41
PM _{2.5}	0.13
Carbon dioxide equivalents	106.40 (metric tons/year)

^a Source: CalEEMOD version 2013.2.1

As shown in Table 2, the Proposed Action has been estimated to emit less than the *de minimus* thresholds for NO_x, ROG/VOC as O₃ precursors, PM_{2.5}, and PM₁₀; therefore, a Federal general conformity analysis report is not required.

Notwithstanding this observation, the Proposed Action would comply with the SJVAPCD’s Regulation VIII (SJVAPCD 2012) control measures for construction emissions of PM₁₀. One of these control measures includes the use of water with all “land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities” for fugitive dust suppression. However, if dust suppression measures are not implemented, the estimated emissions for PM_{2.5} (0.21 tons/year) and PM₁₀ (0.69 tons/year) would still be well below the respective thresholds.

3.2.3 Biological Resources

The action area is the footprint of the installation and modification activities for the Proposed Action and a 200-foot buffer around those activities in which noise and dust could occur. The present land use around the action area consists of agricultural fields and orchards, farm roads and shoulders, and existing ditches and canal infrastructure. The majority of the crops grown within the FCWD consist of cotton, alfalfa, tomatoes, wheat, barley, melons, pomegranates,

pistachios, asparagus and onions. Currently the Proposed Action area is annually excavated, graded, and sprayed for maintenance. In addition, irrigation, maintenance and harvesting occur throughout the surrounding area on an annual basis.

On September 26, 2014, a list of species protected by the Endangered Species Act of 1973 (as amended), including species listed as threatened, endangered, proposed and candidate species potentially occurring within the action area was generated from the U.S. Fish & Wildlife Service’s (Service) website, California Natural Diversity Database, and other sources available to Reclamation to help determine potential Project effects on federally listed species. A California Natural Diversity Database query was run for the Proposed Action area to a 10-mile radius in order to determine what listed species may occur nearby and that may be within range of the Proposed Action area. Table 3 includes protected species potentially occurring within the Firebaugh and its surrounding Mendota Dam, Tranquillity, Coit Ranch, Broadview Farms, Oxalis, Poso Farm, and Firebaugh NE USGS 7.5-minute Quadrangles. Also included is a brief description of each species’ habitat and status, a determination of effects from the Proposed Action, and a summary of the rationale supporting the determination.

Table 3: Federally Listed Species Identified as Potentially Occurring in the Firebaugh and Immediate Surrounding USGS 7.5-minute Quadrangles

Scientific Name	Common Name	Federal Status	Effects	Potential habitat utilized by species in Proposed Action Area
INVERTEBRATES				
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	T	NE	Absent. No vernal pool habitat in the Proposed Action area. No vernal pool habitat would be disturbed. Water quality of vernal pools would not be affected.
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	T	NE	Absent. No suitable habitat in the Proposed Action area. No elderberry shrubs would be disturbed.
AMPHIBIANS				
<i>Ambystoma californiense</i>	California tiger salamander, central population	T	NE	Absent. No vernal pool habitat or other suitable wetland habitat in the Proposed Action area. No disturbance to wetland habitat or change to water quality of their habitat.
<i>Rana draytonii</i>	California red-legged frog	T	NE	Absent. Species absent from San Joaquin Valley floor and from vicinity of the Proposed Action area. No suitable habitat in the Proposed Action area. No change to wetland or riparian habitat.
REPTILES				
<i>Gambelia sila</i>	Blunt-nosed leopard lizard	E	NE	Absent. No suitable habitat in the Proposed Action area. No suitable habitat would be disturbed.

Scientific Name	Common Name	Federal Status	Effects	Potential habitat utilized by species in Proposed Action Area
<i>Thamnophis gigas</i>	Giant garter snake (GGS)	T	NE	Absent. No disturbance to aquatic habitat would occur. There are three records of GGS within 10 miles of the Project footprint, with the closest occurrences 5.24 miles away, which is within dispersal distance for GGS. See text below.
MAMMALS				
<i>Dipodomys ingens</i>	Giant kangaroo rat	E	NE	Absent. No suitable habitat in the Proposed Action area. No suitable habitat would be disturbed.
<i>Dipodomys nitratoides exilllis</i>	Fresno kangaroo rat	E, X	NE	Absent. Possibly extirpated; no records for this subspecies recorded since 1992. No suitable habitat in the Proposed Action area. No disturbance of suitable or critical habitat.
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox (SJKF)	E	NLAA	Potential Migratory Corridor. Eight records within 10 miles of the Project footprint. The closest record is 2.42 miles away, which is within dispersal distance of the Project footprint. See text below.
BIRDS				
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	PT	NE	Absent. There is no suitable habitat in the Proposed Action area. No suitable habitat would be disturbed.
<i>Buteo swainsoni</i>	Swainson's hawk	Protected by Migratory Bird Treaty Act	NE	Absent. There is no suitable habitat in the action area. A general biological survey was performed at the Project site on September 17, 2014 and found no active nests. No suitable habitat would be disturbed.

Key:

- (PE) Proposed Endangered – Proposed in the Federal Register as being in danger of extinction
- (PT) Proposed Threatened – Proposed as likely to become endangered within the foreseeable future
- (E) Endangered– Listed in the Federal Register as being in danger of extinction
- (T) Threatened – Listed as likely to become endangered within the foreseeable future
- (C) Candidate – Candidate which may become a proposed species
- (X) Critical Habitat – Critical Habitat has been designated for this species.
- (NE) No Effect – Proposed Action will have no effect on the species
- (NLAA) Not Likely to Adversely Affect – Proposed Action may affect the species, but is not likely to adversely affect.

Though occurrences of neither listed sensitive species nor migratory birds have been observed during the implementation of previous projects within the FCWD area, an analysis of potential impacts and associated avoidance measures for GGS, SJKF, and Swainson's hawk are discussed below due to the Proposed

Action area providing a potential movement corridor or nesting sites in surrounding areas that could conceivably be utilized by these species.

Giant Garter Snake

GGS inhabits agricultural wetlands and other waterways such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley (Service 1999a). Habitat requirements for GGS consist of (1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; (3) grassy banks and openings in waterside vegetation for basking; and (4) higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter (Service 2009).

Considering the following factors, GGS are not expected to be present in the Project action area:

- The action area is at least five miles away from the nearest habitat with confirmed GGS presence;
- Construction will occur during the snake's inactive period (October 2–April 30) when GGS are dormant;
- The surrounding landscape of row crops and other land uses is incapable of supporting GGS, and which has changed dramatically in recent decades with a 60 percent reduction in rice acreage since 1988;
- A Service-approved biologist, Eric Hansen, performed a GGS survey in 2012 along the FCWD's 2nd Lift Canal alignment and determined that all potential habitats within 200 feet of the project site (namely, the 2nd Lift Canal itself) are unsuitable for supporting GGS, or marginal at best (Hansen 2014);
- Features within the 2nd Lift Canal are largely isolated and generally lack the emergent aquatic and terrestrial vegetation that GGS rely upon for cover (Hansen 2014);
- A survey of the nearby FCWD 1st Lift Canal performed on July 12, 2013 determined that the canal itself and vast majority of the potential habitat within 200 feet of the canal was unsuitable for or incapable of supporting GGS (Hansen 2013);
- Hansen conducted GGS surveys 24 hours prior to construction on the 2nd Lift Canal in 2012 and no individuals were detected;
- A letter dated September 15, 2014 from Hansen confirms that, based on the series of 26 detailed photographs taken in September 2014, habitat value for the GGS along the FCWD's 2nd Lift Canal alignment has not changed since the site was first surveyed on September 28, 2012 (Hansen 2014);
- Hansen states in the 2014 letter that, “[c]onsidering the overall character of the potential habitat, the incompatible land uses immediately surrounding the [P]roject site, and the distance of the site from habitats

where [GGS] presence has been verified recently, it is highly unlikely that [GGS] are present within the [P]roject area”.

Reclamation has determined that the Proposed Action would have no effect on GGS.

San Joaquin Kit Fox

Kit fox are an arid-land-adapted species and typically occur in desert-like habitats in North America. Such areas have been characterized by sparse or absent shrub cover, sparse ground cover, and short vegetative structure. The subspecies historically ranged in alkali scrub/shrub and arid grasslands throughout the level terrain of the San Joaquin Valley floor from southern Kern County north to Tracy in San Joaquin County, and up into more gradual slopes of the surrounding foothills and adjoining valleys of the interior Coast Range. Within this range, the kit fox has been associated with areas having open, level, sandy ground that is relatively stone-free to depths of about 3 – 4.5 feet. The SJKF utilizes subsurface dens, which may extend to six feet or more below ground surface, for shelter and for reproduction. SJKF subspecies are absent or scarce in areas where soils are shallow due to high water tables, impenetrable hardpans, or proximity to parent material, such as bedrock. SJKF also do not den in saturated soils or in areas subjected to periodic flooding. Reproductive success appears to be correlated with prey abundance.

Terrestrial habitat in the FCWD is intensively managed for agriculture and the landscape is highly disturbed from land preparation, planting, irrigation and harvesting. Areas that are not cropped are kept barren and free of weeds, limiting areas for potential prey species. These conditions limit invertebrate prey, which are relatively scarce in crop fields. The Proposed Action area does not provide suitable habitat for potential prey (such as kangaroo rats) due to the high intensity agriculture practices within the FCWD and surrounding lands. During a general biological survey that was performed on September 17, 2014, no individuals or appropriate burrows were observed at the Project site (Dean 2014). As this survey’s validity has expired, the site will be re-surveyed within 30 days prior to ground disturbing activities.

Although the Proposed Project area does not contain typical foraging and denning habitat for SJKF, it could potentially be utilized as a movement corridor. Avoidance and minimization measures would be implemented by FCWD if there is detection of the species utilizing the Proposed Action area as a movement corridor.

Avoidance and Minimization Measures for SJKF

As part of the Proposed Action, preconstruction surveys for SJKF will be conducted per the Service’s 2011 *Standardized Recommendations* and 1999 *Survey Protocol* (Service 2011; Service 1999b) no less than 14 days and no more than 30 days prior to the onset of any ground or vegetation-disturbing activity

during the life of the Project. Service-approved biologists will survey the areas subject to surface disturbance and a 200-foot area outside of the Project footprint to identify habitat features and evaluate use by SJKF. If dens are present, their status will be determined by monitoring with a wildlife camera or a tracking medium for a period of three days, and mapped by the biologist (Service 1999). Written results of the preconstruction surveys will be submitted to the Service within five days after survey completion and prior to the start of ground disturbance. In addition, the following measures (derived in part from the Service's 2011 *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance*) will be implemented by FCWD to avoid or minimize potential affects to SJKF:

- If dens are located within the proposed work area, and cannot be avoided during construction activities, a Service-approved biologist will determine if the dens are occupied.
 - If occupied dens are detected at any time, all construction activities associated with the Project will be halted immediately. The Project will be placed on hold until further analysis by Reclamation staff and consultation with the Service is complete.
 - Reclamation will notify the Service immediately if a natal or pupping den is found in the survey area. The Project proponent will present the results of preactivity den searches within five days after these activities are completed and before the start of construction activities in the area.
- All Project-related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. In order to reduce impacts by Project-related vehicles, workers will observe the following:
 - Maintain a daytime speed of 20-mph throughout the site
 - Avoid construction at night and when kit foxes would be most active (30 minutes before sunset to 30 minutes after sunrise).
- Inadvertent entrapment will be prevented via the following activities:
 - Cover all excavated, steep-walled holes or trenches more than two feet deep with plywood or similar materials at the close of each working day.
 - Construct one or more escape ramps of earthen-fill or wooden planks if the trenches cannot be closed.
 - Thoroughly inspect all construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at a construction site overnight before the pipe is subsequently buried, capped or otherwise used in any way.
 - All food-related trash items will be disposed of in securely closed containers and removed at least once a week from the Project site.

An employee education program will be conducted by a qualified biologist consisting of a brief presentation in kit fox biology and legislative protection to

explain endangered species concerns to contractors, their employees, and agency personnel involved in the Project. The program will include a description of the SJKF and its habitat needs, an explanation of the status of the species and its protection under the Endangered Species Act, and a list of measures being implemented to avoid and minimize the chance of impacts to the species during Project construction and implementation. A fact sheet conveying this information will be provided to Project personnel.

Although the Proposed Action area does not contain typical foraging and denning habitat for SJKF, it is conceivable that they could utilize the FCWD as a movement corridor. With implementation of the previously described avoidance and minimization measures for the SJKF, the Proposed Action may affect, but is not likely to adversely affect the SJKF.

Swainson's Hawk

Swainson's hawks (*Buteo swainsoni*) are known to nest within the vicinity of the action area, which also contains suitable foraging habitat. The California Natural Diversity Database contains several records of Swainson's hawk within six miles from the Project site, and there are a few large trees within 200 yards of the canal alignment near Washoe Avenue that could potentially be used for nesting, but no species were observed at the Proposed Action area during the September 17, 2014 general biological survey (Dean 2014). However, there is potential for other raptors protected by the MBTA to nest in trees within the action area, mostly within the residential areas.

Project-related noise from ground-disturbance and equipment engines could have indirect impacts on Swainson's hawks and other raptors. Noise impacts could cause adults to abandon the nests too early and leave any eggs or chicks vulnerable. The project construction timeframe is January to February 28, 2015 and October 2015 up to February 2016, which are outside both the period Swainson's hawks are typically found in the Central Valley and the active nesting season (March 1 to September 15). If all Project activities cannot be completed by February 28, then work will resume after the nesting season ends in October up to February 29, 2016. If particular construction activities run into the beginning of the active nesting season and cannot be avoided, a qualified biologist will conduct pre-construction surveys for active raptor nests on and adjacent to the action area, where appropriate, within 10 days of the construction activities. Surveys for Swainson's hawk nests would extend out to 1/2 mile from the action area. If an active nest is located within 1/2 mile of the action area, then FCWD will consult with the California Department of Fish and Wildlife to identify a suitable construction-free buffer around the nest. The buffer(s) will be identified on the ground with flagging, fencing or by other easily visible means, and will be maintained and monitored by a qualified biologist until it has been determined that the young have fledged. With construction activities occurring outside of the nesting period and pre-construction surveys being taken if construction runs into

March, potential impacts to Swainson's hawk and other raptors protected by the MBTA would be avoided and not reach the level of take.

The Proposed Action would not result in a significant change in the surrounding environment and would not result in short-term or long-term adverse impacts to biological resources. However, by reducing the seepage contribution to the local perched water table, the Proposed Action would reduce the production of subsurface drain water which is currently discharged to the San Joaquin River and eventually to San Joaquin/Sacramento Delta thus providing possible habitat benefits in the surrounding area. In addition, the FCWD has completed multiple canal lining projects within the district. These previous projects objectives were successful and no impacts to species were documented.

3.2.4 Cultural Resources

The study area is located on the western side of the San Joaquin Valley. The San Joaquin River is the San Joaquin Valley's dominant hydrological feature. The river descends from the foothills northeast of Fresno and flows west across the valley floor toward the community of Mendota, where it turns and follows a north-northwest course to the Sacramento–San Joaquin Delta. Prior to the mid twentieth century and the construction of Friant Dam, which controls the river's natural runoff, the river's periodic overflow during the rainy seasons (winter and spring) created marshes and swamps along its banks. Both historical and current maps of the West Side show a dense network of sloughs on either side of the river, some of which have since been channelized.

The development of agriculture and particularly control of the Sierra Nevada's immense water resources have shaped much of the history of the San Joaquin Valley. With private efforts, like Miller and Lux and Panoche Canal Company, as well as public efforts, including the federally authorized Central Valley Project and California's State Water Project, the construction and operation of irrigation projects within the area, agricultural and irrigation is a central theme to the development of the area.

The Proposed Action would allow the expenditure of Federal funds by FCWD to line a portion of its 2nd Lift Canal with concrete and update its turnout and PS 109 structures. There would be no new construction and there are no proposed activities resulting in new ground disturbance. With supporting documentation prepared by Applied EarthWorks, Inc., Reclamation evaluated the FCWD Lift System, including the 2nd Lift Canal, for National Register of Historic Places (National Register) eligibility. Reclamation determined that the system was not eligible for inclusion in the National Register. The upgrade to PS 109 on the DMC resulted in Reclamation's determination that the DMC is a historic property, eligible as a component of the Central Valley Project, but that PS 109 falls outside of the period of significance, and is non-contributing to the significance of the canal. Reclamation determined that a finding of no adverse effects to historic properties pursuant to 36 CFR §800.5(b) is appropriate for the

undertaking. On December 8, 2014, Reclamation entered into consultation with the California State Historic Preservation Officer (SHPO) on its findings. There will be no significant impact to cultural resources for the No Action or Proposed Action alternatives. .

In the unlikely event that cultural resources or human remains are identified during the implementation of this project there may be additional considerations pursuant to Section 106 of the National Historic Preservation Act (NHPA). If inadvertent discoveries of cultural resources or human remains occur during project implementation, work shall temporarily stop and Reclamation cultural resources staff shall be contacted immediately.

3.2.5 Cumulative Impacts

According to the CEQ regulations for implementing the procedural provisions of NEPA, a cumulative impact is defined as *the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions*. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Air Quality

The Proposed Action has the potential to impact air quality through emissions of the criteria pollutants of most concern from ground disturbance and construction equipment. As described earlier, FCWD lies within the SJVAB, which currently does not meet all CAAQS and NAAQS. As a federally-funded Project, the Proposed Action must conform with the SIP's purpose, part of which is to maintain emissions below the *de minimus* threshold for federal general conformity of the four remaining criteria pollutants that the SJVAB is in nonattainment with (refer to Table 2). Because the SJVAB encompasses seven counties in addition to Fresno County, emissions from projects occurring in those counties within the SJVAB within the same general time period as the Proposed Action could lead to a cumulative impact. Additional projects proposed to be implemented simultaneously with the Proposed Action in the SJVAB that Reclamation is aware of include:

- **Fresno & Madera Counties:** Upper San Joaquin River Basin Storage Investigation Geotechnical Field Exploration (USJRBSI GFE)

The purpose of the geological field exploration is to collect feasibility-level data for the Upper San Joaquin River Basin Storage Investigation. Field exploration efforts will be focused at the proposed Temperance Flat Dam alignment at RM 274 and along the diversion tunnel alignment. Seven drill holes will be drilled to collect information that will be used to determine if geologic conditions at RM 274 are suitable to construct Temperance Flat Dam. Construction is currently underway through December 2014. Emissions from this project were calculated with the 2013 CalEEMOD software and are presented in Table 4 below.

- **Stanislaus, Merced, and Fresno Counties:**

- Central California Irrigation District (CCID) East Ditch and Poso Canal Reservoirs Project
 Reclamation awarded CCID with grant funding for a portion of the district’s project to construct two separate regulating reservoirs complete with inlet and outlet pump stations with piped discharges and Supervisory Control and Data Acquisition system integrated controls. The East Ditch Reservoir is expected to occupy no more than 37.5 acres. The Poso Canal Reservoir is expected to occupy approximately 48 acres. Diversion facilities would be constructed at each reservoir as well. Construction is expected to start as soon as permitted and most likely occur during the winter when agricultural activities have ceased and irrigation canals are dry. Construction activities would take approximately 12 months to complete over a two-year period. Emissions from this project were calculated with the 2011 CalEEMod software and are presented in Table 4 below.
- CCID Amaral System Improvements Project
 Reclamation awarded CCID with grant funding for a portion of the district’s project to address the major deficiencies of the existing Amaral System and provide a new facility with the capacity, control and reliability necessary to eliminate operational spills and to encourage growers to install high-efficiency irrigation systems. The project will replace portions of the Amaral System with a new linear reservoir and concrete-lined ditch or pipeline to provide a larger volume for storage, construct two new small pump stations, and install a Supervisory Control and Data Acquisitions system. The project will result in 487 afy of water conserved. Construction is expected to occur October 2014 through February 2015. Emissions from this project were calculated with the 2011 CalEEMod software and are presented in Table 4 below.

Table 4. Estimated Cumulative Mitigated Project Emissions

Pollutant	FCWD tons/year ^a	USJRBSI GFE tons/year ^{b&c}	CCID East Ditch and Poso Canal Reservoirs Project tons/year ^d	CCID Amaral System Improvements Project tons/year ^e	Total tons/year
ROG/VOC	0.14	0.04	0.80	0.13	1.11
NO _x	1.35	0.37	9.40	1.24	12.36

PM ₁₀	0.41	0.79	4.80	0.40	6.40
PM _{2.5}	0.13	0.10	1.20	0.13	1.56
Carbon dioxide equivalents	106.40 metric tons/year	31.52 metric tons/year	887.90 metric tons/year	98.39 metric tons/year	1124.21 metric tons/year

^a Source: CalEEMod Version 2013.2.1

^b Estimated Emissions from whole project were overestimated and included activities that occurred in different time frames not to be included for this air quality analysis, therefore 25 percent of those estimates were obtained and applied for this cumulative impacts analysis.

^c Source: Meier 2014: 11

^d Source: Hatleberg 2014b: 11

^e Source: Hatleberg 2014a: 11

As shown in Table 4, the USJRBSI GFE and two CCID projects have been estimated to individually emit less than the *de minimus* thresholds for NO_x and ROG/VOC as O₃ precursors, PM_{2.5}, and PM₁₀. In combination with FCWD's Project emissions, the total for these criteria pollutants are still below the *de minimus* thresholds, with the exception of NO_x. Cumulatively, there would be an additional 12.36 tons/year of NO_x emissions added to the SJVAB. The baseline emissions trend for NO_x in the SJVAB is 144,832 tons/year (396.8 tons/day) (Ramalingam 2004: 3); therefore, the additional NO_x emissions from the conservation projects are discountable). A Federal general conformity analysis report is not required.

Greenhouse gas (GHG) impacts are considered to be cumulative impacts since any increase in greenhouse gas emissions would add to the existing inventory of gases that could contribute to climate change. The estimated GHG emission due to temporary Project construction activities is 106.40 metric tons of carbon dioxide equivalents. There are no on-going operational emissions from the Project. Since the amount of GHGs emitted from the Proposed Project is well below 25,000 metric tons/year, no report is required to be submitted to the U.S. Environmental Protection Agency and California Air Resources Board.

Surface Water Resources

The Proposed Action has the potential to impact surface water availability in the Fresno and San Joaquin Rivers due to additional water conservation projects on connected waterways.

The San Joaquin River Exchange Contractors (includes CCID) historically diverted water from the San Joaquin River to 240,000 acres of irrigated land in the San Joaquin Valley. In 1939, they entered into contracts with Reclamation to exchange their river water for Central Valley Project water delivered from the Delta-Mendota Canal and/or other works or sources of supply (called substitute water). Water for the Delta-Mendota Canal is diverted from the Delta at the federal C.W. "Bill" Jones Pumping Plant. The Exchange Contractors divert water from the Delta-Mendota Canal and the Mendota Pool, and from the San Joaquin River downstream of the Mendota Pool.

CCID is a member district of the Exchange Contractors and its conservation projects either currently undergoing construction or proposed to occur in combination with the Proposed Action could lead to cumulative impacts. Water delivered through FCWD's 2nd Lift Canal is diverted from the Mendota Pool, to which the San Joaquin River feeds, through Fresno Slough and drains further north back into wetland channels that meander through agricultural operations and wildlife areas north to the San Joaquin River. The canal lining and structure updates on this canal would conserve approximately 336 afy and reduce water diversions from Mendota Pool by that amount. The 336 afy conserved in the Mendota Pool could remain part of the San Joaquin River system and be used by a different Exchange Contractor or offset some of the water that would not return to the San Joaquin River due to the water conserved by CCID's projects.

CCID diverts its water from the Delta-Mendota Canal through the Main Canal, Outside Canal, Helm Ditch and other facilities. CCID drain water flows through various channels in agricultural areas and wildlife areas back to the San Joaquin River. The East Ditch and Poso Canal Reservoirs Project is expected to capture and reuse up to 10,000 afy of operational spill and drain water that would otherwise have been discharged to Salt Slough (if not diverted prior), and ultimately to the San Joaquin River. The Amaral Systems Improvement Project is expected to conserve 487 afy as well.

The Proposed Action would conserve 336 afy, which would further reduce returns to the San Joaquin Rivers accordingly. The total amount of water conserved by CCID's and FCWD's conservation projects would equal approximately 11,000 afy. The return flow from these water districts leading to the San Joaquin Rivers could be reduced by 11,000 afy. Although spill and drain water from the corresponding water districts would be reduced and could no longer return to relative water systems, water conserved from the associated projects would provide additional allocations stored behind federal dams for other users and remain part of the San Joaquin River system.

Section 4 Consultation and Coordination

4.1 Public Review Period

Reclamation intends to sign a Finding of No Significant Impact for this Project, and will make the EA available for a 15-day period beginning December 22, 2014. All comments will be addressed in the Finding of No Significant Impact. Additional analysis will be prepared if substantive comments identify impacts that were not previously analyzed or considered.

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

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

In a memo dated September 22, 2014, Reclamation requested written concurrence from the Service that the Proposed Action is not likely to adversely affect the SJKF. The Service concurred with Reclamation's determination in a memo dated October 31, 2014.

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

The NHPA of 1966, as amended (16 USC 470 et seq.), requires that federal agencies give the Advisory Council on Historic Preservation an opportunity to comment on the effects of an undertaking on historic properties, properties that are eligible for inclusion in the 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.

Based on review of the available information, Reclamation initiated consultation with the SHPO on the finding of no adverse effect to historic properties pursuant to 36 CFR § 800.5(b) on December 08, 2014. Consultation with SHPO is ongoing and will be completed prior to the completion of the FONSI.

Section 5 References

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Appendix A – ITA Determination

9/8/2014 DEPARTMENT OF THE INTERIOR Mail - ITA Request: Firebaugh Canal Water District 2nd Lift Canal Lining Phase 4 - Washoe to Douglas Avenue



Aviles, Alexandra <aaviles@usbr.gov>

ITA Request: Firebaugh Canal Water District 2nd Lift Canal Lining Phase 4 - Washoe to Douglas Avenue

RIVERA, PATRICIA <privera@usbr.gov>

Mon, Sep 8, 2014 at 1:35 PM

To: "Aviles, Alexandra" <aaviles@usbr.gov>, Kristi Seabrook <kseabrook@usbr.gov>

Alex,

I reviewed the proposed action to award a Department of the Interior DOI CalFed Natural Resources Conservation Sciences grant to the FCWD to fund a portion of the Project. The Project would involve lining 2.6 miles of FCWD's unlined, earthen 2nd Lift Canal with concrete from near Washoe Avenue to Douglas Avenue. The Project would also involve the upgrading of 15 turnout connections and the Pump Station 109 meter structure at the discharge pipeline and its controls.

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

Patricia Rivera
Native American Affairs Program Manager
US Bureau of Reclamation
Mid-Pacific Region
2800 Sacramento, California 95825
(916) 978-5194

Kristi please log in. No further action. Thanks