Environmental Assessment/Initial Study

South Valley Water Banking Authority
Modified Pixley Groundwater Banking Project

December 2017

Mission Statements

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated 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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Abbreviations and Acronyms

Act	San Joaquin River Settlement Act
AF	Acre Feet
AFD	Acre Feet per Day
AFY	Acre Feet per Year
APE	Area of Potential Effects
ARB	California Air Resources Board
ASTM	American Society for Testing and Materials
Authority	South Valley Water Banking Authority
Bank Partners	Potential Project Partners
Bgs	Below ground surface
BMPs	Best Management Practices
CARB	California Air Resources Board
CDC	California Department of Conservation
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CH_4	Methane
CHRIS	California Historical Resources Information System
CNDDB	California Natural Diversity Database
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CRHR	California Register of Historical Resources
CVP	Central Valley Project
DBH	Diameter at Breast Height
DCP	Dust Control Plan
DEID	Delano-Earlimart Irrigation District
DFIRM	Digital Flood Insurance Rate Map
District	Tulare Irrigation District
DOC	Department of Conservation
DPM	Diesel-Exhaust Particulate Matter
DWR	Department of Water Resources
EA/IS	Environmental Assessment/Impact Study
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FKC	Friant-Kern Canal
FMMP	Farmland Mapping and Monitoring Program
FWCA	Fish and Wildlife Coordination Act
GHG	Greenhouse Gases
GSA	General Services Administration
GSP	Groundwater Sustainability Plan
HP	Horse Power
IPac	U.S. Fish and Wildlife Service's Information for Planning and Conservation
ITA	Indian Trust Assets

KDWSD	Kaweah Delta Water Conservation District
Ldn	day/night average noise level
LOA	Live Oak Associates, Inc.
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Level
MND	Mitigated Negative Declaration
mg/L	Milligrams per Liter
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRDC	Natural Resources Defense Council
NRHP	National Register of Historic Places
PEIS/R	Program Environmental Impact Statement/Impact Report
PID	Pixley Irrigation District
PM	Particulate Matter
PM_{10}	Particulate Matter Less Than 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Less Than 2.5 Microns in Diameter
QSD	Qualified SWPPP Developer
QSP	Qualified SWPPP Preparer
Reclamation	United States Bureau of Reclamation
ROD	Record of Decision
ROG	Reactive Organic Gases
RWQCB	Regional Water Quality Control Board
SAGBI	Soil Agricultural Groundwater Banking Index
SCADA	Supervisory Control and Data Acquisition
SF	Square Feet
SGMA	Sustainable Groundwater Management Act
SHPO	State Historic Preservation Officer
SJKF	San Joaquin kit fox
SJRRP	San Joaquin River Restoration Project
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TID	Tulare Irrigation District
U.S.	United States
USBR	United State Bureau of Reclamation
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Section 1 Introduction

1.1 Background

The South Valley Water Banking Authority (Authority) is a Joint Powers Authority between Pixley Irrigation District (PID) and Delano-Earlimart Irrigation District (DEID). The Authority is proposing to implement the Pixley Groundwater Banking Project (Proposed Action/Proposed Project, hereafter, "Project"). Regional vicinity and Project features and Area of Potential Effect (APE) are shown on Figure 1-1: Regional Vicinity Map and Figure 1-2: Project Features and Area of Potential Effect Map**.**

In March of 2016 the Authority circulated the South Valley Water Bank Authority Pixley Groundwater Banking Project joint Draft Environmental Assessment/Initial Study-Mitigated Negative Declaration (EA/IS) for public review and comment. Upon consideration of comments received, the Authority determined certain modifications to the Project could be made that would be responsive to concerns raised and beneficial towards reducing potential impacts identified in the Draft EA/IS.

Therefore, this revised EA/IS evaluates the Project as modified. The modified Project includes the elements of the original Project plus the modifications, as further described in Section 2.2.

The Authority is proposing to finance, manage, construct, operate, and maintain a 30,000 acre-feet per year (AFY) dry-year return water bank facility, with total groundwater storage availability of 90,000 AF. The Project, as modified, includes an additional 480 acres of potential recharge basins for a total of approximately 1,012 acres included in the study area, within which up to 800 acres (likely within a range of 500-800 acres) of recharge basins would be constructed, with a total of 16 recovery wells distributed within the boundaries of the recharge basin areas. (Figure 1-2: Project Features and Area of Potential Effect). Water would be conveyed to these new recharge basin facilities via new turnout and pipelines from the Friant-Kern Canal (FKC). Figure 1-2 shows the facilities associated with the Project. Alternatively, up to five (5) of the sixteen (16) recovery wells could end up being developed in the 3,500-acre in-lieu area if beneficial and consistent with the Sustainable Groundwater Management Act (SGMA), along with appurtenant grower turnouts, related control facilities, and connecting pipeline to the mainline along Avenue 80 to facilitate return of banked groundwater to the FKC.

In 1988, a coalition of environmental groups, led by the Natural Resources Defense Council (NRDC), filed a lawsuit challenging renewal of long-term water service contracts between the United States and Central Valley Project (CVP) Friant Division (Friant Division). After more than 18 years of litigation, *NRDC, et al., v. Kirk Rodgers, et al.,* a settlement was reached (Settlement). In September of 2006, the Settling Parties, including NRDC, Friant Water Users Authority (now represented by Friant Water Authority), and the U.S. Departments of the Interior and Commerce, agreed on the terms and conditions of the Settlement, which was subsequently approved by the U.S. Eastern District Court of California on October 23, 2006. The Settlement establishes two primary goals:

- Restoration Goal – To restore and maintain fish populations in "good condition" in the main stem of the San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish.

- Water Management Goal – To reduce or avoid adverse water supply impacts on all of the Friant Contractors that may result from the Interim Flows and Restoration Flows provided for in the Settlement.

The Secretary of the Interior is authorized and directed to implement the terms and conditions of the Settlement in the 2009 San Joaquin River Settlement Act (Act), included in Public Law 111-11. The San Joaquin River Restoration Program (SJRRP) is implemented by the U.S. Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), State of California Department of Water Resources (DWR), and State of California Department of Fish and Wildlife (CDFW), in coordination with the Natural Resources Defense Council (NRDC), and Friant Water Authority (FWA).

The SJRRP Programmatic Environmental Impact Statement/ Report (PEIS/R) was finalized in July 2012 and the corresponding Record of Decision (ROD) was issued on September 28, 2012 (Reclamation 2012a and 2012b) and the Notice of Determination was completed in 2012 as well. The PEIS/R analyzed at a project-level the reoperation of Friant Dam to release Interim and Restoration Flows to the San Joaquin River, making water supplies available to Friant Division long-term contractors at a pre-established rate, and the recapture of Interim and Restoration Flows at existing facilities within the Restoration Area and the Delta.

Part III of Title X, Subtitle A of Public Law 111-11 (Part III) authorizes Reclamation to provide financial assistance to local agencies within the Central Valley Project (CVP) of California for the planning, design, environmental compliance, and construction of local facilities to bank water underground, or to recharge groundwater to reduce, avoid, or offset the quantity of expected water supply impacts to Friant Division long-term contractors caused by Restoration flows authorized by Public Law 111-11. Because the Part III Guidelines were in development at the time of preparation of the SJRRP PEIS/R, potential actions in accordance with Part III were not included as an element of any of the alternatives analyzed in the PEIS/R. In accordance with Part III, Reclamation is proposing to provide partial funding for construction of the Project. Therefore, Reclamation is the lead agency in accordance with the National Environmental Policy Act (NEPA) for the preparation of this EA/IS. The Authority is the lead agency in accordance with CEQA for the preparation of this EA/IS. This EA/IS has been prepared to meet the requirements of both NEPA and CEQA.

1.2 Need for the Proposal

The release of Restoration Flows has and will continue to reduce annual surface water deliveries to Friant Division water contractors, placing greater stress on the region's groundwater basins and the region's agricultural economy. The purpose of the proposed action is to contribute to achieving the Settlement Water Management Goal by reducing, avoiding, or offsetting the quantity of expected water supply impacts to Friant Division long-term contractors caused by the

release of Restoration Flows by facilitating groundwater banking and recharge activities by local districts in accordance with Part III.

Key objectives of the Project include:

- Improve water supply reliability to prevent loss of permanent plantings during drought conditions.
- Provide flexibility to local agencies seeking to comply with California's 2014 SGMA.
- Utilize geologically and hydrologically conducive lands within the PID to operate a groundwater bank.
- Utilize a site that is proximal to the FKC.
- Provide opportunities for bank partners to bank water in wet years, including floodwater, Section 215 water[1], Recovered Account water, unreleased Restoration Flows, or Class 1[2] and 2[3] allocations that would otherwise leave the Friant Division service area as unusable flood water; and recover water in normal and dry years to reduce impacts to water users from implementation of the Settlement;
- Provide a dry-year water supply to bank partners to prevent fallowing, crop loss, or municipal water supply reductions and provide Reclamation an opportunity to participate in banking water as needed for the SJRRP).
- Provide water supply benefits to PID by the construction of additional water distribution facilities, increases in groundwater recharge through a 10-percent "leave-behind" allocation that is applied to each volume of water recharged to the Bank, and generally improving groundwater conditions in PID. PID is directly impacted by the implementation of the SJRRP, as it relies heavily on purchasing surplus Friant CVP water when available from Reclamation and from other Friant Contractors which has and will continue to be reduced in availability as a result of implementation of the San Joaquin River Restoration Settlement;
- Reduce subsurface groundwater outflow from DEID and other neighboring long-term Friant contractors into PID through improved groundwater conditions resulting from storage of banked water and groundwater replenishment.

[1] Section 215 water is defined under Section 215 of the Reclamation Reform Act of 1982 (RRA), as unstorable irrigation water to be released due to flood control criteria or un-managed flood flows. Section 215 water is exempt from the full cost provisions of the RRA. Section 215 Water Rates are the rates per acre/foot assessed on contractors who subsequently "take" Section 215 Water. M&I "spill" water has essentially the same characteristics as 215 water, but is referenced differently as the RRA provides only for unstorable irrigation. The following paragraphs just reference Section 215 water, but the comments apply to M&I "spill" water as well. Source: http://www.usbr.gov/mp/cvpwaterrates/rate_process/special_rates.html#special_215_rates

[2] Friant Division Class 1: The supply of water in or flowing through Millerton Lake which, subject to the contingencies described in the water service or repayment contracts, will be available for delivery from Millerton Lake and the Friant-Kern and Madera Canals as a dependable water supply during each Contract Year.

[3] Friant Division Class 2: The supply of water which can be made available subject to the contingencies described in the water service or repayment contract for delivery from Millerton Lake and the Friant-Kern and Madera Canals in addition to the supply of Class 1 water. Because of its uncertainty as to availability and time of occurrence, such water will be undependable in character and will be furnished only if, as, and when it can be made available.

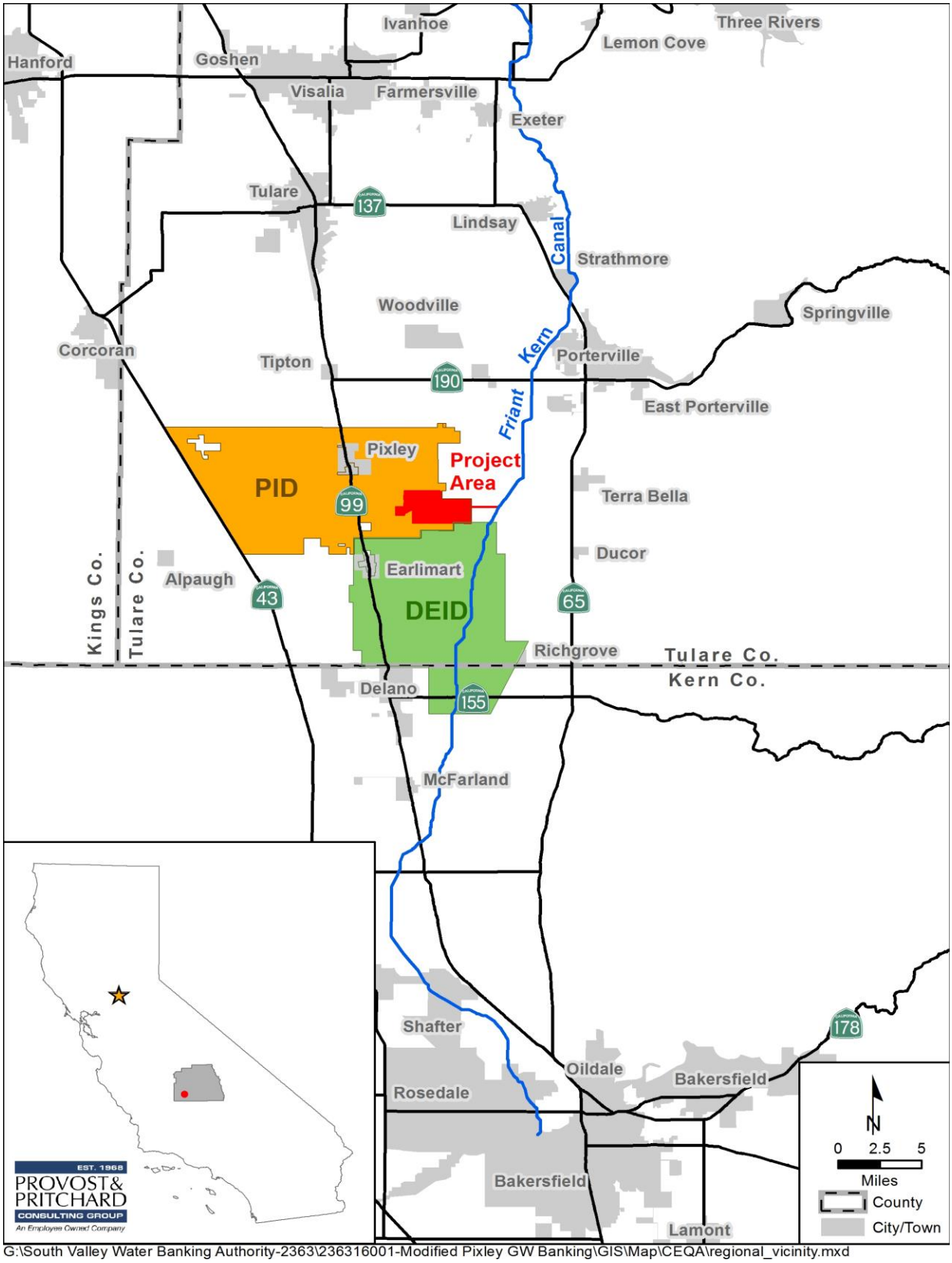

Figure 1-1: Regional Vicinity Map

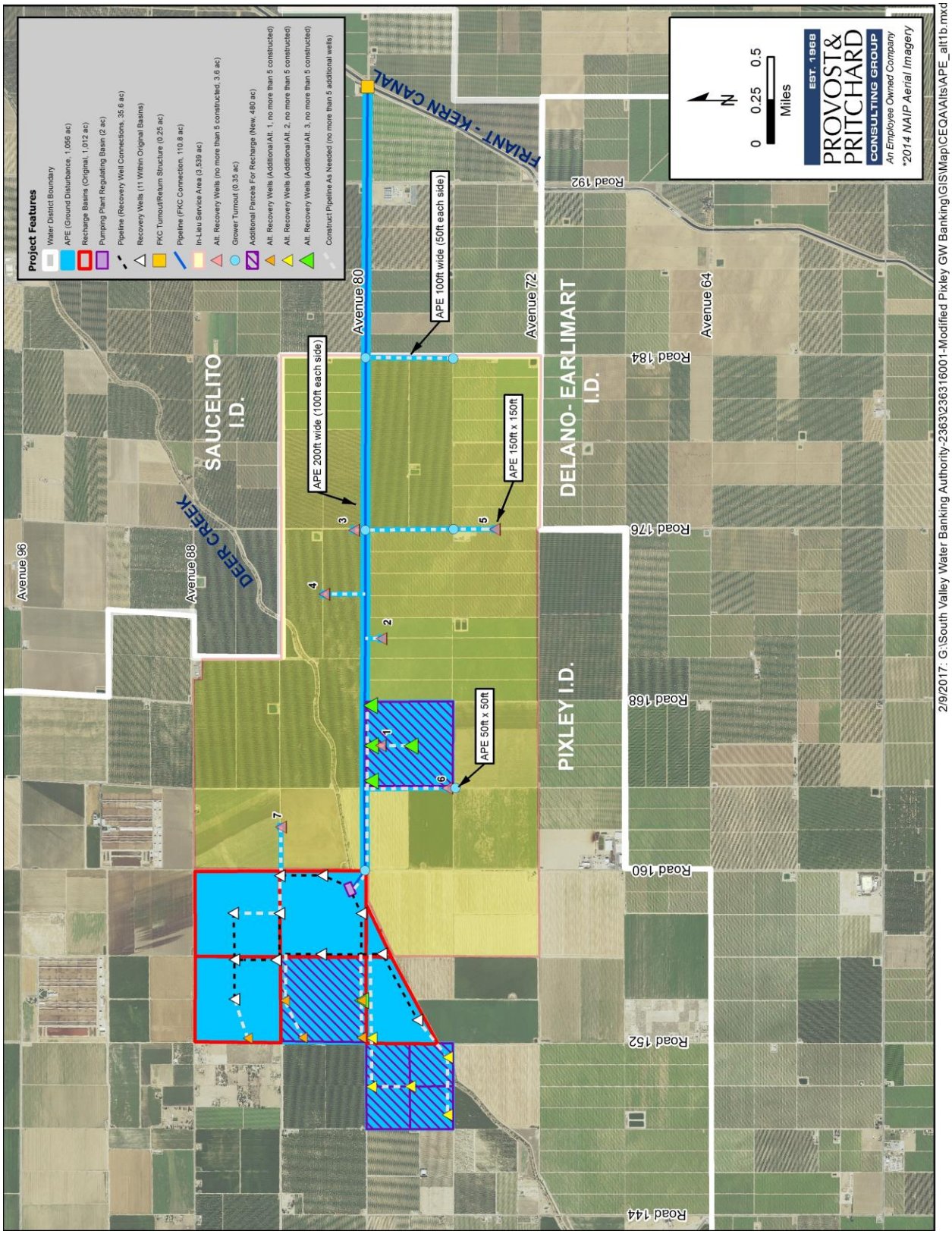

Figure 1-2: Project Features and Area of Potential Effect

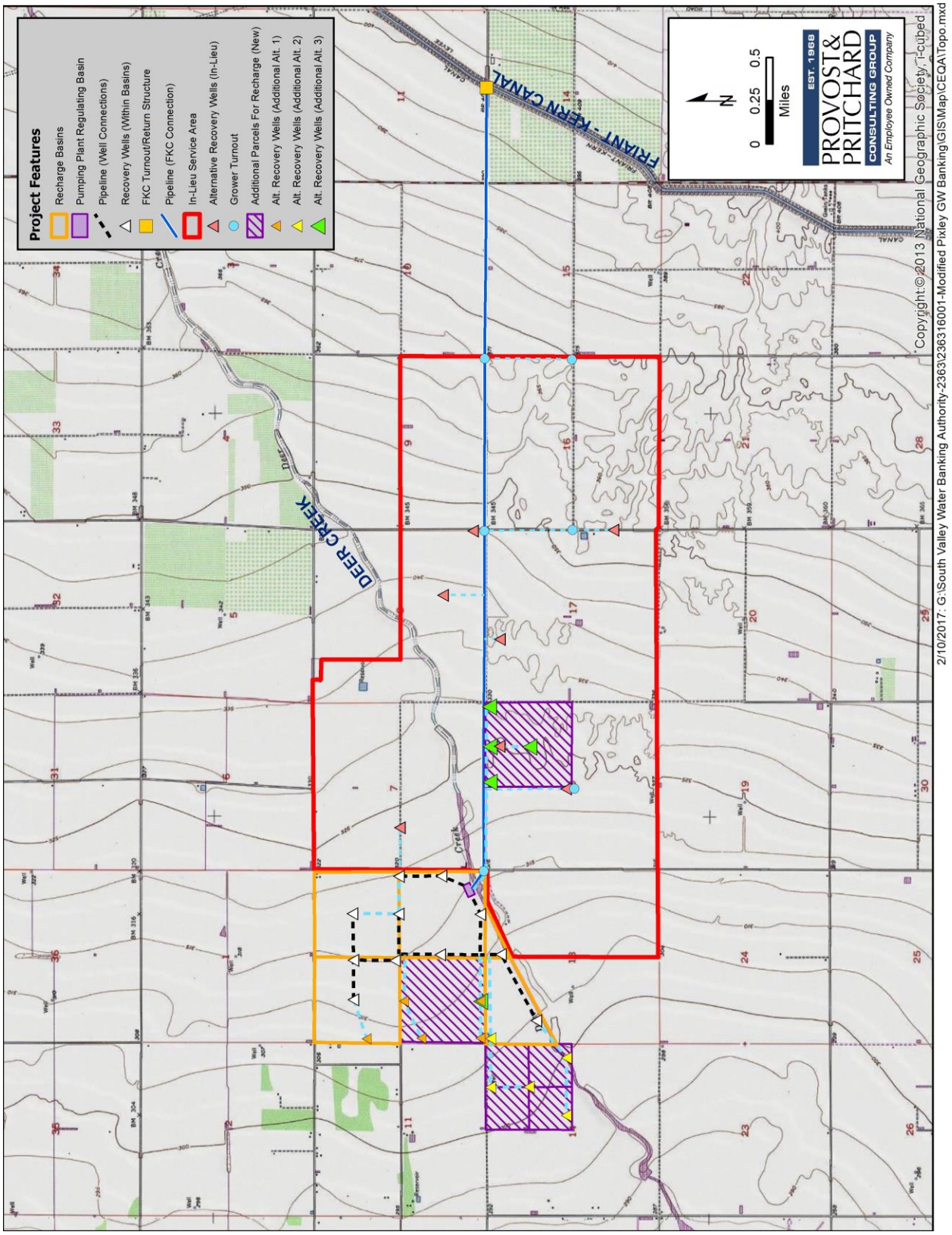

Figure 1-3: USGS Topological Map, Sausalito School QUAD

Section 2 Alternatives

This EA considers two possible alternatives: the No Action/No Project Alternative and the Project. The No Action Alternative reflects future conditions without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment in accordance with NEPA. For purposes of CEQA analysis, the No Project Alternative is the same as existing conditions.

2.1 No Action/No Project Alternative

Under the No Action Alternative, the continued demand for water to meet irrigation supplies would force agricultural water users to rely more heavily on groundwater pumping causing further decline in groundwater levels within the PID service area. Under current groundwater conditions and trends, continued reliance on groundwater in the absence of water banks or similar projects, would cause water levels to further decline. This would result in higher pumping costs, potential loss of wells, and exacerbation of overdraft conditions, including subsidence, on local and regional scales. As the CVP Friant system allocates more water to the SJRRP, the amount of water available to Friant contractors would be reduced during all years that Restoration Flows are allocated for release from Friant Dam. This reduction would decrease the availability of wet year recharge water and dry year irrigation supplies.

Under the No Project Alternative without added capacity for recharge, PID would be limited to only its current facilities which would be solely dependent upon groundwater supplies.

PID and DEID service areas overlie the greater San Joaquin Valley Groundwater Basin that is subject to the SGMA enacted by the State of California in 2014. The district service areas occur within the Tule Subbasin, Department of Water Resources (DWR) Basin No. 5-22.13 (Bulletin 118, Update 2016). The Tule Subbasin was identified by DWR as having conditions of critical overdraft[4]. Local agencies within the Tule Subbasin have formed Groundwater Sustainability Agencies (GSA) charged with preparation of a Groundwater Sustainability Plan (GSP), or multiple coordinated plans. A GSP must include "[m]easurable objectives, as well as interim milestones in increments of five years, to achieve the sustainability goal in the basin within 20 years of the implementation of the plan[5]." PID and DEID have been designated as exclusive GSAs for their respective service areas[6] and have the authorities and powers granted under SGMA to conduct a broad range of actions to sustainably manage groundwater resources within the Tule Subbasin.

The No Action/No Project Alternative would result in loss of a new opportunity to capture and conserve water sources for the Tule Subbasin and elsewhere for participants in the Project. Under SGMA, the PID and DEID GSAs would need to develop multiple projects of similar scale and scope to achieve groundwater sustainability within their service areas and, through

[4] DWR Website Accessed November 2016: water.ca.gov/groundwater/sgm/pdfs/COD_BasinsTable.pdf
[5] Water Code § 10727.2(b)(1)
[6] DWR Website Accessed December 2016: http://water.ca.gov/groundwater/sgm/gsa_table.cfm

coordination with other GSAs, within the Tule Subbasin. Mitigation of overdraft in San Joaquin Valley subbasins will require multiple actions including reductions in groundwater pumping and development of conjunctive use projects using alternate supply sources. A consequence of constraints on groundwater pumping where alternate supplies cannot be developed, such as under the Project, is reduced agricultural activity. Thus, in the absence of other viable recharge sites and conjunctive use concepts, the No Action/No Project Alternative would incrementally reduce existing agricultural activity compared to the Project.

2.2 Project Alternative

Under the Project, Reclamation would be responsible for the following Federal actions:

- Provide partial funding (up to a 50% cost share with the Authority) through the Part III Program to the Authority for constructing the proposed Pixley Groundwater Banking Project.
- Approve the Pixley Groundwater Bank as an acknowledged facility for the banking of CVP water as authorized by the Central Valley Project Improvement Act, and as allowed by certain Federal contracts.
- Issue permits and/or approvals for installation, operation, and maintenance of a new turnout along the Friant-Kern Canal.
- Issue temporary and long-term land use authorizations for installation, operation, and maintenance of a new pipeline within Reclamation Right-of- Way that would connect to the new turnout.
- Issue Warren Act Contract(s) and/or agreement(s) for introduction and conveyance of non-CVP water into the Friant-Kern Canal pending completion of additional environmental review, as applicable.

Any banking action that includes CVP water will require Reclamation's approval in accordance with Reclamation's then current Water Baking Guidelines. Further environmental compliance documentation, specific to the banking action, will be completed as necessary. Any banking action that includes non-CVP water being conveyed via Reclamation facilities will require Warren Act Contract(s) and additional environmental compliance documentation will be completed as necessary.

The Project includes the construction, operation, and maintenance of a water bank with a total storage capacity of 90,000 AF. The annual recharge capacity of the Bank is 45,000 AF with an annual extraction rate of 30,000 AF. The Bank has the potential to receive and recharge CVP water in addition to other non-CVP water sources. Water would first be delivered to the Bank and then later returned, with the exception of a required 10% leave-behind, to partners via the FKC (as discussed in this EA/IS at Sections 1.2, 2.2, 3.2 and 3.3). Water returned to the FKC may be composed of both CVP and non-CVP water and must meet Reclamation's then-current water quality requirements prior to introduction (USBR, 2008) (Appendix I of Attachment 1). Project elements include:

1) Recharge Basin facility of up to 800 acres and cessation of any active agricultural activity (e.g. cultivated crops and orchards) within the basin facilities.

2) A well field of 16 recovery wells within the Recharge Basin boundaries,

3) A new up to 60-inch diameter turnout from the west bank of the FKC (subject to issuance of a MP620 Permit by Reclamation, a Section 404 Permit under the Clean Water Act (CWA) by the U.S. Army Corps of Engineers, a Section 401 Certification under the CWA by the Central Valley Regional Water Quality Control Board, and a NPDES Permit by the Central Valley Regional Water Quality Control Board, together with any related licenses),

4) A 4.5-mile long, up to 60-inch diameter (depending on final engineering determinations), bi-directional concrete main pipeline from the new turnout to the in-lieu service area and recharge area (subject to issuance of a Lake and Streambed Alteration Agreement under section 1603 of the CA Fish and Game Code for the pipeline crossing under Deer Creek),

5) An approximately 2-acre pumping plant and regulating basin,

6) Approximately 14 acres of grower turnouts, related control facilities, connecting pipelines, and up to 5 groundwater recovery wells within an approximately 3,500-acre in-lieu service area,

7) Implementation of a groundwater pumping and groundwater quality monitoring program,

8) The creation of a Technical Committee charged with monitoring of the recharge and recovery operations for the Authority for the purposes of assessing performance and reporting results to stakeholders.

Collectively, these actions would allow the Authority to capture and conserve water, improve regional groundwater recharge efforts, and implement groundwater monitoring. Further, these actions serve to partially satisfy the Water Management Goal of the Settlement, provide for effective water bank operation, and benefit local groundwater management in an area identified by the State as being in a condition of critical overdraft.

The Project facilities would be located east of SR 99 and west of the FKC in the PID, southeast of the community of Pixley within an agricultural region of the mid-southern portion of Tulare County, CA (see Figure 1-1: Regional Vicinity Map and Figure 1-2: Project Features and Area of Potential Effect).

The basins would consist of cells of 40 to 80 acres each and excavated to a depth of approximately 3-4 feet below natural grade with 1- to 2-foot high berms built up above natural grade. All water stored in the recharge basins would sit below surrounding natural grade. The recharge basins have an expected ability to direct the recharge approximately 45,000 AF per year to the groundwater aquifer.

The Authority intends to operate a total of 16 recovery wells dispersed throughout the basin area and potentially the in-lieu area if that feature is implemented in the future. Although the 16 total new wells would have the capability to recover approximately 34,000 AF of previously banked groundwater over an eight-month period, the operational obligation of the Project is limited to 30,000 AFY. The recharge basin facility area would also include an approximately 2-acre

regulating basin area and pumping plant with associated electrical and control facilities to boost water recovered from the recovery wells to the FKC, to meet scheduled irrigation deliveries of CVP contractors and banking partners.

An approximately 3,500-acre in-lieu recharge component would consist of approximately 14 acres of ground disturbance associated with construction of new grower turnouts, related control facilities, connecting pipelines and up to five (5) groundwater recovery wells. The in-lieu service area is estimated to have an effective recharge capacity of up to approximately 6,500 AFY.

Water returned to the FKC may be composed of both CVP and non-CVP water and must meet Reclamation's then-current water quality requirements prior to introduction (USBR, 2008) (Appendix I of Attachment 1). Any non-CVP water introduced into the FKC would require a Warren Act Contract from Reclamation and supplemental environmental documentation, as necessary. Any banking of CVP water would also require approval from Reclamation and applicable environmental review. Potential banking participants with existing diversion points along the FKC are listed in Table 2-1.

Table 2-1 Potential Banking Participants with Existing Diversion Points along the FKC

Friant Division Contractors	Friant Division Contractors
Arvin-Edison Water Storage District	Chowchilla Water District
City of Fresno	City of Lindsay
City of Orange Cove	County of Madera
Delano-Earlimart Irrigation District	Exeter Irrigation District
Fresno County Waterworks #18	Fresno Irrigation District
Garfield Water District	Gravelly Ford Water District
Hills Valley Irrigation District	International Water District
Ivanhoe Irrigation District	Kaweah Delta Water Conservation District
Kern-Tulare Water District	Lewis Creek Water District
Lindmore Irrigation District	Lindsay-Strathmore Irrigation District
Lower Tule River Irrigation District	Madera Irrigation District
Orange Cove Irrigation District	Porterville Irrigation District
Saucelito Irrigation District	Shafter-Wasco Irrigation District
Southern San Joaquin Municipal Utility District	Stone Corral Irrigation District
Tea Pot Dome Water District	Terra Bella Irrigation District
Tri-Valley Water District	Tulare Irrigation District
Cross Valley Contractors	**Cross Valley Contractors**
County of Fresno[1]	County of Tulare[2]
Hills Valley Irrigation District	Kern-Tulare Water District (previously combined with Rag Gulch Water District)
Lower Tule River Irrigation District	Pixley Irrigation District
Tri-Valley water District	
[1]Including its subcontractors: Fresno County Service Areas #5, #10, and #14 and Fresno County Water Works #34. [2]Iincluding its subcontractors: Alpaugh Irrigation District, Atwell Island Water District, City of Lindsay, Smallwood Vineyards, Hills Valley Irrigation District, Saucelito Irrigation District, Stone Corral Irrigation District, Strathmore Public Utilities District, Styrotek, Inc., and City of Visalia.	[1]Including its subcontractors: Fresno County Service Areas #5, #10, and #14 and Fresno County Water Works #34. [2]Iincluding its subcontractors: Alpaugh Irrigation District, Atwell Island Water District, City of Lindsay, Smallwood Vineyards, Hills Valley Irrigation District, Saucelito Irrigation District, Stone Corral Irrigation District, Strathmore Public Utilities District, Styrotek, Inc., and City of Visalia.

Additionally, a new up to 60-inch diameter turnout from the west bank of the FKC would be constructed generally at the Road 80 intersection with the FKC. Water from this turnout would be conveyed via gravity delivery to the in-lieu service area and the Recharge basins through the planned 4.5-mile long, up to 60-inch diameter, bi-directional, concrete main pipeline along the north side of Road 80. This main pipeline would also convey water recovered from the proposed Pixley Groundwater Banking facilities via both the well field at the Recharge basins and from any wells located within the in-lieu service area back to the FKC. This new turnout would require Reclamation approval for construction of a new FKC turnout. Further, this turnout would be a new point of diversion for PID, DEID, and other CVP contractors wishing to bank water in the Project, as a Reclamation acknowledged water bank.

The new turnout would be owned, operated and maintained under license with Reclamation by the Authority and/or the non-federal operating entity of the FKC.

Monitoring and Oversight

The Project includes implementation of a groundwater monitoring program and formation of a Technical Committee. The program will employ standards for groundwater monitoring consistent with DWR and others with respect to groundwater level and water quality measurements, locations, and frequency. In addition, the monitoring program will incorporate Best Management Practices (BMPs) when finalized and specified under SGMA for measurement of groundwater levels and other related parameters including recharge and extraction quantities. The program will be based on continuous data collection that integrates manual readings and pressure transducers with data loggers at key locations to identify direct pumping interference by recovery wells (if any).

The Technical Committee will develop reporting protocol to the Authority and will regularly assess groundwater conditions including pumping influences on nearby non-CVP wells by recovery wells.

During the construction period, dedicated observation or monitoring wells will be installed to allow evaluation of recharge and recovery operations by the Technical Committee. A conceptual drawing of a multiple completion, or nested, observation well is shown on **Error! Reference s ource not found.**. The observation wells will be designed based on conditions encountered at each site. As determined in conjunction with the Technical Committee, observation wells would be situated at sentinel locations surrounding the Project site so that the Authority may mitigate impacts before they exceed thresholds of significance. Protocols for frequency and method of measurement will conform to recognized industry standards including final BMPs for monitoring under SGMA.

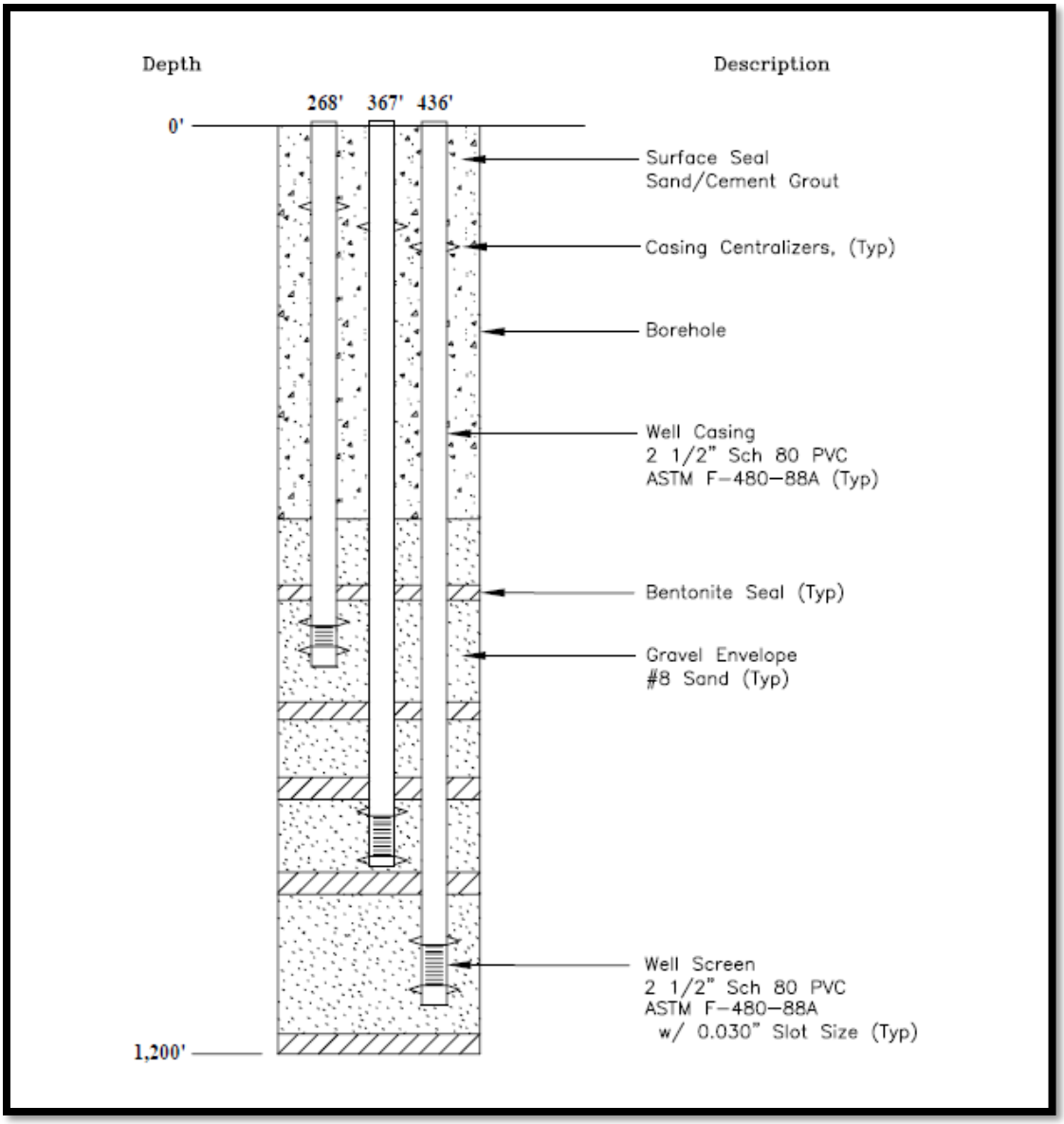

Figure 2-1: Observation Well Design

Water Bank Accounting

The Authority will establish a program of groundwater banking and recovery including necessary contracts to provide the ability to place into groundwater storage up to 30,000 AFY of CVP Friant Division water, other CVP water including Unreleased Restoration flows, State Water Project (SWP) water of the Kern County Water Agency and/or its member units, the Dudley Ridge Water District or the Tulare Lake Basin Water Storage District or other local water supplies from within the Friant Division service area. Ten percent of the water placed into storage would not be returnable and would be left to improve groundwater conditions in the area and to mitigate for losses or groundwater migration. Up to 90,000 AF of water could be stored at any one point in time. Up to 30,000 AF of water could be returned to bank partners in any one

year. Storage of Section 215[7] water or Class 1 and 2 allocations or other wet year water allocations supplies that would otherwise leave the Friant Division service area as unusable flood water would have a beneficial effect on water supply for participating districts. The groundwater banking program and impact evaluation contained in Appendix H of Attachment 1 is based on estimates of available surface water over a hydrologic base period of 1983 to 2003 (Provost & Pritchard, 2008).

DEID Friant water availability as well as their demand for firm return water was modeled. DEID was chosen because of its interest as a potential bank participant and as a surrogate for other potentially participating CVP Friant districts given the makeup of their supply and firm water demand. DEID would contribute recharge water to the Project during water years when the total water supply exceeds the irrigation demand within its service area. During the 20-year base period, the total annual water supply delivery to DEID exceeded the irrigation demand in 13 out of the 20 years, or approximately 2 out of every 3 years. Thus, DEID would have surplus water supplies that can it can contribute to the proposed bank.

Table 2-2: DEID Surface Water Supply History and Estimated Surplus Water below summarize historical DEID total surface water supplies from 1983 through 2003, along with an estimate of surplus surface water that could be utilized.

Potential Bank Partners include Friant Division CVP contractors, Reclamation, CVP contractors within the Cross Valley, Delta-Mendota Unit, San Luis Unit and Exchange Contractors service areas, the Kern County Water Agency and/or its member units, the Dudley Ridge Water District, the Tulare Lake Basin Water Storage District, and other water agencies, entities or individuals within the Friant Division service area of the CVP. Water would be banked and returned consistent with state and Federal law including State of California authorized places-of-use.

As part of the future bank component, the Authority would use the proposed facilities to deliver irrigation water from the FKC to the in-lieu service area and to recharge the groundwater in the PID at times when the proposed facilities are not obligated for use by Bank Partners.

[7] Section 215 of the Reclamation Reform Act of 1982, *opt. cit.*

Table 2-2: DEID Surface Water Supply History and Estimated Surplus Water

Year	Total Surface Water Supplies (AF)	Estimated Surplus Surface Water (AF)
1983	142,700	22,700
1984	159,700	39,700
1985	127,600	7,600
1986	148,900	28,900
1987	107,200	0
1988	97,600	0
1989	112,300	0
1990	81,500	0
1991	108,900	0
1992	91,000	0
1993	251,500	131,500
1994	88,400	0
1995	286,900	166,900
1996	207,600	87,600
1997	200,400	80,400
1998	199,300	79,300
1999	154,200	34,200
2000	146,000	26,000
2001	121,600	1,600
2002	126,500	6,500
2003	126,400	6,400
Average	147,000	34,300
Minimum	81,500	0
Maximum	286,900	166,900
Average Wet Year (w/ Surplus Water Available)	171,400	51,400

Construction and Testing

Construction activity for the Project would commence in early 2018. Construction will begin with recharge basin site preparation and grading. Other activities expected to begin later in 2018 include installation of recharge basin infrastructure as well as lift station and pipeline construction. Project construction is expected to continue into 2019.

Construction would require the use of diesel or gasoline-powered equipment, including: scrapers, graders, compacters, trenchers, backhoes, forklifts, front-end loaders, water trucks, and materials and equipment hauling trucks.

Construction of recovery wells would include a planning phase consisting of, but not limited to, evaluations of test holes and pilot borings to delineate completion zones through evaluation of cuttings and geophysical logs, observation well installation at selected locations for the monitoring program, zone sampling for water quality testing, and final recovery well

construction and testing. Aquifer and interference testing will be performed on each recovery well to determine variations in yields, aquifer parameters, and to verify assumptions regarding potential impacts on other groundwater near the Project site. These activities would commence in 2018 and continue into 2019.

Operation and Maintenance

The Technical Committee will review and report on monitoring of operations to the Authority to ensure that the Project does not adversely affect groundwater pumping by any property owners in proximity of the Bank. An assessment of operations will be prepared for the Authority on a regular basis. The Authority would distribute findings to local property owners, water agencies, and other interested parties, such as Reclamation. The Authority would also notify and provide reports of operations to GSAs formed under SGMA within the Tule Subbasin.

The Project may utilize Supervisory Control and Data Acquisition (SCADA) or other control strategy to operate and monitor well and pump facilities. Occasionally, service employees may be on-site for scheduled preventive maintenance as well as unscheduled service. On-site above-ground activities would include levee maintenance, weed abatement, trash removal, periodic sediment removal and water-control structure adjustments and maintenance. Other activities include periodic maintenance of recovery wells involving pump or drilling rigs to perform equipment changes and well rehabilitation to maintain system capacity.

2.3 Environmental Commitments

The following environmental commitments will be incorporated into the construction, operation and maintenance of the Project:

Water Resource Commitments

- Recovery wells will be designed to meet water quality standards established by Reclamation (USBR, 2008) (Appendix I of Attachment 1) for water returned to the FKC. Zone sampling will be performed at prospective well locations and observation wells will be used to evaluate water quality characteristics of aquifer units underlying the Project site.
- Well water returned to the FKC will be commingled in the up to 60-inch diameter turnout before being discharged into the FKC. Based on the water quality characteristics of individual wells, a protocol will be developed to ensure that blending and mixing through the 4.5-mile long, up to 60-inch diameter conveyance to the FKC meets Reclamation's then-current water quality requirements. Ongoing sampling in accordance with Reclamation's then-current water quality standards will also be performed to ensure compliance.
- Before Project recharge operations begin, a groundwater level monitoring program will be funded, designed and implemented by the Authority to establish a baseline to continue to evaluate potential well interference effects during recovery pumping operations. The program shall be designed by a certified hydrogeologist registered with the State of California and shall include a monitoring well layout and location plan based on

stratigraphic conditions in the area of Project's recovery wells, consistent with the California Department of Water Resource's Sustainable Groundwater Management Program (December 2016) -- Best Management Practices (BMPs) for the Sustainable Management of Groundwater: Monitoring Protocols, Standards and Sites for monitoring well programs implemented under the Sustainable Groundwater Management Act (SGMA), which BMPs are found at: http://www.water.ca.gov/groundwater/sgm/pdfs/BMP_Monitoring_Protocols_Final_2016-12-23.pdf (as may be updated or amended). The program also shall integrate continuous data collection from manual readings and pressure transducers with data loggers for selected wells in the monitoring well network to identify possible well interference effects from Project recovery well pumping consistent with California Water Code sections 10726.4 and 10727.2.

Further, monitoring wells at targeted aquifer depths shall be installed as part of the program to identify and avoid potentially significant well interference impacts from recovery pumping to any nearby well completed to within similar depth ranges. Monitoring wells shall be installed consistent with Department of Water Resources Bulletin 74-90, which supplements Bulletin 74-81.

The monitoring program designed by the certified hydrogeologist shall require:

- Recordation of water levels in selected monitoring wells on a one (1) hour frequency to provide an accurate determination of Project area water levels before recovery pumping operations begin and by which to detect influences of other nearby operating wells. Transducer data from monitoring wells will be downloaded weekly for a one (1) month period before the start of recovery pumping operations to establish water levels in the area.
- Recordation of water levels in selected monitoring wells on a fifteen (15) minute frequency during Project recovery pumping to provide an accurate determination of the Project's drawdown effects. Transducer data from monitoring wells will be downloaded weekly during Project recovery pumping operations.
- Timely preparation of reports by the Authority that shall contain (1) water level hydrographs and tabulated water level data for each monitoring well both in the one (1) month before Project recovery pumping, and during Project recovery pumping operations, (2) tabulated groundwater recovery volumes from each recovery well during Project recovery pumping, and (3) documentation of drawdown effects on groundwater levels at each monitoring well. During recovery pumping, reports shall be prepared by the Authority weekly. Any interested party may request the reports and raw data in hardcopy and/or electronic format and the Authority shall comply within ten (10) business days. In addition to the monitoring data collected as described above, the Authority shall assess and integrate as applicable basin-wide monitoring data from the California Statewide Groundwater Elevation Monitoring Program (CASGEM) for the Tule Subbasin.

A Technical Committee shall be formed by the Authority upon completion of Project construction and prior to initial recharge operations and shall be comprised of one (1)

staff representative each from PID and DEID, and five (5) representative landowners within the Project sphere of influence appointed by the Authority's Board of Directors. The Technical Committee shall adhere to these protocols to (1) insure reasonable and sound data acquisition, (2) the timely review of claims, and (3) further minimization of identified significant well interference effects.

The Technical Committee and Authority shall implement the following procedure for assessing and processing any claim received:

- All such claims shall be submitted in writing to the Authority's Project Manager on behalf of the Technical Committee. At a minimum, a claim submitted to the Technical Committee shall comply with the Government Claims Act and shall provide information about the condition of the well and its casing and pumping equipment, and other information relevant to the claim.

- The Technical Committee shall timely meet to review any submitted claim(s) for the further minimization of identified significant well interference effects. In no event shall the Technical Committee meet more than ten (10) business days after such claim has been received for further minimization to compensate for added lift, or more than three (3) business days after a claim has been submitted for further minimization of any identified inadequate suction head for operation of a well pump.

- The Technical Committee shall evaluate any claim in conjunction with recorded and reported data under the groundwater monitoring program described above, as well as any necessary field verification efforts.

- The Technical Committee shall make recommendations to the Authority Board regarding resolution of such claim and the recommendations to the Authority shall be made in writing no later than five (5) business days after the Technical Committee meets to consider such claim.

- The Authority Board shall meet timely and as soon as reasonably practicable to review the Technical Committee's recommendations for such claim. The Authority Board also can meet and act in a special meeting (upon 24 hours public notice) to provide solutions to further minimize any identified significant well interference effects, if needed to address an exigent claim under the circumstances (such as a claim relating to alleged Project drawdown effects that result in inadequate suction head to operate a nearby well pump), before any Technical Committee recommendation is made for a significant well interference claim.

Thresholds of significance requiring mitigation have been quantified with measures that shall be employed and implemented by the Authority, including through recommendations by the Technical Committee pursuant to Table 2-2:

Table 2-2: WAT-3 Monitoring Program

Threshold	Discussion	Mitigation
< 10 feet induced drawdown	This degree of influence is considered reliably detectable, but generally not a significant impact for the Project setting.	No action. Continue monitoring to determine whether Project influences may induce drawdown to next threshold level.
>10 feet induced drawdown	This degree of influence may cause significant added cost in operating high capacity wells over an irrigation season.	**Added Lift**: Authority shall timely compensate well owner for added lift no later than thirty (30) days after a claim is approved by the Authority Board. A written protocol for reasonable documentation and review of significant well interference claims will be developed and managed by the Technical Committee and approved by the Authority.
>20 feet induced drawdown	This degree of influence may pose operational problems by reducing the margin between pumping levels and pump setting depths.	**Added Lift or Other Solutions**: Authority shall timely compensate for added lift no later than thirty (30) days after a claim is approved by the Authority Board. Authority shall timely compensate well owner to lower a pump if induced drawdown by Project recovery wells results in inadequate suction head to operate well pump, or shall timely provide other solutions as identified below to reduce any significant well interference effects to a less than significant level.

The Authority shall employ other measures to further minimize a significant adverse well interference impact resulting in inadequate suction head to operate well pump attributed to the Project recovery pumping to a less than significant level. Such measures, at the Authority's discretion, shall include, but are not limited to the following:

1. Reduce recovery pumping volumes or the rate of groundwater withdrawal, or shut off Project recovery wells to reduce well interference impacts to nearby wells, including

reducing Project recovery pumping volumes as needed to avoid an impact resulting in inadequate suction head to operate a well pump, and extending the Project's recovery pumping operations beyond the target eight (8) month pumping period.

2. Supply well owner's parcel with a different source of equivalent quantity and quality water at no greater cost to an affected well owner, including from Project recovery pumping wells connected via above-ground pipes to the owner's parcel;

3. Lower or replace a well pump; and/or

4. Replace a well.

Biological Commitments

San Joaquin kit fox (SJKF)

The following conservation measures, which are consistent with the SJRRP Conservation Strategy and *U.S. Fish And Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011), will be implemented to avoid and minimize potential impacts to SJKF associated with the construction, operation, and maintenance activities for Project:

- **(*Pre-Construction Surveys*).** A USFWS-approved biologist will conduct pre-construction surveys no fewer than 14 days and no more than 30 days prior to the onset of any ground disturbing activity. The primary objective is to identify kit fox habitat features (e.g. potential dens and refugia) on the project site. If San Joaquin kit fox are detected at any time, all activities associated with the project will be halted immediately. The project will be placed on hold until consultation with the USFWS and CDFW is completed.

- ***(Employee Education Program).*** The Authority will conduct an employee education program prior to the start of construction. The Authority will retain a USFWS-approved biologist to conduct one brief presentation on the San Joaquin kit fox to train any and all construction staff that will be involved with the Project. This training will include:
  - A description of the San Joaquin kit fox and its habitat needs;
  - Information on San Joaquin kit fox occurrence within the Project vicinity;
  - An explanation of the status of the species and its protection under the Endangered Species Act; and
  - A list of the measures being taken to reduce impacts to the species during construction.
  - A "fact sheet" conveying all of the training information prepared and distributed to all construction personnel in attendance at the initial training and to be used by construction manager to train any additional construction staff that was not in attendance at the first meeting, prior to starting work on the Project.
  - The Authority will provide a summary of the training provided, including a list of personnel attending to Reclamation and the USFWS within 7 days of the training.

- ***(Avoidance).***-San Joaquin kit fox surveys of the recharge basins will be conducted by a USFWS approved biologist prior to the inundation of the recharge basins. The purpose of these surveys is to ensure that San Joaquin kit fox have not moved into the area. Surveys will only occur in years when flooding of the recharge basins will occur. The need for these surveys will be reassessed in consultation with the USFWS and coordination with CDFW after seven years of surveys have been completed. A San Joaquin kit fox survey report will be submitted to USFWS and CDFW by December 31 of each year in which surveys are conducted.

- ***(Minimization).*** Construction activities will be carried out in a manner that minimizes adverse effects to San Joaquin kit foxes, should they occur in the action area. Minimization measures will include:

  - Project-related vehicles will observe a daytime speed limit of 15-mph throughout the site in all project areas, except on state and federal highways Night-time work, such as equipment maintenance will be minimized to the extent possible. However, if work does occur after dark, the speed limit will be reduced to 10-mph.

  - Off-road project-related construction traffic outside of designated Project Area will be prohibited.

  - Construction work at night (half hour after sunset to half-hour before sunrise) will not be allowed.

  - To prevent inadvertent entrapment of San Joaquin kit fox or other animals during construction, all excavated, steep-walled holes or trenches more than 1 foot deep will be covered with plywood or similar materials at the end of each workday. If the trenches cannot be closed, one or more escape ramps constructed of earthen fill or wooden planks will be installed. Before such holes or trenches are filled, they will be inspected for trapped animals.

  - All construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at a construction site for one or more overnight periods will be thoroughly inspected for San Joaquin kit fox before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe will not be moved until the USFWS has been consulted and CDFW contacted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.

  - Before the start of work each day, the work site will be checked for animals under any equipment to be used that day, such as vehicles or stockpiles of items such as pipes. If a San Joaquin kit fox is found it will be allowed to leave on its own volition. Work will be halted and Reclamation contacted. Reclamation will notify the Service and CDFW within 48 hours.

  - All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in securely closed containers and removed at least once a day from a construction or project site.

  - No firearms will be permitted on the project site.

- No pets will be permitted on the project site.
- Use of rodenticide in the project areas will not be allowed.
- Upon completion of the project, all areas subject to temporary ground disturbances, including staging areas, temporary roads, and borrow sites will be re-contoured if necessary and revegetated with native seed to promote restoration of the area to pre-project conditions.
- Sightings of San Joaquin kit fox will be reported to California Natural Diversity Data Base.[8]
- The contractor will be required to keep their equipment in good working condition in order to prevent leaks and spills of petroleum products or other fluids into waters of the U.S.
- All equipment will be washed prior to arriving at the Project site to remove soil and seeds and to prevent spread of noxious weeds.

Raptors (Swainson's hawk and white-tailed kite)

- ***(Avoidance).*** In order to avoid impacts to Swainson's hawks from Project construction, construction will occur between September 1st and January 31st, outside the Swainson's hawk nesting season to the extent feasible.
- ***(Pre-construction Surveys).*** If construction must occur between February 1st and August 31st, a qualified biologist will conduct a pre-construction survey for Swainson's hawk and white-tailed kite nests on the Project site and on lands within a half mile from the Project site no more than 10 days before the onset of these activities. Survey shall follow the methodology developed by the Swainson's hawk Advisory Committee (SWHA TAC, 2000).
- ***(Establish Buffers).*** Should any active nests be discovered in or near proposed construction zones, the biologist will establish a half-mile no disturbance buffer, unless a smaller buffer can adequately protect the nest as determined by the biologist, in coordination with the Authority, Reclamation, the USFWS and CDFW, pending the nature of disturbance and the presence or absence of disturbance barriers between the nest and construction. This buffer will be identified on the ground with flagging or fencing, and will be maintained until the biologist has determined that the young have fledged.[9]

Migratory Bird Nests

- **(*Avoidance*).** In order to avoid impacts to all nesting migratory birds from grading and construction, these activities will occur outside of the typical avian nesting season, between September 1 and January 31, to the extent feasible.

[8] Appendix C of Attachment 1, Live Oak Associates, Inc. Biological Resources Report for the Proposed Pixley Groundwater Bank Project. March 2015. Page 35-36.
[9] Appendix C of Attachment 1, Live Oak Associates, Inc. Biological Resources Report for the Proposed Pixley Groundwater Bank Project. March 2015. Page 37-38.

- ***(Pre-construction Surveys).*** If applicable activities must occur during the nesting season (February 1-August 31), a qualified biologist will conduct preconstruction surveys for active raptor and migratory bird nests within no more than 10 days before the start of any ground or vegetation disturance. Surveys for raptors will include areas on and within 500 feet, and migratory birds on and within 250 feet of the site, where accessible. If no active nests are found within the survey area, no further mitigation is required.

- ***(Establish Buffers).*** Should any active nests be discovered in or near proposed construction zones, the biologist will identify a suitable construction-free buffer around the nest in coordination with the Authority, Reclamation, the USFWS and CDFW. This buffer will be identified on the ground with flagging or fencing, and will be maintained until the biologist has determined that the young have fledged.

Burrowing Owl

- ***(Take Avoidance Surveys).*** A take avoidance survey for burrowing owls will be conducted by a biologist who meets the qualifications to perform burrowing owl surveys as set forth in the *Staff Report on Burrowing Owl Mitigation (CDFW2012).* The surveys will be conducted between 14 and 30 days prior to the start of construction. This take avoidance survey will be conducted according to methods described in the Staff Report on Burrowing Owl Mitigation (CDFG 2012). The survey area will include all suitable habitats on and within 200 meters of Project impact areas, where accessible.

- (Avoidance). Burrowing owl surveys of the recharge basins will be conducted by a biologist who meets the qualifications to perform burrowing owl surveys as set forth in the Staff Report on Burrowing Owl Mitigation (CDFW 2012). The surveys will be conducted prior to the inundation of the recharge basins. The purpose of these surveys is to ensure that burrowing owl have not moved into the area. Surveys will only occur in years when flooding of the recharge basins will occur. The need for these surveys will be reassessed in coordination with the USFWS and CDFW after seven years of surveys have been completed. A burrowing owl survey report will be submitted to CDFW and the USFWS by December 31 of each year in which surveys are conducted.

- (Avoidance of Active Nests). If Project activities are undertaken during the breeding season (February 1-August 31) and active nest burrows are identified within or near Project impact areas, a 200-meter disturbance-free buffer will be established around these burrows, or alternate avoidance measures implemented by the Authority in consultation with CDFW. The buffers will be enclosed with temporary fencing or flagging to prevent construction equipment and workers from entering the setback area. Buffers will remain in place for the duration of the breeding season, unless otherwise arranged with CDFW. After the breeding season (i.e. once all young have left the nest), passive relocation of any remaining owls may take place as described below.

- ***(Passive Relocation of Resident Owls).*** During the non-breeding season (September 1-January 31), resident owls occupying burrows in Project impact areas may either be avoided, or passively relocated to alternative habitat. If the Authority chooses to avoid active owl burrows within the impact area during the non-breeding season, a 50-meter

disturbance-free buffer will be established around these burrows, or alternate avoidance measures implemented in consultation with CDFW. The buffers will be enclosed with temporary fencing, and will remain in place until a qualified biologist determines that the burrows are no longer active. If the Authority chooses to passively relocate owls during the non-breeding season, this activity will be conducted in accordance with a relocation plan prepared by a qualified biologist. Passive relocation may include one or more of the following elements: 1) establishing a minimum 50-foot buffer around all active burrowing owl burrows, 2) removing all suitable burrows outside the 50-foot buffer and up to 50 meters outside of the impact areas as necessary, 3) installing one-way doors on all potential owl burrows within the 50-foot buffer, 4) leaving one-way doors in place for 48 hours to ensure owls have vacated the burrows, and 5) removing the doors and excavating the remaining burrows within the 50-foot buffer.

Roosting Bats

- ***(Temporal Avoidance).*** Riparian tree removal and/or structure demolition will occur after September 30, and before April 1, outside the roosting bat season.

- ***(Preconstruction Surveys).*** If removal of riparian trees and/or structure demolition must occur between April 1 and September 30 (general maternity bat roost season), a qualified biologist will survey affected trees for the presence of bats within 30 days prior to these activities. The biologist will look for individuals, guano, and staining, and will listen for bat vocalizations. If necessary, the biologist will wait for nighttime emergence of bats from roost sites. If no bats are observed to be roosting or breeding, then no further action would be required, and construction would proceed.

- ***(Minimization).*** If a non-breeding bat colony is detected during preconstruction surveys, the individuals will be humanely evicted via partial dismantlement of trees prior to full removal under the direction of a qualified biologist to ensure that no adverse impact to any bats occurs as a result of construction activities.

- ***(Avoidance of Maternity Roosts).*** If a maternity colony is detected during preconstruction surveys, a disturbance-free buffer will be established around the colony and remain in place until a qualified biologist deems that the nursery is no longer active. The disturbance-free buffer will range from 50 to 100 feet as determined by the biologist.

- ***(Consultation if Maternity Roosts Cannot be Avoided).*** If roosts are determined to be present and must be removed, the bats will be excluded from the roosting site before the tree is removed. A mitigation program addressing compensation, exclusion methods, and roost removal procedures will be developed by the Authority in consultation with CDFW before implementation. Exclusion methods may include use of one-way doors at roost entrances or sealing roost entrances when a site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g. during hibernation or while females in maternity colonies are nursing young).

- ***Mitigation Measure 3.3.6 (Compensation for Habitat Loss).*** The loss of each roost will be replaced by the Authority, in consultation with CDFW, and may include construction

and installation of bat boxes suitable to the bat species and colony size excluded from the original roosting site(s). Roost replacement will be implemented before bats are excluded from the original roost site(s). Once the replacement roosts are constructed and it is confirmed that bats are not present in the original roost sites, the tree(s) may be removed.

Riparian and Other Sensitive Habitats

- ***(Revegetation of Disturbed Areas).*** After construction, all disturbed areas within Deer Creek will be restored to the original contours. The small area of Deer Creek to be disturbed is anticipated to re-vegetate naturally.

- ***(Replacement Planting).*** Should avoidance of riparian trees not be possible, the Authority will provide the compensation. Replacement planting will be implemented at a ratio of 3:1 for trees between 4-24 inches in diameter at breast height (DBH), and at a ratio of 10:1 for trees greater than 24 inches in DBH. Species chosen for the plant pallet will include native riparian trees such as valley oaks, Oregon ash and Fremont's cottonwoods. Seed and cuttings will be gathered from its lands fronting the Deer Creek watershed, if possible. These trees will be planted as container plants and cuttings. All planting material will be installed in the late fall or early winter. All plantings will be monitored annually for a minimum of five years. A revegetation plan pursuant the Lake and Streambed Alteration Agreement with the CDFW will be completed and implemented, which will detail the maintenance, monitoring, performance criteria and success rate for trees planted within the project site.

Cultural and Paleontological Commitments

- In the unlikely event that unanticipated buried archaeological deposits are encountered during construction, work in the immediate vicinity of the discovery will cease until the find can be evaluated by Reclamation and managed pursuant to the requirements of 36 CFR 800.13 and other applicable Federal laws and regulations. If human remains are inadvertently discovered, Reclamation will comply fully with the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) as outlined at 43 CFR Part 10, and other Federal laws and regulations as appropriate.

Air Quality Commitments

Implementation Measures to Comply with San Joaquin Valley Air Pollution Control District's (SJVAPCD) Regulation VIII-Fugitive Dust Prohibitions:

- Construction of the Project will comply with SJVAPCD's *Regulation VIII Fugitive Dust Prohibitions* and implement all applicable control measures. In accordance with SJVAPCD's Regulation VIII, a Dust Control Plan (DCP) will be prepared for the Project. The DCP will be submitted to and approved by the SJVAPCD prior to issuance of construction/grading permits. Fugitive dust control measures to be included in the DCP will include, but are not limited to, the following:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, will be effectively stabilized of dust emissions using water,

chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.

- All on-site unpaved roads and off-site unpaved access roads will be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities will be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When materials are transported off-site, all material will be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container will be maintained.
- All operations will limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions.) (Use of blower devices is expressly forbidden.)
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles will be effectively stabilized of fugitive dust emissions
- Utilizing sufficient water or chemical stabilizer/suppressant.
- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles will implement measures to prevent carryout and trackout.

Implementation Measures to Reduce Construction Emissions of NOx:

The following measures will be implemented to reduce mobile-source emissions of NOx:

- To the extent locally available, alternative fueled, electrically driven, hybrid, or catalyst construction equipment will be used.
- Heavy-duty (50 hp, or greater) off-road construction equipment will, at a minimum, meet U.S. EPA Tier 3 emission standards.
- A minimum of 50% of construction waste materials will be recycled.
- When not in use, idling of on-site construction equipment and vehicles will be minimized. Idling of on-site diesel-powered equipment and vehicles will be limited to no more than 5 minutes when not in use.

Minimizing Personnel and Public Exposure

To minimize personnel and public exposure to potential Valley Fever–containing dust both on- and off-site, the following additional control measures will be included in the DCP to be prepared for this project as required by Mitigation Measure AQ-1:

- Equipment, vehicles, and other items will be thoroughly cleaned of dust before they are moved offsite to other work locations.
- Wherever possible, grading and trenching work will be phased so that earth-moving equipment is working well ahead or down-wind of workers on the ground.
- The area immediately behind grading or trenching equipment will be sprayed with water before ground workers move into the area.
- In the event that a water truck runs out of water before dust is sufficiently dampened, ground workers being exposed to dust are to leave the area until a full truck resumes water spraying.

- All heavy-duty earth-moving vehicles will be closed-cab and equipped with a HEP-filtered air system.
- Workers will receive training to recognize the symptoms of Valley Fever, and will be instructed to promptly report suspected symptoms of work-related Valley Fever to a supervisor.
- A Valley Fever informational handout will be provided to all on-site construction personnel. The handout will, at a minimum, provide information regarding the symptoms, health effects, preventative measures, and treatment.
- Onsite personnel will be trained on the proper use of personal protective equipment, including respiratory equipment. National Institute for Occupational Safety and Health (NIOSH)-approved respirators will be provided to onsite personnel, upon request.

Geology and Soils Commitments

The Authority will complete a Storm Water Pollution Prevention Plan (SWPPP) prior to any ground moving activities. As part of the SWPPP, the Authority will be required to incorporate any Best Management Practices (BMPs), as deemed appropriate by the design engineer, Qualified SWPPP Practitioner (QSP), and the SWRCB, for the Project's construction-specific needs to further protect and avoid unnecessary erosion of the topsoil.

Section 3 Affected Environment and Environmental Consequences

This section analyzes the potential effects of the alternatives in accordance with NEPA and CEQA. The analysis in this section is coordinated and consistent with the Initial Study Checklist provided herein as Attachment 1 with its Appendices A - I. While the NEPA environmental effects analysis compares the Proposed Action to the No Action condition, the CEQA environmental impact analysis is based on the change that would result from Project implementation and operation compared to existing conditions. The No Action/No Project condition is similar to existing conditions for most of the resources addressed in this analysis, with differences highlighted as appropriate in the sections below.

3.1 Environmental Issues Not Further Analyzed

The Project would have no impacts to aesthetics due to the low-profile nature of the groundwater banking infrastructure and the fact that no lights are proposed in this Project. The Project would not involve the use or transport of hazardous materials and there are no mineral resources in the Project vicinity. The Project does not involve the addition of any new housing and would not require the need for any additional public services or recreational facilities. The Project would not cause an increase in local traffic nor would it create additional demand from utility providers. There would be no impacts regarding the above-mentioned resource areas; therefore, they are not further analyzed.

3.2 Water Resources

The water resources setting and potential effects are further evaluated in Appendix H of Attachment 1: *Hydrology and Water Quality Impacts Analysis, Pixley Groundwater Banking Project, Tulare County* (Amec Foster Wheeler, 2017). The findings are summarized below.

3.2.1 Affected Environment

Water Supply

PID is an agricultural irrigation district that covers approximately 70,000 acres in southern Tulare County, California. It is located immediately to the north of DEID (Figure 1-1: Regional Vicinity Map) Deer Creek, a local ephemeral stream, flows from east to west through the middle of the Authority. The Authority enjoys excellent groundwater quality. Depths to static groundwater within PID average approximately 300 feet indicating significant groundwater storage potential within the Authority. PID holds a water service contract with Reclamation for a maximum of 31,102 AFY of water from the Cross Valley Canal of the CVP.

In addition to its CVP water service contract of 31,102 AFY from the Delta, PID currently has a temporary one-year contract to purchase temporary un-storable (Section 215) water from the Friant Division of the CVP and has a long history of purchasing surplus water from other Friant Division contractors. PID has long-term water management programs with the Stone Corral

Irrigation District and Kern-Tulare Water District. Those programs could transfer a total of 36,000 AF of Friant CVP water supply to PID over the next 10 years. PID also has a Memorandum of Understanding with Lower Tule River ID, which allows PID to purchase Class 2 water from Lower Tule River ID during periods of Uncontrolled Season[10] water availability from Friant Division facilities. PID can also access its Cross Valley Canal supply from the Friant Division per article 3(f) of the PID Cross Valley Water Service Contract. These relationships make it evident that PID, while not a long-term Friant contractor, has a significant dependence upon Friant Division operations for surface water supply, and has been and will be impacted by implementation of the San Joaquin River Settlement.

PID has a total irrigated demand of 157,600 AFY, while the District's total water sold to growers averages only 21,600 AF/y. The 136,000 AFY deficit is assumed to be pumped from private groundwater wells (Provost &Pritchard, 2008).

DEID is an agricultural irrigation district encompassing approximately 56,500 acres that borders PID to the south in southern Tulare County and northern Kern County. DEID has a Friant Division CVP Repayment water contract that includes the largest Class 1 water supply maximum allocation in the Friant Division of up to 108,800 AFY. It also has a maximum Class 2 contract allocation of up to 74,500 AFY. As a long-term Friant Division contractor, DEID has a history of accessing temporary un-storable (Section 215 water) CVP water supplies (surplus to contract supplies and/or project purposes) and banking water for future needs both within the Authority as well as outside of the Authority. The DEID successfully completed the development of the Turnipseed Basin Groundwater Bank Phase II Project and has also entered into two separate agreements with North Kern Water Storage District and Rosedale Rio Bravo Water Storage District to bank water for dry-year return.

The estimated irrigation demand for DEID is approximately 145,600 AFY (DEID Water Management Plan, December 2016). To meet agricultural demand, it is estimated that between 35,000 and 40,000 AF is pumped by private landowner wells (Provost & Pritchard, 2008).

Potential Project partners (Bank Partners) include water users or districts with the Friant Division long-term contractors which would be the preferred Bank Partners. Other potential Bank Partners include, CVP Contractors, Reclamation, the San Joaquin River Exchange Contractors, local water companies, the Kern County Water Agency and/or its member units, the Dudley Ridge Water District, and the Tulare Lake Basin Water Storage District. Bank Partners would provide water for recharge in the Bank and pay all costs of acquisition and delivery of water to the Bank, including any additional environmental review if applicable. Effective delivery of

[10] "Uncontrolled Season":
Uncontrolled Season is any time during the Year when the Contracting Officer determines that a need exists to evacuate water from Millerton Lake in order to prevent or minimize spill or to meet flood control criteria, taking into consideration, among other things, anticipated upstream reservoir operations and the most probable forecast of snowmelt and runoff projections for the upper San Joaquin River, Friant Division Project Contractors utilize a portion of their undependable Class 2 Water in their service areas to, among other things, assist in the management and alleviation of groundwater overdraft in the Friant Division service area, provide opportunities for restoration of the San Joaquin River below Friant Dam, minimize flooding along the San Joaquin River, encourage optimal water management, and maximize the reasonable and beneficial use of the water.

water would be canal-side in the FKC at the new turnout location near the Road 80 crossing. (Figure 1-2: Project Features and Area of Potential Effect).

The Authority would administer a total of 30,000 shares that would provide the benefit of firm dry-year return of water to Bank Partners. Water would be banked or "put" via the Project recharge facilities using CVP water supplies such as Class 1, Class 2, Section 215 water or Article 16(b) water (often referred to as "$10 Settlement water[11]"), or other available wet-year water supplies. These waters would be stored within the groundwater system underlying PID until recovered in a dry year. Other sources of CVP or non-CVP water could also be able to be stored through Project operations.

Location and Physiography

The Project is located within the Central Valley physiographic province of California. The Central Valley is divided between the northern San Joaquin Basin that drains into the Sacramento Delta and the southern Tulare Basin, which is hydrologically closed. The Project is located within Tulare Lake Hydrologic Region within the Tule Sub-basin number 5-22.13, Bulletin 118 (Update 2003). The Tule Subbasin comprises approximately 467,000 acres and is bordered by Kern County to the south, Tulare Lake to the west, Kaweah River to the north, and the Sierra foothills to the east. There are three major watersheds located within the boundary of the Tule Subbasin: Tule River, Deer Creek and White River.

Hydrogeology

An evaluation of the Project hydrogeologic setting is presented in Appendix H of Attachment 1 and entails a review of over 480 water well drillers' reports and oil and gas electric logs, plus nine geotechnical borings at the Project site to investigate the upper 100 feet of sediments. Two regional and two site-specific geologic cross sections were constructed to characterize the occurrence of aquifer materials and their stratigraphic relationships. The regional cross sections delineate the edge of the Corcoran Clay west of the Project site and nature and distribution of aquifer units that are targets of water supply wells in the Tule Subbasin. Near the Project site, aquifer materials are grouped stratigraphically, but exhibit variable continuity and are interbedded with finer-grained materials including clay beds.

The conceptualization of the aquifer system in the Project area is of a single aquifer system consisting of sands and interbedded clays typical of alluvial plain deposition. From its configuration, the aquifer system is expected to be leaky, but with impedance to vertical flow of varying degrees. Direct recharge would move vertically and horizontally and accrue to groundwater storage in the manner that streamflow from Deer Creek and irrigation conveyances recharge the underlying aquifer system under existing conditions. This conceptualization is reflected in numerical modeling used to evaluate potential benefits of recharge and the 10-percent leave-behind components of the Project (see Appendix H of Attachment 1).

[11] Article 16(b) refers to Article 16(b) of the San Joaquin River Restoration Settlement Agreement. Said article provides for surplus water to be made available to Friant Division contractors to offset their loss of water diverted for Restoration purposes for the price of $10 per AF of water. (One AF equals 43,560 cubic feet or one AFY is approximately 893 gallons per day.)

Figure 1-3: USGS Topological Map, Sausalito School QUAD Banking Components shows the conceptualization of water bank components and key features of the physical system including:

1. Proximity to the FKC for conveying surplus water to the bank and dry-year return flows;
2. Proximity to Deer Creek;
3. Edge of the Corcoran Clay west of the Project.
4. Base of freshwater at approximately 2,000 feet below ground surface (bgs) in the Project vicinity.

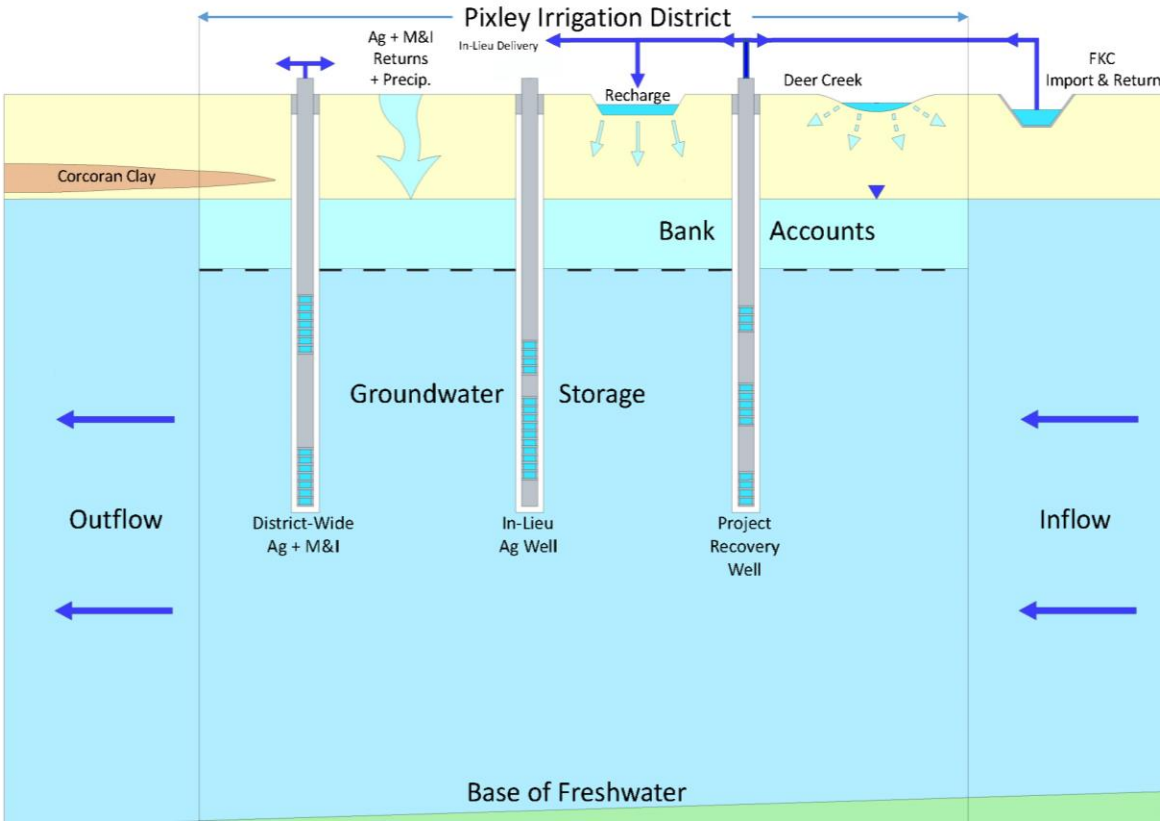

Figure 3-1: Water Banking Components

As described in the conceptualization, high capacity supply wells including the Project recovery wells would target aquifer units to about 1,200 feet bgs with few viable aquifer units at greater depths. Bank operations would occur within the main aquifer system tapped by other groundwater users including adjacent landowners. Based on groundwater flow modeling detailed in Appendix H of Attachment 1, recharge bank accounts would accrue within the PID service area.

Figure 3-1: Water Banking ComponentsPumping Interferences shows a conceptualization of potential impacts by bank recovery operations as a result of pumping interference. The induced drawdown by Project recovery wells would have a local effect, which has been evaluated with a groundwater flow model and analytical solutions summarized in this section and detailed in Appendix H of Attachment 1. The zone of influence shown in Figure 3-2: Pumping Interference

would occur within the PID service area and potentially affect wells nearest the Project. Monitoring and mitigation will be focused on the radius of estimated influence and will be verified and modified, if needed, with test data obtained during construction and testing of Project wells. Through implementation of the monitoring program, further refinements may be recommended as pumping influences are delineated through water level monitoring using transducers and data loggers that provide continuous feedback. Such refinements may include changing monitoring frequency, deployment of water level transducers to other locations, and installation of additional observation wells. Any adverse influence attributed to recovery well operation will be mitigated through measures discussed in this section and in Appendix H of Attachment 1 and included in the environmental commitments described in Section 2.2.1.

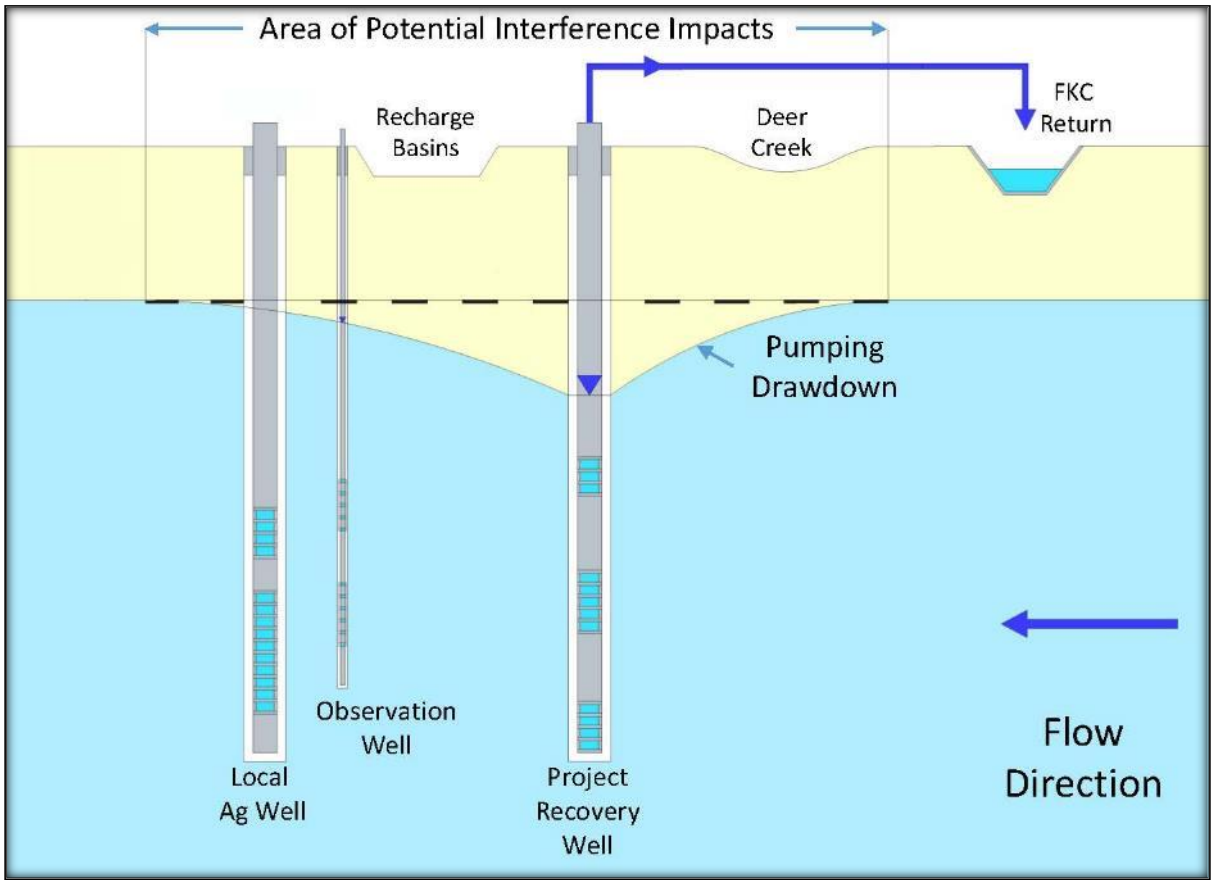

Figure 3-2: Pumping Interference

Surface Water Hydrology and Water Quality

There are only two surface waters of significance near the Project: Deer Creek and the CVP FKC. The relevant features of these surface waters are as follows:

Deer Creek

Deer Creek is an intermittent stream extending from the Greenhorn Mountains in the Sierra Nevada and terminating in the Lakeland and Homeland Canals near the Tulare/Kings County border. Prior to diversion for agricultural purposes, Deer Creek ran into the former Tulare

Lake bed. Peak flows from 40 to 70 cubic feet per second (cfs) typically occur from January through May. The long-term average monthly discharge of Deer Creek is about 30 cfs (51,800 AF per month).

Friant Kern Canal

The FKC passes within one mile of the eastern edge of the Project. It is operated and maintained by the Friant Water Authority and is used to convey water from the San Joaquin River (diverted at Friant Dam and stored in Millerton Lake) to Kern County and points in between. The canal originates at Friant Dam which is operated by Reclamation. The FKC flows southerly along the western flank of the Sierra Nevada foothills through Fresno, Tulare, and Kern Counties. The FKC has a capacity of approximately 5,300 cfs (10,510 AF/d), which decreases to about 2,500 cfs (4,959 AF/d) as demand decreases toward its end in the Kern River, near Bakersfield, California.

Surface water quality in the Tulare Lake Basin is generally good, with excellent quality exhibited by most eastside streams. Common water quality issues are a result of influences from industrial and commercial activities, resource withdrawal, leaking sewer infrastructure, and illicit dumping during wet weather conditions. Further potential sources of polluted water within the area include past waste disposal practices, agricultural chemicals, and fertilizers applied to landscaping. Characteristic water pollutant contaminants include sediments, hydrocarbons and metals, pesticides, nutrients, bacteria, and trash.

Irrigated agriculture accounts for most water used in the Tulare Lake Basin. Agricultural drainage, depending on management and location, carries varying amounts of salts, nutrients, pesticides, trace elements, sediments, and other by-products to surface and ground waters (RWQCB, 2004).

The water from the San Joaquin River that is delivered via the FKC is considered to be of excellent quality. Reclamation maintains guidelines for the quality of any water introduced into the FKC that does not originate from the San Joaquin River (USBR, 2008) (Appendix I of Attachment 1). These guidelines generally specify that water discharged to the FKC must meet Title 22 State drinking water quality standards (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).

Groundwater Levels, Quality, and Overdraft

Groundwater levels near the Project site have been measured on a semi-annual basis by PID, DWR and cooperating agencies. Long-term hydrographs for wells near the Project site show that groundwater levels have decreased as much as 100 feet since the 1940s (see Appendix H of Attachment 1). The regional groundwater decline decreased with the availability of CVP water starting in the 1950s; however, CVP water is not available in the immediate vicinity of the Project and groundwater levels continue to decline in the PID service area.

Groundwater Quality

In the northern portion of the Tule Subbasin, groundwater is characterized as calcium bicarbonate (USGS, 1968), while the southern portion is sodium bicarbonate (USGS, 1963). Concentrations of total dissolved solids (TDS) typically range from 200 to 600 milligrams per liter (mg/L), which is satisfactory for a wide range of agricultural uses. TDS values of shallow groundwater in poorly drained areas are as high as 30,000 mg/L (USGS, 1995), exceeding all beneficial uses. The state Department of Drinking Water, which monitors Title 22 water quality standards for domestic uses, reports TDS values in 65 wells ranging from 20 to 490 mg/L, with an average value of 256 mg/L. The eastern side of the Tule Subbasin, which includes areas near the Project location, has had occurrences of elevated nitrate.

The groundwater quality characteristics of the Deer Creek/White River Watershed vary from east to west. In general, water quality on the east side of the valley floor in this area may be of poor quality where nitrate, phenols, and salts are present in varying concentrations and locales. On the westerly side of the watershed, groundwater quality may also have unfavorable characteristics including elevated arsenic concentrations exceeding the Title 22 Maximum Contaminant Level (MCL) (10 µg/L). Arsenic is naturally occurring and commonly found in drinking water sources in California. More groundwater sources exceeded the Title 22 MCL after the state raised the standard from 50 to 10 µg/L in 2008.

Groundwater quality within the Project area is generally good and complies with Title 22 drinking water standards. Samples of groundwater were obtained from fourteen (14) existing wells in the area of the proposed Project and analyzed for quality constituents of concern and compared against primary and secondary Title 22 drinking water quality standards (RWQCB, 2016). (Appendix H-1 pages 7-9). The test results demonstrated that groundwater within the Project site met Title 22 standards. Groundwater quality from these wells is considered most representative of the quality of water to be recovered from the Project operations together with recharge water from the FKC. (Appendix H-1, page 8).

Over pumping of groundwater and chronic water level declines in the Tule Subbasin and in other parts of the San Joaquin Valley have induced land subsidence due to deep compaction of fine-grained units. Areas most vulnerable to subsidence are where pumping occurs beneath the Corcoran Clay, a widespread and distinctive lacustrine clay unit present beneath much of western and central San Joaquin Valley. Land subsidence beneath portions of the Tule Subbasin of 12 to 16 feet from 1926 to 1970 was reported by the United States Geologic Survey (USGS, 1984). Between 2007 and 2011, an additional 0.5 to 1 foot of subsidence in the Project area occurred due to reduced availability of surface water supplies (LSCE, 2014). More recently, subsidence measurements taken May of 2015 to September 2016 measured between 15 and 20 inches of subsidence on the FKC at milepost 102.7 near the project area (FWA, 2017). Subsidence is expected to be a continuing problem for the region and a focus of sustainability planning by local agencies, including PID and DEID, under SGMA.

Overdraft for the Tulare Lake Hydrologic Region has been projected at 820,000 AF per year (Tulare County, 2012). The Tule Subbasin is one of six major subbasins in this hydrologic region. The Tule Subbasin has also has been identified by DWR as a basin in critical condition

of overdraft. As defined in SGMA, a basin is identified as in critical overdraft "when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." As a consequence, the Tule Subbasin will be required to be managed under a GSP, or coordinated plans, by January 31, 2020.

Flooding

Portions of the Project Area are located within the 100-year flood plain of Deer Creek (Appendix H of Attachment 1, Figure 8). The 100-year flood is defined as a flood flow that has a 1-percent chance of being equaled or exceeded in any given year (FEMA, 2009). 100-year flood zones are located throughout southern Tulare County from a number of waterways, including the White and Tule Rivers, and Deer Creek (FEMA, 2009). A portion of the Project Area is within the 100-year flood plain of Deer Creek.

3.2.2 Environmental Consequences

No Action Alternative

Under the No Action/No Project Alternative, Reclamation would not implement the various federal actions associated with the Project (see Section 2.2) including funding of the construction of the groundwater banking and recovery program and the Authority would not build and operate the proposed Bank. Groundwater levels underlying PID would not benefit from the 10-percent "leave-behind" from bank operations nor would it benefit from improved groundwater conditions, including reduced pumping costs from banking recharge. Subsurface groundwater outflow from DEID and other neighboring long-term Friant contractors into PID would not be reduced.

On a regional scale, additional dry-year water supply would not be available to Bank Partners that would otherwise reduce fallowing, crop loss, or municipal water supply reductions, and/or potentially provide supplemental supplies for the SJRRP. Members of the Authority would continue to use surface water and groundwater supplies as has historically occurred subject to reduced availability due to the release of SJRRP Restoration Flows and SGMA-related limitations on historical groundwater extractions.

A significant overall consequence of the No Action/No Project Alternative is forgoing an action that would contribute to the Water Management Goals of the SJRRP Settlement and to aid local sustainable groundwater management under SGMA.

This increased pressure on an already limited supply would force market prices for water up and create a significant impact to the conjunctive use of operations within the PID and DEID, which depend on a wet-year pricing structure to acquire large quantities of surface water for groundwater recharge.

Proposed Action/Project

The proposed Pixley Groundwater Banking Project relies on CVP surface water diverted from the FKC, and other potential sources noted in this EA. Banked water would be recharged and returned to Bank Partners via the FKC consistent with state and Federal law including the State of California authorized water rights place-of-use and Reclamation Law. A turnout in the FKC would be constructed as part of the Project that would allow CVP water to be routed into the recharge basins and also be returned to the FKC from the proposed recovery wells.

Water Supply

The Project would not alter existing CVP water supply contracts or existing exchange and water bank agreements. Rather, it would provide a mechanism to improve the reliability of water provided under these existing contracts and other arrangements and would allow for the capture/redirect CVP water from the FKC to a new groundwater bank with a capacity of 90,000 AF. Up to 30,000 AFY of the banked water would be put to beneficial use by banking partners. Local benefits within the PID service area and the Tule Subbasin include a 10-percent leave-behind fraction of each volume of recharged water resulting in improved groundwater conditions during recharge periods. Project operations in which water would be banked in wet years and recovered in normal and dry years would reduce the losses in firm water supply from SJRRP Restoration Flows. The storage of various types of CVP water supplies as well as other local and non-federal water supplies that may be available that would otherwise leave the Friant Division service area as unusable flood water would have a beneficial effect on water supply for participating districts.

Other Groundwater Users

The Project would provide a program of long-term groundwater banking where up to 30,000 AFY of surface water would be recharged to groundwater up to a maximum of 90,000 AF. The Project would provide opportunities for partners to bank water during wet years and recover water in normal and dry years. Most important to groundwater levels in the Tule Groundwater Subbasin or more locally within the PID/DEID service areas are that the bank would operate on a 10 percent "leave-behind" fraction, where water recovered would not exceed more than 90 percent of the previously recharged water, creating a minimum net benefit to groundwater levels of at least 10 percent of the banked groundwater, which applies to each volume of water that is recharged to the Bank. The Project seeks participants to actively use the Bank so that the 10-percent leave-behind benefit is maximized.

The estimated contribution to the local water balance from this source is shown in the following table using estimated deliveries over a 30-year base period for San Joaquin River hydrology[12]. The deliveries are based on a similar scheme described in Section 2.2 whereby DEID and other potentially participating CVP Friant districts would contribute recharge water to the Project during water years when the total available water supply exceeds the contracted irrigation

[12] This hydrology is employed in evaluating impacts to groundwater with a numerical groundwater flow model presented in Appendix H."

demand within the participant's respective service areas. For the 30-year hydrology, the leave-behind fraction totals nearly 32,000 AF.

Impacts to Local Water Balance

A groundwater model was employed to evaluate the general benefits of the leave-behind fraction and improved conditions from recharge operations. The simulation results, presented in Appendix H of Attachment 1, indicate that the Proposed Action/Project would result in an incremental benefit of increased aquifer storage and higher groundwater levels at the end of the 40-year simulation period compared to a baseline scenario representing the No Action/No Project alternative. These results indicate that the Project has potential benefits to the SJRRP Water Management Goal and in meeting sustainable management under SGMA.

Mitigation Measures. None required. The Project would not substantially deplete groundwater supplies, interfere with groundwater recharge, or result in a net deficit to groundwater levels.

Surface Water and Groundwater Quality

The Project could potentially result in temporary adverse effects to groundwater quality and then on the quality of the extracted water that would be introduced into the FKC (surface water) and used subsequently in the Bank Partners' service areas. However, groundwater returned to the FKC must and will meet the then current Reclamation water quality standards.

Surface water applied to the recharge basins and in-lieu lands would be delivered via the FKC. The water quality of these deliveries, because of their similar tributary origins, would be comparable to sources that naturally recharge the underlying groundwater system. Hence, no long-term negative effect or impact on groundwater quality would be expected. However, residual concentrations of nitrates and other agricultural related chemicals, if present, could be mobilized beneath the recharge basins with initial water applications. This may result in short-term and temporary impacts to groundwater quality during initial recharge operations. Assuming a 20-foot thick zone of impacted soils, with soils possessing 15 percent void space, and 30,000 AFY of applied water, the 20-foot zone would be flushed more than 16 times in the first year of recharge, significantly diluting potential impacts to deeper groundwater. Additionally, water quality sampling before Project implementation and during the first year of bank operation would detect the impacts, if any, of increased chemical concentrations and the effects of dilution by applied water.

Table 3-1: Summary of Banking Operations

	San Joaquin River	Banking Operations	Banking Operations	Banking Operations	Banking Operations
	Hydrology	Delivery to Bank	10% "Leave Behind"	Return from Bank	Available Bank Balance
Year of Operations	% of Average Water Year	AF	AF	AF	AF
1	119%	30,000	3,000	0	27,000
2	98%	30,000	3,000	0	54,000
3	34%	0	0	30,000	24,000
4	20%	0	0	24,000	0
5	185%	30,000	3,000	0	27,000
6	100%	30,000	3,000	0	54,000
7	162%	30,000	3,000	0	81,000
8	58%	2,482	248	0	83,234
9	181%	7,517	752	0	89,999
10	253%	0	0	0	89,999
11	111%	0	0	0	89,999
12	70%	0	0	23,073	66,926
13	151%	25,082	2,508	0	89,500
14	42%	0	0	30,000	59,500
15	47%	0	0	30,000	29,500
16	52%	0	0	29,500	0
17	40%	0	0	0	0
18	66%	0	0	0	0
19	46%	0	0	0	0
20	150%	30,000	3,000	0	27,000
21	50%	0	0	27,000	0
22	218%	30,000	3,000	0	27,000
23	124%	30,000	30,000	3,000	54,000
24	158%	30,000	3,000	0	81,000
25	178%	10,000	1,000	0	90,000
26	150%	0	0	0	90,000
27	103%	0	0	0	90,000
28	60%	0	0	30,000	60,000
29	65%	0	0	30,000	30,000
30	81%	3,574	357	0	33,217
Total	0	318,655	31,866	253,573	0
Average	106%	10,622	1,062	8,452	48,263

Mitigation Measures. The Project will include implementation of the following measures related to water quality:

- **WAT-1:** Project recovery wells will be designed to meet water quality criteria by Reclamation. During the construction phase, zone sampling will be performed at prospective well locations and observation wells will be used to evaluate water quality characteristics of aquifer units underlying the Project site. Based on water quality from each recovery well, a blending protocol will be implemented to meet Reclamation requirements for deliveries via the FKC under WAT-2.
- **WAT-2:** Well water returned to the FKC will be commingled in the up to 60-inch diameter turnout before being discharged into the FKC. Based on the water quality characteristics of individual wells, testing protocol will ensure that blending and mixing through the 4.5-mile long main pipeline conveyance to the FKC meets Reclamation's then-current water quality requirements prior to introduction. Ongoing sampling in accordance with Reclamation's then-current water quality requirements will also be performed to ensure compliance.

Direct Pumping Impacts on Neighboring Wells

Operation of recovery wells for dry-year return has the potential to induce drawdown in groundwater levels in wells owned by other groundwater users in the immediate vicinity of the Project. Operation of a recovery well, or wells, induces direct pumping drawdown, or interference, as a function of distance, pumping rate and duration, and aquifer properties. Direct pumping interference is a temporary effect that would only occur when recovery wells are running. Pumping interference can be evaluated with a numerical groundwater flow model and analytic solutions and verified through field testing and water level observations. These approaches are incorporated into this EA and in the Project development plan.

The following table shows the expected extent of pumping interference induced from the edges of the recovery well field using analytic and modeling tools as detailed in Appendix H of Attachment 1: The results were used to determine the degree to which pumping impacts would exceed thresholds of significance and in the development of mitigation measures.

Table 3-2: Analytical and Modeled Projected Drawdown

Distance from Project Site (mi)	Drawdown by Analytical Solution (ft)	Drawdown by Numerical Model (ft)
0.5	58	72
1.0	30	47
1.5	23	31
2.0	7	20

The Project includes implementation of a groundwater monitoring program and formation of a Technical Committee comprised of one representative each from PID and DEID, and five representative property owners from within the project vicinity appointed by the Authority board. The Authority will inform stakeholders and interested parties, as defined under SGMA,

including neighboring landowners, and others involved in groundwater resource management in the Tule Subbasin of the Bank operations and monitoring program. The Technical Committee will monitor the Project operations and the changes to groundwater conditions created by the Bank and will recommend measures that may be taken by the Authority if any condition is determined to be adverse according to the thresholds described below.

Mitigation Measures

Mitigation Measures. The Project will include implementation of the following measures to mitigate potential significant adverse impacts during recovery pumping:

- **WAT-3**: Before Project recharge operations begin, a groundwater level monitoring program will be funded, designed and implemented by the Authority to establish a baseline to continue to evaluate potential well interference effects during recovery pumping operations. The program shall be designed by a certified hydrogeologist registered with the State of California and shall include a monitoring well layout and location plan based on stratigraphic conditions in the area of Project's recovery wells, consistent with the California Department of Water Resource's Sustainable Groundwater Management Program (December 2016) -- Best Management Practices (BMPs) for the Sustainable Management of Groundwater: Monitoring Protocols, Standards and Sites for monitoring well programs implemented under the Sustainable Groundwater Management Act (SGMA), which BMPs are found at: http://www.water.ca.gov/groundwater/sgm/pdfs/BMP_Monitoring_Protocols_Final_2016-12-23.pdf (as may be updated or amended). The program also shall integrate continuous data collection from manual readings and pressure transducers with data loggers for selected wells in the monitoring well network to identify possible well interference effects from Project recovery well pumping consistent with California Water Code sections 10726.4 and 10727.2.

  Further, monitoring wells at targeted aquifer depths shall be installed as part of the program to identify and avoid potentially significant well interference impacts from recovery pumping to any nearby well completed to within similar depth ranges. Monitoring wells shall be installed consistent with Department of Water Resources Bulletin 74-90, which supplements Bulletin 74-81.

  The monitoring program designed by the certified hydrogeologist shall require:

  - Recordation of water levels in selected monitoring wells on a one (1) hour frequency to provide an accurate determination of Project area water levels before recovery pumping operations begin and by which to detect influences of other nearby operating wells. Transducer data from monitoring wells will be downloaded weekly for a one (1) month period before the start of recovery pumping operations to establish water levels in the area.
  - Recordation of water levels in selected monitoring wells on a fifteen (15) minute frequency during Project recovery pumping to provide an accurate determination of the Project's drawdown effects. Transducer data from monitoring wells will be downloaded weekly during Project recovery pumping operations.

- Timely preparation of reports by the Authority that shall contain (1) water level hydrographs and tabulated water level data for each monitoring well both in the one (1) month before Project recovery pumping, and during Project recovery pumping operations, (2) tabulated groundwater recovery volumes from each recovery well during Project recovery pumping, and (3) documentation of drawdown effects on groundwater levels at each monitoring well. During recovery pumping, reports shall be prepared by the Authority weekly. Any interested party may request the reports and raw data in hardcopy and/or electronic format and the Authority shall comply within ten (10) business days. In addition to the monitoring data collected as described above, the Authority shall assess and integrate as applicable basin-wide monitoring data from the California Statewide Groundwater Elevation Monitoring Program (CASGEM) for the Tule Subbasin.

A Technical Committee shall be formed by the Authority upon completion of Project construction and prior to initial recharge operations and shall be comprised of one (1) staff representative each from PID and DEID, and five (5) representative landowners within the Project sphere of influence appointed by the Authority's Board of Directors. The Technical Committee shall adhere to these protocols to (1) insure reasonable and sound data acquisition, (2) the timely review of claims, and (3) further minimization of identified significant well interference effects.

The Technical Committee and Authority shall implement the following procedure for assessing and processing any claim received:

- All such claims shall be submitted in writing to the Authority's Project Manager on behalf of the Technical Committee. At a minimum, a claim submitted to the Technical Committee shall comply with the Government Claims Act and shall provide information about the condition of the well and its casing and pumping equipment, and other information relevant to the claim.

- The Technical Committee shall timely meet to review any submitted claim(s) for the further minimization of identified significant well interference effects. In no event shall the Technical Committee meet more than ten (10) business days after such claim has been received for further minimization to compensate for added lift, or more than three (3) business days after a claim has been submitted for further minimization of any identified inadequate suction head for operation of a well pump.

- The Technical Committee shall evaluate any claim in conjunction with recorded and reported data under the groundwater monitoring program described above, as well as any necessary field verification efforts.

- The Technical Committee shall make recommendations to the Authority Board regarding resolution of such claim and the recommendations to the Authority shall be made in writing no later than five (5) business days after the Technical Committee meets to consider such claim.

- The Authority Board shall meet timely and as soon as reasonably practicable to review the Technical Committee's recommendations for such claim. The Authority Board also

can meet and act in a special meeting (upon 24 hours public notice) to provide solutions to further minimize any identified significant well interference effects, if needed to address an exigent claim under the circumstances (such as a claim relating to alleged Project drawdown effects that result in inadequate suction head to operate a nearby well pump), before any Technical Committee recommendation is made for a significant well interference claim.

Thresholds of significance requiring mitigation have been quantified with measures that shall be employed and implemented by the Authority, including through recommendations by the Technical Committee:

Table -3: WAT-3 Monitoring Program

Threshold	Discussion	Mitigation
< 10 feet induced drawdown	This degree of influence is considered reliably detectable, but generally not a significant impact for the Project setting.	No action. Continue monitoring to determine whether Project influences may induce drawdown to next threshold level.
>10 feet induced drawdown	This degree of influence may cause significant added cost in operating high capacity wells over an irrigation season.	**Added Lift**: Authority shall timely compensate well owner for added lift no later than thirty (30) days after a claim is approved by the Authority Board. A written protocol for reasonable documentation and review of significant well interference claims will be developed and managed by the Technical Committee and approved by the Authority.
>20 feet induced drawdown	This degree of influence may pose operational problems by reducing the margin between pumping levels and pump setting depths.	**Added Lift or Other Solutions**: Authority shall timely compensate for added lift no later than thirty (30) days after a claim is approved by the Authority Board. Authority shall timely compensate well owner to lower a pump if induced drawdown by Project recovery wells results in inadequate suction head to operate well pump or shall timely provide other solutions as identified below to reduce any significant well interference effects to a less than significant level.

Authority shall employ other measures to further minimize a significant adverse well interference impact resulting in inadequate suction head to operate well pump attributed to the Project recovery pumping to a less than significant level. Such measures, at the Authority's discretion, shall include, but are not limited to the following:

1. Reduce recovery pumping volumes or the rate of groundwater withdrawal, or shut off Project recovery wells to reduce well interference impacts to nearby wells, including reducing Project recovery pumping volumes as needed to avoid an impact resulting in inadequate suction head to operate a well pump, and extending the Project's recovery pumping operations beyond the target eight (8) month pumping period.

2. Supply well owner's parcel with a different source of equivalent quantity and quality water at no greater cost to an affected well owner, including from Project recovery pumping wells connected via above-ground pipes to the owner's parcel;

3. Lower or replace a well pump; and/or

4. Replace a well.

Drainage Patterns

The Project would construct 4- to 5-foot deep recharge basins with 1- to 2-foot tall berms over an approximate 500-800-acre area. The construction of the basins would alter the existing drainage pattern and could increase the rate of erosion at the site during construction. Implementation of erosion and sediment control measures including a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the Clean Water Act would reduce erosion rates during and after construction.

As shown on Figure 3-3: FEMA DFIRM, portions of the Project area, including portions of the recharge basins fall within a 100-year flood zone. The 100-year flood is defined as a flood flow that has a one percent chance of being equaled or exceeded in any given year (FEMA, 2009). Special consideration would be taken in the engineering and construction of the berms such that the recharge basins are constructed in a way to capture flows to the extent that the basins are capable, thereby reducing inundation off-site, and in a manner, that protects the berms from failure from a 100-year flood that could affect other properties.

Mitigation Measure. Prior to the construction of the Project all of the following measures shall be implemented.

- **WAT-4:** Specific engineering techniques shall be incorporated into the design of the recharge basin berms as would be recommended by the geotechnical report prepared prior to design to protect the recharge basins from 100-year flood related failure. Techniques may include shallower outside slopes with rock rip-rap, higher level compaction of berms, deeper key-ways at the outside toe of slope or other appropriate equivalent measures.

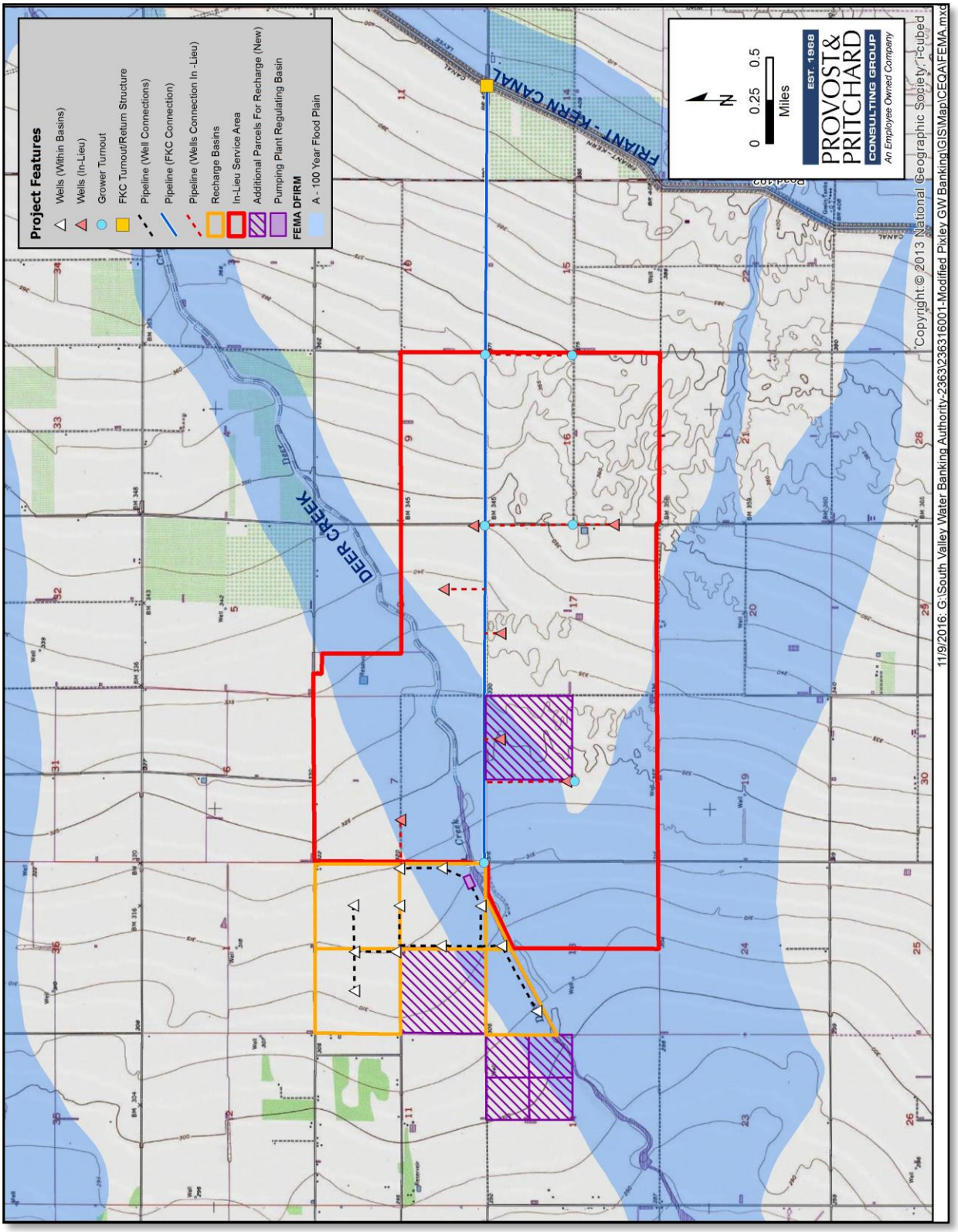

Figure 3-3: FEMA DFIRM

3.3 Biological Resources

3.3.1 Affected Environment

Appendix C of Attachment 1 contains a Report of Biological Evaluation prepared by Live Oak Associates, Inc. (LOA). The Report evaluates potential effects to biological resources from construction and operation of the Project. The report includes a description of the environmental setting of the Project and an analysis of: (1) Literature Search (2) Floristic Survey (3) Wildlife Survey and (4) Survey for Jurisdictional Waters. Additionally, the report includes the findings of a reconnaissance-level field survey of the Project site that was conducted on October 2 and 11, 2014, and on November 1, 2016 by LOA biologists. This survey consisted of driving the perimeter of the agricultural fields and along the onsite canals, and walking within and around representative habitats of the Project site. Information from that report is utilized below in the description of baseline conditions (environmental and regulatory), impact analysis, and recommended mitigation measures.

The study area includes areas within the footprint of the proposed groundwater recharge facilities, as well as the proposed in-lieu service area that would be beneficially impacted from the Proposed Action/Project. With the exception of the wells and pipelines to be constructed, the Project does not propose any alteration of the lands within the in-lieu service area. Four land use/biotic habitats were identified within the study area, including agricultural land (orchards and field crops), ruderal areas (i.e. County road alignments, agricultural roads, Harris Ditch, and concrete-lined FKC), intermittent channel of Deer Creek, and agricultural ponds (Appendix C of Attachment 1, Figure 4). Native and naturalized habitats were limited to the Deer Creek corridor. Natural terrestrial and aquatic communities were absent from the remainder of the study area. The vegetation associations and likely complement of wildlife species occurring on the study area are described below.

Special Status Species

The California Natural Diversity Data Base (CDFW 2015) was queried for special status species and natural communities of special concern occurrences in the nine USGS 7.5-minute quadrangles containing and surrounding the Project site (Sausalito School, Ducor, Richgrove, Delano East, Delano West, Pixley, Tipton, Woodville, and Porterville). Additionally, the same nine quadrangles were queried for Federal listed species and designated critical habitat using the Sacramento Fish and Wildlife Office's Endangered Species List Generator. These species, and their potential to occur on the Project site, are contained in the Biological Evaluation in Appendix C of Attachment 1.

3.3.2 Environmental Consequences

No Action/No Project Alternative

No changes in conditions or habitats would occur under the No Action/No Project Alternative. Operations and water management practices would not change. Therefore, the No Action/No Project Alternative would not result in changes to biological resources or habitats.

Proposed Action/Project

Any native habitats once present on the Project site have been heavily altered by human enterprise such that the site no longer provides suitable habitat for any locally occurring special status plant species; hence, the Project would not impact special status plants. Of the 36 special status animal species potentially occurring in the region, 27 species would be absent or unlikely to occur on the site due to unsuitable habitat condition. Loss of potential habitat as a result of implementation of the Project would not result in a significant adverse effect on these species, because there is little or no likelihood that they are present.

Special status species that may be affected by the Project include the SJKF, Swainson's hawk, migratory birds, burrowing owl, and roosting bats.

According to the CNDDB there have been 45 historical sightings of SJKF within ten miles of the study area (see Figure 6 of Appendix C of Attachment 1,) (CDFW 2014). These sightings occurred north, east, south and west of the study area between 1971 and 2004. Only one of these sightings occurred in the 21st century (2004) and it was 9 miles southwest of the site. An additional five sightings were in the 90s (between 1992 and 1997), with all remaining sightings greater than 25 years old. None of these sightings occurred within the study area itself.

A single large burrow providing marginal suitable denning habitat was observed along the steep embankment of a small, highly maintained irrigation tailwater basin at the project footprint's northwestern corner. Because the basin would be regularly maintained, and would have minimal vegetative cover, it is not anticipated that it would attract or maintain populations of small mammals. No evidence of use by the SJKF was observed during reconnaissance surveys. The burrow did not have a dirt berm or matted vegetation near the entrance, or prey remains in the vicinity that would suggest it has been used by SJKF. Given the disturbed habitats of the study area, and resulting limited prey base, the potential for SJKF to travel through the project area on their way to foraging or denning habitat is low. However, given its presence in the region it could conceivably pass through the study area from time to time. With implementation of the proposed avoidance and minimization measures described in Section 2.2.1, the proposed action would be unlikely to adversely affect SJKF because potential effects would be insignificant and discountable. Reclamation received concurrence from the USFWS on its determination on September 19, 2017.

Two Swainson's hawk nests have been identified between 9-10 miles west of the study area at the Pixley Wildlife Preserve (Rob Hansen, personal communication). Although no suitably sized nests were observed within the Project footprint during the field surveys, trees located within the larger study area and adjacent to the study area provide potential nesting habitat for Swainson's hawks. Project-related activities occurring at or near potential nest trees could result in the

abandonment of active Swainson's hawk nests or direct mortality to these birds, should they be nesting in them at the start of construction.

In addition to the Swainson's hawk, other raptor species such as white-tailed kites, red-tailed hawks and American kestrels likely forage over the study area and could potentially nest in large trees within the study area or directly adjacent to the site. Additionally, the site provides nesting habitat for a number of migratory bird species. Even the most disturbed habitats of the study area could be used by loggerhead shrike; killdeer (*Charadrius vociferous*) or other disturbance-tolerant birds protected by the Migratory Bird Treaty Act and related state laws. If birds were to nest on the Project site prior to construction, Project-related activities could result in the abandonment of active nests or direct mortality to these birds.

The study area provides some suitable nesting/denning habitat in the form of a few scattered California ground squirrel burrows, primarily located along the banks of Deer Creek. Foraging habitat is extremely limited. These small raptors are protected under the Migratory Bird Treaty Act and California Fish and Game Code. Project-related grading activities have the potential to bury owls that may retreat to burrows ahead of heavy equipment.

Riparian trees and roadway bridges within the study area provide potential roosting habitat for several species of bat. Development of the Proposed Action/Project could result in removal of trees potentially supporting maternal roosting bats. Impacts to maternal roosts have the potential to result in the mortality of juvenile bats. However, implementation of the relevant environmental commitments as described below and in Section 2.2.1 would compensate for any such impacts.

The biological survey conducted by LOA also determined that potential impacts could occur to riparian habitat or other sensitive habitats. Riparian habitat within the study area is limited to Deer Creek; no other sensitive habitats are present. A few large riparian trees are present within the Project site. Temporary impacts would occur to approximately 1,400 square feet (sf) of Deer Creek from trenching the pipeline crossing, which is proposed to occur west of the modified turn-out structure and east of the Road 160 bridge over Deer Creek. The existing check structure west of the Road 160 bridge would be modified and could permanently impact up to 1,000 sf of the channel. No more than 1,000 sf of the FKC would be permanently impacted from the construction of a turnout at this location. All three locations appear to lack suitable roosting vegetation.

Woody riparian vegetation within the Project footprint is not anticipated to be impacted by construction of the Project, and shall be avoided to the extent feasible. However, should impacts to riparian vegetation be necessary during construction, implementation of the applicable measure as described below and in Section 2.2.1 would compensate for any such impacts.

Further, the Project would not have a substantial adverse effect, either directly or through habitat modifications, on any special status species with implementation of the following conservation measures which are consistent with the SJRRP Conservation Strategy and *U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011). Implementation of these measures will avoid and minimize potential impacts associated with the implementation of the Proposed Action:

BIO 1: San Joaquin kit fox (SJKF)

The following conservation measures, which are consistent with the SJRRP Conservation Strategy and *U.S. Fish And Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011), will be implemented to avoid and minimize potential impacts to SJKF associated with the construction, operation, and maintenance activities for Project:

- **(*Pre-Construction Surveys*).** A USFWS-approved biologist shall conduct pre-construction surveys no fewer than 14 days and no more than 30 days prior to the onset of any ground disturbing activity. The primary objective is to identify kit fox habitat features (e.g. potential dens and refugia) on the project site. If San Joaquin kit fox are detected at any time, all activities associated with the project shall be halted immediately. The project shall be placed on hold until consultation with the USFWS and CDFW is completed.

- ***(Employee Education Program).*** The Authority shall conduct an employee education program prior to the start of construction. The Authority shall retain a USFWS-approved biologist to conduct one brief presentation on the San Joaquin kit fox to train any and all construction staff that shall be involved with the Project. This training shall include:
  - A description of the San Joaquin kit fox and its habitat needs;
  - Information on San Joaquin kit fox occurrence within the Project vicinity;
  - An explanation of the status of the species and its protection under the Endangered Species Act; and
  - A list of the measures being taken to reduce impacts to the species during construction.
  - A "fact sheet" conveying all of the training information prepared and distributed to all construction personnel in attendance at the initial training and to be used by construction manager to train any additional construction staff that was not in attendance at the first meeting, prior to starting work on the Project.
  - The Authority shall provide a summary of the training provided, including a list of personnel attending to Reclamation and the USFWS within 7 days of the training.

- ***(Avoidance).***-San Joaquin kit fox surveys of the recharge basins will be conducted by a USFWS approved biologist prior to the inundation of the recharge basins. The purpose of these surveys is to ensure that San Joaquin kit fox have not moved into the area. Surveys shall only occur in years when flooding of the recharge basins shall occur. The need for these surveys shall be reassessed in consultation with the USFWS and coordination with CDFW after seven years of surveys have been completed. A San Joaquin kit fox survey report shall be submitted to USFWS and CDFW by December 31 of each year in which surveys are conducted.

- ***(Minimization).*** Construction activities shall be carried out in a manner that minimizes adverse effects to San Joaquin kit foxes, should they occur in the action area. Minimization measures shall include:

- Project-related vehicles shall observe a daytime speed limit of 15-mph throughout the site in all project areas, except on state and federal highways. Night-time work, such as equipment maintenance shall be minimized to the extent possible. However, if work does occur after dark, the speed limit shall be reduced to 10-mph.
- Off-road project-related construction traffic outside of designated Project Area shall be prohibited.
- Construction work at night (half hour after sunset to half-hour before sunrise) will not be allowed.
- To prevent inadvertent entrapment of San Joaquin kit fox or other animals during construction, all excavated, steep-walled holes or trenches more than 1 feet deep will be covered with plywood or similar materials at the end of each workday. If the trenches cannot be closed, one or more escape ramps constructed of earthen fill or wooden planks will be installed. Before such holes or trenches are filled, they will be inspected for trapped animals.
- All construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at a construction site for one or more overnight periods will be thoroughly inspected for San Joaquin kit fox before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe will not be moved until the USFWS has been consulted and CDFW contacted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
- Before the start of work each day, the work site will be checked for animals under any equipment to be used that day, such as vehicles or stockpiles of items such as pipes. If a San Joaquin kit fox is found it will be allowed to leave on its own volition. Work will be halted and Reclamation contacted. Reclamation will notify the Service and CDFW within 48 hours.
- All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed on in securely closed containers and removed at least once a day from a construction or project site.
- No firearms will be permitted on the project site.
- No pets will be permitted on the project site.
- Use of rodenticide in the project areas will not be allowed.
- Upon completion of the project, all areas subject to temporary ground disturbances, including staging areas, temporary roads, and borrow sites will be re-contoured if necessary and revegetated with native seed to promote restoration of the area to pre-project conditions.
- Sightings of San Joaquin kit fox will be reported to California Natural Diversity Data Base.[13]

[13] Appendix C of Attachment 1, Live Oak Associates, Inc. Biological Resources Report for the Proposed Pixley Groundwater Bank Project. March 2015. Page 35-36.

- The contractor will be required to keep their equipment in good working condition in order to prevent leaks and spills of petroleum products or other fluids into waters of the U.S.

- All equipment will be washed prior to arriving at the Project site to remove soil and seeds and to prevent spread of noxious weeds.

BIO-2: Raptors (Swainson's hawk and white-tailed kite)

- ***(Avoidance).*** In order to avoid impacts to Swainson's hawks from Project construction, construction will occur between September 1st and January 31st, outside the Swainson's hawk nesting season to the extent feasible.

- ***(Pre-construction Surveys).*** If construction must occur between February 1st and August 31st, a qualified biologist will conduct a pre-construction survey for Swainson's hawk and white-tailed kite nests on the Project site and on lands within a half mile from the Project site within no more than 10 days of the onset of these activities. Survey shall follow the methodology developed by the Swainson's hawk Advisory Committee (SWHA TAC, 2000).

- ***(Establish Buffers).*** Should any active nests be discovered in or near proposed construction zones, the biologist will establish a half-mile no disturbance buffer, unless a smaller buffer can adequately protect the nest as determined by the biologist, in coordination with the Authority, Reclamation, the USFWS and CDFW, pending the nature of disturbance and the presence or absence of disturbance barriers between the nest and construction. This buffer will be identified on the ground with flagging or fencing, and will be maintained until the biologist has determined that the young have fledged.[14]

BIO -3: Migratory Bird Nests

- **(*Avoidance*).** In order to avoid impacts to all nesting migratory birds from grading and construction, these activities will occur outside of the typical avian nesting season, between September 1st and January 31st, to the extent feasible.

- ***(Pre-construction Surveys).*** If applicable activities must occur during the nesting season (February 1-August 31), a qualified biologist will conduct preconstruction surveys for active raptor and migratory bird nests within no more than 10 days before the start of any ground or vegetation disturbance. Surveys for raptors will include areas on and within 500 feet, and migratory birds on and within 250 feet of the site, where accessible. If no active nests are found within the survey area, no further mitigation is required.

  (Establish Buffers). Should any active nests be discovered in or near proposed construction zones, the biologist will identify a suitable construction-free buffer around the nest in coordination with the Authority, Reclamation, the USFWS and/or CDFW.

[14] Appendix C of Attachment 1, Live Oak Associates, Inc. Biological Resources Report for the Proposed Pixley Groundwater Bank Project. March 2015. Page 37-38.

This buffer will be identified on the ground with flagging or fencing, and will be maintained until the biologist has determined that the young have fledged.

BIO-4: Burrowing Owl

- ***(Take Avoidance Surveys).*** A take avoidance survey for burrowing owls will be conducted by a biologist who meets the qualifications to perform burrowing owl surveys as set forth in the *Staff Report on Burrowing Owl Mitigation (CDFW 2012).* The surveys will be conducted between 14 and 30 days prior to the start of construction. This take avoidance survey will be conducted according to methods described in the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). The survey area will include all suitable habitats on and within 200 meters of Project impact areas, where accessible.

- ***(Avoidance).***-Burrowing owl surveys of the recharge basins will be conducted by a biologist who meets the qualifications to perform burrowing owl surveys as set forth in the *Staff Report on Burrowing Owl Mitigation (CDFW 2012).* The surveys will be conducted prior to the inundation of the recharge basins. The purpose of these surveys is to ensure that burrowing owl have not moved into the area. Surveys will only occur in years when flooding of the recharge basins will occur. The need for these surveys will be reassessed in coordination with the USFWS and CDFW after seven years of surveys have been completed. A burrowing owl survey report will be submitted to CDFW and the USFWS by December 31 of each year in which surveys are conducted.

- ***(Avoidance of Active Nests).*** If Project activities are undertaken during the breeding season (February 1-August 31) and active nest burrows are identified within or near Project impact areas, a 200-meter disturbance-free buffer will be established around these burrows, or alternate avoidance measures implemented by the Authority in consultation with CDFW. The buffers will be enclosed with temporary fencing or flagging to prevent construction equipment and workers from entering the setback area. Buffers will remain in place for the duration of the breeding season, unless otherwise arranged with CDFW. After the breeding season (i.e. once all young have left the nest), passive relocation of any remaining owls may take place as described below.

- ***(Passive Relocation of Resident Owls).*** During the non-breeding season (September 1-January 31), resident owls occupying burrows in Project impact areas may either be avoided, or passively relocated to alternative habitat. If the Authority chooses to avoid active owl burrows within the impact area during the non-breeding season, a 50-meter disturbance-free buffer will be established around these burrows, or alternate avoidance measures implemented in consultation with CDFW. The buffers will be enclosed with temporary fencing, and will remain in place until a qualified biologist determines that the burrows are no longer active. If the Authority chooses to passively relocate owls during the non-breeding season, this activity will be conducted in accordance with a relocation plan prepared by a qualified biologist. Passive relocation may include one or more of the following elements: 1) establishing a minimum 50-foot buffer around all active burrowing owl burrows, 2) removing all suitable burrows outside the 50-foot buffer and

up to 50 meters outside of the impact areas as necessary, 3) installing one-way doors on all potential owl burrows within the 50-foot buffer, 4) leaving one-way doors in place for 48 hours to ensure owls have vacated the burrows, and 5) removing the doors and excavating the remaining burrows within the 50-foot buffer.

Bio-5: Roosting Bats

- ***(Temporal Avoidance).*** Riparian tree removal and/or structure demolition will occur after September 30, and before April 1, outside the roosting bat season.

- ***(Preconstruction Surveys).*** If removal of riparian trees and/or structure demolition must occur between April 1 and September 30 (general maternity bat roost season), a qualified biologist will survey affected trees for the presence of bats within 30 days prior to these activities. The biologist will look for individuals, guano, and staining, and will listen for bat vocalizations. If necessary, the biologist will wait for nighttime emergence of bats from roost sites. If no bats are observed to be roosting or breeding, then no further action would be required, and construction would proceed.

- ***(Minimization).*** If a non-breeding bat colony is detected during preconstruction surveys, the individuals will be humanely evicted via partial dismantlement of trees prior to full removal under the direction of a qualified biologist to ensure that no adverse impact to any bats occurs as a result of construction activities.

- ***(Avoidance of Maternity Roosts).*** If a maternity colony is detected during preconstruction surveys, a disturbance-free buffer will be established around the colony and remain in place until a qualified biologist deems that the nursery is no longer active. The disturbance-free buffer will range from 50 to 100 feet as determined by the biologist.

- ***(Consultation if Maternity Roosts Cannot be Avoided).*** If roosts are determined to be present and must be removed, the bats will be excluded from the roosting site before the tree is removed. A mitigation program addressing compensation, exclusion methods, and roost removal procedures will be developed by the Authority in consultation with CDFW before implementation. Exclusion methods may include use of one-way doors at roost entrances or sealing roost entrances when a site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g. during hibernation or while females in maternity colonies are nursing young).

- ***(Compensation for Habitat Loss).*** The loss of each roost will be replaced by the Authority, in consultation with CDFW, and may include construction and installation of bat boxes suitable to the bat species and colony size excluded from the original roosting site(s). Roost replacement will be implemented before bats are excluded from the original roost site(s). Once the replacement roosts are constructed and it is confirmed that bats are not present in the original roost sites, the tree(s) may be removed.

Bio-6: Riparian and other Sensitive Habitats

- ***(Revegetation of Disturbed Areas).*** After construction, all disturbed areas within Deer Creek will be restored to the original contours. The small area of Deer Creek to be disturbed is anticipated to re-vegetate naturally.

  (Replacement Planting). Should avoidance of riparian trees not be possible, the Authority will provide compensation. Replacement planting will be implemented at a ratio of 3:1 for trees between 4-24 inches in diameter at breast height (DBH), and at a ratio of 10:1 for trees greater than 24 inches in DBH. Species chosen for the plant pallet will include native riparian trees such as valley oaks, Oregon ash and Fremont's cottonwoods. Seed and cuttings will be gathered from its lands fronting the Deer Creek watershed, if possible. These trees will be planted as container plants and cuttings. All planting material will be installed in the late fall or early winter. All plantings will be monitored annually for a minimum of five years. A revegetation plan pursuant to the Lake and Streambed Alteration Agreement with the CDFW will be completed for the project that will detail the maintenance, monitoring, performance criteria and success rate for trees planted within the project site.

3.4 Land Use

3.4.1 Affected Environment

The Project is located in unincorporated, rural southern Tulare County. The area consists of 4,189 acres of rural lands zoned agricultural adjacent to the FKC and is bisected by Deer Creek (Figure 3-3-4 Tulare County Zoning). Tulare County lies south of the Sacramento-San Joaquin Delta, and is comprised of 4,840 square miles. The area has historically been used for agricultural cultivation and associated infrastructure, including irrigation related tail water and regulating ponds. The Project is designated Valley Agricultural within the Rural Valley Lands Plan area, as identified in the Tulare County General Plan[15]. Land uses surrounding the site are predominately agricultural and rural residential.

3.4.2 Environmental Consequences

No Action/No Project Alternative

Under the No Action/No Project Alternative, PID would not construct the groundwater basin and related appurtenances. Conditions related to the current use of lands would remain the same, and there would be no impact to land use.

Proposed Action/Project

The groundwater banking infrastructure, including a new turnout from the FKC, pipelines, control facilities, groundwater recovery wells, recharge basins and "in-lieu" banking acreage, support agriculture in the Project Area and vicinity and are consistent with the General Plan

[15] Tulare County General Plan 2030 Update, Figure 4-1.

designations and zoning for Tulare County found within the Project area. The Project would not conflict with any applicable land use plans, policies, or regulations of an agency with jurisdiction over the Project. The Project would have no impacts to land use.

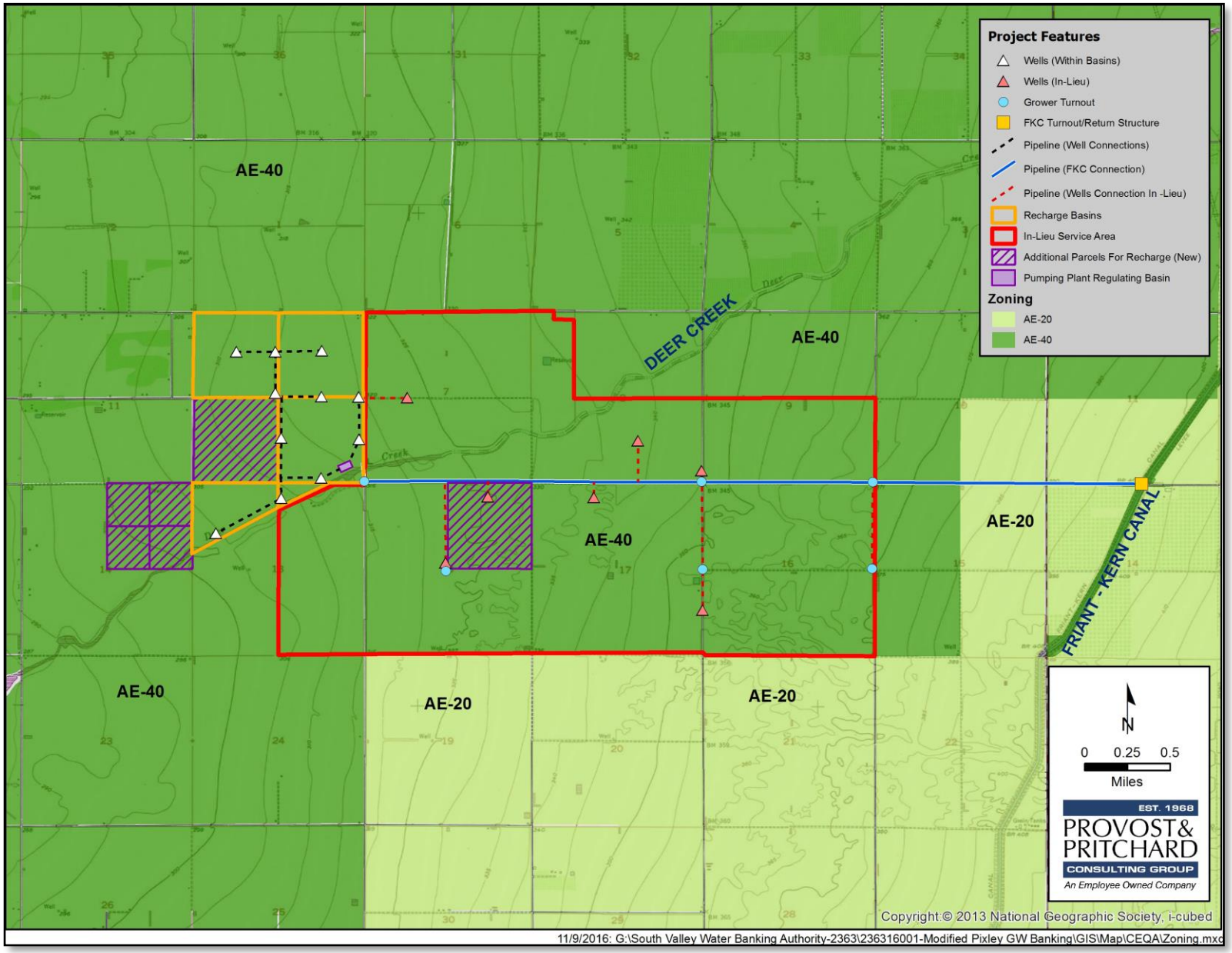

Figure 3-3-4 Tulare County Zoning

3.5 Cultural Resources

"Cultural Resources" is a broad term that typically applies to archaeological resources, the built environment, and Traditional Cultural Properties (TCPs). Such resources include prehistoric and historic-era archaeological sites that provide evidence of past human lifeways; structures, such as buildings, bridges, dams, and canals related to more recent human activity; and specific locations strongly associated with the traditions or cultural identity of living communities. Cultural resources that are included in, or eligible for inclusion in, the National Register of Historic Places (National Register) are known as historic properties [36 CFR § 800.16(l)(1)]. Title 54 U.S.C. § 306108, commonly known as Section 106 of the National Historic Preservation Act (NHPA), requires that Federal agencies take into account the effects of their undertakings on historic properties. The CEQA process is the primary State process for considering effects to cultural resources. CEQA requires the State and local governments to identify Historic Resources, which are those cultural resources that could be eligible for inclusion on the California Register of Historic Resources (CRHR). For Federal projects, cultural resource significance can be evaluated in terms of eligibility for listing in the National Register.

The Section 106 process, as outlined at 36 CFR Part 800, describes how Federal agencies meet their statutory responsibilities for NHPA Section 106 compliance. The process involves efforts to identify historic properties in the undertaking's APE. The APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist therein [36 CFR § 800.16(d)]. The Section 106 process requires consultation with Indian tribes concerning the identification of sites of religious or cultural significance that may be present in the APE. Other groups or individuals who are entitled, or have requested, to be consulting parties may also participate in the Section 106 process. Consultation with the State Historic Preservation Officer (SHPO) and/or the Advisory Council on Historic Preservation (ACHP), Indian tribes, and other groups or individuals who are entitled or have requested to be consulting parties, is also as part of the Section 106 process. Reclamation uses the findings made through Section 106 compliance to inform the cultural resources impact analysis under NEPA.

Reclamation's Proposed Action's described in Section 2.2 are undertakings as defined in 36 CFR § 800.16(y) and are the type of activities that have the potential to cause effects on historic properties under 36 CFR § 800.3(a).

3.5.1 Affected Environment

The Central Valley of California is abundant with cultural resources ranging from small archaeological sites to pre-historic villages, and historic era resources ranging from bridges and buildings to canals and roads. Native Americans broadly used the landscapes south of the San Joaquin River and cultural resources related to that use have been identified and recorded within the region. Historic use of the landscape is also quite prevalent and broadly distributed over the landscape. The contemporary landscape is a heavily altered landscape consisting of agricultural fields of permanent and rotational crops, supporting infrastructure such as water conveyance systems, roads, farm outbuildings, residences, and other components of the built environment. While the potential for archaeological resources exists it is somewhat anticipated, due to the large-scale landscape modification, that much of their context is heavily disturbed.

In an effort to identify historic properties/historical resources, the Authority contracted ASM Affiliates to conduct investigations to identify cultural resources that are eligible for inclusion or listing on the NRHP or CRHR. Appendix E of Attachment 1 contains the compilation of two separate reports comprising the totality of ASM Affiliates' cultural evaluations and conclusions regarding the APE for the Modified Pixley Groundwater Banking Project. An Executive Summary at the front of the more recent study summarizes the impacts, conclusions and mitigation measures of both reports as applicable to the entire APE. Due to a lack of access, an additional 160-acre portion of the Project modification for recharge was not surveyed for cultural resources. This parcel may be subject to further analysis at a later date should the property be acquired for the Project.

Four cultural resources were identified within the APE: two segments of the Harris Ditch and Deer Creek (both are part of PID's water conveyance facilities), the Pixley-1 Bridge on Road 160 over Deer Creek, and the FKC.

The PID was organized in 1958 for flood control on Deer Creek and to obtain CVP water from the FKC. One of the primary water conveyance features is Deer Creek, into which CVP water is delivered from the FKC. Deer Creek was originally a natural creek and the portion of Deer Creek in and adjacent to the APE was channelized in the 1970s. The Deer Creek check structure and headworks of the Harris Ditch were constructed in 1981 (Carey et. al. 2015:18). The channelized Deer Creek and the Harris Ditch headworks are less than 50 years old and do not meet the general age criteria for consideration as historic properties pursuant to 36 CFR Part 60.4. Additionally, these facilities do not meet the criteria considerations as they do not possess exceptional significance in their association to events or people that are important in the history of flood control and water conveyance in the Tulare County, nor do they possess exceptional significance for their design and construction as earthen structures. Therefore, the channelized portion of Deer Creek and the Harris Ditch and its headworks are not historic properties/historical resources.

The Pixley-1 Bridge is a 40-foot long, two-lane; concrete bridge on Road 160 that spans Deer Creek. The bridge was constructed in 1961 and is identified as bridge number 46C0317 on the Caltrans Local Agency Bridges list. Caltrans has evaluated this bridge and determined it to be not eligible for inclusion on the National Register (Carey et. al. 2015). It is therefore also not eligible for inclusion on the CRHR.

The FKC is a component of Reclamation's CVP Friant Division. In 1997, the Federal Highway Administration obtained a consensus determination for the National Register eligibility for the FKC, and Reclamation has treated the FKC as eligible for inclusion in the National Register pursuant to 36 CFR § 60.4 under Criterion A for its contribution to the development of agriculture in California and the San Joaquin Valley, but has not received a consensus determination on its own formal evaluation of the FKC. The FKC is therefore also eligible for inclusion on the CRHR pursuant to Section 15064.5.

Reclamation originally initiated consultation with the SHPO for the Project in February 2016, seeking their concurrence on a finding of "no adverse effect to historic properties pursuant to 36 CFR § 800.5(b)." A concurrence from SHPO (BUR_2016_0302_001) was received on March 2, 2016. With the current changes in the project, Reclamation has determined that the finding of effect is still appropriate. Reclamation re-initiated consultation and received SHPO concurrence on May 12, 2017.

3.5.2 Environmental Consequences

No Action/No Project Alternative

Under the No Action/No Project Alternative, there would be no impacts to cultural resources since there would be no change in operations and no ground disturbance. Conditions related to cultural resources would remain the same as existing conditions.

Proposed Action/Project

The Proposed Action/Project is a type of activity that has the potential to cause effects on historic properties under 36 CFR § 800.3(a). A records search, a cultural resources survey, and Tribal consultation identified historic properties within the APE. The only identified historic property within the APE is the FKC, which is a component of the CVP. Reclamation applied the criteria of adverse effect [36 CFR § 800.5(a)] for the current undertaking and found that the proposed activities would result in no significant alterations to the historic characteristics that make the FKC eligible for the National Register. The proposed actions of installing a new turnout on the FKC for this project will not alter any physical characteristics of the canal or its berm. This turn-out installation is consistent with other similar existing facilities that pump water from the FKC. Since there will be no alterations to the FKC that would affect its integrity, the CVP will also be unaffected. Therefore, Reclamation determined that there will be no adverse effect to historic properties pursuant to 36 CFR § 800.5(b); therefore, no cultural resources would be affected as a result of implementing the proposed action. Additional consultation may be needed for the additional 160-acre portion of the Project modification for recharge that was not surveyed should the property be acquired for the Project.

Reclamation re-initiated consultation and received SHPO concurrence on May 12, 2017.

Although it was determined that there would be no impact to known cultural resources, the Authority recognizes that there could be an impact to undiscovered resources within the Project's APE as a result of the Proposed Action/Project. Measure CUL-1 would minimize potential adverse effects from inadvertent discoveries of buried resources.

Mitigation Measure. During the course of all ground disturbing activities of construction the following mitigation measure shall be implemented:

- **CUL -1:**

  In the unlikely event that unanticipated buried archaeological deposits are encountered during construction, work in the immediate vicinity of the discovery must cease until the find can be evaluated by Reclamation and managed pursuant to the requirements of 36 CFR 800.13 and other applicable Federal laws and regulations. If human remains are inadvertently discovered, Reclamation will comply fully with Native American Graves Protection and Repatriation Act of 1990 NAGPRA as outlined at 43 CFR Part 10, and other Federal laws and regulations as appropriate.

As a result of Mitigation CUL-1 as well as Reclamation's efforts to consider impacts to cultural resources through the Section 106 process, it is determined that the Proposed Action would have no impacts to cultural resources.

3.6 Indian Trust Assets

3.6.1 Affected Environment

Indian Trust Assets (ITAs) are legal interests in assets that are held in trust by the United States (U.S.) 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 U.S. on behalf of the 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 as compensation or injunction, if there is improper interference. ITAs cannot be sold, leased or otherwise alienated without the approval of the U.S. "Assets" can be real property, physical assets, or intangible property rights, such as a lease, or right to use something; which may include lands, minerals and natural resources in addition to hunting, fishing, and water rights. Indian reservations, rancherias, and public domain allotments are examples of lands that are often considered trust assets. In some cases, ITAs may be located off trust land. Reclamation shares the Indian Trust responsibility with all other agencies of the Executive Branch to protect and maintain ITAs.

3.6.2 Environmental Consequences

No Action/No Project Alternative

Under the No Action Alternative, there would be no impacts to ITAs as there would be no ground-disturbing activities and conditions would remain the same as existing conditions.

Proposed Action/Project

The closest Indian Trust lands, the Santa Rosa Rancheria, is located approximately 20 miles to the west of the Project Area, with the Tule River Tribal Indian Trust lands located approximately 34 miles to the southwest. The Proposed Action/Project would not affect any ITAs.

3.7 Indian Sacred Sites

3.7.1 Affected Environment

Executive Order 13007 provides that in managing Federal lands, each Federal agency with statutory or administrative responsibility for management of Federal lands would, to the extent practicable and as permitted by law, accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and avoid adversely affecting the physical integrity of such sacred sites.

The Proposed Action involves construction of groundwater recharge and infrastructure facilities primarily on land that is not owned by a federal agency and therefore is not subject to Executive Order 13007, with the exception of construction of the new turnout on the FKC, which would occur on Reclamation property.

3.7.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, Reclamation would not provide funding for the construction of the proposed groundwater recharge basins and related facilities and appurtenances, including water control and conveyance structures. If no project were constructed, there would be no adverse effects to Indian sacred sites since conditions would remain the same as existing conditions.

Proposed Action

The majority of the Project is not located on Federal lands and would not limit access to any known resources on Federal lands. Construction of the new turnout on the FKC on Reclamation property would not impact Indian Sacred Sites as defined by Executive Order 13007 as there are none within the Project area.

3.8 Air Quality

3.8.1 Affected Environment

The Project lies within the San Joaquin Valley Air Basin (SJVAB), the second largest air basin in the State, consisting of eight counties: Fresno, Kern (western and central), Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Air basins share a common "air shed", the boundaries of which are defined by surrounding topography. Although mixing between adjacent air basins inevitably occurs, air quality conditions are relatively uniform within a given air basin. The San Joaquin Valley 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.

An Air Quality and Greenhouse Gas Impact Analysis study[16] completed for this project by Ambient Air Quality and Noise Consulting in January 2017, is contained in full in Appendix B of Attachment 1. That study provides a detailed description of the existing environment in the project area and identifies potential impacts associated with the proposed Pixley Groundwater Banking Project (Project) in relation to regional and local air quality, as well as increased emissions of greenhouse gases (GHGs). The study also addresses odors and other potential issues of concern related to air quality for sensitive receptors, such as Valley Fever and asbestos, and also summarizes various federal, state and local air quality regulations applicable to the project. Said study was prepared in accordance with the San Joaquin Valley Air Pollution Control District's (SJVAPCD) Guidance for Assessing and Mitigating Air Quality Impacts (2015). The evaluation in this EA/IS relies on the information and conclusions presented in that study.

Despite years of improvements, the SJVAB does not meet some State and Federal health-based air quality standards. To protect health, the San Joaquin Valley Air Pollution Control District (SJVAPCD) is required by Federal law to adopt stringent control measures to reduce emissions. On November 30, 1993, the Environmental Protection Agency (EPA) promulgated final general conformity regulations at 40 CFR 93 Subpart B for all Federal activities except those covered under transportation conformity. The general conformity regulations apply to a proposed

[16] Air Quality & Greenhouse Gas Impact Analysis for the Proposed Pixley Groundwater Banking Project, Ambient Air Quality and Noise Consulting, Paso Robles, California, January 2017.

Federal action in a non-attainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutant caused by a proposed action equal or exceed certain emissions thresholds, thus requiring the Federal agency to make a conformity determination. Table 3-4: San Joaquin Valley General Conformity “de minimis” Thresholds

below presents the emissions thresholds and attainment status covering the Project location’s overlying air basin.

Table 3-4: San Joaquin Valley General Conformity "de minimis" Thresholds

Pollutant	Averaging Time	California Standards*	California Standards*	National Standards*	National Standards*
		Concentration*	Attainment Status	Primary	Attainment Status
Ozone (O_3)	1-hour	0.09ppm	Non-Attainment	-	Non-Attainment (Extreme)**
Ozone (O_3)	8-hour	0.070 ppm	Non-Attainment	0.075 ppm	
Particulate Matter (PM10)	AAM	20 µg/m3	Non-Attainment	-	Attainment
Particulate Matter (PM10)	24-hour	50 µg/m3	Non-Attainment	150 µg/m3	Attainment
Fine Particulate Matter (PM2.5)	AAM	12 µg/m3	Non-Attainment	15 µg/m3	Non-Attainment
Fine Particulate Matter (PM2.5)	24-hour	No Standard	Non-Attainment	35 µg/m3	Non-Attainment
Carbon Monoxide (CO)	1-hour	20 ppm	Attainment/ Unclassified	35 ppm	Attainment/ Maintenance
Carbon Monoxide (CO)	8-hour	9 ppm	Attainment/ Unclassified	9 ppm	Attainment/ Maintenance
Carbon Monoxide (CO)	8-hour (Lake Tahoe)	6 ppm	Attainment/ Unclassified	-	Attainment/ Maintenance
Nitrogen Dioxide (NO_2)	AAM	0.030 ppm	Attainment	0.053 ppm	Attainment/ Unclassified
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm	Attainment	0.100 ppb	Attainment/ Unclassified
Sulfur Dioxide (SO_2)	AAM	-	Attainment	0.03 ppm	Attainment/ Unclassified
Sulfur Dioxide (SO_2)	24-hour	0.04 ppm	Attainment	0.14 ppm	Attainment/ Unclassified
Sulfur Dioxide (SO_2)	3-hour	-	Attainment	-	Attainment/ Unclassified
Sulfur Dioxide (SO_2)	1-hour	0.25	Attainment	75 ppb	Attainment/ Unclassified
Lead	30-day average	1.5 µg/m3	Attainment	-	No Designation/ Classification
Lead	Calendar Quarter	-	Attainment	1.5 µg/m3	No Designation/ Classification
Lead	Rolling 3-Month Average	-	Attainment	0.15 µg/m3	No Designation/ Classification
Sulfates	24-hour	25 µg/m3	Attainment	No Federal Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m3)	Unclassified	No Federal Standards	
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m3)	Attainment	No Federal Standards	
Visibility-Reducing Particulate Matter	8-hour	Extinction coefficient: 0.23/kilometer- visibility of 10 miles or more (0.7-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70%.	Unclassified	No Federal Standards	
**For more information on standards visit: http://www.arb.ca.gov.research/aaqs/aaqs2.pdf*	***No Federal 1-hour standard. Reclassified extreme nonattainment for the Federal 8-hour standard May 5, 2010.*	****Secondary Standard*	*Source: ARB 2013; SJVAPCD 2013*		

Project operations would not contribute to criteria pollutant emissions, as water banking is largely a passive process; however, emissions would be associated with construction. Construction of the Project would be accomplished with scrapers, excavators, front-end loaders, backhoes, compactors, cranes, water truck for dust control, an earthmover, and miscellaneous equipment. Construction of the Project would occur over an approximately two-year period.

3.8.2 Environmental Consequences

No Action/No Project Alternative

Under the No Action/No Project Alternative, there would be no impacts to air quality since no construction would take place.

Proposed Action/Project

There are several rural residences located in the general vicinity of the Project site, the closest of which is approximately 93 feet away from the pipeline to the southeast on Road 176. Short-term air quality impacts would be associated with construction, and would generally arise from dust generation (fugitive dust) and operation of construction equipment. Fugitive dust results from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. Fugitive dust is a source of airborne particulates, including PM10 and PM2.5. Large earth-moving equipment, trucks, and other mobile sources powered by diesel or gasoline are also sources of combustion emissions, including nitrogen dioxide (NO_2), CO, carbon dioxide (CO_2), ROG, sulfur dioxide, and small amounts of air pollutants. Table 3-5: Calculated Project Construction Emissions below provides a summary of the estimated emissions during construction of the Project.

Table 3-5: Calculated Project Construction Emissions

Construction Activity/Source	Emissions (lbs/day)[1]	Emissions (lbs/day)[1]	Emissions (lbs/day)[1]	Emissions (lbs/day)[1]	Emissions (lbs/day)[1]	Emissions (lbs/day)[1]
	ROG	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Recharge Basin (Construction Year 1)						
Site Preparation & Orchard Removal: On-Site	2.50	24.0	13.50	0.50	7.50	4.50
Site Preparation & Orchard Removal: Off-Site	0.50	17.00	3.50	0.50	1.00	0.50
Grading: On-Site	5.40	63.40	36.00	0.10	7.80	2.90
Grading: Off-Site	0.30	0.30	2.40	0.10	0.90	0.20
Total:	8.70	104.70	55.40	0.16	17.20	8.10
Recharge Basin (Construction Year 2)						
Grading: On-Site	3.25	38.00	22.50	0.05	14.50	2.75
Grading: Off-Site	0.25	0.25	1.50	0.00	0.75	0.25
Excavation: On-Site	0.21	2.74	3.37	0.00	0.21	0.21
Excavation: Off-Site	0.21	0.21	0.21	0.00	0.21	0.21
Well Drilling: On-Site	0.70	8.00	5.00	0.02	0.30	0.30
Well Drilling: Off-Site	0.10	0.08	0.80	0.00	0.20	0.05
Infrastructure: On-Site	0.80	9.60	6.40	0.02	0.28	0.40
Infrastructure: Off-Site	0.04	0.03	0.32	0.00	0.08	0.02
Total:	5.32	58.62	40.06	0.09	16.36	3.89
In-Lieu Banking Area						
Excavation: On-Site	1.33	11.33	7.33	0.02	0.47	0.47
Excavation: Off-Site	0.03	0.02	0.20	0.00	0.04	0.01
Trenching: On-Site	0.20	2.00	2.00	0.00	0.18	0.18
Trenching: Off-Site	0.02	0.02	0.18	0.00	0.04	0.01
Total:	1.58	13.37	9.71	0.02	0.73	0.67
Pipeline Installation						
Trenching: On-Site	1.67	17.11	12.44	0.02	0.78	0.78
Trenching: Off-Site	0.11	0.11	0.67	0.00	0.03	0.11
Lift Stations: On-Site	1.33	13.33	9.33	0.02	0.67	0.67
Lift Stations: Off-Site	0.07	0.03	0.33	0.00	0.10	0.02
Total:	3.18	30.59	22.78	0.04	1.58	1.58
Maximum Daily Onsite Emissions – Year 1:	12.4	**131.2**	80.6	0.2	17.4	9.5
Maximum Daily Onsite Emissions – Year 2:	9.5	**102.1**	68.4	0.2	17.4	5.8
Significance Thresholds:[2]	*100*	*100*	*100*	*100*	*100*	*100*
Exceed Thresholds?	*No*	***Yes***	*No*	*No*	*No*	*No*

1. Emissions were quantified using CalEEMod, version 2016.3.1. Totals may not sum due to rounding. A maximum average-daily emission assumes in-lieu banking and pipeline construction could occur during either recharge basin construction years. Total onsite and off-site emissions are presented for informational purposes. Refer to Appendix A for modeling results and assumptions.
2. *SJVAPCD significance thresholds for localized impacts are based on onsite emission sources.*

Short-term Construction-Generated Emissions

Short-term construction emissions associated with the Project, including emissions associated with the operation of off-road equipment, haul-truck trips, on-road worker vehicle trips, and vehicle travel on paved and unpaved surfaces and fugitive dust from material handling activities were calculated using the California Emissions Estimator Model (CalEEMod), version 2016.3.1. Emissions modeling were based on estimated construction schedules for the project and assuming an overall construction period of approximately 15 months. Emissions modeling included emissions generated during site preparation/grading, as well as, the installation of basin and in-lieu bank infrastructure and pipelines. Emissions were quantified based on anticipated construction schedules and construction equipment requirements provided by the project proponent. Haul truck trips for the removal of the existing orchards were based on a total of 720 acres and an estimated 1.5 haul trucks/acre assuming that all material would be chipped and exported off site (P&P 2016). The import/export of soil is not anticipated to be required for this project. All remaining assumptions were based on the default parameters contained in the model.

Mitigated construction-generated fugitive dust emissions were quantified assuming an on-site speed limit of 15 miles per hour (mph), a control efficiency of 61% for watering of disturbed surfaces, and 50% control efficiency for watering of on-site unpaved roadways. Watering control efficiencies were based on a minimum application rate of three times daily, sufficient to keep soils and roadway base materials moist. Short-term increases of odors and toxic air contaminants attributable to the Project were qualitatively assessed. Emissions modeling assumptions and output files are included in Appendix A of Attachment 1 of this report.

Long-term Operational Emissions

The CalEEMod computer program, version 2016.3.1 was used to estimate emissions of criteria pollutants (i.e., NOx, ROG, PM10, PM2.5, SOx, and CO) associated with long-term operation of the Project. During long-term operation of the Project, emissions would be associated with on-site energy use, motor vehicle operations, and the operation of off-road equipment associated with routine maintenance activities, generating less annual emissions than on-going agricultural activities consistent with existing conditions. Onsite emissions associated with energy use, motor vehicle operations, and off-road equipment operations were based on operational data provided by the Authority and the default emission factors and usage rates contained in CalEEMod. Net increases in emissions were calculated in comparison to existing operational emissions, which include the operation of off-road equipment, worker commute trips, and water pumps. To be conservative, haul truck trips associated with the transport of agricultural products were not included in the analysis. Existing emission sources and associated annual emissions for the project buildout year 2019 conditions are summarized in Table 4 of the study contained in Appendix B of Attachment 1 of this EA/IS. Emissions modeling assumptions and output files are included in Appendix A of Attachment 1 of that study as well.

Mitigation Measures:

Mitigation Measure AQ-1: Comply with SJVAPCD's Regulation VIII-Fugitive Dust Prohibitions.

Construction of the Project will comply with SJVAPCD's *Regulation VIII Fugitive Dust Prohibitions* and implement all applicable control measures. In accordance with SJVAPCD's Regulation VIII, a Dust Control Plan (DCP) will be prepared for the Project. The DCP will be submitted to and approved by the SJVAPCD prior to issuance of construction/grading permits. Fugitive dust control measures to be included in the DCP will include, but are not limited to, the following:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, will be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.

- All on-site unpaved roads and off-site unpaved access roads will be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.

- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities will be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.

- When materials are transported off-site, all material will be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container will be maintained.

- All operations will limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions.) (Use of blower devices is expressly forbidden.)

- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles will be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.

- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles will implement measures to prevent carryout and trackout.

Mitigation Measure AQ-2: Implement Measures to Reduce Construction Emissions of NOx below threshold levels.

The following measures shall be implemented to reduce mobile-source emissions of NOx below threshold levels:

- To the extent locally available, alternative fueled, electrically driven, hybrid, or catalyst construction equipment will be used.

- Heavy-duty (50 hp, or greater) off-road construction equipment will, at a minimum, meet U.S. EPA Tier 3 emission standards.

- A minimum of 50% of construction waste materials will be recycled.

- When not in use, idling of on-site construction equipment and vehicles will be minimized. Idling of on-site diesel-powered equipment and vehicles will be limited to no more than 5 minutes when not in use.

Mitigation Measure AQ-3: Minimize personnel and public exposure to potential Valley Fever.

To minimize exposure to potential Valley Fever containing dust both on- and off-site, the following additional control measures will be included in the DCP to be prepared for this project as required by *Mitigation Measure AQ-1*:

- Equipment, vehicles, and other items will be thoroughly cleaned of dust before they are moved offsite to other work locations.

- Wherever possible, grading and trenching work will be phased so that earth-moving equipment is working well ahead or down-wind of workers on the ground.

- The area immediately behind grading or trenching equipment will be sprayed with water before ground workers move into the area.

- In the event that a water truck runs out of water before dust is sufficiently dampened, ground workers being exposed to dust are to leave the area until a full truck resumes water spraying.

- All heavy-duty earth-moving vehicles will be closed-cab and equipped with a HEP-filtered air system.

- Workers will receive training to recognize the symptoms of Valley Fever, and will be instructed to promptly report suspected symptoms of work-related Valley Fever to a supervisor.

- A Valley Fever informational handout will be provided to all on-site construction personnel. The handout will, at a minimum, provide information regarding the symptoms, health effects, preventative measures, and treatment.

- Onsite personnel will be trained on the proper use of personal protective equipment, including respiratory equipment. National Institute for Occupational Safety and Health (NIOSH)-approved respirators will be provided to onsite personnel, upon request.

General Conformity Applicability Assessment

As shown in the tables in Appendix B of Attachment 1, the total of direct and indirect emissions attributable to the Project are less than the corresponding General Conformity de minimis emission levels. Given that the net emissions associated with the Project are less than the General Conformity de minimis emission levels, the Project is not subject to General Conformity determination requirements.

Implementation of the Project would not result in the long-term operation of any major onsite stationary sources of toxic air contaminants (TACs), nor would Project implementation result in an increase in vehicle trips along area roadways, in comparison to existing conditions. However, construction of the Project may result in temporary increases in emissions of diesel-exhaust particulate matter (DPM) associated with the use of off-road diesel equipment. Health-related risks associated with diesel-exhaust emissions are primarily associated with long-term exposure and associated risk of contracting cancer. As such, the calculation of cancer risk associated with exposure to TACs are typically calculated based on a long-term (e.g., 70-year) period of exposure. The use of diesel-powered construction equipment, however, would be temporary and episodic and would occur over a relatively large area. Construction activities would occur over an approximate fifteen-month construction period, which would constitute approximately 2 percent of the typical 70-year exposure period. As a result, exposure to construction-generated DPM would not be anticipated to exceed applicable thresholds (i.e., incremental increase in cancer risk of 10 in one million).

Although construction emissions would not be anticipated to result in long-term health impacts that would exceed applicable thresholds, short-term exposure to DPM could still result in potential health effects. The type and severity of health effects depends upon several factors including the dose of the pollutant the individual is exposed to and the duration of exposure. Short-term exposure to DPM may cause irritation to the eyes, nose, throat and lungs, as well as, some neurological effects such as lightheadedness. Acute exposure may also elicit a cough or nausea as well as exacerbate asthma. These potential health effects are of particular concern among the more sensitive members of the population, such as children, the elderly, and individuals suffering from lung ailments (e.g., asthma).

Table 3-6: Calculated Project Operational Criteria Pollutant Emissions

Source	Annual Emissions (tons/ year)[1]	Annual Emissions (tons/ year)[1]	Annual Emissions (tons/ year)[1]	Annual Emissions (tons/ year)[1]	Annual Emissions (tons/ year)[1]	Annual Emissions (tons/ year)[1]
	ROG	**NO_X**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Road Grading: On-Site Off-Road Equipment	<0.01	0.03	0.01	<0.01	<0.01	<0.01
Road Grading: Off-Site Worker Trips	<0.01	<0.01	<0.01	0.00	<0.01	<0.01
Discing: On-Site Off-Road Equipment	<0.01	0.01	0.01	<0.01	<0.01	<0.01
Discing: Off-Site Worker Trips	<0.01	<0.01	<0.01	0.00	<0.01	<0.01
Spraying: On-Site Off-Road Equipment	<0.01	0.007	<0.01	<0.01	<0.01	<0.01
Spraying: Off-Site Worker Trips	<0.01	<0.01	<0.01	0.00	<0.01	<0.01
Booster Lift & Well Pumps: Off-Site Electricity Use	1.16	11.29	5.57	0.03	0.35	0.35
Worker Trips: Off-Site Routine Maintenance & Inspection	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total:	1.2	11.3	1.5	<0.0	0.4	0.4
Existing Emissions to be Removed:	*0.2*	*1.6*	*4.1*	<0.01	*0.1*	*0.1*
Net Increase:	*1.0*	*9.7*	*4.1*	*<0.0*	*0.3*	*0.3*
SJVAPCD Significance Thresholds:	*10*	*10*	*100*	*27*	*15*	*15*
Exceed SJVAPCD Thresholds?	*No*	*No*	*NA*	*No*	*No*	*NA*
Emissions were quantified using CalEEMod, version 2016.3.1. Totals may not sum due to rounding. *1. Onsite Emissions include off-road equipment operations.* *2. SJVAPCD significance threshold for localized impacts applies to onsite emissions only.* *Refer to Appendix A of Attachment 1 for modeling results and assumptions.*						

3.9 Global Climate Change

Climate change refers to change in measures of climate (e.g., temperature, precipitation, or wind) lasting for decades or longer. Many environmental changes (changes in sun's intensity, changes in ocean circulation, deforestation, urbanization, burning fossil fuels, etc.) can contribute to climate change (EPA 2009a). Gases that trap heat in the atmosphere are often called greenhouse gases (GHG). Some GHG such as CO_2 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_2, methane (CH_4), nitrous oxides, and fluorinated gasses (EPA 2009a). 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_2 and CH_4, 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 2009). More than 20 million Californians rely on regulated delivery of water resources such as the State Water Project and the CVP, as well as established water rights from rivers. 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 the State'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).

3.9.1 Affected Environment

In 2002, with the passage of Assembly Bill 1493, the State launched an innovative and proactive approach to dealing with GHG emissions and climate change at the state level. Assembly Bill 1493 requires the California Air Resources Board to develop and implement regulations to reduce automobile and light truck GHG emissions. The State also adopted Assembly Bill 32, which identified GHG reduction goals and noted the effect of increased GHG emissions as they relate to global climate change. While the emissions of one single Project would not cause global climate change, GHG emissions from multiple projects throughout the world could result in an adverse impact with respect to global climate change.

3.9.2 Environmental Consequences

No Action/No Project Alternative

Under the No Action/No Project Alternative, there would be no material change to climate change/global warming effects from the Project. However, if global warming continues on its current trend, the Project site and surroundings could be adversely affected by timing and reduction of snow melt needed for irrigation with surface water. In addition, the No Action/No Project Alternative would foreclose the opportunity and ability to store in the recharge basin additional run-off that could result from global warming, resulting in more productive agricultural lands to be fallowed.

Proposed Action/Project

The Project would involve short-term effects consisting of emissions during construction and long-term effects attributable to operations including regular maintenance employee trips to the site (approximately 30 per year). The estimated unmitigated overall GHG emission due to temporary Project construction activities is 1,287.56 metric tons of CO_2 equivalents (reference Appendix B of Attachment 1). The estimated unmitigated overall GHG emissions within considering cap-and-trade offsets due to on-going operational activities are 7,683.6 metric tons of carbon dioxide equivalents. Since the combined amount of GHGs emitted from the Project would be well below 25,000 metric tons/year threshold, no report is required to be submitted to the U.S. EPA and California Air Resources Board (CARB).

Table 3-7: Calculated Project Operational CO_2 Emissions

Source	Annual Emissions (MT CO_2e)[1]
Mobile Sources	**Mobile Sources**
Operational Maintenance Activities (On-Road Vehicles & Off-Road Equipment)	7.6
Amortized Construction Emissions	58.8
Total:	66.4
Existing Emissions to be Removed:	5.8
Net Increase:	60.6
Significance Threshold:	1,100
Exceed Thresholds?	No
Stationary Sources	
Stationary Sources (Booster Lift & Well Pumps)	2,796.1
Existing Emissions to be Removed:	367.6
Net Increase:	2,428.5
Significance Threshold:	10,000
Exceed Thresholds?	No
1. Emissions were quantified using CalEEMod, version 2016.3.1. Totals may not sum due to rounding. *2. Existing emissions include emissions associated with the use of off-road equipment, worker commute trips. To be conservative, existing emissions do not include mobile-source emissions associated with the transport of agricultural products.*	*3. Includes the operation of existing stationary sources (water pumps). Refer to Appendix B of Attachment 1 for modeling results and assumptions.*

Accordingly, construction and operation under the Project would result in below de minimis impacts to the global climate. Project recharge operations would be beneficial in increasing groundwater storage capability of increased snow melt that would result from continued global warming.

3.10 Socioeconomic Resources

3.10.1 Affected Environment

The agricultural industry in Tulare County contributes to the overall economic stability of the San Joaquin Valley. In addition, other industries include dairy and food processing. The market for seasonal workers on local farms draws thousands of migrant workers.

3.10.2 Environmental Consequences

No Action/No Project Alternative

Under the No Action/No Project Alternative, Reclamation would not help fund construction of the groundwater banking infrastructure, and the Authority would not construct the project. Groundwater levels underlying the area would not be able to benefit from the additional recharge and the Districts would not be able to further regulate their surface water supplies. Surface water supplies would continue historical use patterns.

Local farmers relying on irrigation water from PID and DEID could be impacted during years when surface water supplies are insufficient.

Proposed Action/Project

The Project would increase the water reliability for the region. As a result, agricultural production in the region would benefit from a more reliable irrigation water supply, which would help to protect agriculture related jobs within the Districts. There would be potential for a beneficial impact to socioeconomics from the increased water supply reliability inside the Project area facilitated by Project implementation.

3.11 Environmental Justice

Environmental justice refers to the fair treatment of peoples of all races, income levels, and cultures with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment implies that no person or group of people should shoulder a disproportionate share of negative impacts resulting from the execution of Federal programs. Executive Order 12898, dated February 11, 1994, establishes the achievement of environmental justice as a Federal agency priority. The memorandum accompanying the order directs heads of departments and agencies to analyze the environmental effects of Federal actions, including human health, economic, and social effects, and to address significant and adverse effects on minority and low-income communities.

3.11.1 Affected Environment

Tulare County employs seasonal workers on local farms that include migrant workers, commonly of Hispanic origin. Approximately 62.3 percent of the population within Tulare County is of Hispanic origin[17], and the communities in which they reside depend on the City of Tulare for municipal and industrial water.

3.11.2 Environmental Consequences

No Action/No Project Alternative

Under the No Action/No Project Alternative, Reclamation would not help fund construction of the groundwater banking infrastructure and the Authority would not construct the project. Groundwater levels underlying the region would not be able to benefit from the additional recharge and the Districts would not be able to further regulate their surface water supplies to

[17] US Census Bureau, 2010. Site Accessed May 2015. http://quickfacts.census.gov/qfd/states/06/06107.html

control seepage losses. The Districts would continue to use their surface water supplies as has historically occurred. All of the surrounding communities rely upon groundwater for municipal and industrial use and local farms depend on surface water delivered by the Districts for irrigation purposes; therefore, the No Action/No Project Alternative could result in slight adverse impacts to minority or low-income populations near the Project location.

Proposed Action/Project

To the extent that water supply reliability is improved in Tulare County under the Project, it would serve to support the continued viability of available agricultural water to the surrounding local farms, as wells as improving the reliability of groundwater supplies relied upon by surrounding homes and other users down gradient of the basin. As a result, there would be beneficial impacts to minority and/or disadvantaged populations from implementation of the Project and not any adverse impact to minority groups. In addition, the Project would not disproportionately affect one community over another.

3.12 Agriculture Resources

Agriculture is the dominant land use within the area surrounding the Project and the San Joaquin Valley region. It is identified as the largest private employer in the region accounting for a quarter of the jobs in the area. Please reference Figure 3-3-5 Farmland Mapping and Monitoring Program.

3.12.1 Affected Environment

A review of the "Important Farmlands" mapping by the California Department of Conservation's (CDC's) Farmland Mapping and Monitoring Program (FMMP) (Figure 3-3-5 Farmland Mapping and Monitoring Program) shows that the Project site is designated as Prime Farmland, Farmland of State Importance and Unique Farmland. Prime Farmland constitutes over 70% of the site, Farmland of Statewide Importance constitutes less than 25%, Unique Farmland constitutes 2%, and Semi-Ag constitutes less than 1% of the site. The FMMP provides statistics on conversion of farmland to nonagricultural uses for Tulare County, where the Project site is located. Of the total land area that was inventoried (1,585,867 acres), in 2008, Tulare County had approximately 864,437 acres of Important Farmlands (including Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance) and an additional 439,851 acres of grazing land. The remaining 281,579 acres of land were Urban and Built-up Land, Other Land, and Water Area. In the period between 2006 and 2008, Important Farmlands had shown a net decrease of 13,730 acres (1.5 percent) within the County[18].

Historically, land use at the Project site has included active farming of orchards and row crops. No forest or timber land is present at the Project site or in the Project vicinity. According to the United States Department of Agriculture (USDA) Natural Resources Conservation (NRCS) Soil Survey for western Tulare County area, the survey area contains the following soil types (in order of greatest percentage of occurrence within the Project boundaries to least): Colpien loam, Flamen loam, Hanford sandy loam, Akers-Akers saline-sodic complex, Biggriz-Biggriz saline-Sodic complex, Crosscreek-Kai association, Centerville clay, Exeter loam, Calgro-Calgro saline-

[18] California Department of Conservation. FMMP – Report and Statistics. http://www.conservation.ca.gov/dlrp/fmmp/products/Pages/ReportsStatistics.aspx. Site accessed January 2017.

Sodic complex, and Riverwash (Deer Creek).[19] As discussed in the NRCS soil survey, all soil types found in the Project area originate from alluvial fans with a parent material of granite rock sources. These soil types range from well-drained to somewhat poorly-drained; have wide-ranging water holding capacity and encounter rare to very rare flooding.[20]

3.12.2 Environmental Consequences

No Action/No Project Alternative

Under the No Action/No Project Alternative, all lands within the Project would continue to be used agriculturally and the recharge basins area would remain in agricultural production and would not convert to basin use. If surface or groundwater supplies continue to diminish or are otherwise not available due to adverse effects of climate change or other reductions in Federal or State water allocations, agricultural lands within the Project in-lieu and recharge basins areas, and lands in surrounding areas could become fallow.

Proposed Action/Project

The Project serves to meet both State of California water conservation goals in response to more than four year-long drought conditions and worsening groundwater overdraft by providing a recharge basin to facilitate replenishment of the groundwater aquifer as well as requirements of the SJRRP water management goal by avoiding and minimizing the water supply impacts of implementing the Settlement on Friant Contractors as described in more detail in Chapter 1. The project site is designated by the County General Plan and Zone for Exclusive Agriculture. Recharge basins are considered a compatible use within areas of active agricultural activities such as farming of orchards and row crops.

While the project would remove up to 800 acres of agricultural lands from production, the adverse effect of this is offset by the beneficial effect of increasing ability for groundwater storage, and ability to make beneficial use of excess surface water flows and irrigation during wet periods that might otherwise leave the basin area. The purpose and function of the recharge basins is to provide a "greater good" to existing agricultural operations by conserving excess surface water as groundwater recharge for banking purposes.

[19] U.S. Department of Agriculture, Natural Resource Conservation Service. Custom Soil Resource Report of Tulare County, Western Part, California. Produced March 11, 2015.
[20] U.S. Department of Agriculture, Natural Resource Conservation Service. Custom Soil Resource Report of Tulare County, Western Part, California. Produced March 11, 2015.

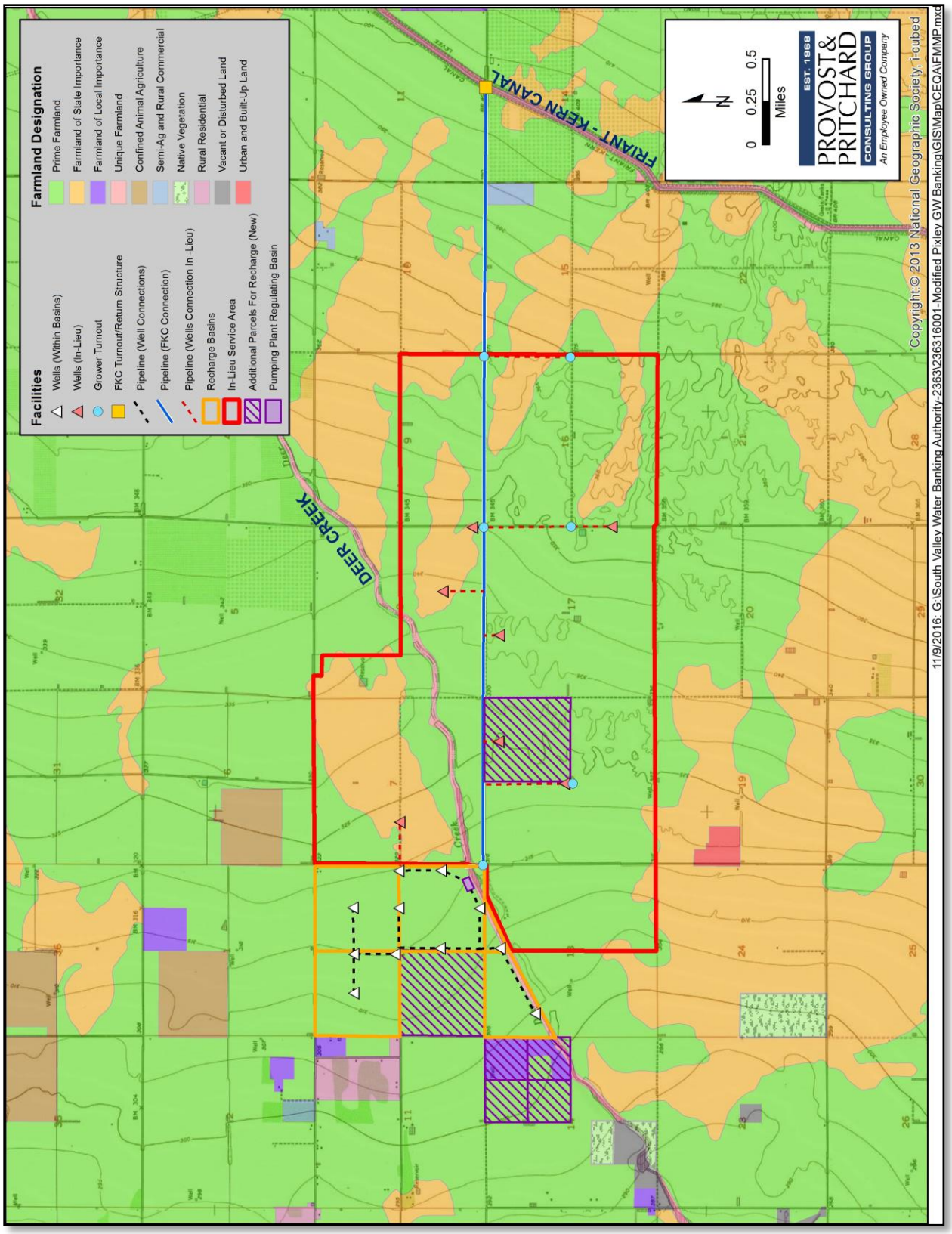

Figure 3-3-5 Farmland Mapping and Monitoring Program

This concept is consistent with the purpose of Part III, as well as Drought and Water Conservation Declarations and Executive Orders issued in recent years by the Governor, and with the more contemporary California Water and Water Action Plans and legislative directives to conserve water state-wide. The conversion of the Project Area from active agricultural orchard and row crop farming activities to recharge basins is consistent with the Tulare County General Plan land use designation for "Agriculture" and a compatible use within the "Exclusive Agriculture" implementing Zoning. The establishment of recharge basins where soils are conducive to recharge in place of active orchard and row crop farming is considered a compatible use because the basins are integral to supporting agricultural and preventing other lands from being fallowed.

3.13 Geology and Soils

3.13.1 Affected Environment

Tulare County is divided into two major physiographic and geologic provinces: the Sierra Nevada Mountains and the Central Valley. The Sierra Nevada Physiographic Province, in the eastern portion of the county, is underlain by metamorphic and igneous rock. It consists mainly of homogeneous granitic rocks, with some occurrences of older metamorphic rock. The central and western parts of the county are part of the Central Valley Province, underlain by marine and non-marine sedimentary rocks. It is basically a flat, alluvial plain, with soil consisting of material deposited by the uplifting of the mountains.[21]

Faulting and Seismicity

The Project site is not located within an Alquist-Priolo Earthquake Fault Zone and no known faults cut through the local soil at the site. There are several faults located within a 70-mile radius of the Project site. An unnamed fault is approximately 6.7 miles east/northeast, Poso Creek Fault is 13.8 miles south/southwest, and the San Andreas Fault is approximately 51 miles southwest of the Project site. Ground shaking is the primary seismic hazard in Tulare County because of the county's seismic setting and its record of historical activity. The San Joaquin Valley portion of the Tulare County is located on alluvial deposits, which tend to experience greater ground shaking intensities than areas located on hard rock[22]. In 1973, five counties within the Southern San Joaquin Valley prepared a Five County Seismic Safety Element to assess seismic hazards which projected that with the maximum probable earthquake of a magnitude 8 to 8.5 centered along the San Andreas Fault, "relatively low levels of shaking should be expected in the eastern and central parts of the San Joaquin Valley[23]."

Soils

According to the NRCS, there are nine soil types within the Project area. Colpien loam covers 1,528 acres, Flamen loam covers 580 acres, Hanford sandy loam covers 781.9 acres, Akers-Akers complex covers 443 acres, Biggriz-Biggriz complex covers 391 acres, Crosscreek-Kai association covers 370 acres, Centerville clay covers 183 acres, Exeter loam covers 114 acres,

[21] County of Tulare. 2010. General Plan Background Report. Page 8-4
[22] County of Tulare. 2010. General Plan Background Report. Page 8-7
[23] Ibid. Page 8-6 and 7

and the Calgro-Calgro saline-Sodic complex covers 98 acres (Appendix F of Attachment 1). The soil types range from well drained to somewhat poorly drained, and all are very limited in terms of building due to flooding.

Recharge Capability

Groundwater pumping chronically exceeds natural recharge in many agricultural regions in California. A common method of recharging groundwater — when surface water is available — is to deliberately flood an open area, allowing water to percolate into an aquifer. However, open land suitable for this type of recharge is scarce. Flooding agricultural land during fallow or dormant periods has the potential to increase groundwater recharge substantially, but this approach has not been well studied.[24]

Using data on soils, topography and crop type, [the University of California, Davis, Soil Resources Lab (UCD)] developed a spatially explicit index of the suitability for groundwater recharge of land in all agricultural regions in California. [UCD] identified 3.6 million acres of agricultural land statewide as having Excellent or Good potential for groundwater recharge. The index provides preliminary guidance about the locations where groundwater recharge on agricultural land is likely to be feasible. A variety of institutional, infrastructure and other issues must also be addressed before this practice can be implemented widely. [25]

The UC study developed a Soil Agricultural Groundwater Banking Index (SAGBI) that provides a composite evaluation of soil suitability to accommodate groundwater recharge while maintaining healthy soils, crops and a clean groundwater supply. The Soil Agricultural Groundwater Banking Index (SAGBI) is a suitability index for groundwater recharge on agricultural land. The SAGBI was developed by the University of California, Davis, Soil Resources Lab and is based on five major factors that are critical to successful agricultural groundwater banking[26]:

- deep percolation,
- root zone residence time,
- topography,
- chemical limitations, and
- soil surface condition.

[24] University of California, Agriculture and Natural Resources, "California Agriculture", Vol. 69, Number 2, Research Article. Accessed December 2016 on the web at: http://calag.ucanr.edu/Archive/?article=ca.v069n02p75

[25] University of California, Agriculture and Natural Resources, "California Agriculture", Vol. 69, Number 2, Research Article. Accessed December 2016 on the web at: http://calag.ucanr.edu/Archive/?article=ca.v069n02p75

[26] University of California, Davis, Soil Agricultural Groundwater Banking Index (SAGBI) , Soil Resources Lab. Accessed December 2016 on the web at: https://casoilresource.lawr.ucdavis.edu/sagbi/

shows the 800 acres planned for potential recharge basins are rated primarily “Excellent” and “Good”, and “Moderately Good”.

3.13.2 Environmental Consequences

No Action/No Project Alternative

Under the no Action/No Project Alternative, Reclamation would not provide funding for construction related activities, and the Authority would not construct the project. Current geology and soils conditions would prevail including the on-going adverse potential for ground subsidence.

Proposed Action/Project Alternative

Construction of the recharge basins would require minor grading and compaction of soils on the relatively flat ground surface. Surface erosion and loss of topsoil can follow disturbances caused by grading, which could loosen soil and activate or hasten the loss of soils. Erosion and sediment control measures, including developing and implementing a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the Clean Water Act, would reduce erosion rates during and after construction. Proper implementation of the required SWPPP would ensure no adverse effects of soil erosion would occur.

No substantial faults are known to exist in the Project area according to the Alquist-Priolo Earthquake Fault Zoning Map. The relatively seismically stable setting of the area, the depth to groundwater of approximately 300 feet, the relatively flat ground surface, and the moderately well-drained characteristics of the soil create an environment where ground failure is unlikely to occur; thus there would be no impact regarding the danger associated with geologic instability. According to the United States Department of Agriculture Natural Resources Conservation USFWS, the site contains nine soil mapping units. Colpien loam, 0 to 2 percent slopes; Flamen loam, 0 to 2 percent slopes; Hanford sandy loam, 0 to 2 percent slopes; Akers-Akers complex, 0-2% slopes; Biggriz-Biggriz complex, 0-2% slopes; Crosscreek-Kai association, 0-2% slopes; Centerville clay, 0-2% slopes; Exeter loam, 0-2% slopes; and Calgro-Calgro complex, 0-2% slopes.

No habitable structures would be constructed on the site nor would substantial grading change the topography to the point where the Project would expose people or structures to potential substantial adverse effects. No septic tanks or alternative waste water disposal systems are proposed as part of the Proposed Action/Project. Potential adverse effects of subsidence would be minimized by the ability to increase groundwater storage.

Mitigation Measures:

MM GEO-1: The Authority will complete a SWPPP prior to any ground moving activities. As part of the SWPPP, the Authority would be required to incorporate any of the Best Management Practices (BMPs), as deemed appropriate by the design engineer, QSP, and the SWRCB, for the Project’s construction-specific needs to further protect and prevent unnecessary erosion of the topsoil.

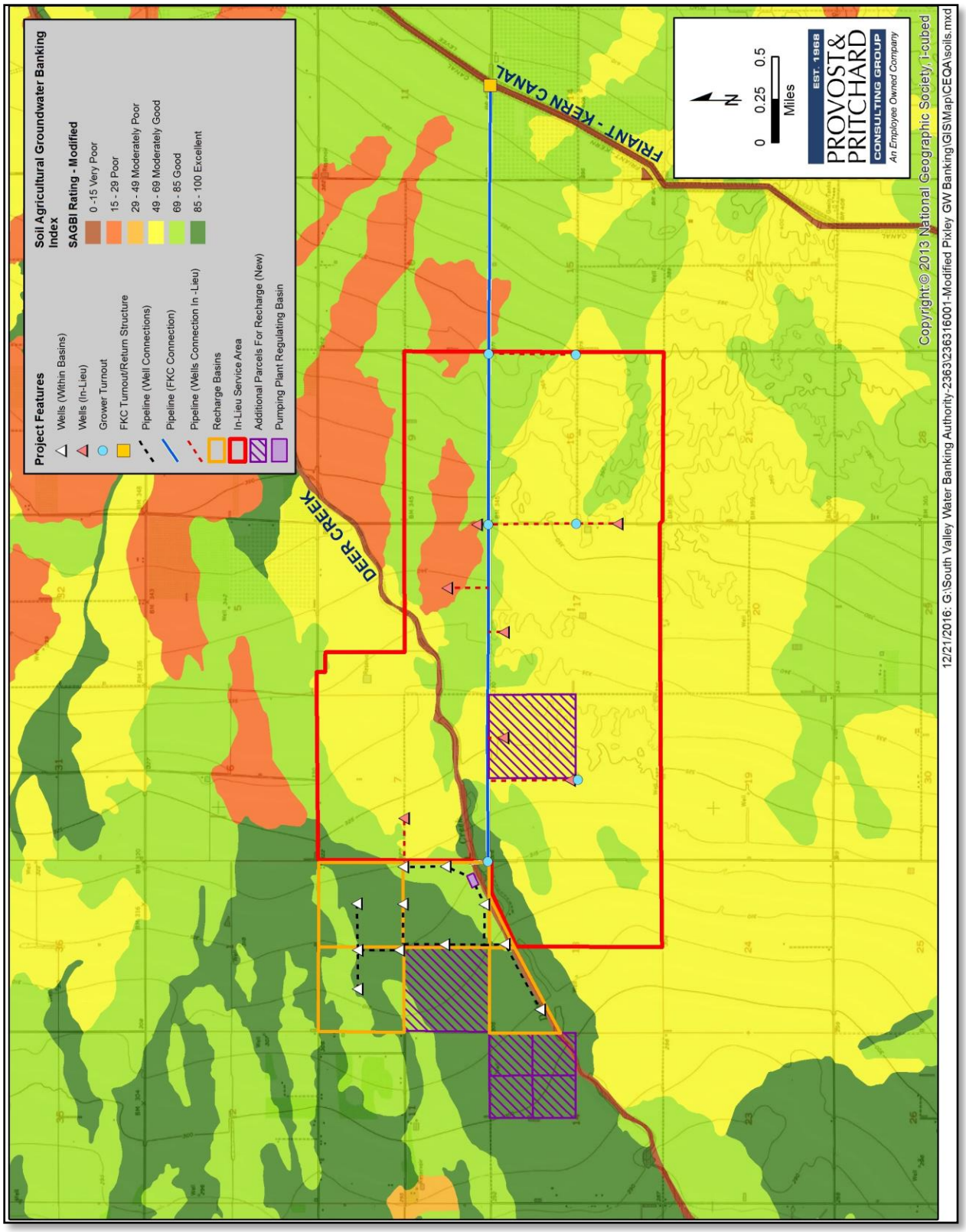

Figure 3-3-6 Soil Agricultural Groundwater Banking

3.14 Noise

3.14.1 Affected Environment

The Project site is designated Valley Agricultural within the Rural Valley Lands Plan policy of the Tulare County General Plan and consists of 4,189 acres of rural agricultural land and Deer Creek. The area has historically been used for agricultural cultivation including vineyards, orchards and other crops and associated infrastructure including wells, pumps, and tail-water and regulating ponds. The site is surrounded by rural agricultural land.

Noise levels generated by farm related equipment ranged from 69 to 100 decibels (Db) at a distance of 50 feet from the equipment according to noise measurements conducted by Tulare County[27]. Due to the seasonal nature of the agricultural industry, there are often extended periods of time when no noise is generated at the Project site, followed by short-term periods of intensive mechanical equipment usage and corresponding noise generation.

According to Table 3.5-1 Land Use Compatibility for Community Noise Environment in the Tulare County General Plan Recirculated Draft EIR, normally acceptable noise exposure for agricultural zoned property is between 50 and 75 day/night average noise level (Ldn).

3.14.2 Environmental Consequences

No Action/No Project Alternative

If the No Action/No Project Alternative is selected, there would be no changes to the current setting. The current noise levels would persist related to agricultural activities and operation and maintenance of the existing settling basin. There would be no additional impacts to noise if the No Action/No Project Alternative is selected.

Proposed Action/Project Alternative

The noise and vibration associated with construction activities under the Project would depend on the equipment used and distance from the source to the receptor.

Typical construction equipment would include scrapers, backhoes, drill rigs and miscellaneous equipment (i.e. pneumatic tools, generators, and portable air compressors). Typical noise levels generated by this type of construction equipment at various distances from the noise source are listed below:

[27] Tulare County General Plan Background Report, Pages 8-71 through 8-73

Table 3-8: Noise Levels

Construction Equipment Noise Source	dBA at 50 ft	dBA at 100 ft	dBA at 1.0 mile
Pneumatic tools	85	79	45
Truck (e.g. dump, water)	88	82	48
Concrete mixer (truck)	85	79	45
Scraper	88	82	48
Bulldozer	87	81	47
Backhoe	85	79	45
Generator	76	70	36
Portable air compressor	81	75	41

Source: Borba Farms Dairy EIR, BASELINE Consulting, 1999, Cunniff 1977

Noise levels generated by the equipment would range from 76 to 88 A-weighted noise level (dBA) at a distance of 50 feet from the noise source; at 100 feet, the noise levels would range from 70 to 82 dBA. There are several rural residences located within the vicinity of the Project site, the closest of which is approximately 93 feet away. Noise from construction activities would exceed the Tulare County General Plan Noise Element (2012) "normally acceptable" noise standards of 75 dBA at the exterior of nearby residences. However, noise from construction activities would be temporary. Further, construction activities would most likely occur during the daytime hours 7 am to 7 pm, Monday through Friday and best practices guidelines would be implemented as appropriate and feasible in accordance with Tulare County General Plan policies. The Project would not result in adverse effects to the ambient noise quality of the site and surrounding area.

3.15 Cumulative Impacts

According to the Council on Environmental Quality 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.

Biological and Air Quality resources would continue to be affected by other types of activities that are ongoing but unrelated to the Project. Impacts to biological and air quality resources from the implementation of the Project would occur only during construction activities. The Project would not have a substantial adverse cumulative effect, either directly or through habitat modifications, on any special status species with implementation of mitigation as identified above in Section 3.2.2 based upon the biological evaluation contained in Appendix C of Attachment 1, page 35 through 46. Additionally, the Air Quality mitigation measure MM AQ-1 identified above in Section 3.7.2 based upon the air quality evaluation contained in Appendix B

of Attachment 1, page 16, would ensure that there would be no adverse cumulative impacts from air emissions during construction. Therefore, the Project, when added to other past, existing, and future actions would not contribute to cumulative adverse impacts to wildlife and air quality resources since construction activities are short-term.

The Project would involve excavation and could affect undiscovered cultural resources. Any unanticipated discoveries during construction or operation would be addressed through applicable Federal processes (e.g., 36 CFR Part 800, 43 CFR Part 10). As the Project would not adversely affect archaeological or built-environment resources, it would not contribute to cumulative impacts on those resources.

The Project would result in an increase in the area's water supply reliability and improve groundwater supplies and conditions. As a result of improved water resource conditions, the Project could contribute to beneficial cumulative impacts to socioeconomic resources resulting from increased local water supply reliability.

Section 4 Consultation and Coordination

Several Federal and State Laws, permits, licenses, and policy requirements are applicable to the Project.

4.1 National Environmental Policy Act

This EA/IS has been prepared pursuant to NEPA, which was signed into law in 1969 (42 USC Section 4321 et seq.). In addition, it was prepared in accordance with Council on Environmental Quality (CEQ) regulations for implementing NEPA, 40 CFR Parts 1500- 1508. This EA/IS analyzes and discloses the potential impacts to the human environment from implementation of the Proposed Action/Project action. The draft EA/IS was circulated for public review and comment for 30 days between April 17 and May 16, 2017.

4.2 Endangered Species Act

Section 7 of the Endangered Species Act (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. Reclamation completed informal consultation with USFWS on September 19, 2017 regarding potential effects of the proposed action on San Joaquin kit fox. The Project would have no effect on fish species.

4.3 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation coordinate with fish and wildlife agencies (Federal and state) on all water development projects that could affect biological resources. USFWS is preparing a FWCA report regarding the proposed action.

4.4 California Endangered Species Act and California Fish and Game Code

In addition to this joint EA/IS having been prepared pursuant to NEPA, it was also prepared in accordance with CEQA and the State Guidelines implementing CEQA regarding the preparation of joint documents. Consequently, regulations for implementing the California Endangered Species Act (CESA) and CDFW Code 1600 have been considered. Due to the proposed pipeline crossing of Deer Creek, the Authority is required to obtain a Streambed Alteration Agreement with CDFW.

4.5 Title 54 U.S.C. § 306108, Commonly Known as Section 106 of the National Historic Preservation Act

Title 54 U.S.C. § 306108, commonly known as Section 106 of the NHPA(formerly 16 U.S.C. 470 et seq.), requires Federal agencies to consider the effects of their undertakings on historic properties, properties determined eligible for inclusion in the National Register, and to afford the ACHP an opportunity to comment. Compliance with Section 106 follows a series of steps, identified in its implementing regulations found at 36 CFR Part 800, that include identifying consulting and interested parties, identifying historic properties within the APE, and assessing effects on any identified historic properties, through consultations with the SHPO, Indian tribes and other consulting parties. Reclamation re-initiated consultation and received SHPO concurrence on May 12, 2017. Additional consultation may be needed for the additional 160-acre portion of the Project modification for recharge that was not surveyed should the property be acquired for the Project.

4.6 Clean Water Act

The Corps issued an Approved Jurisdictional Determination on May 27, 2015, (SPK-2015-00265) and verified the presence of approximately 2.040 acres of waters of the United States (Friant-Kern Canal) within the original 4,222-acre Study Area. The Corps also determined that the 3.086 acres of waters identified as "Deer Creek," the 1.122 acres of water identified as "Tail Water Pond/Ditch," and the 9.568 acres of water identified "Irrigation Holding Pond" on the original delineation map dated April 2015 are intrastate isolated waters with no apparent interstate or foreign commerce connection. The Corps verification letter is included in Appendix D of Attachment 1. The Authority will acquire 401 and 404 permits for installation of the proposed new turnout on the FKC prior to construction.

4.7 Sustainable Groundwater Management Act

The subject Project is an action undertaken by PID and DEID, which have each been designated as exclusive GSAs for their service areas and which shall comply fully with SGMA. The Project shall be integrated by the PID and DEID GSAs into their respective Groundwater Sustainability Plans and coordinated with GSPs by other GSAs to sustainably mange groundwater in the Tule Subbasin as required by and on the timeline prescribed in SGMA.

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