

Draft

SAN JOAQUIN FIELD DIVISION LINER RAISE AND INSTRUMENTATION PROJECT

Initial Study/Proposed Mitigated Negative Declaration

Prepared for
California Department of Water Resources

May 2020



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Prepared for
California Department of Water Resources
1416 9th Street
Sacramento, CA 95814
Contact: Marea McCann
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May 2020



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CHAPTER 1

Introduction

As lead agency under the California Environmental Quality Act (CEQA), the California Department of Water Resources (DWR) has prepared this Initial Study (IS) to address the environmental consequences of the proposed San Joaquin Field Division (SJFD) Liner Raise and Instrumentation Project (proposed project). The proposed project is located within the DWR California Aqueduct (Aqueduct) in the San Joaquin Valley. The proposed project involves raising the Aqueduct liner in Pools 24 and 25, and the installation of water level monitoring instrumentation in Pools 22 and 25 (**Figures 1 and 2**). The proposed project is described in more detail in Chapter 2.

Document Organization

Chapter 1 – Introduction. This chapter provides an introduction to the proposed project, organization of this document, purpose of the IS, and summary of findings.

Chapter 2 – Project Description. This chapter describes the proposed project, including project location, project objectives, activities to be conducted under the proposed project, and potential permits and/or approvals that may be required prior to implementation of the proposed project.

Chapter 3 – Initial Study Environmental Checklist. This chapter presents an analysis of implementation of the proposed project for the resource topics included in the CEQA Environmental Checklist (Appendix G of the CEQA Guidelines). For each resource topic question, the following is provided: (1) environmental setting; (2) discussion of the potential effects of implementing the proposed project; (3) finding of significance; and (4) any mitigation measures to be recommended for incorporation into the proposed project to reduce identified significant impacts to a less-than-significant level. This chapter lists the references used in preparation of this IS for each resource topic.

Following completion of the required 30-day public comment period, and before approving the proposed project, DWR will consider the Mitigated Negative Declaration (MND) together with any comments provided during the public comment period and will adopt the MND if, based on the whole of the record: (1) there is no substantial evidence that the proposed project will have a significant effect on the environment; and (2) that it represents DWR's independent judgement and analysis. DWR will also prepare and adopt a Mitigation Monitoring Reporting Program as part of the approval process as required under Public Resources Code Section 21081.6(c) for mitigation measures identified in the MND.

1.1 Purpose of the Initial Study

This IS was prepared in accordance with Public Resources Code Section 21000 et seq. (CEQA) and Title 14 of the California Code of Regulations Section 15000 et seq. (CEQA Guidelines). The purpose of this IS is to: (1) determine whether project implementation would result in potentially significant or significant effects to the environment; and (2) incorporate mitigation measures into the proposed project design, as necessary, to eliminate the project's potentially significant or significant project effects or reduce them to a less-than-significant level.

1.2 Summary of Findings

Based on the analysis included in Chapter 3, implementation of the proposed project would result in no impact on the following resource topics:

- Agriculture and Forestry Resources
- Land Use and Planning
- Mineral Resources
- Population and Housing
- Recreation
- Wildfire

Less-than-significant impacts on the following resource topics:

- Aesthetics
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Public Services
- Recreation
- Transportation
- Utilities and Service Systems

Less-than-significant impacts following incorporation of mitigation measures into the proposed project on the following resource topics:

- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Tribal Cultural Resources

CHAPTER 2

Project Description

2.1 Background and Need for Project

2.1.1 Background

Owned, operated, and managed by DWR, the State Water Project (SWP) is a complex system of reservoirs, dams, power plants, pumping plants, pipelines, and aqueducts that conveys water from natural stream channels to the Sacramento-San Joaquin Delta (Delta) and pumped into the the 444-mile-long Aqueduct, supplying water agencies and districts in portions of the San Francisco Bay Area, the San Joaquin Valley (Valley), the Central Coast, and Southern California. More than 27 million Californians receive a portion of their drinking water supply from the SWP, and about 750,000 acres of agricultural land, primarily in the Valley, are irrigated with SWP water (DWR 2020). DWR contracts with 29 Public Water Agencies (PWAs) throughout California for the delivery of SWP water. The PWAs receive water service from the SWP in exchange for paying all costs that are associated with the storage and transportation of the water and with planning, constructing, operating, and maintaining the SWP facilities.

2.1.2 Need for Project

The concrete-lined Aqueduct was constructed as a series of interconnected pools that are operated in coordination to convey water primarily by gravity from one pool to the next through check structures and pumping plants. The Aqueduct traverses portions of the Valley that have experienced subsidence, which is defined as a local or regional drop in ground surface elevation. Land subsidence in the Valley was first noted near the Delano area in 1935. Since that time, the Valley has undergone several periods of regional aquifer compaction as a result of groundwater extraction, largely for agricultural uses. In the late 1960s and early 1970s, surface water was imported via canals, and the Aqueduct began importing water to the subsiding areas, reducing groundwater pumping and reducing new land subsidence in the western and southern portions of the San Joaquin Valley Groundwater Basin, a subregion of the Central Valley Aquifer System that underlies the proposed project area (Ireland 1986). By 1981, subsidence reached nearly 30 feet, the greatest subsidence recorded in the United States (Bertoldi et al. 1991). Reduced surface-water availability during 1976 and 1977, 1986 through 1992, 2007 through 2009, and 2012 through 2015 caused groundwater-pumping increases in the Valley, declines in water-levels to near or beyond historic lows, and renewed aquifer compaction. The resulting land subsidence has reduced the freeboard and flow capacity of the Aqueduct and other canals that transport floodwater and deliver irrigation water (USGS 2018). Freeboard refers to the vertical distance between the design water surface and the top of the concrete canal lining. In the SJFD the canal

was designed with a minimum of 2.5 feet of freeboard. The decrease in lined freeboard has decreased or eliminated the potential to store additional water in some pools. The Aqueduct freeboard is used as a reservoir, storing water during low-cost high-pumping period and drafting water for downstream delivery during high-cost low-pumping period. The reduced storage forces more pumping during more expensive periods to meet direct downstream demand. Since 1970, due to continued land subsidence, DWR has implemented numerous liner raises and other rehabilitation projects to maintain adequate freeboard in the Aqueduct (DWR 2017).

In June 2017, DWR prepared the California Aqueduct Subsidence Study, which summarized the magnitude, location, and effects of pre-Aqueduct, historic-Aqueduct and current subsidence on the Aqueduct. The study identified five significant “bowls” of subsidence along the alignment of the Aqueduct (**Figure 1**). The largest bowl, Panoche, is located in Pool 15 through Pool 18, in the San Luis Field Division (SLFD). The second subsidence bowl, Los Gatos, is located in Pool 19 through Pool 21 in the SLFD. Kern, the third bowl, is in Pool 23 through Pool 25 in the SJFD, where the proposed project is located. The Aqueduct was constructed with feet of extra freeboard in each of those bowls. However, due to ongoing subsidence, the liner needed to be raised in the 80s and again in the 90s to maintain adequate freeboard and delivery capacity.

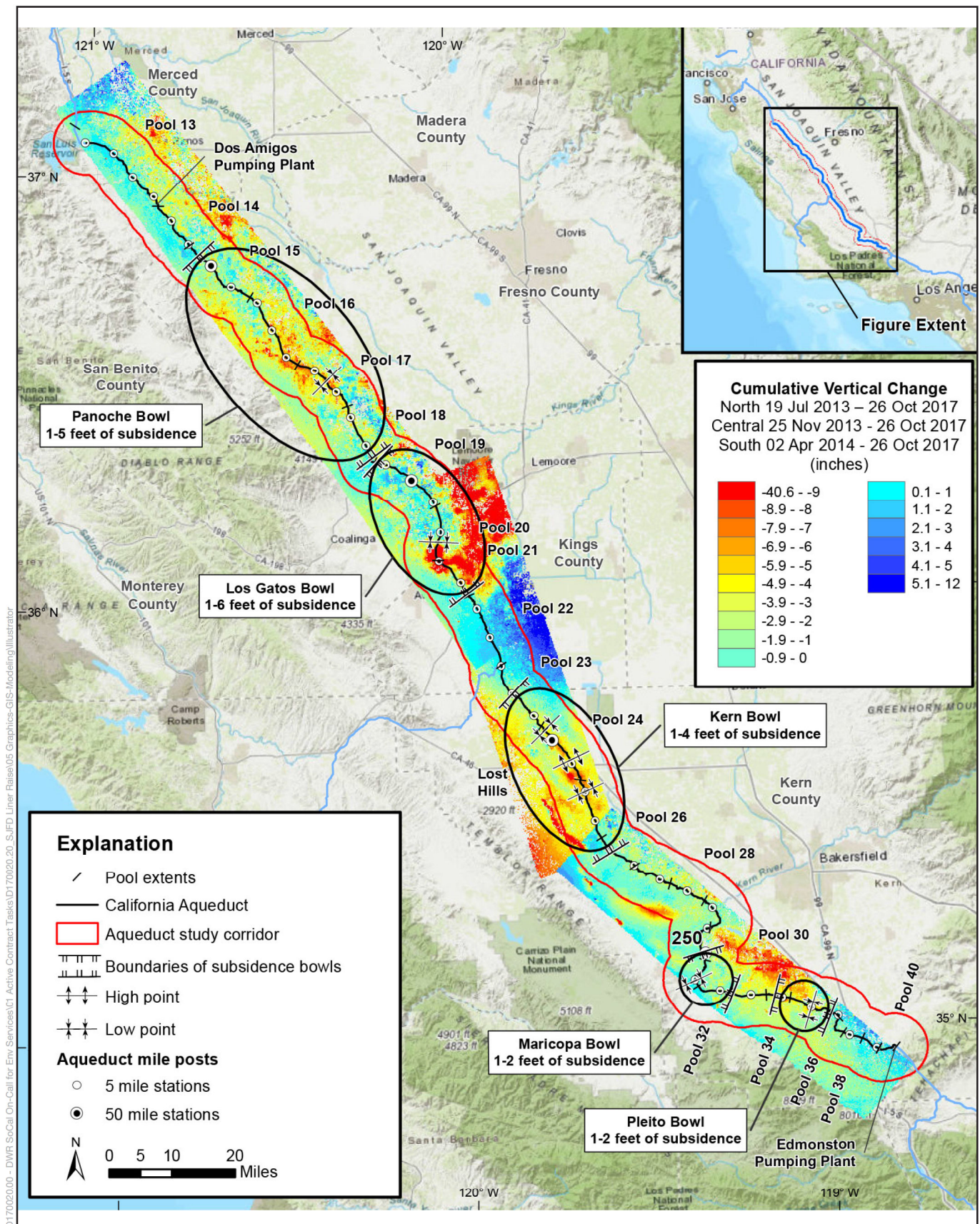
The 2017 study reported that recent drought has exacerbated current subsidence of the Aqueduct, reducing available freeboard to 1 foot or less, thereby further reducing the Aqueduct’s storage and conveyance capacity. While subsidence has reduced the amount of freeboard and flow capacity at specific locations, contracted deliveries have not yet been curtailed. To maintain delivery capacity, pumping has increased during high-cost daytime periods. The reduced freeboard has also become a safety and maintenance issue as the water surface reaches the limits of the concrete liner and encroaches on the earthen embankments. To maintain the historic delivery capacity, portions of the Aqueduct that have experienced subsidence require retrofit to extend the concrete liner within the Aqueduct prism, returning storage and conveyance capacity.

2.2 Project Objectives

The objective of the proposed project is to monitor and restore functionality and original design capacity in Pools 24 and 25 to enable DWR to complete water deliveries to the PWAs, thereby increasing operational flexibility and improving safety and reliability.

2.3 Project Location and Description

The proposed project would raise portions of the concrete liner of Pools 24 and 25, on each side, for approximately 1.65 miles. The proposed project would also involve the installation of water level monitoring instrumentation to provide real-time monitoring of flow and water levels in Pools 22 and 25. These pools are located along the Aqueduct in Kings and Kern Counties between Aqueduct MP 175.16 and MP 213.00. The northernmost site, MP 175.16, Pool 22, is approximately 2 miles southwest of the town of Kettleman City. The southernmost site, MP 213.00, Pool 25, is approximately 8 miles southwest of the town of Lost Hills (**Figure 2**).



SOURCE: DWR, 2019

San Joaquin Field Division Liner Raise and Instrumentation Project

Figure 1
 California Aqueduct Subsidence "Bowls" in the San Joaquin Valley



SOURCE: ESRI

San Joaquin Field Division Liner Raise and Instrumentation Project

Figure 2
Project Location

2.3.1 Concrete Liner Raise

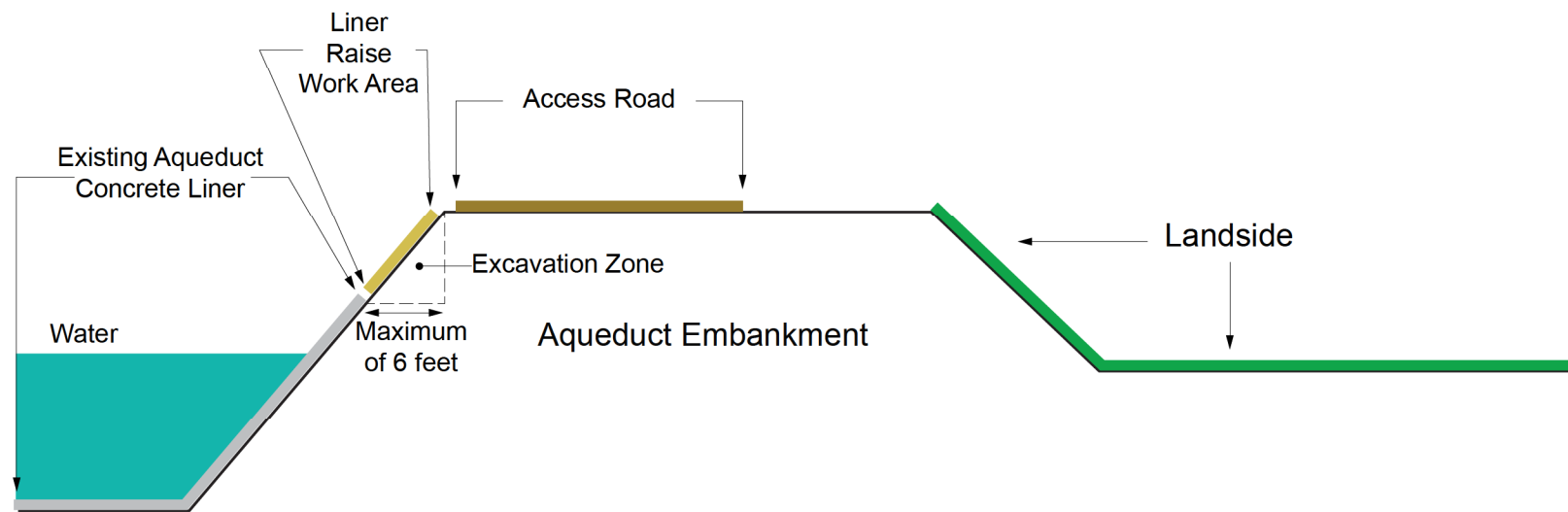
The concrete liner would be raised up to 2.0 feet on both sides of Pool 24, between Aqueduct MP 199.71 to MP 200.01 and in Pool 25, between MP 207.94 to MP 208.11 and MP 209.17 to MP 210.31. The total distance of the Aqueduct that would be raised is approximately 1.65 miles. Refer to **Figure 3** illustrating a typical cross-section of an Aqueduct liner raise footprint.

To accommodate the placement of the additional concrete, existing guardrails, road delineators, hand railings and other features would be removed and salvaged for reuse on-site, if possible. All liner raise construction activities would be completed above the aqueduct water level at the waterside embankment. The waterside embankment would be prepared by excavating approximately 3 to 6 feet behind the existing liner, and then backfilled with the excavated material combined with imported material to achieve a uniform and compact embankment slope at a maximum ratio of 2H:1V. The existing concrete liner would be cleaned by power washing to remove any debris prior to new concrete placement. Power washing would be limited to the upper portions of the new liner. Approximately 1,500 cubic yards of concrete would be sourced from local ready-mix plants and new 4.5-inch thick concrete liner panels would be formed on-site. Approximately 150 concrete truckloads would be needed to deliver concrete to the site.

Polyvinyl chloride (PVC) waterstop material would be installed at expansion and contraction joints, and strip waterstop material installed at longitudinal contraction joints prior to concrete placement. Contraction joints, small grooves cut into the concrete while it's drying to force the concrete to crack in those locations when it shrinks, would be hand tooled in new liner panels. Concrete curing compound would be applied on the fresh concrete surface using a spray nozzle, per manufacturer recommendations, and allowed to cure for approximately two days. After curing, joints would be cleaned by sandblasting to remove all mortar, scale, soil, foreign materials and curing compound. Sealant primer and polyurethane-type joint sealant would be hand placed in all joints. Joint sealant would be approximately 0.25 to 0.5 inch thick, applied to ensure full contact with the joint walls and to remove air entrapment. Staging of equipment and temporary stockpiling of materials would occur adjacent to the Aqueduct along the access road and road aprons (**Figures 4 through 6**).

2.3.2 Water Level Monitoring Instrumentation

Water level monitoring instrumentation would be installed on the existing concrete liner at Pools 22 and 25, on the east side of the Aqueduct (**Figures 6 and 7**). The monitoring equipment would provide additional data for monitoring surface water levels of the Aqueduct. The instrumentation would consist of a pressure transducer with cabling mounted inside of a metal pipe conduit attached by bolts to the concrete liner. The conduit would be placed in trenches and extend from the liner to the vaults. The vaults would be installed on the land side embankment. Power would be supplied to the equipment at Pool 22 through connection to the existing control building. Instrumentation at Pool 25 would be powered by solar equipment installed with a new pole assembly. Antennas would transmit signals by radio to receiving antennas mounted on existing check structures.

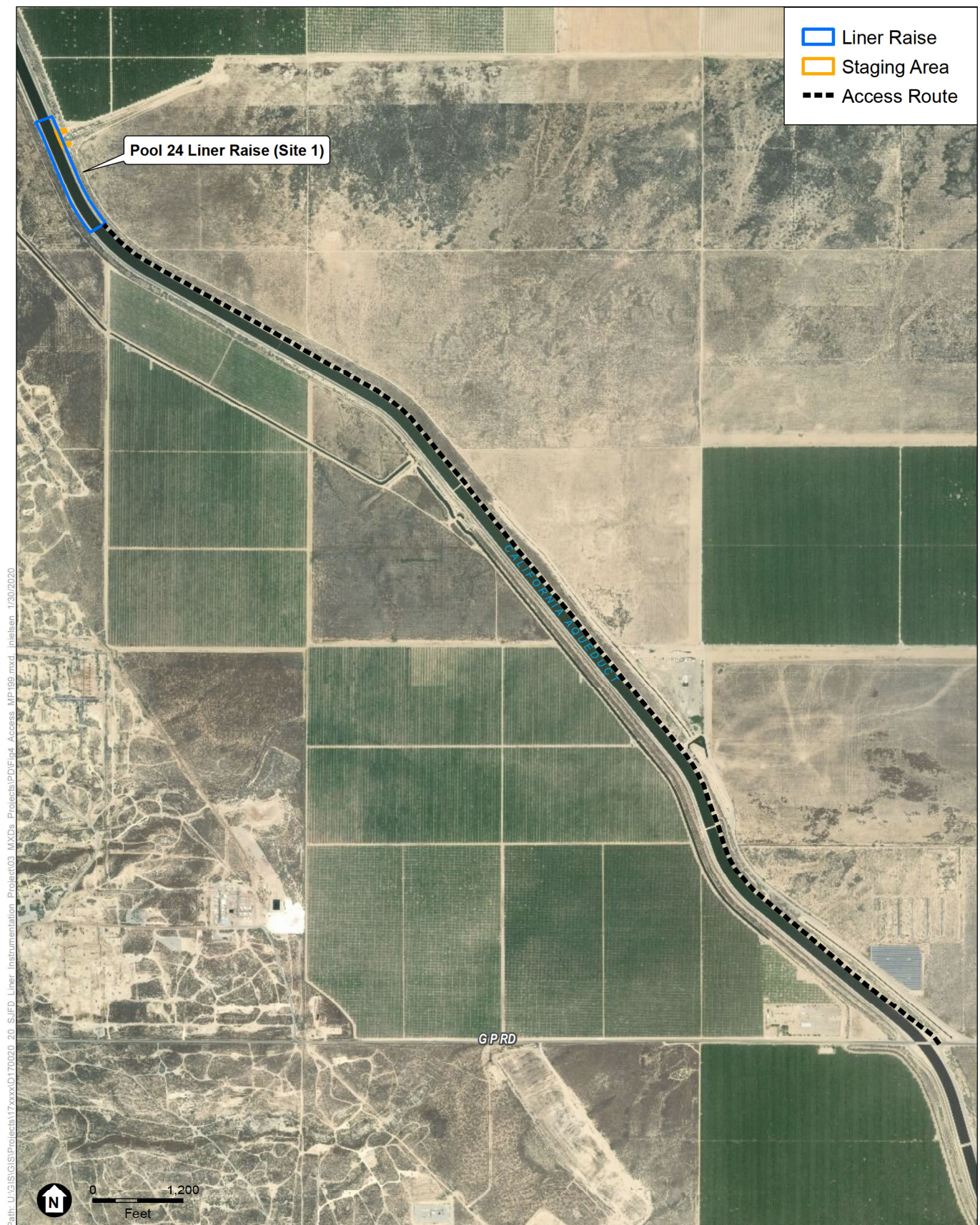


SOURCE: ESA, 2020

San Joaquin Field Division Liner Raise and Instrumentation Project



Figure 3
Liner DWR Right-of-Way
Liner Raise Cross Section



SOURCE: ESRI, 2019.

San Joaquin Field Division Liner Raise and Instrumentation Project

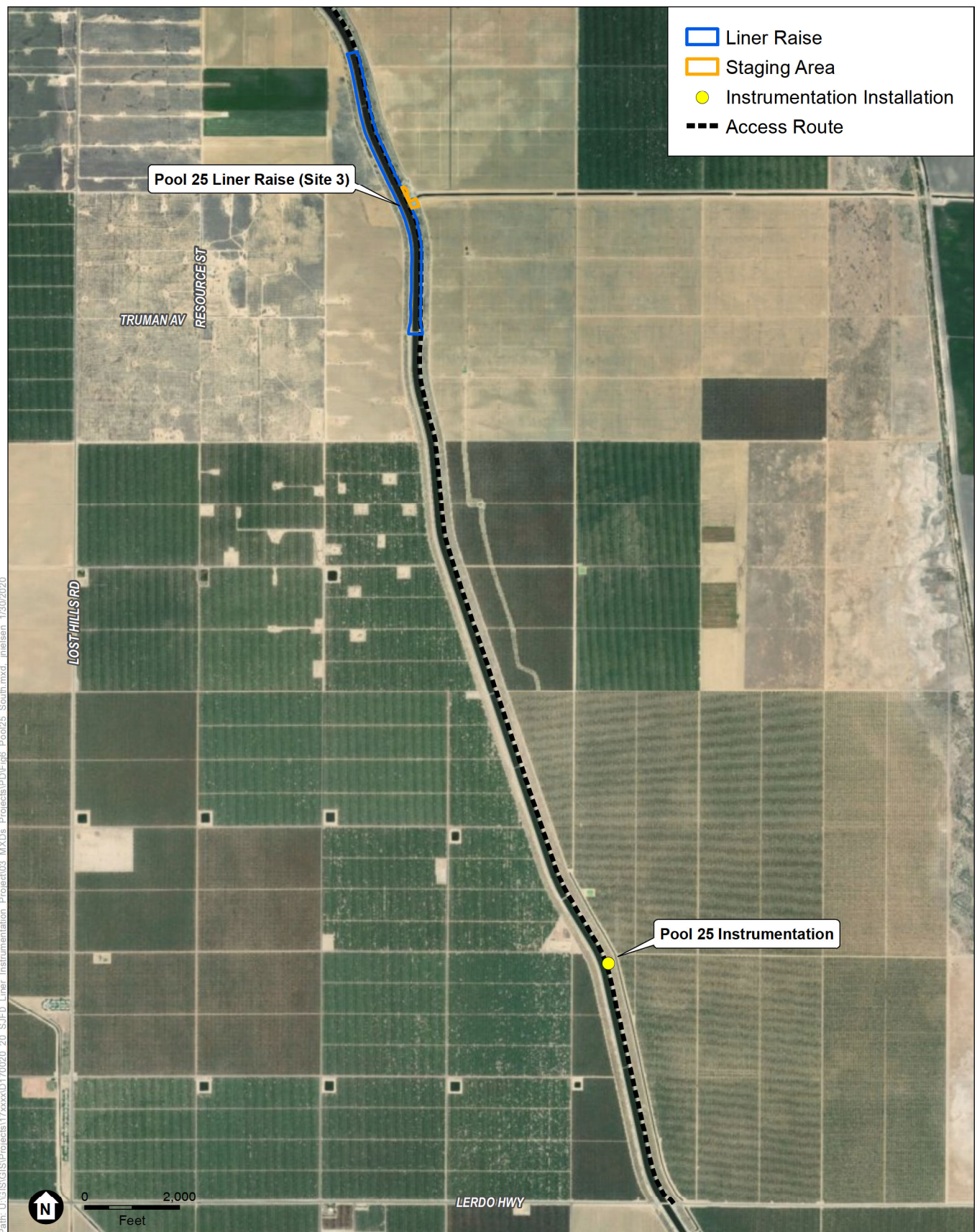
Figure 4
Access to CA Aqueduct MP 199.71 - 200.01 Liner Raise Pool 24



SOURCE: ESRI, 2019.

San Joaquin Field Division Liner Raise and Instrumentation Project

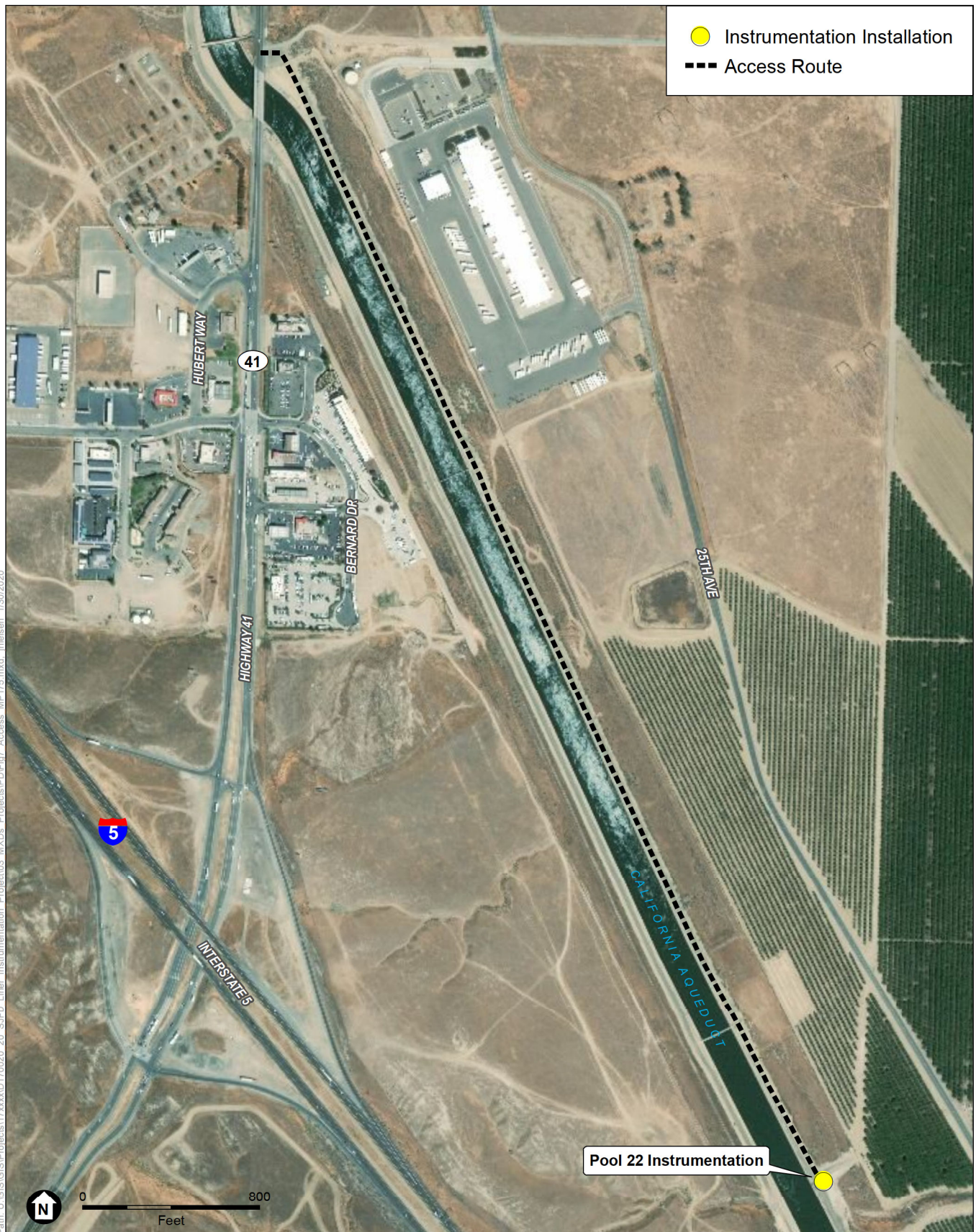
Figure 5
CA Aqueduct MP 207.94 - 208.11 Liner Raise Pool 25



SOURCE: ESRI, 2019.

San Joaquin Field Division Liner Raise and Instrumentation Project

Figure 6
CA Aqueduct MP 209.17 - 210.31 Liner Raise Pool 25



SOURCE: ESRI, 2019.

San Joaquin Field Division Liner Raise and Instrumentation Project

Figure 7
Access to CA Aqueduct MP 175.16 Pool 22

The transmission pole at the Pool 25 site would consist of a maximum 20-foot-tall steel structure with a 3-foot diameter by 3-foot-deep cement foundation constructed within the existing right-of-way on the east side of the roadway. A trench 30 feet in length, 12 inches in width, and 3 feet deep would be excavated from the transmission pole across the road to the instrument. At the Pool 22 site, a trench approximately 80 feet in length, 12 inches in width, and 3 feet deep would be excavated to install conduit and communication and power cables to the existing control building on the east side of the road. An additional trench would be excavated parallel to the eastern edge at the top of the canal liner, approximately 210 feet in length, 2 feet in width, and 2 feet deep to connect to the water level instrument. After conduit and cable placement, the trench would be backfilled with a combination of lean concrete in the bottom 12 inches and imported soil for the remainder up to original grade, and the road would be repaired with asphalt concrete. The Aqueduct right-of-way and embankment slope would be returned to pre-project conditions.

2.4 Construction Considerations

For all work, the aqueduct flow and water levels would be operated normally or temporarily reduced to accommodate instrument placement. All work would be completed above water so deliveries will not be impacted. Operational flexibility within the system will allow water deliveries to be managed so that there would be no disruptions to water deliveries. Construction of the proposed project is anticipated to begin in the summer of 2020 and conclude within 8 months. Construction activities would be limited to the hours of 6:00 a.m. to 6:00 p.m., Monday through Friday to the greatest extent possible. A maximum of 20 construction workers are anticipated to be required during the liner raise construction and up to five during construction and installation of the water level monitoring instrumentation.

The Pool 22 instrumentation site, located approximately 2 miles south of Kettleman City, would be accessed from Highway 41. The remaining construction sites are located at Pools 24 and 25, in Kern County, located approximately 13 miles northwest of Buttonwillow, accessible from West Lerdo Highway, west of Interstate Highway 5. Anticipated construction materials and equipment are listed in **Tables 1 and 2**, respectively. Access to the construction areas would occur on existing roadways and service roads, including access roads on top of both sides of the Aqueduct embankments. No new roads would be required to access the construction areas. All liner raise construction would occur on the water side of the Aqueduct embankments. Staging areas for storage of materials and equipment would be located in previously disturbed roadways and road aprons adjacent to the Aqueduct. Staging and limited stockpiling would occur on less than 1 acre at the toe of the left embankments near MP 199.80, MP 207, and MP 209.80 (**Figures 4 through 6**). Instrumentation sites and connecting utility trenches would be located within previously disturbed roadways or road shoulders.

Upon completion of the proposed project, all construction areas, including access roads, would be regraded to match pre-project conditions. Any remaining stockpiles or materials would be removed from the site.

TABLE 1
ANTICIPATED CONSTRUCTION MATERIALS REQUIRED FOR CONSTRUCTION OF THE PROPOSED PROJECT

Construction Materials	Volume
Compacted Backfill	9,700 cubic yards
Excavation	5,700 cubic yards
2-inch PVC Schedule 80 Pipe and Fittings	320 linear feet
Traffic-Rated Vault with Locking Cover	5 each
Aggregate Base	560 tons
Hot Mix Asphalt	10 tons
Concrete - Liner	1,500 cubic yards
Concrete - Structure	3 cubic yards
Reinforcing Steel	430 pounds
Polyvinyl Chloride Waterstop	6,450 linear feet
Longitudinal Strip Waterstop	17,000 linear feet
2-inch Galvanized Steel Pipe and Fittings	40 linear feet

TABLE 2
ANTICIPATED CONSTRUCTION EQUIPMENT REQUIRED FOR CONSTRUCTION OF THE PROPOSED PROJECT

Construction Equipment	Maximum Number
Flatbed Delivery Trucks	3
Concrete Delivery Trucks	150
2000-Watt Mobile Generators	2
John Deere 410L Backhoe	1
Caterpillar 308E Excavator	4
Ramex Compactors	3
Caterpillar 930 Front-end Loader	2
1.7-cubic-yard Concrete Mixer	1
10-cubic-yard Concrete Truck (in circuit)	4
Personnel Trucks	20
Kenworth T-880 Tandem Axle Dump Trucks	3
Telehandler	1
Caterpillar AP 1000D Paving Machine	1

2.5 Operation and Maintenance

Once constructed, existing staff would resume regular maintenance and operation of the Aqueduct in accordance with existing maintenance and water delivery schedules. Routine maintenance along the Aqueduct and within the proposed project area includes pothole repair; vegetation removal; erosion repairs; building maintenance and inspections; broken liner panels repair and/or replacement; debris removal; and repair and maintenance at check gates.

2.6 Project Approvals

Table 3 presents a preliminary list of the agencies and entities, in addition to DWR, that would use this MND in their consideration during permit submittals and other approvals that may apply to the proposed project. This MND is intended to provide these agencies with information to support their decision-making processes. The table also lists the types of activities that would be subject to these requirements.

TABLE 3
APPROVALS POTENTIALLY REQUIRED

Agency	Permits and Authorizations Potentially Required	Activities Subject to Regulations
Regional Water Quality Control Board	Construction General Permit, NPDES Permit Storm Water Pollution Prevention Plan	Control runoff from construction sites

References

- Bertoldi, G. L., R. H. Johnston, and K. D. Evenson. 1991. Ground Water in the Central Valley, California—A Summary Report. U.S. Geological Survey Professional Paper 1401-A.
- California Department of Water Resources (DWR), 2020. State Water Project Facilities. <https://water.ca.gov/Programs/State-Water-Project/SWP-Facilities>
- California Department of Water Resources (DWR), 2017. California Aqueduct Subsidence Study.
- Ireland, R.L. 1986. Land Subsidence in the San Joaquin Valley, California as of 1983, U.S. Geological Survey Water Resources Investigations Report 85-4196.
- USGS (U.S. Geological Survey). 2018. Current Land Subsidence in the San Joaquin Valley. July 18. Available: <https://ca.water.usgs.gov/projects/central-valley/land-subsidence-san-joaquin-valley.html>. Accessed August 24, 2018.

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CHAPTER 3

Initial Study and Environmental Checklist

1. **Project Title:** San Joaquin Field Division Liner Raise and Instrumentation Project
2. **Lead Agency Name and Address:** California Department of Water Resources
1416 9th Street Sacramento, CA, 95814
3. **Contact Person and Phone Number:** Marea McCann, (916) 653-4270
4. **Project Location:** Pools 22, 24, and 25 of the California Aqueduct within Kings and Kern Counties
5. **Project Sponsor's Name and Address:** Same as Lead Agency
6. **General Plan Designation(s):** N/A
7. **Zoning:** N/A

8. **Description of Project:** (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)

The proposed project would raise portions of the concrete liner on each side of Pools 24 and 25 over 1.65 miles. The proposed project would also involve the installation of water level monitoring instrumentation to provide real-time monitoring of flow and water levels in Pools 22 and 25.

9. **Surrounding Land Uses and Setting.** (Briefly describe the project's surroundings.)

The surrounding vicinity is largely rural and undeveloped except for agricultural and oil production uses.

10. **Other public agencies whose approval is required** (e.g., permits, financing approval, or participation agreement.)

Regional Water Quality Control Board – Construction General Permit; NPDES Permit SWPPP

11. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?**

See Section 3.2, *Environmental Checklist - Tribal Cultural Resources*, for details on tribal consultation

3.1 Environmental Factors Potentially Affected


The environmental factors checked below include impacts that are “Less Than Significant with Mitigation Incorporated.” There are no environmental factors that have an impact that is identified as a “Potentially Significant Impact” as all potential significant impacts can be reduced to less than significant with the incorporation of mitigation measures.

- | | | |
|--|--|--|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agriculture and Forestry Resources | <input type="checkbox"/> Air Quality |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources | <input checked="" type="checkbox"/> Energy |
| <input checked="" type="checkbox"/> Geology/Soils | <input checked="" type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards & Hazardous Materials |
| <input type="checkbox"/> Hydrology/Water Quality | <input type="checkbox"/> Land Use/Planning | <input type="checkbox"/> Mineral Resources |
| <input type="checkbox"/> Noise | <input type="checkbox"/> Population/Housing | <input type="checkbox"/> Public Services |
| <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation | <input checked="" type="checkbox"/> Tribal Cultural Resources |
| <input type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Wildfire | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial study:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.



 Signature

5/13/2020

 Date

 Signature

 Date

3.2 Environmental Checklist

Aesthetics

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
I. AESTHETICS — Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

Aqueduct Pool 22 is located within Kings County, while Pools 24 and 25 are located in Kern County. The proposed project area in its entirety is characterized by the concrete lined Aqueduct canal and compacted soils that serve as access roads and the Aqueduct embankment. The proposed project area is largely uninhabited and surrounded by agricultural crops and oil fields. Agricultural uses near the project area include sparse associated infrastructure, such as barns, warehouses, equipment, and storage areas. Topography of the project area and surrounding vicinity is relatively flat. The primary roadways providing access to the project area are State highways 41 and 46. There are no scenic parks or trails located near the project area (Caltrans, 2020).

A portion of State Route 41 (SR-41), commencing at the intersection of SR-33 and proceeding south to the Kings County line, where it continues into San Luis Obispo County, is eligible for designation as a Scenic Highway by the California Department of Transportation (Caltrans) (County of Kings 2010; Caltrans 2020). This segment is located approximately 0.6 miles west of Pool 22. Other segments of SR-33 located approximately 5 miles north and southwest of Pools 24 and 25 are considered scenic by the County of Kern General Plan EIR (County of Kern 2004); however, none of these are officially designated by Caltrans (Caltrans 2020).

Discussion

- a) Scenic vistas are defined as expansive views of distant landforms and aesthetic features from public vantage points, including areas designated as official scenic vistas along roadway corridors or otherwise designated by local jurisdictions. The proposed project

area is not located in the vicinity of an officially designated scenic vista or Scenic Highway by Kings and Kern Counties (County of Kings 2010; County of Kern 2009). However, the project area (Pool 22) is adjacent to agricultural lands, which are considered scenic to the County of Kings. Further, natural landforms such as surrounding hillsides may be seen in the far off distance surrounding Pools 22, 24, and 25.

Activities associated with implementation of the proposed project would include stockpiling of materials and equipment staging in designated staging areas adjacent to the Aqueduct along the access road. Construction sites would be accessed using existing roadways and service roads, including along both sides of the Aqueduct embankments. All liner raise construction would occur on the water side of the Aqueduct embankments. Staging areas would be located in previously disturbed road aprons, on the landside aqueduct embankment between the edge of the road and the canal liner, adjacent to the work. Staging and limited stockpiling would occur on less than one acre at the toe of the left embankments near MP 199.80, MP 207, and MP 209.80 (refer to **Figures 4 through 6**). Instrumentation sites and connecting utility trenches would be located within previously disturbed roadways or road shoulders.

After construction, the water level monitoring instrumentation would be permanent at Pools 22 and 25. However, control facilities currently exist within the project area. Further, the proposed instrumentation would not have the scale or massing to obstruct or adversely impact expansive scenic vistas of distant hillsides, mountains, or surrounding agricultural lands within the project area. Therefore, due to the limited presence of construction equipment and the short-term temporary nature of project activities, project implementation would not significantly impact surrounding scenic vistas or resources. Impacts to scenic vistas would be considered **less than significant**.

- b) A scenic highway is officially designated as a State Scenic Highway when a local jurisdiction adopts a scenic corridor protection program, applies to Caltrans for scenic highway approval, and receives notification from Caltrans that the highway has been designated as an official Scenic Highway. Based on a review of the local General Plans and Caltrans List of Scenic Highways, the project area is not located along a State Scenic Highway (Caltrans 2020). The nearest Eligible State Scenic Highway is a segment of SR-41, less than 4 miles from Pool 22 (refer to **Figure 2**). Construction activities associated with the proposed project would not be visible to motorists traveling along this portion of SR-41 due to the distance and intervening topography. Therefore, the proposed project would not impact scenic resources, which include rock outcroppings, trees, or historic buildings within a designated State Scenic Highway corridor and **no impact** would occur.
- c) The surrounding vicinity is largely rural and uninhabited. Public views of the area are provided very briefly to motorists traveling along local roadways and recreational visitors who may fish within the area. Construction activities associated with the proposed project include equipment staging and material stockpiling within and immediately adjacent to Pools 22, 24, and 25. Excavated areas, stockpiled soils, and other materials generated during construction could change the visual character of the surrounding

- environment. These changes would be temporary, occurring over the 8-month construction period, and would not permanently affect the existing visual character of the Aqueduct or surrounding area. Once construction is completed, all project areas would return to pre-project conditions. Further, operation of the water level monitoring instrumentation would be within the Aqueduct right-of-way, and within an area that already contains similar aboveground facilities, such as DWR control and maintenance buildings. Therefore, impacts to the visual character and quality of public views in the project area would be **less than significant**.
- d) The project area is located within a rural setting where primary sources of nighttime light and daytime glare in the project vicinity are limited to sparse agricultural structures, some nighttime agricultural activities, and passing vehicles. The proposed project would not install or add new permanent sources of light or glare to the project vicinity, other than a small array of solar panels to power the water level monitoring instrumentation at Pool 25, however, the project area is uninhabited and remote, therefore, the source of glare is not likely to be seen by the public. Furthermore, as noted in the project description, construction activities would be limited to the hours of 6:00 a.m. to 6:00 p.m., Monday through Friday and no nighttime work would occur. Therefore, **less than significant impacts** from light or glare would occur.

References

- Caltrans, 2020. Scenic Highways. Available online at: <https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways>, accessed January 2020.
- County of Kern, 2004. Revised Update of the Kern County General Plan, Volume I, Recirculated Draft Program Environmental Impact Report. Available online at: https://psbweb.co.kern.ca.us/planning/pdfs/kcgp/KCGP_RPEIR_vol1.pdf, accessed January 2020.
- County of Kern, 2009. General Plan, Land Use, Open Space, and Conservation Element, Chapter 1. Available online at: <https://psbweb.co.kern.ca.us/planning/pdfs/kcgp/KCGPChp1LandUse.pdf>, accessed January 2020.
- County of Kings, 2010. General Plan, Open Space Element. Available online at: <https://www.countyofkings.com/home/showdocument?id=13519>, accessed January 2020.

Agriculture and Forestry Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
II. AGRICULTURE AND FORESTRY RESOURCES —				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The proposed project area is entirely within the Aqueduct right-of-way and dominated by the concrete lined canal, canal levee and gravel access road. There are no Department of Conservation (DOC) classified farmlands; lands under Williamson Act contracts; or lands with forestry resources within the proposed project area. There would be no change to existing land use conditions.

Discussion

- a-e) The proposed project occurs entirely within the Aqueduct and DWR right-of-way. There are no lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide importance or lands enrolled under a Williamson Act Contract in the proposed project area (DOC 2016; DOC, 2019; DOC, 2019a). There are no forestry resources within the proposed project area, therefore, there would be no conflict with existing zoning of forest land or cause rezoning of forest land, timberland, or timberland zoned for Timberland Production. The project does not involve any changes to current General Plan land use or zoning designations. No other adverse impacts to the existing environment would occur

from implementation of the proposed project that could result in conversion of farmland to non-agricultural use or forest land to non-forest use. Thus, **no impact** would occur.

References

California Department of Conservation (DOC), 2016. California Important Farmland Finder. Available online at: <https://maps.conservation.ca.gov/DLRP/CIFF/>, accessed January 2020.

DOC, 2019. Farmland Mapping and Monitoring Program. Available online at: <https://www.conservation.ca.gov/dlrp/fmmp>, accessed January 2020.

DOC, 2019a. Williamson Act Program. Available online at: <https://www.conservation.ca.gov/dlrp/wa>,. Accessed January 2020.

Air Quality

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
III. AIR QUALITY —				
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The project sites are located along the Aqueduct in Kings and Kern Counties within the San Joaquin Valley Air Basin (SJVAB), which is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The topography and meteorology of the SJVAB provide ideal conditions for trapping air pollution for long periods of time and producing harmful levels of air pollutants. Low precipitation levels, cloudless days, high temperatures, and light winds during the summer in the SJVAB are conducive to high ozone levels resulting from the photochemical reaction of precursors nitrogen oxides (NO_x) and volatile organic compounds (VOC) in the presence of sunlight.

The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (U.S. EPA) to set ambient air quality standards for the following seven criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter with a diameter of up to ten microns (PM₁₀), particulate matter with a diameter of up to 2.5 microns (PM_{2.5}), and lead (Pb). Standards are set at levels of air quality deemed necessary, with an adequate margin of safety, to protect public health. In addition, the California Air Resources Board (CARB) has established ambient air quality standards for these and other pollutants, which are typically more stringent than the federal standards.

Under amendments to the federal CAA, the U.S. EPA has classified air basins or portions thereof as either “attainment” or “non-attainment” for each criteria air pollutant, based on whether or not the national standards have been achieved. The California CAA, which is patterned after the federal CAA, also requires areas to be designated as “attainment” or “non-attainment” for the state standards. Thus, areas in California have two sets of attainment/non-attainment designations: one set with respect to the national standards and one set with respect to the state standards. The SJVAB is currently designated as a non-attainment area for state and national ozone standards, state and national PM_{2.5} standards, and the state PM₁₀ standard. SJVAB is

designated as “attainment” or “unclassified” with respect to all other criteria air pollutant standards (SJVAPCD 2019).

Discussion

a) As discussed above, the SJVAB is currently designated as a non-attainment area for federal and state standards with regard to PM_{2.5} and ozone, and the state PM₁₀ standard. The SJVAPCD is responsible for implementing programs and regulations required by the federal CAA and the California CAA within the SJVAB. In this capacity, SJVAPCD has prepared plans to attain federal and state ambient air quality standards for which it has been designated as non-attainment. Current air quality plans for the SJVAB include:

- 2018 Plan for the 1997, 2006, and 2012 PM_{2.5} standards;
- 2016 Plan for the 2008 ozone 8-hour standard; and
- 2014 Reasonably Available Control Technology demonstration for the 8-Hour Ozone State Implementation Plan.

The air quality plans include emissions inventories that identify sources of air pollutants, evaluations for feasibility of implementing potential opportunities to reduce emissions, sophisticated computer modeling to estimate future levels of pollution, and a strategy for how air pollution will be further reduced. In addition, the SJVAPCD has adopted a guidance document, *Guidance for Assessing and Mitigating Air Quality Impacts* (Guidance), to assist in the evaluation of air quality impacts of projects proposed within its jurisdiction (SJVAPCD 2015). The Guidance provides recommended procedures for evaluating potential air quality impacts during the environmental review process consistent with CEQA requirements and includes recommended thresholds of significance, mitigation measures, and background air quality information. It also includes recommended assessment methodologies for air toxics, odors, and greenhouse gas (GHG) emissions.

Based on the Guidance, a project’s air quality impacts during construction would be considered significant if emissions generated exceed 10 tons per year of reactive organic gases (ROG) or NO_x, 15 tons per year of PM₁₀ or PM_{2.5}, or 100 tons per year of CO. These thresholds of significance are based on the SJVAPCD’s New Source Review (NSR) offset requirements and are applied to evaluate regional impacts of project specific emissions of air pollutants and their impact on the region’s ability to reach attainment (SJVAPCD 2015). The SJVAPCD’s attainment plans demonstrate that project specific emissions below the offset thresholds would have a less-than-significant impact on air quality (SJVAPCD 2015). Thus, the SJVAPCD concludes that use of NSR offset thresholds as its thresholds of significance for criteria pollutants is an appropriate and effective means of promoting consistency in significance determinations within the environmental review process. Therefore, projects with emissions below the thresholds of significance for criteria pollutants would be determined to not conflict or obstruct implementation of the SJVAPCD’s air quality plans.

Construction

Project construction activities would result in emissions of ozone precursors (ROG and NO_x) and PM in the form of dust (fugitive dust) and exhaust (e.g., vehicle tailpipe emissions). Emissions of ozone precursors and PM are primarily a result of the combustion of fuel from on-road vehicles and off-road construction equipment. Pollutant emissions associated with project construction would be generated from the following general construction activities: (1) grading, excavation, and backfill; (2) vehicle trips from workers traveling to and from the construction areas; (3) trips associated with delivery of construction supplies to, and hauling debris from, the construction areas; (4) fuel combustion by on-site construction equipment; and (5) paving. These construction activities would temporarily generate air pollutant emissions in addition to dust and fumes. The amount of emissions generated on a daily basis would vary, depending on the intensity and types of construction activities occurring simultaneously. Overall, construction associated with the project is expected to last 7 to 8 months.

PM is among the pollutants of greatest localized concern with respect to construction activities. Construction emissions of PM can vary greatly depending on the level of activity, the specific operations taking place, the number and types of equipment operated, local soil conditions, weather conditions, and the amount of earth disturbance. Fugitive dust emissions from construction would be regulated by SJVAPCD's Rule VIII, which limits fugitive dust emissions from construction, demolition, excavation, extraction, and other earthmoving activities. The project would be required to comply with these limits.

Construction emissions were estimated using the California Emissions Estimator Model (CalEEMod), version 2016.3.2, and are presented in **Table 4**. Project-specific information was used for modeling when possible. Where project-specific data was unavailable, CalEEMod defaults were used as inputs, which capture assumed values consistent with standard practice. CalEEMod assumptions and detailed output can be found in **Appendix A**. The table shows the project's annual emissions and compares them to the SJVAPCD significance thresholds for construction.

TABLE 4
PROJECT CONSTRUCTION EMISSIONS

Construction Year	Estimated Annual Construction Emissions (tons/year)					
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
2020	0.12	1.01	0.84	<0.01	0.15	0.09
SJVAPCD Significance Threshold	10	10	100	27	15	15
Exceed Threshold?	No	No	No	No	No	No

SOURCE: Data compiled by ESA 2020.

As shown in Table 4, annual construction emissions of ROG, NO_x, CO, SO_x, PM₁₀, and PM_{2.5} would not exceed the SJVAPCD significance thresholds for construction. In addition, project construction would be required to comply with the requirements of SJVAPCD Rule VIII (SJVAPCD, 2004), which aims to limit fugitive dust emissions from construction, demolition, excavation, extraction, and other earthmoving activities (SJVAPCD 2004). Control measures required and enforced by the SJVAPCD under Regulation VIII would further reduce the PM emissions shown in Table 4.

As discussed earlier, based on the SJVAPCD's approach to air quality planning, as the project's construction emissions would be below applicable SJVAPCD thresholds for construction, the project would be considered to be consistent with the region's air quality plans.

Operation

Once operational, the project would not create any new sources of air pollutant emissions. The Aqueduct would operate similar to existing conditions and there would be no change in operations resulting in a new source of emissions. All water level monitoring instrumentation installed would be powered either by a new solar panel or the existing control building. No new diesel-powered equipment would be required for project operations. Existing staff would resume regular maintenance and operation of the Aqueduct following construction. Therefore, no new emissions would be generated as a result of project operation, and project operation would not conflict with or obstruct implementation of the regional air quality plan. As a result, construction and operation of would result in a **less than significant** impact.

- b) CEQA defines cumulative impacts as two or more individual impacts which, when considered together, are either significant or "cumulatively considerable," meaning they add considerably to a significant environmental impact. An adequate cumulative impact analysis considers a project over time and in conjunction with other past, present, and reasonably foreseeable future projects whose impacts might compound those of the project being assessed.

By its very nature, air pollution is largely a cumulative impact. No single project would likely be sufficient in size, by itself, to result in non-attainment of the regional air quality standards. Instead, a project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development within the SJVAB. The non-attainment status of the SJVAB with respect to regional pollutants is a result of past and present development. Future attainment of state and federal ambient air quality standards is a function of successful implementation of SJVAPCD's attainment plans. Consequently, the SJVAPCD's application of thresholds of significance for criteria pollutants is a relevant way to determine whether a project's individual emissions would have a cumulatively significant impact on air quality.

Per CEQA Guidelines Section 15064(h)(3), a Lead Agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable

if the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (SJVAPCD 2015). The SJVAPCD has established thresholds of significance for criteria pollutant emissions, which are based on NSR offset requirements for stationary sources. Emission reductions achieved through implementation of offset requirements are a major component of the SJVAPCD's air quality plans. Thus, projects with emissions below the thresholds of significance for criteria pollutants would be determined to comply with the SJVAPCD's air quality plans and would not contribute a cumulatively considerable increase for these criteria pollutants (SJVAPCD 2015).

As shown in Table 4, project construction emissions would be less than the SJVAPCD recommended thresholds of significance for construction emissions, and project operations would not generate new air emissions. Therefore, the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard. The impact with respect to criteria air pollutant emissions would be **less than significant**.

- c) Sensitive receptors are defined as facilities and land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals, and daycare centers. Residential areas are also considered sensitive to poor air quality because people usually stay home for extended periods of time, which results in greater exposure to ambient air quality.

The section of Aqueduct in which the project would occur primarily runs through agricultural fields and undeveloped land. The area is rural and predominately uninhabited, and there are no sensitive receptors within 1,000 feet of any of the project sites. Additionally, the project's construction is linear in nature and is not anticipated to occur at any one site for an extended period of time. Operation of the project would not result in any new emissions. If implemented, the proposed project would not expose sensitive receptors to substantial criteria pollutants due to the lack of receptors near the project site and the short-term nature of construction activity. Therefore, impacts would be **less than significant**.

- d) Operation of the Aqueduct would be similar to existing conditions and would not introduce any new sources that would generate odorous emissions. Diesel-powered construction equipment can generate short-term, non-persistent odors due to engine exhaust, but these dissipate quickly and would likely not be noticeable beyond the work site. Additionally, as discussed above, the area surrounding the project site is rural and uninhabited. Therefore, the project would not create odors that could impact a substantial number of people, and **no impact** would occur.

References

San Joaquin Valley Air Pollution Control District (SJVAPCD), 2004. *Regulation VIII: Fugitive PM₁₀ Prohibition*. Available at: <http://www.valleyair.org/rules/1ruleslist.htm#reg8>. Accessed January 27, 2020.

SJVAPCD, 2015. *Guidance for Assessing and Mitigating Air Quality Impacts*. March 19, 2015. Available at: http://www.valleyair.org/transportation/GAMAQI_12-26-19.pdf. Accessed January 27, 2020.

SJVAPCD, 2019. *Ambient Air Quality Standards & Valley Attainment Status*. Available at: <https://www.valleyair.org/aqinfo/attainment.htm>. Accessed January 27, 2020.

Biological Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
IV. BIOLOGICAL RESOURCES — Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Regulatory Setting

Federal

Endangered Species Act of 1973 (USC, Title 16, Sections 1531 through 1543)

The federal Endangered Species Act (FESA) and subsequent amendments provide guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend. In addition, the FESA defines species as threatened or endangered and provides regulatory protection for listed species. The FESA also provides a program for the conservation and recovery of threatened and endangered species as well as the conservation of designated critical habitat that United States Fish and Wildlife Service (USFWS) determines is required for the survival and recovery of these listed species.

Section 7 of the FESA requires federal agencies, in consultation with and assistance from the Secretary of the Interior or the Secretary of Commerce, as appropriate, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species. The USFWS and National Marine Fisheries Service (NMFS) share responsibilities for administering the FESA. Regulations governing interagency cooperation under Section 7 are

found in CCR Title 50, Part 402. The opinion issued at the conclusion of consultation will include a statement authorizing “take” (i.e., to harass, harm, pursue, hunt, wound, kill, etc.) that may occur incidental to an otherwise legal activity.

Section 9 lists those actions that are prohibited under the FESA. Although take of a listed species is prohibited, it is allowed when it is incidental to an otherwise legal activity. Section 9 prohibits take of listed species of fish, wildlife, and plants without special exemption. The definition of “harm” includes significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns related to breeding, feeding, or shelter. “Harass” is defined as actions that create the likelihood of injury to listed species by disrupting normal behavioral patterns related to breeding, feeding, and shelter significantly.

Section 10 provides a means whereby a nonfederal action with the potential to result in take of a listed species can be allowed under an incidental take permit. Application procedures are found at Code of Federal Regulation (CFR), Title 50, Sections 13 and 17 for species under the jurisdiction of USFWS and CFR, Title 50, Sections 217, 220, and 222 for species under the jurisdiction of NMFS.

Section 4(a)(3) and (b)(2) of the FESA requires the designation of critical habitat to the maximum extent possible and prudent based on the best available scientific data and after considering the economic impacts of any designations. Critical habitat is defined in Section 3(5)(A) of the FESA: (1) areas within the geographic range of a species that are occupied by individuals of that species and contain the primary constituent elements (physical and biological features) essential to the conservation of the species, thus warranting special management consideration or protection; and (2) areas outside of the geographic range of a species at the time of listing but that are considered essential to the conservation of the species.

Migratory Bird Treaty Act (USC, Title 16, Sections 703 through 711)

The Migratory Bird Treaty Act (MBTA), first enacted in 1918, domestically implements a series of treaties between the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former Soviet Union that provide for international migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds; the act provides that it shall be unlawful, except as permitted by regulations, “to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird” (U.S. Code Title 16, Section 703). The current list of species protected by the MBTA includes several hundred species and essentially includes all native birds. Permits for take of nongame migratory birds can be issued only for specific activities, such as scientific collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and personal property.

Federal Clean Water Act (USC, Title 33, Sections 1251 through 1376)

The federal Clean Water Act (CWA) provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation’s waters. Section 401 requires a project proponent for a federal license or permit that allows activities resulting in a discharge to waters of the U.S. to obtain State certification, thereby ensuring that the discharge will comply with provisions of the CWA. The Regional Water Quality Control Boards (RWQCB) each

administer the certification program in California. Section 402 establishes a permitting system for the discharge of any pollutant (except dredged or fill material) into waters of the U.S.. Section 404 establishes a permit program administered by U.S. Army Corp of Engineers (USACE) that regulates the discharge of dredged or fill material into waters of the U.S., including wetlands. USACE implementing regulations are found at CFR, Title 33, Sections 320 and 330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines, which were developed by the U.S. Environmental Protection Agency in conjunction with USACE (40 CFR 230). The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

State

California Endangered Species Act (California Fish and Game Code Section 2050 et seq.)

The California Endangered Species Act (CESA) establishes the policy of the State to conserve, protect, restore, and enhance threatened or endangered species and their habitats. The CESA mandates that State agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no State agency consultation procedures under the CESA. For projects that would affect a listed species under both the CESA and the FESA, compliance with the FESA would satisfy the CESA if CDFW determines that the federal incidental take authorization is “consistent” with the CESA under California Fish and Game Code Section 2080.1. For projects that would result in take of a species listed under the CESA only, the project proponent would have to apply for an Incidental Take Permit under Section 2081(b) to remain in compliance with the CESA.

Regional Water Quality Control Board

Under Section 401 of the CWA, the RWQCB must certify that actions receiving authorization under Section 404 of the CWA also meet State water quality standards. The RWQCB also regulate waters of the State under the Porter-Cologne Act Water Quality Control Act (Porter-Cologne Act). The RWQCB require projects to avoid impacts to wetlands if feasible and requires that projects do not result in a net loss of wetland acreage or a net loss of wetland function and values. The RWQCB typically require compensatory mitigation for impacts to wetlands and/or waters of the State. The RWQCB also have jurisdiction over waters deemed ‘isolated’ or not subject to Section 404 jurisdiction under the Solid Waste Agency of Northern Cook County decision. Dredging, filling, or excavation of isolated waters constitutes a discharge of waste to waters of the State and prospective dischargers are required obtain authorization through an Order of Waste Discharge or waiver thereof from the applicable RWQCB and comply with other requirements of Porter-Cologne Act. The project site is located within the jurisdiction of the Lahontan RWQCB.

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act, waters of the State fall under the jurisdiction of the appropriate RWQCB. Under the act, the RWQCB must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point

sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters must meet waste discharge requirements of the RWQCB, which may be issued in addition to a water quality certification or waiver under Section 401 of the CWA. The project site is under the jurisdiction of the Lahontan RWQCB and its associated basin plan.

California Fish and Game Code

Section 460. Under this section of the California Fish and Game Code (CFGC), desert kit fox may not be taken at any time.

Sections 1600 through 1616. Under these Sections of the CFGC, the project operator is required to notify California Department of Fish and Wildlife (CDFW) prior to any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Pursuant to the code, a “stream” is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Based on this definition, a watercourse with surface or subsurface flows that supports or has supported riparian vegetation is a stream and is subject to CDFW jurisdiction. Altered or artificial watercourses valuable to fish and wildlife are subject to CDFW jurisdiction. CDFW also has jurisdiction over dry washes that carry water during storm events. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement, which becomes part of the plans, specifications, and bid documents for the project.

Sections 2080 and 2081. Section 2080 of the CFGC states that “No person shall import into this State [California], export out of this State, or take, possess, purchase, or sell within this State, any species, or any part or product thereof, that the Commission [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, or the Native Plant Protection Act, or the California Desert Native Plants Act.” Pursuant to Section 2080.1 or 2081 of the code, CDFW may authorize individuals or public agencies to import, export, take, or possess State-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or memoranda of understanding if the take is incidental to an otherwise lawful activity, impacts of the authorized take are minimized and fully mitigated, the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and the project proponent ensures adequate funding to implement the measures required by CDFW, which makes this determination based on available scientific information and considers the ability of the species to survive and reproduce.

Sections 3503, 3503.5, 3513, and 3800. Under these Sections of the CFGC, the project proponent is not allowed to conduct activities that would result in the taking, possessing, or destroying of any birds of prey or their nests or eggs; the taking or possessing of any migratory nongame bird as designated in the MBTA unless authorized by rules or regulations approved by the Secretary of the Interior; the taking, possessing, or needlessly destroying of the nest or eggs of any bird; or the taking of any nongame bird pursuant to California Fish and Game Code Section 3800.

Sections 3511, 4700, 5050, and 5515. Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the CFGC. These statutes prohibit take or possession of fully protected species. CDFW is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species.

Sections 4000 through 4003. Under Section 4000 of the CFGC, it is unlawful to conduct activities that would result in the taking, possessing, or destroying of any fur-bearing mammals, including desert kit foxes, without prior authorization from the CDFW.

CEQA Guidelines, Section 15380

In addition to the protections provided by specific federal and state statutes, CEQA Guidelines Section 15380(b) provides that a species not listed on the federal or state list of protected species nonetheless may be considered rare or endangered for purposes of CEQA if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the FESA and the Section of the CFGC dealing with rare or endangered plants or animals. This Section was included in CEQA primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on, for example, a candidate species that has not been listed by either USFWS or CDFW. Thus, CEQA provides an agency with the ability to protect a species from the potential impacts of a project until the respective government agencies have an opportunity to designate the species as protected, if warranted. CEQA also calls for the protection of other locally or regionally significant resources, including natural communities. Although natural communities do not at present have legal protection of any kind, CEQA calls for an assessment of whether any such resources would be affected and requires findings of significance if there would be substantial losses. Natural communities listed by CNDDDB as sensitive are considered by CDFW to be significant resources and fall under the CEQA *Guidelines* for addressing impacts. Local planning documents such as general plans often identify these resources as well.

Native Plant Protection Act (California Fish and Game Code Sections 1900 through 1913)

California's Native Plant Protection Act (NPPA) requires all State agencies to use their authority to carry out programs to conserve endangered and rare native plants. Provisions of the NPPA prohibit the taking of listed plants from the wild and require notification of CDFW at least 10 days in advance of any change in land use. This allows CDFW to salvage listed plant species that otherwise would be destroyed. The project proponent is required to conduct botanical inventories and consult with CDFW during project planning to comply with the provisions of this act and Sections of CEQA that apply to rare or endangered plants.

California Desert Native Plants Act (California Food and Agricultural Code Sections 800071 through 80075)

The California Desert Native Plants Act affords protection to certain native desert plant species, including all species of the agave family (*Agavaceae*), all species of the genus *Prosopis*, all species of the genus *Cercidium*, and makes the harvest, transport, sale, or possession of these species unlawful unless a permit is first obtained.

Environmental Setting

The following is based on the Biological Resources Report prepared by ESA (2019) and the San Joaquin Field Division Liner Raise and Instrumentation Project Survey Results Summary Report prepared by DWR (2019) (Appendix B) in support of the proposed project. ESA biologists with the support of Blackhawk Environmental, completed vegetation mapping, rare plant surveys, and focused surveys for the San Joaquin antelope squirrel (*Ammospermophilus nelsoni*,), blunt-nosed leopard lizard (*Gambelia sila*,) and western burrowing owl (*Athene cunicularia*,). Small mammal trapping was conducted to detect potential special-status small mammal species, including short-nosed kangaroo rat (*Dipodomys nitratoideus* ssp. *brevinasus*), giant kangaroo rat (*D. ingens*), Tipton kangaroo rat (*D. n. n.*), and. Reconnaissance-level den surveys for the San Joaquin kit fox (*Vulpes macrotis mutica*) were conducted, as well. Surveys were conducted from May through July 2019 along the Aqueduct in Kern and Kings Counties.

Environmental scientists from DWR's South Central Region Office conducted biological surveys from January 24, 2019 through July 10, 2019 that encompassed both sides of the Aqueduct at Pools 22, 24 and 25. A general habitat assessment was conducted as well as species-specific surveys for western burrowing owl and their burrows, blunt-nosed leopard lizard, federally- and/or state-listed small mammals and their burrows, and dens for San Joaquin kit fox and American badger.

The proposed project is located entirely within DWR's right-of-way. As depicted on **Figures 6 and 7**, the instrumentation locations would occur at two locations on the east-side of the Aqueduct, at Pools 22 and 25, and the liner raise locations would occur along both sides of the Aqueduct. For the purposes of this discussion, the proposed "project site" encompasses the construction footprint within DWR's right-of-way where instruments would be installed and where excavation and construction for the liner raising would occur. The project site consists of disturbed areas devoid of vegetation that includes paved and unpaved roads adjacent to the Aqueduct. The project area also contains native and non-native herbaceous communities immediately adjacent to the Aqueduct, between the access road and adjacent agriculture fields within DWR's right-of-way.

Special-Status Species

Special-status species are legally protected under the state and federal ESAs or other regulations, or are considered sufficiently rare by the scientific community to qualify for such listing. These species are classified under the following categories:

1. Species listed or proposed for listing as threatened or endangered under the federal ESA (50 Code of Federal Code of Regulations 17.12 [listed plants], 17.11 [listed animals] and various notices in the Federal Register [FR] [proposed species]);
2. Species that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 40, February 28, 1996);
3. Species listed or proposed for listing by the State of California as threatened or endangered under the CESA (14 California Code of Regulations 670.5);

4. Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.);
5. Animal species of special concern to the CDFW;
6. Animals fully protected under CFGC (California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]);
7. Species that meet the definitions of rare and endangered under CEQA. CEQA Section 15380 provides that a plant or animal species may be treated as “rare or endangered” even if not on one of the official lists (State CEQA Guidelines, Section 15380); and
8. Plants considered under the CDFW and California Native Plant Society (CNPS) to be “rare, threatened or endangered in California” (California Rare Plant Rank [CRPR] 1A, 1B, and 2) (CNPS 2020).

A query of the CDFW California Natural Diversity Database (CNDDDB), the CNPS on-line database, and the USFWS Information for Planning and Consultation Online System was conducted to identify special-status species that have been previously recorded within a 3-mile radius of the project area. A list of plant and animal species detected during biological studies conducted by ESA and DWR in 2019 are provided in the respective technical reports in Appendix B. A map depicting the results of the database queries is provided in Appendix C.

Special-Status Plants

No special-status plant species were observed during the focused rare plant surveys. The proposed project activities, including construction and staging, would occur entirely within disturbed or developed portions of the Aqueduct and would not involve the removal of native vegetation or disturbances in areas that have not already been disturbed; therefore, no special-status plant species have potential to occur within the project site where construction-related disturbances would occur. The following special-status plants have a medium-to-high potential to occur within allscale shrubland habitat located in the project area: Howell’s onion (*Allium howellii*), forked fiddleneck (*Amsinckia furcata*), Earlimart orache (*A. cordulata* ssp. *erecticaulis*), California jewelflower (*Caulanthus californicus*), San Joaquin woollythreads (*Monolopia congonii*), California alkali grass (*Pucinelia simplex*), San Joaquin bluecurls (*Trichostema ovatum*), and king’s gold (*Tropidocarpum californicum*). These species, including those with a low potential to occur, are presented below in **Table 5**. The potential for a particular species to occur in the project area is based on the following criteria:

- **Low Potential:** The project area and/or immediate vicinity only provide limited habitat for a particular species. In addition, the survey area may lie outside the known range for a particular species.
- **Moderate Potential:** The project area and/or immediate vicinity provide suitable habitat for a particular species.
- **High Potential:** The project area and/or immediate vicinity provide high-quality or ideal habitat (i.e., soils, vegetation assemblage, and topography) for a particular species.

TABLE 5
POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES

Common Name	Scientific Name	Status¹ (Federal/State/Other)	Habitat¹	Blooming Period	Potential to Occur within the Project Area
Howell's onion	<i>Allium howellii</i> var. <i>howellii</i>	None/None/4.3	Found clay or serpentinite soils and valley and foothill grasslands.	April-June	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland and herbaceous communities within project area. The nearest occurrence was recorded in 1952 (CNPS 2019).
Forked fiddleneck	<i>Amsinckia furcata</i>	None/None/4.2	Found in cismontane woodlands and valley and foothill grasslands.	February-May	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland and herbaceous communities within project area. The nearest occurrence was recorded in 1936 (CNPS 2019).
Horn's milk vetch	<i>Astragalus hornii</i> var. <i>hornii</i>	None/None/1B.1	Found in lake margins, meadows, seeps, and playas.	May-October	Low potential to occur. Suitable habitat does not occur within the project area. The nearest occurrence was recorded in 1952 near the Highway 5 and Highway 46 confluence (CNPS 2019).
Heartscale	<i>Atriplex cordulata</i> var. <i>cordulata</i>	None/None/1B.2	Found in saline or alkaline soils. Habitats include chenopod shrubland, meadows, seeps, valley and foothill grasslands.	April-October	Moderate potential to occur. Suitable habitat within project area; however, this species was not observed during focused rare plant surveys (ESA 2019). The nearest occurrence was recorded in 1995 (CNPS 2019).
Earlimart orache	<i>Atriplex cordulata</i> var. <i>erecticaulis</i>	None/None/1B.2	Found in valley and foothill grasslands.	August-September	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland and herbaceous communities within project area. The nearest occurrence was recorded in 1995 (CNPS 2019).
Crownscale	<i>Atriplex coronata</i> var. <i>coronata</i>	None/None/4.2	Found in alkaline and clay soils. Habitats include chenopod shrubland, valley and foothill grasslands, and vernal pools.	March-October	Moderate potential to occur. Suitable habitat exists within the project area; however, this species was not observed during focused rare plant surveys (ESA 2019). The nearest occurrence was recorded in 1987 (CNPS 2019).

¹ Cal Flora. 2019.

Common Name	Scientific Name	Status ¹ (Federal/State/Other)	Habitat ¹	Blooming Period	Potential to Occur within the Project Area
San Jacinto Valley crownscale	<i>Atriplex coronata</i> var. <i>notatior</i>	FE/None/1B.1	Found in alkaline soils. Habitats include playas, vernal pools, valley and foothill grassland.	April-August	Low potential to occur. Suitable habitat not within the project area. Species is prominent in Riverside County (CNPS 2019).
Lost Hills crownscale	<i>Atriplex coronata</i> var. <i>vallicola</i>	None/None/1B.2	Found in alkaline soils. Habitats include chenopod shrubland, valley and foothill grassland, and vernal pools.	April-September	Low potential to occur. Suitable habitat not within the project area. Nearest occurrence was recorded in 1937 (CNPS 2019).
lesser saltscale	<i>Atriplex minuscule</i>	None/None/1B.1	Found in alkaline and sandy soils. Habitats include chenopod shrubland, playas, and valley and foothill grasslands.	May-October	Low potential to occur. Suitable habitat occurs on site. Species has not been recorded within the project area and the nearest occurrence was in 1991.
California jewelflower	<i>Caulanthus californicus</i>	FE/CE/1B.1	Found in sandy soils. Habitats include chenopod shrubland, pinyon and juniper woodland, and valley and foothill grasslands.	February-May	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland, chenopod and herbaceous communities within project area. The nearest occurrence was in 1988 (CNPS 2019).
Recurved larkspur	<i>Delphinium recurvatum</i>	None/None/1B.2	Found in alkaline soils. Habitats include chenopod shrubland, cismontane woodland, and valley and foothill grasslands.	March-June	Low potential to occur. Suitable habitat occurs within the project area; however, no CNPS or CNDDB occurrences have been recorded within the project area. The nearest occurrence was in 2005 at the confluence of Highway 5 and Highway 46.
Kern mallow	<i>Eremalche parryi</i> ssp. <i>kernensis</i>	FE/None/1B.2	Found on dry, open sandy to clay soils; often at edge of balds. Habitats include chenopod shrubland, pinyon and juniper woodland, and valley and foothill grassland.	January, March, April, and May.	Low potential to occur. The nearest occurrences to the project area were in 1954 and 1965 (CNPS 2019). Suitable habitat does not exist within the project area.
Hoover's eriastrum	<i>Eriastrum hooveri</i>	None/None/4.2	Found sometimes in gravelly soils. Habitats include chenopod shrubland, pinyon and juniper woodland, and valley and foothill grassland.	March-July	Low potential to occur. Species falls within elevation range; however, species has not been observed within project area.
Munz's tidy-tips	<i>Layia munzii</i>	None/None/1B.2	Habitats include chenopod shrubland and valley and foothill grassland.	March-April	Low potential to occur. Grassland communities could potentially support this species. Species has not been observed within project area and falls under of elevation range.

Common Name	Scientific Name	Status ¹ (Federal/State/Other)	Habitat ¹	Blooming Period	Potential to Occur within the Project Area
Jared's pepper-grass	<i>Lepidium jaredii</i> ssp. <i>jaredii</i>	None/None/1B.2	Habitats include valley and foothill grasslands.	March-May	Low potential to occur. One occurrence was observed and recorded in Kern County in 1989 (CNPS 2019). Project area does not support suitable habitat.
Showy madia	<i>Madia radiata</i>	None/None/1B.1	Habitats include cismontane woodland and valley and foothill grasslands.	March-May	Low potential to occur. Suitable habitat does not occur within the project area and there have been no CNDDDB or CNPS observations within the project area.
San Joaquin woollythreads	<i>Monolopia congdonii</i>	FE/None/1B.2	Habitats include chenopod shrubland and valley and foothill grasslands.	February-May	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland, chenopod shrubland and herbaceous communities within project area. Numerous occurrences have been recorded near the intersection of Highway 5 and Highway 46 (outside of project area) (CNPS 2019).
California alkali grass	<i>Puccinellia simplex</i>	None/None/1B.2	Found in alkaline and vernal mesic soils; sinks, flats, and lake margins. Habitats include chenopod shrubland, meadows and seeps, valley and foothill grassland, and vernal pools.	March-May	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland, chenopod shrubland and herbaceous communities within project area.
San Joaquin bluecurls	<i>Trichostema ovatum</i>	None/None/4.2	Habitats include chenopod shrubland and valley and foothill grasslands.	July-October	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland, chenopod shrubland and herbaceous communities within project area.
Kings gold	<i>Tropidocarpum californicum</i>	None/None/1B.1	Habitats include chenopod shrubland.	February-March	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented chenopod shrubland within project area.

¹ Federal/State/Other Status: FT – federally threatened, SE – State endangered; California Native Plant Society (CNPS) Rare Plant Ranks 1B – Plants rare, threatened or endangered in California and elsewhere, 2 – Plants rare, threatened or endangered in California, but more common elsewhere, and 4 – Plants of limited distribution; CNPS Threat Ranks 0.1 – Seriously threatened in California (over 80 percent of occurrences threatened/high degree and immediacy of threat), 0.2 – Moderately threatened in California (20-80 percent of occurrences threatened/moderate degree and immediacy of threat), and 0.3 – Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known).

Special-Status Wildlife

The biological studies conducted in 2019 summarize the special-status wildlife species with potential to occur within the project area. Special-status wildlife having a low-to-high potential to occur within or immediately adjacent to the proposed project site, including those observed during 2019 biological resource surveys, are presented below in **Table 6**. The potential for each of these species to occur is based on the following criteria:

- **Low Potential:** The project area and/or immediate vicinity only provide limited habitat for a particular species or the species was not detected during focused surveys. In addition, the survey area may lie outside the known range for a particular species.
- **Moderate Potential:** The project area and/or immediate vicinity provide suitable habitat for a particular species.
- **High Potential:** The project area and/or immediate vicinity provide high-quality or ideal habitat (i.e., soils, vegetation assemblage, and topography) for a particular species.
- **Present:** This species was observed within or adjacent to the proposed project site.

TABLE 6
POTENTIALLY OCCURRING SPECIAL-STATUS WILDLIFE SPECIES

Common Name	Scientific Name	Status ¹ (Federal/State)	Habitat ²	Potential to Occur within the Project Area
Mammals				
San Joaquin Antelope Squirrel	<i>Ammospermophilus nelsoni</i>	None/ST	Arid, grassy open stages within chenopod shrubland with sandy/friable soils for burrowing.	Present. Suitable habitat is present throughout much of the project area and. Two individuals were observed adjacent to the project site at MP 210.23 and one individual was observed adjacent to the project site at MP 210. 31.
Giant kangaroo rat	<i>Dipodomys ingens</i>	FE/SE	Arid, grassy open stages with alkaline/loose sandy/friable soils for burrowing.	Low. Suitable habitat is present throughout much of the project area; however, this species was not detected during small mammal trapping efforts.
Short-nosed kangaroo rat	<i>Dipodomys nitratoides</i> ssp. <i>bevinasus</i>	None/SSC	Arid, grassy open stages with alkaline/loose sandy/friable soils for burrowing.	Low. Suitable habitat is present throughout much of the project area; however, this species was not detected during small mammal trapping efforts.
Tipton kangaroo rat	<i>Dipodomys nitratoides</i> ssp. <i>nitratoides</i>	FE/SE	Arid, grassy open stages with alkaline/loose sandy/friable soils for burrowing.	Low. Suitable habitat is present throughout much of the project area; however, this species was not detected during small mammal trapping efforts.
San Joaquin pocket mouse	<i>Perognathus inornatus</i>	None/None	Arid, grassy open stages with loose friable soils for burrowing.	Low. Suitable habitat is present throughout much of the project area; however, this species was not detected during small mammal trapping efforts.

² Cal Flora. 2019.

Common Name	Scientific Name	Status ¹ (Federal/State)	Habitat ²	Potential to Occur within the Project Area
American badger	<i>Taxidea taxus</i>	None/SSC	Various habitats with sandy/friable soils for burrowing.	High. No American badgers or active/occupied dens were observed during the surveys. However, numerous suitably sized burrows were identified during the reconnaissance surveys.
San Joaquin kit fox	<i>Vulpes macrotis</i> <i>ssp. mutica</i>	FE/ST	Grassy open stages with scattered shrubs and sandy soils for burrowing. Requires the presence of small mammals for prey.	High. No San Joaquin kit fox or active/occupied dens were observed during the surveys. However, numerous suitably sized burrows were identified during the reconnaissance surveys.
Birds				
Western burrowing owl	<i>Athene cunicularia</i>	None/SSC	Grasslands and chenopod shrublands with low vegetation. This species may also utilize heavily disturbed areas within and/or adjacent to urban settings.	Present. No western burrowing owl were observed during focused surveys; however, active burrows with positive signs (i.e., whitewash and pellets) were observed in 5 locations: one active burrow at Pool 24 adjacent to the proposed project staging area, two active burrows less than 100 feet to the north of the proposed liner raise at Pool 25 between MP 207.94 and 208.11 and two active burrows located at 48 feet and 75 feet from the proposed liner raise at Pool 25 between MP 209.17 and 210.31.
Swainson's hawk	<i>Buteo swainsoni</i>	None/ST	Great Basin grassland, Riparian forest, Riparian woodland, Valley & foothill grassland	Low. Very limited foraging habitat is present within the fragmented shrubland and herbaceous vegetation communities present within the project area, and adjacent agricultural land; however, this species is not expected to utilize this area to breed.
Reptiles				
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	FE/SE;FP	Found in alkaline soils. Habitats include chenopod shrubland, valley and foothill grassland, and vernal pools.	Low. Blunt-nosed leopard lizard was not observed within the project area during focused surveys.
San Joaquin coachwhip	<i>Masticophis flagellum</i> ssp. <i>ruddocki</i>	None/SSC	Grasslands and chenopod shrublands with low vegetation. This species generally requires rodent burrows for refugia.	Present. One individual was observed adjacent to the proposed project site at MP 213.00, during the focused blunt-nosed leopard lizard surveys conducted by DWR in 2019.

¹ Federal/State: FE - Federally endangered; FT – federally threatened, SE – State endangered; ST – State threatened; FP – fully protected; SSC – Species of special concern

Special-Status Reptiles

Blunt-Nosed Leopard Lizard

The blunt-nosed leopard lizard is a relatively large lizard species that is native to the saltbush (*Atriplex sp.*) and alkali shrubland habitats of the San Joaquin Valley and occurs between 100 and 2,400 feet above mean sea level (amsl). It is listed as state endangered, state Fully Protected and federally endangered. Blunt-nosed leopard lizards are carnivorous, generally feeding on grasshoppers, cicadas, and small lizards (including other leopard lizards). They are known to utilize mammal burrows for shade and hibernation and generally do not excavate their own burrows. The blunt-nosed leopard lizard hibernates in the winter and is active between March and late June or July. The distribution of the blunt-nosed leopard lizard has been reduced through habitat impacts and conversion from oil exploration and cultivation operations (CDFW 2020).

No blunt-nosed leopard lizards were observed during the protocol-level survey efforts. Suitable habitat for this species in the project vicinity is present within the vegetation communities on the landside of the Aqueduct's embankment.

San Joaquin Coachwhip

The San Joaquin coachwhip, one of three subspecies of the coachwhip occurring within California and Baja California, is a long, slender, fast-moving snake of open, hot dry areas. Their color is variable; tan, silver, brown, reddish or black, with irregular blotches or bands on the neck. This subspecies is restricted to the San Joaquin Valley and its historic range and population density is thought to have declined dramatically as a result of human development, most notably, the oil and agriculture industries (Californiaherps, 2020). Suitable habitat for this species in the project vicinity is present within the vegetation communities on the landside of the Aqueduct's embankment. One San Joaquin coachwhip was observed at MP 213.00, Pool 25, during the blunt-nosed leopard lizard surveys.

Special-Status Birds

Western Burrowing Owl

The western burrowing owl is a small diurnal owl that generally occurs throughout dry, open areas dominated by grasses and/or forbs up to 1,600 feet amsl. It is a species of concern with the CDFW. It preys on small mammals, reptiles, and birds; roosts/breeds in ground squirrel burrows; and is known to inhabit man-made structures, such as irrigation pipes. This species has declined throughout its range within California due to habitat conversion (CDFW 2020).

Western burrowing owl individuals were not observed during surveys; however, active burrows with positive signs (i.e., whitewash and pellets) were observed in 5 locations: one active burrow at Pool 24 adjacent to the proposed project staging area (**Figure 8**); two active burrows approximately 100 feet to the north of the proposed liner raise at Pool 25 between MP 207.94 and 208.11 (**Figure 9**), and two active burrows located less than 100 feet from the proposed liner raise at Pool 25 between MP 209.17 and 210.31 (**Figure 10**). Additional burrowing owl burrows were also encountered as depicted however, these burrows are located greater than 100 feet from the proposed liner raise locations.



SOURCE: ESRI, 2019.

San Joaquin Field Division Liner Raise and Instrumentation Project

Figure 8

Location of Mammal Burrows;
CA Aqueduct MP 199.71 - 200.01 Liner Raise Pool 24



SOURCE: ESRI, 2019.

San Joaquin Field Division Liner Raise and Instrumentation Project

Figure 9

Location of Mammal Burrows;
CA Aqueduct MP 207.94 - 208.11 Liner Raise Pool 25



SOURCE: ESRI, 2019.

SJFD Liner and Instrumentation Project

Figures 10

Location of Mammal Burrows;
CA Aqueduct MP 209.17 - 210.31 Liner Raise Pool 25

Swainson's Hawk

This species is an uncommon breeding resident and migrant within the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County and the Mojave Desert. Swainson's hawks prey upon various small mammals, large arthropods, amphibians, reptiles, and rarely fish. They are known to nest within juniper-sage flats, riparian area, and in oak savannah, and forage in adjacent grasslands, grain/alfalfa, livestock pastures. Nest site are typically near the top of a solitary tree or in a small grove of trees along a stream. Pairs often build nests in shelterbelts or other trees located near agricultural fields and pastures where they feed. Nesting trees often include willow, black locust, oak, aspen, cottonwood, and conifers. In the southern part of their range Swainson's Hawks will build nests as little as three feet off the ground in mesquite bushes, and on occasion, they'll nest on a power pole or transmission tower. It is thought that breeding throughout California has been on a sharp decline due to a loss of nesting habitat.

This species may utilize the fragmented shrubland and herbaceous communities within the right-of-way to forage, and most notably, the adjacent agricultural fields; however, no suitable nesting habitat is present in the vicinity of the proposed project.

Special-Status Mammals

American Badger

The American badger is a medium-sized mammal that occurs in dry, shrub-dominated habitats throughout California. It is designated as a species of special concern by the CDFW. This species primarily feeds on fossorial rodents and excavates its own burrows in sandy, friable soils. The American badger is active year round and functions both diurnally and nocturnally. This species is uncommon throughout its range within the state.

American badgers were not observed during the surveys. However, numerous suitably sized dens were identified within the vegetation communities on the landside of the Aqueduct's embankment.

San Joaquin Kit Fox

The San Joaquin kit fox is a small subspecies of kit fox that occurs in native shrub-dominated habitat within the San Joaquin Valley, and is listed as state threatened and federally endangered. This species feeds on various small prey items, including black tailed jackrabbits, desert cottontail, kangaroo rats, ground squirrels, snakes, lizards, and small birds. The San Joaquin kit fox excavates its own dens in sandy and/or friable soils and, due to seasonally extreme temperatures, for thermal regulation and water conservation. Agriculture and oil exploration have eliminated much of the San Joaquin kit fox habitat (CDFW 2020).

No San Joaquin kit fox individuals or active/occupied dens were observed during the surveys. However, numerous suitably sized burrows were identified (**Figures 8, 9, and 10**) within the vegetation communities on the landside of the Aqueduct's embankment.

San Joaquin Antelope Squirrel

The San Joaquin antelope squirrel is a permanent resident of the San Joaquin Valley, ranging between 200 and 1,200 feet amsl. It is listed as state threatened. This species primarily feeds on insects, green foliage and seeds, and small vertebrates. These squirrels live in small underground familial colonies on sandy, easily excavated grasslands in isolated locations in San Luis Obispo and Kern Counties. San Joaquin antelope squirrel prefers deep, rich soil types since they are easy to dig through in both winter and summer temperatures (Hawbecker 1953). They may live in burrows of their own construction or take over and enlarge those dug by kangaroo rats. The San Joaquin antelope squirrel is generally considered diurnal; however, it avoids the hottest part of the day. Cultivation and overgrazing have been instrumental in the decline of this species within its range (CDFW 2020).

Suitable burrows for San Joaquin antelope squirrel were observed on the landside of the Aqueduct embankment and individuals were observed in these areas adjacent to the project site during focused surveys. As depicted on **Figure 10**, two individuals were observed adjacent to the project site on May 29, 2019, at MP 210.23 and one was observed outside the project site on June 24, 2019, at MP 210.31, both near the vicinity of Pool 25 (DWR 2019).

Tipton Kangaroo Rat

The Tipton kangaroo rat is a subspecies of the San Joaquin kangaroo rat (USFWS 2020) that occurs within alkali shrubland and ancillary herbaceous habitats within the southwestern San Joaquin Valley, at elevations up to 1,800 feet amsl. It is listed as State and federally endangered. This species collects seeds of annual grasses and forbs for immediate consumption and for caching in holes excavated adjacent to their burrows. Tipton kangaroo rat prefers flat topography and sandy loam soils to excavate burrows; however, burrows may also be located in slightly elevated mounds, the berms of roads, canal embankments, railroad beds, and bases of shrubs and fences where wind-blown soils accumulate above the level of surrounding terrain. Tipton kangaroo rat is known to develop burrow complexes of up to 144 square feet. According to a burrow study on Tipton's kangaroo rat and Heerman's kangaroo rat (*D. heermanni tulernsis*) in fallow fields of the southern San Joaquine Valley, Tipton's kangaroo rat burrow length varied between 0.75-3.5 meters (2.5-11.5 feet) (Germano, David J and Rhodehamel, Westley, 1995). Soft soils, such as fine sands and sandy loams, and powdery soils of finer texture and of higher salinity generally support higher densities of Tipton kangaroo rats than other soil types³. Burrows are typically simple, but may include interconnecting tunnels. Most are less than 10 inches deep (USFWS 2010). Rapid urbanization and cultivation have been instrumental in the decline of this species within its range (CDFW 2020). No Tipton kangaroo rats were captured during the small mammal trapping efforts.

Giant Kangaroo Rat

The giant kangaroo rat occurs throughout portions of the western San Joaquin Valley, within sparse annual grass/forb vegetation and alkali desert shrubland with fine, sandy/loamy soils. Giant kangaroo rats prefer annual grassland on gentle slopes of generally less than 10 degrees,

³ (CSU Stanislaus, Endangered Species Recovery Program, <https://esrp.csustan.edu/speciesprofiles/profile.php?sp=dinin>, accessed April 22, 2020)

with friable, sandy-loam soils. They develop burrow systems with one to five or more separate openings. There are generally two types of burrows: 1) vertical shaft with a circular opening and no dirt apron and 2) larger, more horizontally-opening shaft, usually wider than high with a well-worn path leading from the mouth. Reproduction is influenced by population density and availability of food⁴. This species currently occupies approximately 2 percent of its former range and its population decline is thought to be the result of cultivation, damage caused by domesticated cattle and use of rodenticides. No giant kangaroo rats were captured during the small mammal trapping efforts.

Short-nosed Kangaroo Rat

This species is very similar in distribution and habitat requirements, and co-occurs with the Tipton kangaroo rat; however, tends to be larger in size. Specific information on burrows of this species is limited; however, *Dipodomys* species are known to build their burrow openings, which range from 60-80 mm in diameter, in arid and alkaline plains under shrub and grass vegetation. Their burrows are approximately 200-250 mm underground with a tunnel diameter of 50 mm and may be 2 to 3 meters in area. Burrows may consist of one vertical entrance and several slanting ones, with usually only two openings being used at a time (Whitaker, 1996). Historically, this species ranged throughout much of the San Joaquin Valley, between Los Banos, California to the foothills of the Tehachapi Range. The population saw significant declines as a result of various forms of agricultural development and now is thought to occur in scattered populations throughout its original range. No short-nose kangaroo rats were captured during the small mammal trapping efforts.

San Joaquin pocket mouse

This species occurs intermittently throughout the San Joaquin Valley, within sparse annual grass/forb vegetation and alkali desert shrubland with fine textured soils, between 350 and 600 meters amsl. Seeds likely constitute the majority of its diet; however, they are thought to eat green vegetation as well. Seeds are cached in cheek pouches in the short-term, prior to storage within their burrows (CDFW 2020). No San Joaquin pocket mice were captured during the small mammal trapping efforts.

Migratory and Nesting Birds

Nesting birds were observed adjacent to the project site (within the project area) during the biological studies conducted in 2019. Nesting cliff swallows (*Petrochelidon pyrrhonota*) was observed on the check station at MP 207.94, the overchute at MP 208.11 and on the bridge at 210.31; nesting ravens (*Corvus corax*) were observed on a radio tower located at MP 207.93; and nesting western kingbirds (*Tyrannus verticalis*) were observed within a mesquite tree located at MP 209.21. Additional birds observed during the surveys that have potential to nest in the project area and general vicinity, include white-throated swift (*Aeronautes saxatalis*), mallard (*Anas platyrhynchos*), red-tailed hawk (*Buteo jamaicensis*), California quail (*Callipepla californica*), turkey vulture (*Cathartes aura*), killdeer (*Charadrius vociferous*), American crow (*C. brachyrhynchos*), horned lark (*Eremophila*

⁴ (https://www.fws.gov/sacramento/es_species/Accounts/Mammals/giant_kangaroo_rat/documents/giant_kangaroo_rat.pdf. Accessed April 22, 2020)

alpestris), brewer's blackbird (*Euphagus cyanocephalus*), American kestrel (*Falco sparverius*), greater roadrunner (*Geococcyx californianus*), house finch (*Haemorhous mexicanus*), northern mockingbird (*Mimus polyglottos*), pied-billed grebe (*Podilymbus podiceps*), northern rough-winged swallow (*Stegidopteryx serripennis*) and mourning dove (*Zenaida macroura*). It should be noted that none of these species have potential to nest on the project site where construction activities would occur due to the disturbed conditions that exist.

Wildlife Corridors

Movements of wildlife generally fall into three basic categories: (a) movements along corridors or habitat linkages associated with home-range activities such as foraging, territory defense, and breeding; (b) dispersal movements—typically one-way movements; and (c) temporal migration movements—essentially dispersal actions which involve a return to the place of origin.

The project site is located within the Pacific Flyway, a large bird migration corridor between Alaska and South America that is approximately 4,000 miles in length and 1,000 miles across that encompasses states of the intermountain west and those that border the Pacific Ocean, in the United States including all of California, Oregon, Washington, Idaho, Utah, Nevada, Alaska, and Hawaii, as well as parts of Montana, Wyoming, Colorado, and New Mexico. Bird migration along the Pacific Flyway occurs in a north-south direction. Primary migration routes in California occur along the coast for ocean-going species, and through the Central Valley and eastern deserts of southern California. Important habitats and stopovers for migrating birds in the Pacific Flyway include protected coastal waters, as well as interior freshwater sources like the many refuges that exist in the Central Valley.

The Aqueduct supports a consistent, perennial source of fresh water that is utilized by birds for foraging and as a stop-over during spring and fall migration along the Pacific Flyway. Additionally, native habitat located within the project area and along DWR's right-of-way provides foraging and breeding opportunities for a number of terrestrial wildlife species. However, the Aqueduct itself presents a barrier for terrestrial wildlife to move/migrate in a west-to-east direction between large open space areas.

Critical Habitat for Plant and Wildlife Species

The USFWS defines the term critical habitat in the FESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection.

There is no critical habitat present within or adjacent to the proposed project site. The nearest critical habitat is for the Buena Vista Lake ornate shrew located approximately seven miles to the east of the proposed project area.

Jurisdictional Resources

The Aqueduct is not a water of the U.S. or water of the State subject to the jurisdictional permitting requirements of Section 404 and 401 of the Clean Water Act.

Sensitive Natural Communities

Natural communities are evaluated by the CDFW and are assigned global (G) and state (S) ranks based on rarity and threats to these communities in California natural communities with ranks S1–S3 (S1: critically imperiled; S2: imperiled; S3: vulnerable) are considered “sensitive natural communities.” Sensitive natural communities have a limited distribution and are often vulnerable to the environmental effects of projects.

There are no sensitive natural communities in the vicinity of the proposed project.

Discussion

- a) The proposed project involves the installation of concrete on the water side of the Aqueduct, and water level monitoring instruments within and adjacent to the access road of the Aqueduct right-of-way. Soils consist primarily of highly disturbed compacted materials that forming the access road and Aqueduct embankment. The proposed construction and staging footprint would be limited to areas of disturbed bare ground, compacted gravel, or pavement.

Special-Status Plants

No special-status plant species were observed during the focused rare plant surveys. However; the surveys were not conducted during the appropriate blooming period for several of the species having potential to occur. The installation of the liner raise would not involve vegetation clearing, and the instrumentation sites would be located on previously disturbed areas. therefore it is not anticipated that any special-status plants or habitat would be effected and impacts on special-status plants would be **less than significant**.

Special-Status Reptiles

One San Joaquin coachwhip was observed at MP 213.00, Pool 25, during the blunt-nosed leopard lizard surveys. This species may be impacted during installation of instrumentation. There is also potential for an individual to wander into other portions of the proposed project site during construction activities. The implementation of **Mitigation Measure BIO-1** would require that a preconstruction clearance survey is conducted to reduce the potential for a San Joaquin coachwhip to be impacted. Furthermore, as described in **Mitigation Measure BIO-2**, the development and implementation of a Worker Environmental Awareness Program (WEAP) would ensure that impacts to this species would be reduced to a **less-than-significant** level.

Migratory and Nesting Birds

Native resident and migratory bird species protected in accordance with the Migratory Bird Treaty Act of 1918 and Sections 3503.5, 3505, and 3511 of the California Fish and Game Code may nest within 500 feet of the liner raises, instrumentation sites, and staging areas. Bird nests located near the project site can be impacted by direct mortality or impacted indirectly from human presence or ground vibrations and noise generated by heavy equipment. Implementation of **Mitigation Measure BIO-3** requires a preconstruction nesting bird survey and establishment of an avoidance buffer around active nests to prevent unintended impacts during project

construction. This mitigation measure, in combination with **Mitigation Measure BIO-2** (WEAP), ensure that impacts to nesting birds would be reduced to **less than significant**.

Special-Status Birds

Western Burrowing Owl

No western burrowing owls were observed within the proposed liner raise and instrumentation sites during the breeding surveys conducted in 2019; however, as described above under *Special-Status Birds*, five active burrows with positive sign were observed in the vicinity of the proposed liner raise locations and staging area (DWR 2019; see **Figures 8 through 10**). As indicated in the CDFW staff report (CDFG 2012), “*Occupied site or occupancy means a site that is assumed occupied if at least one burrowing owl has been observed occupying a burrow within the last three years.*” The sign observed at the five burrows located at Pools 24 and 25 indicates that these burrows have been occupied by western burrowing owl within the last three years; therefore, presence shall be assumed at these burrows. The burrow located between MP 199.84 and 200.01 (**Figure 8**) is located near the proposed staging area and in proximity to the construction limits of the project. The four burrows located between MP 207.94 and 208.11 and MP 209.17 to 210.31 (**Figures 9 and 10**) are located outside of the proposed project footprint; therefore, direct impact (e.g., collapse of the burrows) is not expected as a result of construction activities. However, breeding or wintering burrowing owls may be indirectly affected from human presence or ground vibration and noise generated by heavy equipment. With the implementation of preconstruction clearance surveys and avoidance/exclusion measures described in **Mitigation Measure BIO-4**, the development and implementation of a WEAP as described in **Mitigation Measure BIO-2**, impacts to western burrowing owl would be reduced to a **less than significant** level.

Special-Status Mammals

American Badger and San Joaquin Kit Fox

No American badgers or San Joaquin kit foxes, including occupied burrows/dens, were observed during the 2019 surveys. However, a total of 64 potential burrows/dens were identified during the surveys; thirteen at MP 175.16, six between MP 199.7 and 200.01, ten between MP 207.94 and 208.11, thirty-two between MP 209.17 and 210.31, and three at MP 213.00. In addition to these burrows/dens, suitable foraging habitat is present in the vicinity of the proposed project; therefore, there is potential that these species could be present during construction activities. **Figures 8 through 10** identify the proximity of mammalian burrows found during the 2019 biological resource surveys, and measures their proximity to the proposed construction excavation zone (i.e., project site).

With the implementation of preconstruction clearance surveys and avoidance as described in **Mitigation Measure BIO-5** including the development and implementation of a WEAP, **Mitigation Measure BIO-2**, impacts to the American badger and San Joaquin kit fox would be reduced to a **less than significant** level.

San Joaquin Antelope Squirrel, Tipton's Kangaroo Rat, Giant Kangaroo Rat and Short-nose Kangaroo Rat

The proposed project would not remove any vegetated habitat currently occupied by burrowing mammals. All construction activities would occur on the waterside of the embankment and in small areas around proposed instrumentation sites that are already devoid of vegetation. No vegetation would be removed as part of the construction activities. Access and mobilization would occur on the embankment road.

Several hundred small mammal burrows were identified on the landside of the embankment, adjacent to but outside of the proposed construction area (DWR 2019). The observed burrows and habitat are suitable for San Joaquin antelope squirrel, Tipton's kangaroo rat, giant kangaroo rat and short-nose kangaroo rat. However, no Tipton kangaroo, giant kangaroo or short-nose kangaroo rats were found during trapping conducted during the 2019 focused surveys (DWR 2019; ESA 2019). Three San Joaquin antelope squirrels were observed adjacent to the project site on May 29, 2019, at MP 210.23, and one was observed adjacent to the project site on June 24, 2019, at MP 210.31. Both were near the vicinity of Pool 25 (DWR 2019). No San Joaquin antelope squirrels were observed within the proposed construction areas.

A few burrows of unidentified small mammal species were detected on the disturbed waterside embankment of the canal within the proposed construction zone (DWR 2019). The disturbed embankment on the waterside is subject to routine maintenance and is entirely devoid of vegetation and lacking in suitable habitat (i.e., arid, grassy open stages/chenopod shrubland with sandy/friable soils optimal for burrowing) that would provide a food source desired by these species, such as green vegetation, fruits and seeds. The potential for San Joaquin antelope squirrel, Tipton's kangaroo rat, giant kangaroo rat and short-nose kangaroo rat to occupy the waterside burrows is low due to the poor habitat. This assumption was supported by the negative results of the 2019 trapping survey data (DWR 2019; ESA 2019), which were conducted on the landside of the embankment adjacent to the proposed construction areas. Traps were not directly set on the waterside of the embankment due to safety concerns for both staff and animals. As noted above, none of the listed kangaroo rats were identified in the trapping surveys, though San Joaquin antelope squirrels were observed nearby the construction areas. Nonetheless, if any of these species were present within the construction zone, construction activities could result in "take."

Because rodent burrows exist near the construction zone, construction activities could impact small rodent species that are present. To ensure that no listed small mammal species are impacted, additional pre-construction presence/absence surveys are necessary. **Mitigation Measure BIO-6** outlines survey methods required to ensure that impacts to San Joaquin antelope squirrel, Tipton's kangaroo rat, giant kangaroo rat and short-nose kangaroo rat are avoided.

With implementation of **Mitigation Measures BIO-1 through BIO-6**, the proposed project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status. Therefore, impacts would be **less than significant with mitigation incorporated**.

- b) No sensitive natural communities or riparian habitats exist within or adjacent to the proposed project site; therefore, **no impact** would occur.
- c) The Aqueduct is not a federally or State regulated water body in accordance with the federal or state CWA or CFGC (Sections 1600 through 1616), respectively. No adjacent wetlands or potentially regulated drainages occur within or adjacent to the project footprint that could potentially be effected by the proposed project. Therefore, **no impact** would occur.
- d) The proposed project is located within the Pacific Flyway. The Aqueduct supports a consistent, perennial source of fresh water that is utilized by birds for foraging and as a stop-over during spring and fall migration along the Pacific Flyway. Additionally, native habitat located on the landside embankment of the Aqueduct provides foraging and breeding opportunities for a number of terrestrial wildlife species; however, the Aqueduct presents a barrier for terrestrial wildlife to move/migrate in a west-to-east direction between large open space areas in the region. It is possible that some migratory birds may temporarily avoid foraging or wading in the Aqueduct immediately adjacent to project site during construction activities, simply because of the mere presence of human activity and noises and vibrations that would be generated during construction activities. However, construction activities associated with the proposed project would not prevent avian or terrestrial species from using other portions of the Aqueduct for these purposes. Construction and operation of the proposed project would not impede wildlife movement in the region, nor would it prevent migratory birds or terrestrial wildlife from using the Aqueduct.

Therefore, the proposed project would not have a significant effect on local or regional wildlife movement, nor would it present an impact to a wildlife movement corridor. As such impacts to wildlife movement would be **less than significant**.
- e) To the extent feasible, implementation of the proposed project would comply with applicable adopted county ordinances protecting biological resources; however, State agencies such as DWR are not subject to local ordinances. Nonetheless, no city, county or other local policies or ordinances applicable to protecting biological resource within the project area have been identified; therefore, **no impact** would occur.
- f) The Southwest San Joaquin Valley Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP) is proposed for public draft review in the spring of 2020. However, these documents have not yet been adopted and will not have an affect the proposed project. No other proposed or existing HCP/NCCP extends into the proposed project site; therefore, **no impact** would occur.

Mitigation Measures

Mitigation Measure BIO-1: Prior to the commencement of construction activities, a qualified biologist shall conduct a preconstruction survey in areas where ground disturbance will occur that also provide suitable habitat for San Joaquin coachwhip. The survey area shall include a 100-foot buffer where access is permitted. If individuals are

observed within or near the project work areas during preconstruction clearance surveys, the individual shall be allowed to leave the project site on its own accord. If absolutely necessary, a qualified biologist may relocate the individual(s) to suitable habitat within, or adjacent to, the project area to ensure that construction-related impacts are avoided.

Mitigation Measure BIO-2: A WEAP will be developed by DWR and approved by CDFW prior to the initiation of ground-disturbing activities. The WEAP shall summarize those special-status species with potential to occur within or adjacent to the proposed project site, including potentially occurring nesting birds. The WEAP shall include measures that will be implemented to avoid impacts to special-status species during construction activities, such as, but not limited to, relocation performed by a qualified biologist or allowing the animal to move out of the construction area on its own accord. The contents of the WEAP shall include an overview of identification characteristics of each special-status species; state, federal, and local regulations protecting said species; and a methodology that outlines the process required for construction personnel to report special-status species detections, including a chain of command and criteria for stopping work and avoiding impacts.

Mitigation Measure BIO-3: If work activities occur within the bird nesting season (generally defined as January 15 through September 15), a qualified biologist shall conduct a nesting bird survey no more than 3 days prior to initiation of ground disturbance, to identify any active bird nests within 300 feet of the proposed project site or active raptor nests within 500 feet. The survey shall be limited to areas with permitted access and shall not be conducted on private property without prior authorization. If an active nest is found, the nest shall be avoided and a suitable buffer zone shall be delineated in the field where no impacts shall occur until the chicks have fledged, as determined by a qualified biologist. Construction buffers shall be determined by a qualified biologist based on the location of the nest, species tolerance to human presence, and the type of construction activities being conducted. Typical buffers include 50-150 feet for passerines. Larger buffers may be required for species that are less tolerant to disturbances, such as raptors and special-status species. Activities requiring heavy equipment that generate ground vibrations and acute noises may require larger buffers, whereas finish work, such as electrical or manual work with hand tools may require a smaller buffer to adequately protect bird nests.

Mitigation Measure BIO-4: Impacts to burrowing owls shall be avoided or minimized through implementation of the steps listed below.

- Conduct a preconstruction burrowing owl survey that includes all areas containing suitable habitat, including areas within 500 feet of burrows, prior to the commencement of construction activities to determine whether any burrowing owls are present. If an owl is not observed during the clearance, including any sign indicating presence (e.g., pellets, feathers and/or white wash), a qualified biologist shall verify presence or absence by inserting a camera scope into the burrow.
 - If an owl is not observed utilizing the burrow during the clearance survey, construction activities may commence. However, if it is determined that a burrow is occupied by an owl, in accordance with the CDFW staff report (CDFG 2012), a qualified biologist shall be retained to conduct site surveillance during construction to ensure that the owl(s) are not disturbed. If

the qualified biologist determines that the owl(s) are negatively affected by noise generated by the construction, activities shall cease until it has been determined by a qualified biologist that the owl(s) are no longer utilizing the burrow.

- If it is determined that an occupied burrow cannot be avoided during construction activities, a Burrowing Owl Exclusion Plan (Passive Relocation) shall be developed to minimize impacts to the extent feasible. In accordance with the CDFW staff report (CDFG 2012), the exclusion plan shall include methods for the proper relocation of an owl (e.g., timing outside of breeding season), and steps necessary to construct two artificial burrows within 210 meters of the occupied burrow. To ensure the long-term reliance of the replacement artificial burrows, semi-annual/annual cleaning and maintenance and/or replacement is necessary as an ongoing management practice. The status of the occupied burrow shall be verified by a qualified biologist using a camera scope prior to implementing the exclusion.
- In accordance with CDFG 2012, during the exclusion process, if a qualified biologist is able to determine that a burrow is not occupied by a burrowing owl, it may be collapsed. Conversely, if it is determined that a burrow is occupied, a one-way door shall be installed by a qualified biologist to prevent re-entry of the owl once it exits the burrow. If follow-up inspection (scoping) of the burrow verifies that the individual(s) are no longer present, the burrow may be collapsed.
- In accordance with the CDFW staff report (CDFG, 2012), where occupied habitat will be temporarily disturbed within 500 feet of an occupied burrow, restore the disturbed area to pre-project conditions including de-compacting soil and revegetating with native, regionally appropriate grasses/forbs.

Mitigation Measure BIO-5: Prior to the commencement of construction activities, a qualified biologist shall conduct a pre-construction survey for American badger and San Joaquin kit fox within 500 feet of potential dens to determine presence/absence of the species in the vicinity of construction activities. If a badger or kit fox is observed utilizing a burrow/den within 500 feet of the project site, consultation with USFWS and CDFW shall occur prior to initiation of construction activities. Construction activities may not commence until impact avoidance measures such as work zone buffers and monitoring measures have been developed, approved by CDFW and USFWS, and implemented.

Mitigation Measure BIO-6: DWR shall conduct a burrow assessment for San Joaquin antelope squirrel, Tipton's kangaroo rat, giant kangaroo rat and short-nose kangaroo rat within six months prior to initiation of any ground-disturbing activities.

- If indicators of presence are observed within 50 feet of construction activities, including suitable-size burrows on the landside and/or waterside of the aqueduct embankment, kangaroo rat and San Joaquin antelope squirrel surveys shall be conducted.
- Surveys for Tipton's kangaroo rat, giant kangaroo rat and short-nose kangaroo rat shall be conducted in accordance with the USFWS *Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats* (USFWS, March 2013). Prior to conducting trapping, a trapping plan shall be prepared and approved by CDFW and USFWS.

- In accordance with this survey protocol, live-trapping shall be conducted over 5 consecutive nights between April 1-October 31. Trapping shall cease upon the first capture of a target species.
- Trapping shall be conducted on the waterside of the embankment near observed burrows. Trapping shall be conducted on the landside of the embankment near burrows that are within 50 feet of the proposed construction zone.
- Traps shall be set approximately 1 hour before sunset and will be checked no later than 1 hour after sunrise the following morning.
- All kangaroo rats will be immediately released at the location they were trapped. No animals will be removed from the wild without prior authorization from the USFWS and/or CDFW.
- If no Tipton's kangaroo, giant kangaroo or short-nose kangaroo rats are captured during the protocol survey, the burrow shall be collapsed or sand bags shall be placed over the burrows to ensure they cannot be occupied between the preconstruction survey and the excavation on the waterside embankment.
- The results of the kangaroo rat surveys shall be compiled in a survey report that shall be submitted to USFWS and CDFW within 14 days following the completion of the surveys.
- Surveys for San Joaquin antelope squirrel shall be conducted near observed burrows on the water side of the embankment and near burrows on the landside of the embankment that are within 50 feet from proposed construction activities. Survey methods shall either be visual surveys or camera surveys.
 - For visual surveys, 5 consecutive daytime surveys shall be conducted by a team of qualified biologists between April 1-July 15. Biologists shall visually survey the proposed construction zone and areas that are within 50-feet throughout the day along selected transects.
 - For camera surveys, camera stations shall be established near burrows at a distance determined by a qualified biologist. Each survey station shall consist of an infrared camera facing a bait station and shall run 24 hours a day for a period of two non-consecutive weeks between April 1-July 15. A qualified biologist shall analyze the images captured.
 - Visual and camera surveys shall be conducted during appropriate weather conditions, avoiding periods of high wind, precipitation, and low temperatures (<50 degrees Fahrenheit). Surveys shall avoid periods of inclement weather and temperatures that are lower than 55 degrees Fahrenheit.
 - If no San Joaquin antelope squirrel are detected during the visual or camera surveys, the burrows on the water side shall be collapsed or sand bags shall be placed over the burrows to ensure they cannot be occupied between the preconstruction survey and the excavation on the waterside embankment.
 - The results of the transect and camera surveys shall be compiled in a survey report that shall be submitted to CDFW within 14 days following the completion of the surveys.

- If any of the listed species are captured during the trapping effort, and avoidance within a minimum distance of 50 feet of the occupied burrow is not feasible, consultation with the USFWS and CDFW shall occur prior to initiation of the proposed project. Construction activities may not commence until a CDFW/USFWS-approved mitigation strategy has been developed and implemented.

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Cultural Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
V. CULTURAL RESOURCES — Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

This section examines the potential impacts of the proposed project on cultural resources. Tribal cultural resources are discussed in a separate section of this document. This section relies upon the analysis presented in the cultural resources technical report, *San Joaquin Field Division Liner Raise and Instrumentation Project, Kern and Kings County, California, Cultural Resources Technical Report* (Vader et al., 2020), prepared for the project. That report details the results of the cultural resources study and includes a records search at the California Historical Resources Information System (CHRIS) Southern San Joaquin Valley Information Center (SSJVIC) conducted on December 2, 2019; a search of the California Native American Heritage Commission (NAHC) Sacred Lands File (SLF) conducted on November 21, 2019; and a cultural resources survey conducted on January 14-15, 2020.

SSJVIC Records Search

The CHRIS-SSJVIC results indicate that three cultural resources studies have been conducted within a 0.25-mile radius of the proposed project area. Approximately 10 percent of the 0.25-mile records search radius has been included in previous cultural resources surveys. Of the three previous studies, one (KI-00271) partially overlaps the Pool 22 instrumentation site (MP 175.16), the northernmost project component. The remaining two studies (KE-03214 and KE-04126) do not overlap project components, but were conducted within close proximity to (within 100-200 feet of) the proposed project area. The project area does not appear to have been subject to previous cultural resources surveys.

The records search results indicate that two cultural resources have been previously recorded within a 0.25-mile radius of the project area. These two resources are historic architectural resources and include the Aqueduct (P-15-015820/P-16-000266) and the Belridge Water Storage District (BWSD) Zone 5 Canal (P-15-019371). The Aqueduct is within the project area and the BWSD Zone 5 Canal is located immediately adjacent to (within 50 feet of) the project area (MP 209.17-210.31). **Table 7** presents the results of the records search results by project component (from north to south).

TABLE 7
SSJVIC RESULTS BY PROJECT COMPONENT

Project Component	Milepost (MP)	Percentage of 0.25-Mile Radius Surveyed	Percentage of Project Area Surveyed	Resources Within or Adjacent	Report
Pool 22 Instrumentation	MP 175.16	1%	100%	P-16-000266	KI-00271
Pool 24 Liner Raising and Staging	MP 199.71-200.01	10%	0%	P-16-000266	KE-04126
Pool 25 Staging	MP 207	1%	0%	P-15-015820	KE-03214
Pool 25 Liner Raising	MP 207.94-208.11	0%	0%	P-15-015820	N/A
Pool 25 Liner Raising and Staging	MP 209.17-210.31	0%	0%	P-15-015820 P-15-019371	N/A
Pool 25 Instrumentation	MP 213	0%	0%	P-15-015820	N/A

The Aqueduct is a 444-mile-long water conveyance structure designed to transport irrigation and drinking water from northern California to southern California. In 2012, the Aqueduct (P-15-015820/P-16-000266) was determined eligible for the National Register of Historic Places (National Register) at the state level of significance under Criteria A and C, through consensus between the State Historic Preservation Officer (SHPO) and the California Department of Transportation (Caltrans) (as delegated by the Federal Highway Administration) (Donaldson 2012). Under Criterion A, a property can be eligible for the National Register if it is associated with events that have made a significant contribution to the broad patterns of our history. Under Criterion C, a property can be eligible for the National Register if: it embodies the distinctive characteristics of a type, period, or method of construction; it represents the work of a master; it possesses high artistic values; or it represents a significant and distinguishable entity whose components may lack individual distinction.

The Aqueduct was determined eligible under Criterion A as the largest and most significant of the water conveyances systems developed as part of the SWP in California. The Aqueduct is significant as a public works project that facilitated development throughout California and for its associations with irrigation and agricultural development in the San Joaquin Valley and Southern California (Ambacher 2011). The Aqueduct was determined eligible under Criterion C for its complex design necessary to redistribute water through the state of California on such a massive level and for its innovations in the construction of the system. Within the context of water conveyance, the Aqueduct is a significant and distinguishable engineering entity significant for its type, period and method of construction and is the largest water conveyance structure in California (Ambacher 2011). Previously identified character-defining features of the Aqueduct include its alignment, open trapezoidal design, concrete lining, and ancillary infrastructure (canal check structures and siphons, overcrossings/bridges, and culverts and overchutes) (Brewster 2012). The period of significance for the resource was identified as 1960-1974, the years of construction (Donaldson 2012).

The BWSD Zone 5 Canal (P-15-019371) was likely constructed in 1968 by the BWSD to draw water from the Aqueduct. The canal was evaluated in 2016 for inclusion in the California Register. It was not found to be significant within the context of local agricultural or the SWP,

nor was it found to be associated with significant individual (Baloian 2016). The canal has a typical design and does not maintain characteristics warranting further study (Baloian 2016). For these reasons, the canal was recommended not eligible for listing in the California Register.

Sacred Lands File Search

The NAHC maintains a confidential file, which contains sites of traditional, cultural, or religious value to the Native American community. The NAHC was contacted on November 18, 2019 to request a search of the SLF. The NAHC responded to the request in a letter dated November 21, 2019. The results of the SLF search conducted by the NAHC indicate that Native American cultural resources are not known to be located within the project area. The NAHC response included a list of Native American contacts for the project. Pursuant to the Department's Tribal Engagement Policy, DWR reached out to 25 individuals representing 17 distinct tribal organizations, in addition to sending formal invitations to consult under Assembly Bill (AB) 52 to two tribes that had previously requested formal project notifications from DWR. Tribal outreach and consultation are discussed in greater detail in the Tribal Cultural Resources section of this document.

Cultural Resources Survey

A cultural resources survey for the project was conducted by ESA cultural resources staff on January 14-15, 2020. The approximately 97-acre survey area consisted of the project components, including (from north to south) the Pool 22 instrumentation at MP 175.16), Pool 24 liner raising and staging at MP 199.71-200.01, Pool 25 staging at MP 207, Pool 25 liner raising and staging at MP 207.94-208.11, Pool 25 liner raising and staging at MP 209.17-210.31, and Pool 25 instrumentation at MP 213. A 100-foot buffer around all project components was included in the survey area. No archaeological resources were identified within the project area as a result of the survey.

The portions of the Aqueduct (P-15-015820/P-16-000266) within the project area were visually inspected and photographed as part of the survey. Ancillary infrastructure noted within the survey areas include turnouts, a culvert, a penstock, a check structure, overchutes, an operational bridge, and cinderblock utility buildings. **Table 8** identifies the infrastructure noted at each location and whether it is considered a character-defining feature of the Aqueduct.

The, culvert, penstock, check structure, overchutes, operational bridge are considered character-defining features of the Aqueduct, since these features were previously identified as character-defining features of the Aqueduct (Brewster 2012). Although not previously identified as character-defining features, turnouts are also considered character-defining features since they facilitate the distribution of water for irrigation of agricultural crops in the San Joaquin Valley. The cinderblock utility buildings are part of the larger SWP, and would be considered as contributing elements of a larger district, should one be identified in the future. However, they are not considered character-defining features of the Aqueduct itself.

TABLE 8
CALIFORNIA AQUEDUCT ANCILLARY INFRASTRUCTURE BY PROJECT COMPONENT

Project Component	Ancillary Infrastructure	Milepost	Character-Defining Feature
Pool 22 Instrumentation at MP 175.16	Turnout (DR1)	MP 175.18	Yes
	Cinderblock Utility Building (DR1)	MP 175.18	No
Pool 24 Liner Raising and Staging at MP 199.71-200.01	Culvert	MP 199.76	Yes
Pool 25 Staging at MP 207	Turnout (ST3)	MP 207.00	Yes
	Cinderblock Utility Building (ST3)	MP 207.00	No
Pool 25 Liner Raising at MP 207.94-208.11	Check Structure 24	MP 207.94	Yes
	Cinderblock Utility Building (Check 24)	MP 207.94	No
	Overchute	MP 208.11	Yes
Pool 25 Liner Raising and Staging MP 209.17-210.31	Overchute	MP 209.36	Yes
	Turnout (BR1A)	MP 209.71	Yes
	Turnout (ST1 and BV1B)	MP 209.78	Yes
	Penstock	MP 209.80	Yes
	Operational Bridge	MP 210.31	Yes
	Four Cinderblock Utility Buildings (one unlabeled, one labeled BR1A/BV1B, one labeled ST1, and one labeled ST2)	MP 209.71-209.80)	No
Pool 25 Instrumentation at MP 213	None	N/A	N/A

Subsurface Archaeological Sensitivity Assessment

The following section provides an assessment of the potential to encounter archaeological resources within the project area. The assessment included a review of historical topographic maps, geologic maps, and historical aerial photographs. **Table 9** summarizes the archaeological sensitivity for each project component (from north to south), with supporting factors. Based on this assessment, ground disturbance at the Pool 24 liner raising and staging at MP 199.71-200.01, Pool 25 staging at MP 207, Pool 25 liner raising at MP 207.97-208.11, Pool 25 liner raising and staging at MP 209.17-210.31, and Pool 25 instrumentation at MP 213 have a low potential to encounter buried archaeological resources. Ground disturbance at the Pool 22 instrumentation at MP 175.16 has a moderate potential to encounter buried archaeological resources.

TABLE 9
SUBSURFACE ARCHAEOLOGICAL SENSITIVITY BY PROJECT COMPONENT

Project Component	Nearest Known Historical Water Source	Geological Unit	Archaeological Sensitivity	Supporting factors
Pool 22 Instrumentation at MP 175.16	Intermittent wash, within area	Holocene-age alluvium;	Moderate for prehistoric	<ul style="list-style-type: none"> Holocene-age soil Proximity to water sources Proximity to Tulare Lake, known area of Native American activity and sites Previous ground disturbance may not have included full extent of proposed trenching
	Tulare Lake, 1.45 mi E	Pliocene-age Tulare Formation	Low for historic	<ul style="list-style-type: none"> No previous historical land uses
Pool 24 Liner Raising and Staging at MP 199.71-200.01 Pool 25 Staging at MP 207	Intermittent wash, 1 mi N	Holocene-age alluvium;	Low for prehistoric	<ul style="list-style-type: none"> Not in close proximity to water sources Not in close proximity to known Native American sites or loci of activity Extent of previous ground disturbance likely included extent of currently proposed ground disturbance
		Pliocene-age Tulare Formation		<ul style="list-style-type: none"> No previous historical land uses
Staging Area 2 Pool 25 Liner Raising at MP 207.94-208.11	Intermittent lake/pond, 2 mi NE	Holocene-age alluvium	Low for prehistoric	<ul style="list-style-type: none"> Not in close proximity to water sources No ground disturbance is proposed for this component
				<ul style="list-style-type: none"> No previous historical land uses
Site 2	Intermittent lake/pond, 2 mi E	Holocene-age alluvium	Low for prehistoric	<ul style="list-style-type: none"> Not in close proximity to water sources Not in close proximity to known Native American sites or loci of activity Extent of previous ground disturbance likely included extent of currently proposed ground disturbance
				<ul style="list-style-type: none"> No previous historical land uses

Project Component	Nearest Known Historical Water Source	Geological Unit	Archaeological Sensitivity	Supporting factors
Pool 25 Liner Raising and Staging MP 209.17-210.31	Intermittent lake/pond, 2.5 mi NE	Holocene-age alluvium	Low for prehistoric	<ul style="list-style-type: none"> Not in close proximity to water sources Not in close proximity to known Native American sites or loci of activity Extent of previous ground disturbance likely included extent of currently proposed ground disturbance
			Low for historic	<ul style="list-style-type: none"> No previous historical land uses
Pool 25 Instrumentation Site	Intermittent wash, 1.5 mi NE Buena Vista Slough, 1.5 mi SE (possibly closer)	Holocene-age alluvium	Low for prehistoric	<ul style="list-style-type: none"> Not in close proximity to water sources Not in close proximity to known Native American sites or loci of activity
			Low for historic	<ul style="list-style-type: none"> No previous historical land uses

Discussion

The following analysis discusses architectural resources as potential historical resources, as defined in State CEQA Guidelines Section 15064.5(a). Archaeological resources, including those that may be historical resources as defined in State CEQA Guidelines Section 15064.5(a) or unique archaeological resources as defined in PRC Section 21083.2(g), are addressed under question b.

- a) Two historic architectural resources were identified within or in the immediate vicinity of project components: BWSO Zone 5 Canal (P-15-019371) and Aqueduct (P-15-015820/P-16-000266). BWSO Zone 5 Canal (P-15-019371) was previously recommended ineligible for listing in the California Register and it does not qualify as a historical resource pursuant to Section 15064.5. Therefore, BWSO Zone 5 Canal (P-15-019371) does not require further consideration as part of this analysis. The Aqueduct (P-15-015820/P-16-000266) was previously determined eligible for the National Register through consensus between SHPO and Caltrans (as delegated by the Federal Highway Administration), and it does qualify as a historical resource pursuant to Section 15064.5.

Under CEQA, a significant effect would occur if the project results in a substantial adverse change in the significance of a historical resource. The significance of a historical resource is materially impaired when a project demolishes or materially alters in an adverse manner those physical characteristics that convey its historical significance (CEQA Guidelines Section 15064.5(b)). In this case, this would include demolition of or material alteration in adverse manner to the character-defining features of the Aqueduct, include the Aqueduct's alignment/route, open trapezoidal design, concrete lining, and

ancillary infrastructure (canal check structures and siphons, overcrossings/bridges, culverts, overchutes, and turnouts).

The project would not alter the canal's alignment or open trapezoidal design, and neither of these character-defining features would be impacted. The project likewise would not demolish or alter the types of canal infrastructure that contribute to the Aqueduct's significance, such as canal check structures and siphons, overcrossings/bridges, culverts, overchutes, or turnouts. While some of these types of infrastructure are present along some segments of the Aqueduct within the project area, they would not be altered as part of the project. The project could remove some guardrails, road delineators, or hand railings; however, these features are not character-defining features of the Aqueduct and their removal would not constitute a substantial adverse change.

The project would alter the concrete lining of the Aqueduct, a character-defining feature. However, only a small portion of the lining would be altered relative to the entire length of the Aqueduct (approximately 1.65 miles of the 444-mile-long Aqueduct, or less than 4 percent of the entire Aqueduct system). Also, even where the liner would be altered, the existing liner would remain and only 2 feet of additional liner would be added, which is a negligible difference in height from the existing canal. The existing slope of 2:1 ratio would also be retained and the resulting modified canal would appear similar to its historical condition. New concrete would be similar in color and texture, and would blend with the existing concrete while remaining distinctive from the historical appearance of the original concrete.

The project would also add instrumentation at two locations along the canal. The instrumentation at Pool 22 and Pool 25 would consist of a pressure transducer with cabling mounted inside of a metal pipe, which would be attached by bolts to the concrete liner, and it would not be highly visible nor detract from the Aqueduct's historical appearance. The new instrumentation at Pool 25 would consist of a maximum 20-foot-tall steel structure with a 3-foot-diameter by 3-foot-deep foundation constructed within the existing ROW on the east side of the roadway, and would not be located on the canal itself.

None of the proposed modifications would impact the integrity of the Aqueduct in a manner that would inhibit its ability to convey its historical significance under either Criterion A or Criterion C. These modifications would not diminish the physical aspects of integrity, including the location, design, materials, and workmanship of the property. Rather the project proposes improvements of the type and scale that already exist as part of the property. Integrity of the setting of the Aqueduct would be retained as the improvements are compatible with the existing physical character of the property and would not present visually perceptible alterations in the spatial relationships associated with the property as it currently exists. The property's feeling and association as a mid-20th-century engineering feature tied to the SWP system would not be altered as a result of this project.

The Aqueduct provides water to millions of people, transporting it from a wetter climate in northern California to a drier climate in southern California. Modifications to a small segment of the concrete lining and addition of minor instrumentation would not impact the ability of the system to convey its overall significance under Criterion A as a water conveyance system that is significant for its solution to water distribution in California. Similarly, the project would not alter the Aqueduct's ability to convey its significance under Criterion C as an award-winning engineering achievement of the last century. Upon completion of the project, the Aqueduct would continue to serve as one of the largest water conveyance systems in California and it would continue to convey its historical significance. Therefore, the project would not result in a substantial adverse change in the significance of the Aqueduct, and project-related impacts to the Aqueduct would be less than significant. However, as described under Checklist Item Vb, because some archaeological resources could qualify as historic resources, the inadvertent disturbance of previously unidentified archaeological resources could result in a substantial adverse change to the significance of that resource. To address the potential impact to unknown archaeological resources that could qualify as historic resources, **Mitigation Measures CUL-1 and CUL-2** would require construction worker cultural resources sensitivity training so that personnel are aware of the types of resources that could be encountered and the procedures to follow in the event of a discovery and protocols for the inadvertent discovery of archaeological materials. Therefore, impacts would be **less than significant with mitigation incorporated**.

- b) No archaeological resources were identified within the project area as result of the SSJVIC records search or the cultural resources survey. Therefore, no known archaeological resources that may qualify as historical resources (as defined in State CEQA Guidelines Section 15064.5(a)) or unique archaeological resources (as defined in PRC Section 21083.2(g)) are present in the project area. The entirety of the project area has been subject to disturbances associated with the construction of the Aqueduct and project-related excavations would likely not extend into undisturbed native sediments that have the potential to contain intact archaeological deposits in most areas. However, there is a moderate potential to encounter prehistoric archaeological resources at the Pool 22 instrumentation at MP 175.16 site given the Holocene-age of underlying soil, the close proximity to historical water sources, and the close proximity to Tulare Lake, an area of known Native American activity and sites. Since the project includes ground disturbance to depths of 6 feet, the potential to encounter archaeological materials cannot be ruled out. Therefore, the project could result in a substantial adverse change to the significance of as-yet-unknown archaeological resources that qualify as either historical resources (as defined in State CEQA Guidelines Section 15064.5(a)) or unique archaeological resources (as defined in PRC Section 21083.2(g)). To address the potential impact to unknown archaeological resources, **Mitigation Measures CUL-1 and CUL-2** would require construction worker cultural resources sensitivity training so that personnel are aware of the types of resources that could be encountered and the procedures to follow in the event of a discovery and protocols for the inadvertent discovery of archaeological materials. Therefore, impacts would be **less than significant with mitigation incorporated**.

- c) No human remains are known to exist within the proposed project area, including those located outside of dedicated cemeteries, and the NAHC does not have any record of Native American burials within or near the project area. Nonetheless, since the project includes ground disturbance to depths of 6 feet, the potential to encounter human remains cannot be ruled out. **Mitigation Measure CUL-3** would provide protocols to follow in the event of the discovery of human remains and compliance with State laws and statutes. Therefore, impacts would be **less than significant with mitigation incorporated**.

Mitigation Measures

CUL-1: Construction Worker Sensitivity Training. Prior to any ground disturbing activities, DWR shall retain and direct a Qualified Archaeologist, defined as an archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for Archaeology (36 CFR Part 61) with expertise in California archaeology, to prepare a cultural resources awareness and sensitivity training program for all personnel involved in construction-related field activities. The training program shall include a presentation that covers, at a minimum, the types of cultural resources that may be encountered, including tribal cultural resources, regulatory protections for cultural and tribal cultural resources, including confidentiality requirements for archaeological resource locations, and of the proper procedures to be enacted in the event of an inadvertent discovery of archaeological resources or human remains. Personnel shall acknowledge these requirements by signing a training attendance sheet. The Qualified Archaeologist, or an archaeologist working under their direct supervision, shall present the training at the initial kickoff or tailgate meeting. Subsequent trainings shall be given on an as-needed basis as new construction personnel join the project. DWR shall ensure that construction personnel are made available for and attend the training, and shall retain documentation demonstrating attendance.

CUL-2: Unanticipated Discoveries of Archaeological Resources: In the event that archaeological resources potentially qualifying as historical resources, unique archaeological resources, or tribal cultural resources under CEQA are encountered, DWR or its contractor shall immediately cease all work activities in the area (within approximately 100 feet) of the discovery until the Qualified Archaeologist has inspected the discovery and conferred with DWR on the potential significance of the resource. If the discovered materials are potential tribal cultural resources, affiliated Native American tribes will be notified and provided an opportunity to participate in the evaluation of the find.

If it is determined that that a discovered archaeological resource meets the definition for historical resource in CEQA Guidelines Section 15064.5(a), unique archaeological resource in PRC Section 21083.2(g), or tribal cultural resource in PRC Section 21074, avoidance and preservation in place shall be the preferred manner of mitigation. Preservation in place maintains the important relationship between artifacts and their archaeological context and also serves to avoid conflict with traditional and religious values of groups who may ascribe meaning to the resource. Preservation in place may be accomplished by, but is not limited to, avoidance, incorporating the resource into open space, capping, or deeding the site into a permanent conservation easement. If avoidance of a resource is determined by DWR to be infeasible in light of factors such as the nature of the find, proposed project design, costs, and other considerations, then the Qualified Archaeologist shall develop and implement an Archaeological Resources Data Recovery and Treatment Plan. Pursuant to PRC Sections 5024 and 5024.5, as a project on state-

owned land DWR shall consult with the California SHPO in the development of the data recovery and treatment plan. DWR shall also consult with appropriate Native American representatives in determining treatment for prehistoric or Native American resources to ensure that cultural values ascribed to the resources, beyond those that are scientifically important, are considered.

CUL-3: Unanticipated Discoveries of Human Remains. If human remains are encountered, DWR or its contractor shall immediately halt work within 100 feet of the discovery and DWR shall contact the County Coroner. No further disturbance shall occur within 100 feet of the discovery until the County Coroner has made the necessary findings as to origin of the remains. Human remains discoveries shall be treated in accordance with California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98, which require assessment of the discovery by the County Coroner, assignment of a Most Likely Descendant (MLD) by the California Native American Heritage Commission, and consultation between the MLD and DWR regarding treatment of the discovery. Until DWR has conferred with the MLD, DWR or its contractor shall ensure that the immediate vicinity where the discovery occurred is not disturbed by further activity, is adequately protected according to generally accepted cultural or archaeological standards or practices, and that further activities take into account the possibility of multiple burials.

References

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- Brewster, Brad, 2012. *Historic Resources Evaluation Report for the Seismic Retrofit of Six Bridges over the California Aqueduct, near Hesperia, San Bernardino County, and Kern County, California*, prepared for the California Department of Transportation, District 8, and the California Department of Water Resources by Environmental Science Associates.
- Donaldson, Milford Wayne, 2012. Letter to Kelly Hobbs, Environmental Branch Chief, Caltrans Central Environmental Division, Regarding Finding of Effect for the Proposed 17 Bridges Seismic Retrofit Project in Merced, Fresno and Kings County, CA. Document on file at California Department of Water Resources.
- Green, Andrew, 2019. Sacred Lands File Search Results for the San Joaquin Field Division Liner Raise and Instrumentation Project, Kern and Kings Counties, prepared for Environmental Science Associates by the California Native American Heritage Commission.
- Vader, Michael, Candace Ehringer, and Hanna Winzenried, 2020. *San Joaquin Field Division Liner Raise and Instrumentation Project, Kern and Kings County, California, Cultural Resources Technical Report*, prepared for the California Department of Water Resources by Environmental Science Associates.

Energy

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
VI. ENERGY — Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

Kings County and Kern County have not implemented an energy action plan. However, the state's Commercial Motor Vehicle Idling Regulation and Off-Road Regulation requires that construction sites minimize idling and associated emissions, which also minimizes use of fuel. Specifically, during construction, idling of commercial vehicles and off-road equipment is limited to 5 minutes to comply with state requirements.⁵

Additionally, DWR has adopted the DWR Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan (GGERP), which details DWR's efforts to reduce its GHG emissions consistent with Executive Order S-3-05 and the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) (DWR 2012) (refer to Checklist Section VIII, *Greenhouse Gas Emissions*). Section 12 of the GGERP outlines the steps that each DWR project will take to demonstrate consistency with the GGERP. These steps include: (1) analysis of GHG emissions from construction of the proposed project (Appendix D), (2) determination that the construction emissions from the project do not exceed the levels of construction emissions analyzed in the GGERP, (3) incorporation into the design of the project DWR's project level GHG emissions reduction strategies, (4) determination that the project does not conflict with DWR's ability to implement any of the "Specific Action" GHG emissions reduction measures identified in the GGERP, and (5) determination that the project would not add electricity demands to the SWP system that could alter DWR's emissions reduction trajectory in such a way as to impede its ability to meet its emissions reduction goals.

Discussion

- a) A full list of construction equipment anticipated to be used for construction activity associated with the liner raise and instrumentation construction activities is included above in Table 2. There would be an increase in fuel demand (gasoline and diesel) that would result from the use of construction tools and equipment, truck trips to haul concrete and backfill to and from the site, and vehicle trips generated from construction workers commuting to and from the site. A GGERP Consistency Determination Checklist documenting that the project has met each of the required elements is included in Appendix D. All best management practices (BMPs) required by the GGERP for a

⁵ California Code of Regulations (CCR), 2005. Title 13, Chapter 10, 2485, updated through 2014.

project of this nature are included in **Mitigation Measure GHG-1** (see Checklist Section VIII, *Greenhouse Gas Emissions*). With implementation of **Mitigation Measure GHG-1**, energy consumed during construction of the proposed project would not result in the wasteful, inefficient, and unnecessary consumption of energy. Therefore, impacts associated with construction of the proposed project would be **less than significant with mitigation incorporated**.

Once the project is constructed, existing staff would resume regular maintenance and operation of the Aqueduct in accordance with existing maintenance and water delivery schedule. Freeboard is used as a reservoir to store water during the low-cost high-pumping period (nighttime) and drafting water for downstream delivery during the high-cost low-pumping period (daytime). The increase to the liner raise would allow DWR to operate the Aqueduct normally and to meet downstream demand. In addition to the increase in water storage, the proposed installation of water level monitoring instrumentation along Pool 22 and Pool 25 would increase DWR's ability to accurately monitor water storage levels and coordinate drawdowns for each pool, thereby optimizing the operations of pumps and check structure gates. Combined, these activities would result in less energy use during operation of the Aqueduct. Thus, operation of the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy.

- b) The proposed project is designed to reduce energy cost associated with current SWP water deliveries. In addition, the water level monitoring instrumentation and associated cable trenches proposed along Pool 22 and Pool 25 would receive energy supply via an existing control building and solar equipment installed with a new pole assembly, respectively. Construction and operation of the proposed project would be consistent with applicable energy efficiency policies and standards. Operation of the proposed project would not create a wasteful, inefficient, or unnecessary consumption of energy. Therefore, there would **no impact**.

References

Department of Water Resources (DWR), 2012. *Climate Action Plan, Phase 1: Greenhouse Gas Emissions Reduction Plan*. Available at:
<https://water.ca.gov/LegacyFiles/climatechange/docs/Final-DWR-ClimateActionPlan.pdf>.

Geology and Soils

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
VII. GEOLOGY AND SOILS — Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

Kings and Kern Counties are located within the Great Valley geomorphic province of California. The geology of the Great Valley is typified by thick sequences of alluvial sediments derived primarily from erosion of the Sierra Nevada to the east, and to a lesser extent erosion of the Klamath Mountains and Cascade Range to the north (San Joaquin Valley Geology 2016). The Great Valley occupies a trough created by tectonic forces related to the collision of the Pacific and North American Plates. The trough is composed of fine-grained clay, sandy clay, stream, and lake deposits susceptible to compaction (U.S. Geological Society [USGS] 2020). Deep soils encountered during construction of the Aqueduct within the proposed project area were predominately complex interbedded thin layers of light brown colored sand and clay. Ancient mudflow deposits were noted occurring at various depths to 30 feet (DWR 2017). Existing soils along the Aqueduct levee and construction zone can be characterized as highly disturbed, compacted mixtures of sediment and gravel derived from sources on- and off-site.

The proposed project area is located within the Kern subsidence bowl (refer to **Figure 1**). The average rate of subsidence in the general proposed project area is approximately 4 mm/year (DWR 2017). Four types of subsidence are known to occur in the Valley: (1) subsidence caused by aquifer system compaction due to the lowering of groundwater levels by sustained groundwater overdraft; (2) subsidence caused by the hydrocompaction of moisture-deficient deposits above the water table; (3) subsidence related to fluid withdrawal from oil and gas fields; and (4) subsidence related to crustal neotectonic movements. Aquifer-system compaction and hydrocompaction have significantly lowered the land surface in the Valley since the 1920s (USGS 2020).

Earthquake fault zones were conceived in the Alquist-Priolo Earthquake Fault Zoning Act. The intent of the Alquist-Priolo Act is to reduce losses from surface fault rupture. California created this law following the destructive 1971 San Fernando earthquake (magnitude 6.6), which was associated with extensive surface fault ruptures that damaged numerous structures. The California Department of Conservation (DOC) maps earthquake hazard zones and other types of geologic ground failure risks, such as liquefaction and earthquake-induced landslides. An active fault, for the purposes of the Alquist-Priolo Act, is one that has ruptured in the last 11,000 years (DOC 2020). The nearest known active fault to the proposed project area is the La Ponza Fault, approximately 25 miles west of the Aqueduct (DOC 2020). Due to the flat topography and lack of saturated soils, liquefaction and landslide risks associated with seismic activity in the proposed project area are low. However, the proposed project area may, at any time, be subject to moderate to severe ground shaking during earthquakes (Kern County General Plan 2009).

Paleontology is a branch of geology that studies the life forms of the past, especially prehistoric life forms, through the study of plant and animal fossils. Paleontological resources represent a limited, non-renewable, and impact-sensitive scientific and educational resource. The following assessment of impacts to paleontological resources relies upon the analysis presented in the cultural resources technical report, *San Joaquin Field Division Liner Raise and Instrumentation Project, Kern and Kings County, California, Cultural Resources Technical Report* (Vader et al. 2020), which includes the results of a paleontological resources records search conducted staff at the Natural History Museum of Los Angeles County (LACM).

The LACM records search conducted for the project indicates that Holocene-age younger Quaternary Alluvium (11,700 years ago to present) is mapped at surface within the entire project area. These deposits typically do not contain vertebrate fossils in the uppermost layers, but older sedimentary deposits underlying the younger alluvium may contain fossils. The museum has three nearby documented fossil localities from similar deposits on file (LACM 1156, LACM 6701, and LACM 4087). LACM 1156, located about 30 miles east of the closest project component (Pool 24 liner raising and staging at MP 199.71-200.01), produced a fossil specimen of horse from a depth of 45 feet below the surface. Locality LACM 6701, located about 50 miles east of the closest project component (Pool 24 liner raising and staging at MP 199.71-200.01), produced a fossil specimen of mammoth from an unspecified depth (McLeod 2019). Locality LACM 4087, located about 50 miles east of the closest project component (Pool 22 instrumentation at MP 175.16), also produced a fossil specimen of mammoth from an unspecified depth (McLeod 2019).

The Pliocene-age Tulare Formation (5.333 million to 2.58 million years ago) may also occur at relatively shallow depths within the Pool 22 instrumentation at MP 175.16 site and Pool 24 liner raising and staging at MP 199.71-200.01. The museum has two nearby documented fossil localities from the Tulare Formation on file (LACM 5458 and LACM 3775). LACM 5458, located about 6 miles south of the closest project component (Pool 22 instrumentation at MP 175.16), produced a fossil specimen of wood rat from an unspecified depth. LACM 3775, located about 25 miles south of the closest project component (Pool 25 instrumentation at MP 213), produced fossil specimens of rabbit and camel from unspecified depths (McLeod 2019).

The most recent geologic map covering the Project area has been mapped at a scale of 1:250,000 and dates to the 1960s (Smith 1964, 1965). **Table 10** provides a summary of the surficial mapping within or near each Project component. Surficial geological mapping indicates the majority of the Project area is underlain by Holocene-age recent alluvial fan deposits (Qf) (11,700 years ago to present) that have accumulated as a result of highland streams and flooding (Smith 1964). The Pool 22 instrumentation at MP 175.16 site, which is the northern-most Project component, is immediately underlain by Pleistocene-age nonmarine sedimentary deposits (Qc) (2.58 million to 11,700 years ago), with Holocene-age recent alluvial fan deposits (Qf) (11,700 years ago to present) to the north and Pliocene-Pleistocene nonmarine sedimentary deposits (5.333 million to 2.58 million years ago) to the west (Smith 1964, 1965).

TABLE 10
GEOLOGIC UNITS BY PROJECT COMPONENT

Project Component	Geologic Unit	Map Symbol	Description	Age
Pool 22 Instrumentation at MP 175.16	Pleistocene Nonmarine Sedimentary Deposits	Qc	Older alluvium consisting mainly of slightly consolidate and dissected fan deposits	2.58 million to 11,700 years ago
	Recent Alluvial Fan Deposits in the Great Valley	Qf	Sediments deposited from streams emerging from high lands surrounding the Great Valley	11,700 years ago to present
	Pliocene-Pleistocene Nonmarine Sedimentary Deposits	QP	Tulare Formation: continental beds of poorly consolidated alternating sand and gravel with lenticular gypsiferous deposits	5.333 million to 2.58 million years ago
Pool 24 Liner Raising and Staging at MP 199.71-200.01	Recent Alluvial Fan Deposits in the Great Valley	Qf	Sediments deposited from streams emerging from high lands surrounding the Great Valley	11,700 years ago to present
Pool 25 Staging at MP 207	Recent Alluvial Fan Deposits in the Great Valley	Qf	Sediments deposited from streams emerging from high lands surrounding the Great Valley	11,700 years ago to present
Pool 25 Liner Raising at MP 207.94-280.11	Recent Alluvial Fan Deposits in the Great Valley	Qf	Sediments deposited from streams emerging from high lands surrounding the Great Valley	11,700 years ago to present
Pool 25 Liner Raising and Staging at MP 209.17-210.31	Recent Alluvial Fan Deposits in the Great Valley	Qf	Sediments deposited from streams emerging from high lands surrounding the Great Valley	11,700 years ago to present
Pool 25 Instrumentation at MP 213	Recent Alluvial Fan Deposits in the Great Valley	Qf	Sediments deposited from streams emerging from high lands surrounding the Great Valley	11,700 years ago to present

Table 11 summarizes the paleontological potential for each Project component (from north to south). Based on this assessment, Pool 22 instrumentation at MP 175.16 and Pool 24 liner raising and staging at MP 199.71-200.01 have a low to high potential for paleontological resources. The staging at MP 207, Pool 25 liner raising and staging at MP 209.17-210.31 and Pool 25 instrumentation at MP 213 have low-to-high potential for paleontological resources increasing with depth.

TABLE 11
PALEONTOLOGICAL SENSITIVITY BY PROJECT COMPONENT

Project Component	Geologic Unit	Map Symbol	Age	Paleontological Potential of Unit	LACM Results	Paleontological Sensitivity
Pool 22 Instrumentation at MP 175.16	Pleistocene Nonmarine Sedimentary Deposits	Qc	2.58 million to 11,700 years ago	High	Tulare Formation may occur at shallow depths. Older alluvium may occur at unknown depths.	Low to high
	Recent Alluvial Fan Deposits in the Great Valley	Qf	11,700 years ago to present	Low		
	Pliocene-Pleistocene Nonmarine Sedimentary Deposits (Tulare Formation)	QP	5.333 million to 2.58 million years ago	High		
Pool 24 Liner Raising and Staging at MP 199.71-200.01	Recent Alluvial Fan Deposits in the Great Valley	Qf	11,700 years ago to present	Low	Tulare Formation may occur at shallow depths. Older alluvium may occur at unknown depths.	Low to high
Pool 25 Staging at MP 207	Recent Alluvial Fan Deposits in the Great Valley	Qf	11,700 years ago to present	Low	Older alluvium may occur at unknown depths.	Low to high, increasing with depth
Pool 25 Liner Raising at MP 207.94-280.11	Recent Alluvial Fan Deposits in the Great Valley	Qf	11,700 years ago to present	Low	Older alluvium may occur at unknown depths.	Low to high, increasing with depth
Pool 25 Liner Raising and Staging at MP 209.17-210.31	Recent Alluvial Fan Deposits in the Great Valley	Qf	11,700 years ago to present	Low	Older alluvium may occur at unknown depths.	Low to high, increasing with depth
Pool 25 Instrumentation at MP 213	Recent Alluvial Fan Deposits in the Great Valley	Qf	11,700 years ago to present	Low	Older alluvium may occur at unknown depths.	Low to high, increasing with depth

Discussion

a.i-iv) The proposed project area is not located within an earthquake fault zone or a liquefaction- or landslide-prone area; therefore, no substantial impacts would occur as a result of rupture of a known earthquake fault. However, in general, Southern California is seismically active, with most locations in proximity to faults that can produce detectable seismic ground shaking. The proposed project would likely be subject to strong seismic ground shaking during a substantial seismologic event that could result in the concrete canal liner cracking and the water level monitoring equipment toppling over. As the

- proposed project area is not near occupied areas and all proposed structures would be installed at or near to ground level, the risk of loss, injury, or death involving strong ground shaking is **less than significant**.
- b) Existing soils along the Aqueduct levee and construction can be characterized as highly disturbed, compacted mixtures of sediment and gravel derived from sources on- and off-site. Construction of the proposed project would require ground-disturbing activities such as grading and excavation to install the concrete liner and instruments. Contractor would follow standard construction specifications to control erosion and water pollution. Upon completion of construction activities, soils exposed would be covered with new concrete, and compacted in place to blend in with the existing embankment and road access soil surfaces. Therefore, impacts associated with erosion of soils would be **less than significant**.
 - c) The proposed project is located in an area of known subsidence, occurring at varying rates since before the Aqueduct was constructed. After water deliveries from the Aqueduct began, subsidence rates decreased to an average of less than 0.1 inch per year during the normal to wet hydrologic years, but during dry to critical hydrologic years, subsidence increased (DWR 2017). Because the Valley in general, and the area surrounding the proposed project, is dominated by agricultural practices—one of the primary causes of subsidence—subsidence is expected to continue. The proposed concrete canal liner raise and the installation of water level monitoring equipment would not result in an increase in subsidence as it does not involve groundwater or oil extraction, or any of the other known causes of subsidence. Therefore, impacts as a result of project implementation on unstable soils is **less than significant**.
 - d) The proposed project components would be located within sloped, man-made levee embankment system where soils consist of compacted mixtures of disturbed sandy sediment and gravel, uncharacteristic of expansive soils that shrink and swell based on water content. The proposed project would not involve the construction of any structures that would be occupied during operation. Therefore, there would be **no impact** as a result of project implementation on expansive soils.
 - e) The proposed project would not include the construction or operation of any septic tanks or alternative water disposal system. Therefore, **no impact** would occur.
 - f) The LACM records search conducted for the project indicates that no fossil localities have been previously recorded within the project area and no known unique paleontological resources would be impacted by the project. However, a number of fossil specimens have been recovered from the region from similar sediments as those that underlie the project area. Although the project area is underlain by geologic units that could contain paleontological resources, the potential to encounter fossiliferous deposits is considered low given the past disturbances associated with construction of the Aqueduct, with the exception of the Pool 22 instrumentation at MP 175.16 site and Pool 24 liner raising and staging at MP 199.71-200.01 where the Tulare Formation occurs at shallow depths. Since the proposed project includes ground distance up to 6 feet in depth,

there is a potential for inadvertent impacts to paleontological resources as a result of project construction at the Pool 22 instrumentation at MP 175.16 site and Pool 24 liner raising and staging at MP 199.71-200.01. **Mitigation Measures GEO-1 and GEO-2**, which apply to the Pool 22 instrumentation at MP 175.16 site and Pool 24 liner raising and staging at MP 199.71-200.01, would require construction worker cultural resources sensitivity training so that personnel are aware of the types of resources that could be encountered and the procedures to follow in the event of a discovery, and protocols for the inadvertent discovery of paleontological resources. Therefore, impacts would be **less than significant with mitigation incorporated**.

Mitigation Measures

GEO-1: Paleontological Sensitivity Training. Prior to any ground disturbing activities associated with the Pool 22 instrumentation at MP 175.16 and Pool 24 liner raising and staging at MP 199.71-200.01 project components, DWR shall retain and direct a Qualified Paleontologist, defined as a paleontologist meeting the Society for Vertebrate Paleontology's standards for Qualified Professional Paleontologist (Society for Vertebrate Paleontology 2010), to prepare a paleontological resources awareness and sensitivity training program for all personnel involved in construction-related field activities. The training program shall include a presentation that covers, at a minimum, the types of paleontological resources that may be encountered, regulatory protections for paleontological resources, and of the proper procedures to be enacted in the event of an inadvertent discovery of paleontological resources (see **Mitigation Measure GEO-2**). The Qualified Paleontologist, or their designee, shall present the training at the initial kickoff or tailgate meeting. Subsequent trainings shall be given on an as-needed basis as new construction personnel join the project. DWR shall ensure that construction personnel are made available for and attend the training, and shall retain documentation demonstrating attendance.

GEO-2: Unanticipated Discoveries of Paleontological Resources. In the event of the unanticipated discovery of paleontological resources the Pool 22 instrumentation at MP 175.16 site or Pool 24 liner raising and staging at MP 199.71-200.01, DWR or its contractor shall immediately cease all work activities in the area (within approximately 100 feet) of the discovery until it can be assessed for significance by the Qualified Paleontologist. The Qualified Paleontologist shall assess the find, implement recovery and reporting measures, if necessary, and determine if paleontological monitoring is warranted once work resumes.

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Greenhouse Gas Emissions

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
VIII. GREENHOUSE GAS EMISSIONS —				
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

GHG emissions worldwide cumulatively contribute to the significant adverse environmental impacts of global climate change. No single project could generate sufficient GHG emissions on its own to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects in the San Joaquin Valley; the entire state of California; across the nation; and around the world contribute cumulatively to the phenomenon of global climate change and its associated environmental impacts.

Discussion

a, b) The SJVAPCD does not recommend quantitative significance thresholds for the analysis of the impact of a project's GHG emissions on the environment. Instead, the SJVAPCD's approach relies on the application of performance-based standards to assess project-specific GHG emission impacts on global climate change. This is based on the principle that projects whose emissions have been reduced or mitigated consistent with Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, should be considered to have a less-than-significant impact on global climate change (SJVAPCD 2015). SJVAPCD's policy provides for the following tiered approach in assessing significance of project-specific GHG emission increases:

- Projects complying with an approved GHG emission reduction plan or GHG mitigation program which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less-than-significant individual and cumulative impact for GHG emissions. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement best performance standards (BPS).
- Projects implementing BPS would not require quantification of project-specific GHG emissions and would be determined to have a less-than-significant individual and cumulative impact for GHG emissions.
- Projects not implementing BPS would require quantification of project-specific GHG emissions and demonstration that project-specific GHG emissions would be reduced or mitigated by at least 29 percent compared to business as usual (BAU), including GHG emission reductions achieved since the 2002–2004 baseline period, consistent with GHG emission reduction targets established in California Air Resources Board's

AB 32 Scoping Plan. Projects achieving at least a 29 percent GHG emission reduction compared to BAU would be determined to have a less-than-significant individual and cumulative impact for GHG emissions.

In May 2012, DWR adopted the DWR GGERP, which details DWR's efforts to reduce its GHG emissions consistent with Executive Order S-3-05 and AB 32 (DWR 2012). DWR also adopted the Initial Study/Negative Declaration prepared for the GGERP in accordance with the CEQA Guidelines review and public process. The GGERP provides estimates of historical (back to 1990), current, and future GHG emissions related to operations, construction, maintenance, and business practices (e.g., building-related energy use). The GGERP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures to achieve these goals.

DWR specifically prepared its GGERP as a "Plan for the Reduction of Greenhouse Gas Emissions" for purposes of CEQA Guidelines Section 15183.5. That section provides that such a document, which must meet certain specified requirements, "may be used in the cumulative impacts analysis of later projects." Because global climate change, by its very nature, is a global cumulative impact, an individual project's compliance with a qualifying GHG Reduction Plan may suffice to mitigate the project's incremental contribution to that cumulative impact to a level that is not "cumulatively considerable." (See CEQA Guidelines, Section 15064(h)(3).)

More specifically, "[l]ater project-specific environmental documents may tier from and/or incorporate by reference" the "programmatic review" conducted for the GHG emissions reduction plan. "An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project." (CEQA Guidelines Section 15183.5[b][2])

Section 12 of the GGERP outlines the steps that each DWR project will take to demonstrate consistency with the GGERP. These steps include: (1) analysis of GHG emissions from construction of the proposed project, (2) determination that the construction emissions from the project do not exceed the levels of construction emissions analyzed in the GGERP, (3) incorporation into the design of the project DWR's project level GHG emissions reduction strategies, (4) determination that the project does not conflict with DWR's ability to implement any of the "Specific Action" GHG emissions reduction measures identified in the GGERP, and (5) determination that the project would not add electricity demands to the SWP system that could alter DWR's emissions reduction trajectory in such a way as to impede its ability to meet its emissions reduction goals.

Consistent with these requirements, a GGERP Consistency Determination Checklist documenting that the project has met each of the required elements is included in Appendix A. All BMPs required by the GGERP for a project of this nature are included in **Mitigation Measure GHG-1**. Based on the analysis provided in the GGERP and the

demonstration that the proposed project is consistent with the GGERP (as shown in Appendix A), the project is compliant with the applicable GHG emission reduction plan, as is required by the SJVAPCD; therefore, the impact with respect to GHG emissions is **less than significant with mitigation incorporated.**

Mitigation Measures

Mitigation Measure GHG-1: The project shall implement the following required best management practices, as applicable:

- Evaluate project characteristics, including location, project work flow, site conditions, and equipment performance requirements, to determine whether specifications of the use of equipment with repowered engines, electric drive trains, or other high efficiency technologies are appropriate and feasible for the project or specific elements of the project.
- Evaluate the feasibility and efficacy of performing on-site material hauling with trucks equipped with on-road engines.
- Ensure that all feasible avenues have been explored for providing an electrical service drop to the construction site for temporary construction power. When generators must be used, use alternative fuels, such as propane or solar, to power generators to the maximum extent feasible.
- Evaluate the feasibility and efficacy of producing concrete on-site and specify that batch plants be set up on-site or as close to the site as possible.
- Evaluate the performance requirements for concrete used on the project and specify concrete mix designs that minimize GHG emissions from cement production and curing while preserving all required performance characteristics.
- Limit deliveries of materials and equipment to the site to off peak traffic congestion hours.
- Minimize idling time by requiring that equipment be shut down after five minutes when not in use (as required by the state airborne toxics control measure, California Code of Regulations, Title 13, Section 2485). Provide clear signage that posts this requirement for workers at the entrances to the site and provide a plan for the enforcement of this requirement.
- Maintain all construction equipment in proper working condition and perform all preventative maintenance. Required maintenance includes compliance with all manufacturer's recommendations, proper upkeep and replacement of filters and mufflers, and maintenance of all engine and emissions systems in proper operating condition. Maintenance schedules shall be detailed in an Air Quality Control Plan prior to commencement of construction.
- Implement a tire inflation program on the job site to ensure that equipment tires are correctly inflated. Check tire inflation when equipment arrives on-site and every two weeks for equipment that remains on-site. Check vehicles used for hauling materials off-site weekly for correct tire inflation. Procedures for the tire inflation program shall be documented in an Air Quality Management Plan prior to commencement of construction.

- Develop a project specific ride share program to encourage carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction worker commutes.
- Reduce electricity use in temporary construction offices by using high efficiency lighting and requiring that heating and cooling units be Energy Star compliant. Require that all contractors develop and implement procedures for turning off computers, lights, air conditioners, heaters, and other equipment each day at close of business.
- For deliveries to project sites where the haul distance exceeds 100 miles and a heavy-duty class 7 or class 8 semi-truck or 53-foot or longer box-type trailer is used for hauling, a SmartWay2 certified truck will be used to the maximum extent feasible.
- Minimize the amount of cement in concrete by specifying higher levels of cementitious material alternatives, larger aggregate, longer final set times, or lower maximum strength where appropriate.
- Develop a project specific construction debris recycling and diversion program to achieve a documented 50 percent diversion of construction waste.
- Evaluate the feasibility of restricting all material hauling on public roadways to off-peak traffic congestion hours. During construction scheduling and execution minimize, to the extent possible, uses of public roadways that would increase traffic congestion.

References

Department of Water Resources (DWR), 2012. *Climate Action Plan, Phase 1: Greenhouse Gas Emissions Reduction Plan*. Available at:
<https://water.ca.gov/LegacyFiles/climatechange/docs/Final-DWR-ClimateActionPlan.pdf>.

Hazards and Hazardous Materials

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
IX. HAZARDS AND HAZARDOUS MATERIALS — Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

A hazardous material is any material that because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or environment. State agencies regulating hazardous materials are the California Environmental Protection Agency (Cal/EPA) and the Office of Emergency Services (OES). Within the Cal/EPA, the California Department of Toxic Substances Control (DTSC) has primary regulatory authority for hazardous materials regulation enforcement. State hazardous waste regulations are contained primarily in the California Code of Regulations (CCR) Title 22. The California Division of Occupational Safety and Health (Cal/OSHA) has primary responsibility for developing and enforcing standards for safe workplaces and work practices in California in accordance with regulations specified in CCR Title 8. The Environmental Health Services Department and the Public Health Services Department enforces hazardous waste regulations and serves as the Certified Unified Program Agency (CUPA) for Kings and Kern Counties, respectively. The CUPAs prepare regional Emergency Response Plans (ERPs) and review local, project-related ERPs.

The DTSC defines the Hazardous Waste and Substance Sites List (also known as the “Cortese Sites” List) as a planning document used by state, local agencies and developers to comply with the CEQA by providing information about the location of hazardous material sites. A review of the DTSC Cortese List indicates that there are no identified hazardous material sites located within the project area (DTSC 2020a). A database search of hazardous materials sites using the online DTSC EnviroStor and State Water Resources Control Board (SWRCB or State Water Board) GeoTracker databases identified zero hazardous clean-up sites (DTSC 2020b; SWRCB 2015).

Discussion

- a) The proposed project would require the use of small quantities of hazardous materials such as diesel fuel, gasoline, oils, grease, equipment fluids, cleaning solutions and solvents, lubricant oils, and adhesives.

During construction, contractors handling, storing or transporting hazardous materials or wastes would comply with numerous hazardous materials regulations such as those described above that would reduce the risk of accidental release and provide protocols and notification requirements should an accidental release occur. By complying with relevant federal, State, and local laws, the proposed project would not result in a significant hazard to the public or to the environment through the routine transport, use, or disposal of hazardous materials during implementation of the proposed project. Further, once construction is complete, the operation of water level monitoring instrumentation would not involve the use of hazardous materials. Therefore, impacts would be **less than significant**.

- b) The small quantities of hazardous materials that would be used during construction of the proposed project would not be stored near the Aqueduct. Any spills of these substances would be minimal and cleaned onsite. In addition to complying with the hazardous materials handling regulations, construction contractors would be required to acquire coverage under the NPDES General Stormwater Permit, which requires the preparation and implementation of a SWPPP for construction activities. The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction; describe spill prevention measures, equipment inspections, equipment and fuel storage; describe protocols for responding immediately to spills; and describe BMPs for controlling site run-on and runoff. The SWPPP prepared for the project would identify BMPs to ensure the lawful transport, use, storage, and disposal of hazardous materials. Further, after construction activities are complete, operation of the Aqueduct with the liner raise and operation of the water level monitoring instrumentation would not involve the use of hazardous materials. Therefore, potential impacts to the public or the environment related to reasonably foreseeable accident conditions involving hazardous materials would be **less than significant**.

- c) There are no schools located within one-quarter mile of the project area. Furthermore, fuels, oils and lubricants used during the proposed liner raise activities would be handled in accordance with DWR material safety storage and handling protocols and BMPs that would contain and prevent spills from occurring on the project area. Therefore, **no impact** would occur.

- d) There are no identified hazardous material sites located within the project area (DTSC 2020a; DTSC 2020b; SWRCB 2015). The proposed project would not be located on a hazardous materials site and **no impact** would occur.
- e) The nearest airport to the project area is the Hanford Municipal Airport, located approximately 28 miles northeast of Pool 22. The proposed project is not located within an airport land use plan or within 2 miles of a public airport or public use airport. **No impact** would occur.
- f) Construction and operation of the proposed project is not anticipated to physically interfere with emergency response access, adopted emergency response plan or evacuation plan because all liner-raise activities, staging areas, and water level monitoring instrumentation would be within the boundaries of Aqueduct and DWR right-of-way. Therefore, **no impact** would occur related to interference with an adopted emergency response plan or emergency evacuation plan.
- g) The project area is located within the Aqueduct and DWR right-of-way. According to the California Department of Forestry and Fire Protection (CAL FIRE), Pools 22, 24, and 25 are located within Local Responsibility Areas (LRAs) of Kings and Kern Counties, and designated as areas with having unzoned and moderate fire severity zones (CAL FIRE 2007a; 2007b). Construction activities would occur within the waterside of the and within existing maintained access roads, composed of compacted soils with no vegetation. The surrounding vegetation and land use types have a low potential for wildland fires. In addition, as a standard DWR safety practice, all vehicles and equipment would have fire prevention equipment on-site, including fire extinguishers and shovels. Because the proposed project is not located within a very high fire hazard zone and not within or adjacent to uses prone to wildfires, the potential for wildfire impacts on people or structures due to project implementation would be considered **less than significant**.

References

- CAL FIRE, 2007a. Fire Hazard Severity Zones in LRA, Kings County. Available online at: https://osfm.fire.ca.gov/media/6689/fhszl06_1_map16.pdf, accessed January 2020.
- CAL FIRE, 2007b. Fire Hazard Severity Zones in LRA, Kern County. Available online at: https://osfm.fire.ca.gov/media/6689/fhszl06_1_map16.pdf, accessed January 2020.
- California Department of Toxic Substances Control (DTSC), 2020a. Cortese List Data Resources. Available online at: <https://calepa.ca.gov/sitecleanup/corteselist/>, accessed January 2020.
- DTSC, 2020b. EnviroStor. Available online at: <https://www.envirostor.dtsc.ca.gov/public/>, accessed January 2020.
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Hydrology and Water Quality

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
X. HYDROLOGY AND WATER QUALITY — Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The proposed project area is within the South Valley Floor Watershed with Region 5 – Tulare Lake Hydrologic Basin (DWR 2020). Major cities in the Tulare Basin include Fresno, Bakersfield and Visalia. Major Geographic Features include Tulare Lake Basin, Kettleman Hills, Kings river, Kern river, Tule River, Tulare Lake, Kern Lake, and Buena Vista Lake. The Tulare Basin has mild winters and hot dry summers. Despite transient tule marsh areas, the area is predominantly dry and the valley summer heat is high. Less than five percent of the basin is urban in nature. The basin has been developed extensively for agriculture and petroleum extraction (USGS 2020a). The SWRCB publishes updates to the *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plan) to improve water quality and maintain beneficial uses in the drainage area of the San Joaquin Valley south of the San Joaquin River. The Basin Plan describes water quality concerns for the area that include agriculture, forestry, urban land uses, and stormwater runoff (RWQCB 2018).

Discussion

- a) The proposed project would include construction activities that would require earthwork activities such as site preparation, excavation, grading, and stockpiling of soils, which would involve the disturbance and exposure of surface soils. In addition, construction activities would involve use of chemicals and solvents such as fuel and lubricating grease for motorized heavy equipment, which could accidentally spill and subsequently impact stormwater quality. A curing compound used during installation of the liner would be applied with a spray nozzle. Spray nozzles would be in new or like-new condition to prevent dripping of the compound.

There is potential for stormwater to transport sediment and/or hazardous materials to the Aqueduct. Since project construction activities would disturb an area greater than an acre, the project would be subject to a Construction General Permit under the NPDES permit program of the federal Clean Water Act. As required under the Construction General Permit, DWR or its contractor would prepare and implement a SWPPP. The objective of a SWPPP is to identify pollutant sources (such as sediment) that may affect the quality of storm water discharge and to implement BMPs to reduce pollutants in storm water.

In particular, erosion control BMPs would be used to prevent the degradation of water quality in the Aqueduct. Examples of erosion control BMPs are installing a silt fence, creating a sediment/desilting basin, installing sediment traps, using fiber rolls, creating gravel bag berms, and creating sandbag or straw bale barriers. BMPs would also include practices for proper handling of chemicals, such as avoidance of fueling at the construction site and overtopping during fueling, and installation of containment pans. Further, implementation of the construction BMPs would begin with the commencement of construction and continue through the completion of the project reduce intrusion of foreign materials into the Aqueduct.

Implementation of the SWPPP and BMPs in compliance with the NPDES permitting requirements would avoid or reduce all erosion and sedimentation impacts to below a level of significance. As a result, impacts to water quality would be **less than significant**.

- b) The proposed project would not disrupt water deliveries, nor would it require the use of groundwater during construction activities. The Aqueduct is a concrete lined canal and therefore, would not contribute groundwater recharge, nor would it interfere. Further, the proposed project would not encounter groundwater during construction consider excavation is limited to 6 feet. In addition, the proposed project would not create impervious surfaces in the project area that are not already impervious (Aqueduct channel and electrical control room areas). Therefore, the proposed project would not prevent recharge of groundwater or lower the groundwater levels in the groundwater basin, or conflict with the Counties' Groundwater Management Plans. Therefore, there would be **no impact** to groundwater recharge.
- c.i) The proposed project would not introduce impervious surfaces or structures where existing impervious areas do not already exist. Therefore, it is unlikely that implementation of water level monitoring instrumentation would alter the existing

drainage pattern of the project sites in a manner which would result in substantial erosion or siltation. Temporary earth-moving activities would slightly alter the topography of the project area to facilitate the liner raise activities. Erosion control measures would be implemented to reduce the potential for stormwater-induced erosion or sedimentation off-site during project activities. All disturbed areas would also be restored to preexisting conditions once construction activities are completed, as described in Chapter 2, *Project Description*. Thus, the proposed project would not substantially alter the existing drainage pattern of the project area in a way such that substantial erosion or siltation would occur on-site or off-site. Impacts would be **less than significant**.

- c.ii) The proposed project would not substantially alter the local drainage pattern of the sites around Pools 22, 24, and 25. The proposed project would not substantially change the rate or amount of surface runoff from the project sites. As such, the proposed project would not result in flooding on-site or off-site. Potential impacts would be **less than significant**.
- c.iii) An increase in runoff would not occur as a result of the project, considering the new water level monitoring instrumentation would be small in scale and the liner raise sites would conform to the existing liner surface. As such, the proposed project would not contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems.

The project would require implementation of a SWPPP, including BMPs for erosion control and for proper handling of chemicals. As such, the proposed project would not provide substantial additional sources of polluted runoff. Impacts would be **less than significant**.

- c.iv) The Federal Emergency Management Agency (FEMA) National Flood Hazard Layer for the project area shows that Pools 22, 24, and 25 are all located within a Zone X “Area of Minimal Flood Hazard” (FEMA 2020). Therefore, the area is at low risk for experiencing flooding. Further, the proposed project would not involve large infrastructure or extensive construction activities that would impede or redirect flows. **No impact** would occur.
- d) The proposed project is not located within a 100-year flood zone, nor is it located in close proximity to a large waterbody with the potential for seismic waves from an earthquake (USGS 2020b). The project area is located far from the nearest ocean, the Pacific, and therefore is not located within the tsunami risk zone. Therefore, the proposed project would not risk release of pollutants due to project inundation. **No impact** would occur.
- e) The proposed project would not involve pumping or extraction of groundwater. Once the liner raise activities and water level monitoring instrumentation installation are completed, operations of the project area/Aqueduct would not change. **No impact** to water quality control plans or sustainable groundwater management plans would occur.

References

- DWR, 2020. Water Management Planning Tool. Available online at: <https://gis.water.ca.gov/app/boundaries/>, accessed January 2020.
- FEMA, 2020. Flood Map Service Center. Available online at: <https://msc.fema.gov/portal/home>, accessed January 2020.
- RWQCB, 2018. Water Quality Control Plan for the Tulare Lake Basin Third Edition. Available online at: https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/tlbp_201805.pdf, accessed January 2020.
- USGS, 2020a. The Central Valley: Tulare Basin. Available online at: <https://ca.water.usgs.gov/projects/central-valley/tulare-basin.html>, accessed January 2020.
- USGS, 2020b. Seismic Seiches. Available at: <https://earthquake.usgs.gov/learn/topics/seiche.php>, accessed January 2020.
- USGS, 2020c. Earthquake Glossary, Tsunami. Available at: <https://earthquake.usgs.gov/learn/glossary/?term=tsunami>, accessed January 2020.
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Land Use and Planning

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XI. LAND USE AND PLANNING — Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The proposed project construction sites span approximately 36 miles between Aqueduct MP 175.16 and MP 213.00 in the vicinity of Kettleman City and Lost Hills communities (**Figure 2**). The Aqueduct and existing access roads are within the DWR right-of-way. Lands immediately surrounding the Aqueduct and right-of-way are subject to Kings County and Kern County land use plans, policies, and regulations.

Aqueduct Pool 22 is located in southern Kings County. The Kings County General Plan Land Use Map designates land adjacent to the west side of Pool 22 as Open Space, and land adjacent to the east side of Pool 22 as General Agriculture – 40 Acre. Aqueduct Pools 24 and 25 are located in western Kern County. The Kern County (Western Section) Land Use, Open Space, and Conservation Element map designates land adjacent to the east and west sides of Pools 24 and 25 as 8.1: Intensive Agriculture (min. 20-acre parcel size) (Kern County Planning Department 2009).

Discussion

- a) Kettleman City and Lost Hills, the communities nearest to the proposed Aqueduct construction areas, are located approximately 0.5 miles and 1.5 miles, respectively. The proposed project includes upgrades to the existing Aqueduct and would not introduce any additional structures, such as roads or freeways, with the potential to physically divide a community. Therefore, **no impact** would occur.
- b) All liner raise construction would occur on the water side of the Aqueduct. Locations of water monitoring equipment and connecting utility trenches would be limited to the previously disturbed footprint of the Aqueduct access road and embankment. Access to the construction areas would occur on existing roadways and service roads within the DWR right-of-way, including along both sides of the Aqueduct. Therefore, project construction would occur entirely within the DWR right-of-way and would not conflict with any land use plan, policy, or regulation. **No impact** would occur.

References

Kern County Planning Department, 2009. Kern County General Plan. Available: <https://kernplanning.com/planning/planning-documents/general-plans-elements/>. Accessed January 14, 2020.

Kern County Public Works Department, 2020. Zone Maps Index: map numbers 28 and 52. Available: <https://kernpublicworks.com/maps/zone-maps/>. Accessed February 20, 2020.

Kings County Community Development Agency, 2010a. 2035 Kings County General Plan, Land Use Element. Available: <https://www.countyofkings.com/home/showdocument?id=15995>. Accessed January 14, 2020.

Mineral Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XII. MINERAL RESOURCES — Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The proposed project sites are not included in Mineral Land Classification (MLC)/Surface Mining and Reclamation Act (SMARA) designated areas (California Department of Conservation 2020).

Discussion

- a) The proposed project construction sites are not included on any CGS maps or reports identifying potentially important mineral resources. Kings and Kern County land use maps do not identify any valuable mineral resources in the project area. Additionally, excavation activity associated with utility trenching would be confined to the previously disturbed areas on the Aqueduct access road and embankment. Therefore, **no impact** would occur.
- b) Kern County and Kings County land use maps do not delineate locally important mineral resources lands near the proposed project sites, and, as described in (a), excavation activity associated with utility trenching would be confined to the previously disturbed areas on the Aqueduct access road and embankment. Therefore, **no impact** to locally important mineral resources would occur.

References

California Department of Conservation, 2020. CGS Information Warehouse: Mineral Land Classification Tool. Available: <https://maps.conservation.ca.gov/cgs/informationwarehouse/mlc/>. Accessed: February 20, 2020.

Noise

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XIII. NOISE — Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude. Given that the typical human ear is not equally sensitive to all frequencies of the audible sound spectrum, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes low and extremely high frequencies, referred to as A-weighting, and is expressed in units of A-weighted decibels (dBA).⁶

Noise Exposure and Community Noise

Noise levels rarely persist consistently over a long period. Rather, noise levels at any one location vary with time. Specifically, community noise is the result of many distant noise sources that constitute a relatively stable background noise exposure where the individual contributors are unidentifiable. Throughout the day, short duration single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens) that are readily identifiable to the individual add to the existing background noise level. The combination of the slowly changing background noise and single-event noise events give rise to a constantly changing community noise environment.

To legitimately characterize a community noise environment and evaluate cumulative noise impacts, community noise levels must be measured over an extended period of time. This time-varying characteristic of environmental noise is described using statistical noise descriptors, including the ones described below:

⁶ All noise levels reported herein reflect A-weighted decibels unless otherwise stated.

- L_{eq}:** The equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level that would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
- L_{max}:** The instantaneous maximum noise level measured during the measurement period of interest.
- L_{dn}:** The day-night average sound level (L_{dn}) is the energy average of the A-weighted sound levels occurring during a 24-hour period, accounting for the greater sensitivity of most people to nighttime noise by weighting (“penalizing”) nighttime noise levels by adding 10 dBA to noise between 10:00 p.m. and 7:00 a.m.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise would be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause adverse response.

These relationships occur in part because of the logarithmic nature of the decibel system. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Applicable Noise Regulations

Kings County. The Kings County Code does not address construction or operation related noise. However, the Noise Element of the Kings County General Plan describes fixed noise sources within the County. The General Plan requires that site-specific noise analyses should be performed where noise sensitive land uses are proposed in proximity to noise-sensitive land uses. Pool 22 is located within the DWR right-of-way and adjacent land uses include agricultural uses and open spaces. The County’s General Plan includes average and maximum noise level standards for various land uses. Average daytime noise level standards range from 55 to 60 dBA and maximum levels range from 75 to 80 dBA. Project construction would occur during daytime hours between 6:00 a.m. and 6:00 p.m. No residents or sensitive receptors are located near the project area. The General Plan states the following:

N Policy B1.1.3: Noise associated with construction activities shall be considered temporary, but will still be required to adhere to applicable County Noise Element standards.

There are no relevant goals or policies that would be applicable to the proposed project (County of Kings 2003).

Kern County. The Noise Element of the Kern County General Plan (County of Kern 2009) provides goals, policies, and implementation measures applicable to noise, which, as related to the project, are provided below. The major purpose of the County's Noise Element is to establish reasonable standards for maximum noise levels desired in Kern County, and to develop an implementation program which could effectively mitigate potential noise problems and not subject residential or other sensitive noise land uses to exterior noise levels in excess of 65 dBA L_{dn} , and interior noise levels in excess of 45 dBA L_{dn} .

The Kern County Code includes the following Noise Control Ordinance regarding construction noise (Elaws.us 2020):

It is prohibited to create noise from construction, between the hours of nine (9:00) p.m. and six (6:00) a.m. on weekdays and nine (9:00) p.m. and eight (8:00) a.m. on weekends, which is audible to a person with average hearing faculties or capacity at a distance of one hundred fifty (150) feet from the construction site, if the construction site is within one thousand (1,000) feet of an occupied residential dwelling except as provided below:

- 1. The development services agency director or his designated representative may for good cause exempt some construction work for a limited time.*
- 2. Emergency work is exempt from this section.*

The project area is not located within 1,000 feet of an occupied residence. Therefore, the above code would not apply to the proposed project.

The Kern County General Plan does not contain any goals or policies that are applicable to the proposed project because the project area is not considered a sensitive land use, nor is the project area located near sensitive land uses (County of Kern 2009).

Discussion

- a) The proposed project is located within Kings and Kern Counties. As stated in Chapter 2, *Project Description*, the proposed project would occur over approximately six months. Construction activities would be limited to the hours of 6:00 a.m. to 6:00 p.m. Monday through Friday. There are no residents located within 1,000 feet of the project area.

Neither the Counties' codes nor the Counties' General Plans establish quantitative noise exposure standards that apply to construction activity. However, for the purposes of due diligence, resultant noise levels from simultaneous operations of the two noisiest pieces of construction equipment were estimated, consistent with the general assessment methodology of the Federal Transit Administration (FTA). Using the Roadway Construction Noise Model and conservatively assuming simultaneous operation of loaders, compactors, generator sets, forklifts, and excavators for trenching, excavation and backfill, and equipment installation would result in a noise levels of 88 dBA at a reference distance of 50 feet. Accounting for distance attenuation, noise levels at 1,000 feet would be 59 dBA. As mentioned above, there are no sensitive receptors within 1,000 feet of the construction activity. Further, the closest sensitive receptor is located

approximately 7,600 feet (1.4 miles) north of the Pool 25 construction site. At this distance noise levels decrease to 41 dBA, and would be virtually imperceptible and indistinguishable from the local noise environment. Noise levels at all other sensitive receptors would be lower than 41 dBA and would be lower than Kings County's and Kern County's noise standards of 55 dBA and 65 dBA, respectively. Therefore, the proposed project would not result in a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies, during construction.

Further, after construction is complete, the operation of water level monitoring instrumentation would be required. This instrumentation would not generate noise levels that are any louder than large agricultural equipment. Further, most equipment would be buried underground or housed within existing control buildings within the DWR right-of-way. Therefore, the project would result in **less than significant** noise impacts during operation.

- b) Groundborne vibration from construction activities at the project area would produce negligible vibration. The types of construction equipment associated with the liner raise and instrumentation construction activities include excavators, backhoes, concrete mixers, generators, and trucks. This type of equipment is not identified by Caltrans (2013) or the Federal Transit Administration (FTA 2018) as associated with generation of notable vibration. Additionally, construction and operational activities of the water level monitoring instrumentation would not take place near any residencies or other noise-sensitive land uses. Vibration attenuates rapidly with distance and would be imperceptible at the distances to the closest structures and sensitive receptors. Therefore, vibration associated with proposed project would result in **less than significant** impacts.
- c) The proposed project would not establish new noise sensitive land uses that could be exposed to noise from local airports. The project sites are located in a rural area that is distant from commercial or general aviation airports. The closest airports are private agricultural airstrips over 2.5 miles away from Pools 22, 24, and 25. Therefore, there would be **no impact** in relation to airports and the project exposing people residing or working in the project area to excessive noise levels.

References

California Department of Transportation (Caltrans), 2013. *Transportation and Vibration Guidance Manual*, September 2013; p. 37.

County of Kern, 2009. Kern County General Plan, Noise Element. Available online at: <https://psbweb.co.kern.ca.us/planning/pdfs/kcgp/KCGPChapter3.pdf>, accessed January 2020.

County of Kings, 2003. Kings County General Plan, Noise Element. Available online at: <http://www.countyofkings.com/home/showdocument?id=3120>, accessed January 2020.

Elaws.us, 2020. Section 8.36.020. Prohibited sounds. Available online at: http://kerncounty-ca.elaws.us/code/coor_title8_ch8.36_sec8.36.020, accessed January 2020.

U.S. Department of Transportation, Federal Transit Administration (FTA), 2018. *Transit Noise and Vibration Impact Assessment*, September 2018.

Population and Housing

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XIV. POPULATION AND HOUSING — Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

Two of the sites (Pool 24 and 25) are located in Kern County, whose population, according to the U.S. Census Bureau's (Bureau) 2018 population estimates, contains approximately 896,764 residents (Bureau 2018a). Pool 22 is located in Kings County, which is home to approximately 151,366 residents (Bureau 2018b). Surrounding the project area is extensive rural and agriculture areas. There are no residential structures on or directly adjacent to the project area.

Based on the Bureau's 2010 through 2018 estimates, Kern County's growth rate is 6.8 percent. Most of the growth in Kern County is due to its geographical location, resource-based sectors, and the promotion of commercial and industrial developments (Milken Institute 2015). As of 2018, Kern County contained 300,377 housing units with an owner-occupied housing unit rate of 58 percent. Between 2010 and 2018, Kings County growth rate was reported to be -1.1 percent by the Bureau. The county contains approximately 46,645 housing units as of 2018 with an owner-occupied housing unit rate of 51.7 percent.

Discussion

- a) The proposed project would raise the concrete liner of aqueducts in Pools 24 and 25 in addition to the installation of water level monitoring instrumentation in Pools 22 and 25 and would not involve the construction of new homes, businesses, extensions of roads, or other infrastructure. The proposed project is anticipated to begin in the summer of 2020 for up to 8 months and have a maximum of 20 construction workers for construction activities associated with raising the concrete liner and up to five during the construction and installation of the water level monitoring equipment. Construction workers employed for these activities are expected to come from the existing labor pool within the region and would be involved with the project temporarily for the approximately 8-month construction period. Implementation of the proposed project would not directly or indirectly induce substantial population growth because the project does not involve the construction of new homes, businesses, extensions of roads or other infrastructure. Therefore, **no impact** would occur.
- b) The proposed project includes raising the concrete liner along both sides of Pools 24 and 25 and the installation of water level monitoring instrumentation in Pools 22 and 25. No

existing housing occurs within the project area that would be displaced and necessitate the construction of replacement housing elsewhere. Therefore, **no impact** would occur.

References

Milken Institute. 2015 (March). An Economic Road Map for Kern County. Available:
<https://www.kerncounty.com/econdev/pdf/economic-road-map.pdf>.

United States Census Bureau (Bureau). 2018a. QuickFacts Kern County, California. Available:
<https://www.census.gov/quickfacts/kerncountycalifornia>.

_____. 2018b. QuickFacts Kings County, California. Available:
<https://www.census.gov/quickfacts/kingscountycalifornia>

Public Services

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XV. PUBLIC SERVICES —				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:				
i) Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
v) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

Kings County Fire Department serves all unincorporated areas of the County. Kings County operates 10 fire stations and one headquarters, and has a professional staff of 61 employees who are assisted by approximately 100 volunteer fire fighters. The Kings County Sheriff's Office provides law enforcement response to unincorporated territories of the County. The County is divided into six beat districts, and each beat district has at least one deputy sheriff on duty at all times (Kings County Community Development Agency 2010c). The nearest schools to the proposed project sites in Kings County are Adelante High School and Kettleman City Elementary School, approximately 2 miles northwest of the northernmost project site. There are no parks in close proximity to the proposed project sites in Kings County.

Kern County Fire Department stations would serve the project sites in Kern County. The Kern County Fire Department stations closest to the proposed project sites are Lost Hills, Lokerm Buttonwillow, and Wasco (Kern County Fire Department 2020). The Kern County Sheriff Station in Wasco, approximately 20 miles east of proposed project sites, would service the proposed project sites. The nearest schools to Pools 23 and 24 are Lost Hills Union School District, A.M. Thomas Middle, and Wonderful College Prep Academy Lost Hills, approximately 2 miles away from the project. The nearest public park is Wonderful Park, also located in Lost Hills.

Discussion

- a.i, ii) Construction of the project would entail delivery of fuel and fueling/maintenance of construction equipment, in addition to temporary storage of construction equipment and materials at nearby staging areas. In the event of a fire or other emergency within the proposed project area, existing fire protection and police services in Kern and Kings Counties would be able to sufficiently respond to emergency events with existing equipment and staffing capacities.

The proposed project would be implemented within existing facilities and access roads, and upon completion the Aqueduct would be operated within existing capacity constraints. As a result, relative to existing conditions, the proposed project would not introduce new facilities that would require additional emergency response services. Therefore, implementation of the proposed project would not require new fire or police facilities to maintain response ratios, service ratios, or other measures of performance. Impacts would be **less than significant**.

- a.iii) The proposed project would not result in an increase in population. As a result, the proposed project would not lead to the construction of new housing, which could prompt a need for additional school services. Therefore, the proposed project would have **no impact** related to school services.
- a.iv) The proposed project would not result in an increase in population, and would not prompt the need for new parks. Therefore, the proposed project would have **no impact** related to parks.
- a.v) The proposed project would not include new housing or bring new businesses to the area that would require any additional services or public facilities, including libraries. Therefore, the proposed project would have **no impact** related to other public facilities.

References

Kern County Fire Department, 2020. Available: <https://www.kerncountyfire.org/operations/fire-stations.html#>. Accessed: January 15, 2020.

Kings County Community Development Agency, 2010c. 2035 Kings County General Plan, Health and Safety Element. Available: <https://www.countyofkings.com/home/showdocument?id=13515>. Accessed: January 15, 2020.

Recreation

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XVI. RECREATION —				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

There are no existing neighborhood or regional parks or other recreational facilities in close proximity to the proposed project area. DWR does however, allow recreational fishing along segments of the Aqueduct.

Discussion

a-b) The closest designated Aqueduct fishing access sites to the project area are the Kettleman City Site and the Avenal Cutoff Site, approximately 32 and 40 miles upstream of the nearest liner raise construction area (DWR 2020). The proposed project would not increase the need to construct or expand recreational facilities or opportunities near the Kettleman City Site, Avenal Cutoff Site, or other recreational facilities as populations in the vicinity are not expected to increase as a result of the proposed project. Therefore, **no impact** would occur.

References

DWR (Department of Water Resources). 2020. Fishing Along the SWP. Available:
https://water.ca.gov/LegacyFiles/pubs/swp/fishing_along_the_swp/fishingswpeng.pdf

Transportation

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XVII. TRANSPORTATION — Would the project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

Kings and Kern County have a comprehensive transportation system to serve the rural travel needs of the proposed project. They include state highways, local roads, rural highways and streets, bus transit services, freight rail, and airports (primarily private airstrips) (Kings county Association of Governments 2018; Kern Council of Governments 2018). Car and truck traffic bringing workers and supplies to the project area would increase during construction activities. Access to the project area would be from the counties roads, such as 25th Avenue, Lost Hills Road; some unpaved agricultural roads; and SR-41, the West Lerdo Highway, SR-46, and I-5. Most of the trucks and other earth moving and hauling equipment, once brought to the project area, would remain within the project area for the duration of the project schedule.

Discussion

- a) Direct impacts to the local circulation system would occur due to the temporary addition of project-related vehicles to local roadways over the 8-month construction time period. Implementation of the proposed project could temporarily increase the number of vehicles on local roadways due to the transport and delivery of construction equipment, daily worker commute trips over an 8-month period, and staff maintenance trips. All equipment and materials would be transported to the site on public highways, local roads, and private driveways, using standard transport vehicles.

The delivery of construction vehicles and equipment to the sites is only expected to occur when the equipment is delivered to/from the sites (two one-way trips for all equipment). The majority of traffic impacts would occur from the daily arrival and departure of workers. A maximum of up to 20 workers would be required at the site per day. The addition of 40 worker round trips (20 one-way trips) along local roads would not substantially affect the circulation capacity, and therefore, the trips would not substantially affect the capacity of the local roadways. Traffic control is not anticipated to be required along local roadways. DWR would coordinate with the appropriate property owners if private road access is required at any point. All worker parking would be accommodated at the staging area on-site; however, carpooling may be required if up to

20 workers are needed at any given time (which would reduce the number of overall trips). Project-generated traffic and operational maintenance would be temporary, and therefore, would not result in any long-term degradation in operating conditions on local roadways used for the project. Impacts to the local circulation system would be **less than significant**.

Further, the proposed project would not conflict with adopted policies, plans, or programs related to public transit or alternative modes of transportation. The project would not decrease the performance or safety of these facilities, which are sparse within the largely rural project area. Project activities would not disrupt services along local public transit, bicycle, or pedestrian routes. **No impact** would occur.

- b) “Vehicle miles traveled” refers to the amount and distance of automobile travel attributed to a project. A maximum of 20 workers would be required during various proposed project activities. These trips would be temporary over the approximately 8-month construction period and would not result in any perceivable increase in vehicle miles traveled that would exceed a County threshold of significance. There are no new permanent vehicle trips associated with the proposed project other than routine maintenance. As a result, the proposed project would be consistent with CEQA Guidelines Section 15064.3 subdivision (b), and **no impact** would occur.
- c) The proposed project would be implemented entirely within the DWR right-of-way. The proposed project does not include the construction or design of any roadway infrastructure that would cause a safety risk to vehicle operations. The proposed project would not adversely alter the physical configuration of the existing roadway network serving the area, and would not introduce unsafe design features associated with large equipment transport. In addition, the proposed project would not introduce uses (types of vehicles) that are incompatible with existing uses already served by the area’s road system. There would be **no impact**.
- d) The proposed project would temporarily add vehicles to the local roadway and circulation system. However, no lane or road closures would be required. All project-related activities would occur on-site. The proposed project would not interfere with emergency response access. The proposed project would **not impact** long-term emergency access.

References

Kern Council of Governments, 2018. 2018 Regional Transportation Plan. Available online at: https://www.kerncog.org/wp-content/uploads/2018/10/2018_RTP.pdf, accessed January 2020.

Kings County Association of Governments, 2018. Regional Transportation Plan. Available online at: https://www.kingscog.org/vertical/Sites/%7BC427AE30-9936-4733-B9D4-140709AD3BBF%7D/uploads/KCAG_2018_RTPSCS_Full_Document.pdf, accessed January 2020.

Tribal Cultural Resources

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XVIII. TRIBAL CULTURAL RESOURCES —				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental Setting

This section provides an assessment of potential impacts related to tribal cultural resources that could result from implementation of the proposed project. “Tribal cultural resources” are defined as “sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe” that are either included or determined to be eligible for inclusion in the California Register or included in a local register of historical resources, or a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant (PRC subdivision 21074(a)). A cultural landscape that meets these criteria is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape. A historical resource, unique archaeological resource, or non-unique archaeological resource may also be a tribal cultural resources if it meets these criteria. Archaeological resources and human remains are frequently also tribal cultural resources; therefore, many of the identification efforts described under Section 3.1.4, Cultural Resources, also apply to the identification of a tribal cultural resources.

The analysis in this section is based, in part, on the results of an SLF search from the NAHC and AB 52 outreach with California Native American Tribes that are traditionally and culturally affiliated with the geographic area in which the proposed project is located and who have requested in writing to be informed by the lead agency.

The NAHC maintains a confidential file, which contains sites of traditional, cultural, or religious value to the Native American community. The NAHC was contacted on November 18, 2019 to request a search of the SLF. The NAHC responded to the request in a letter dated November 21,

2019. The results of the SLF search conducted by the NAHC indicate that Native American cultural resources are not known to be located within the project area (Green 2020).

Pursuant to AB 52, which requires government-to-government consultation within the CEQA process, DWR contacted two California Native American Tribes who have previously requested in writing to be informed by DWR through formal notification of proposed projects within the geographic area in which each tribe is traditionally and culturally affiliated pursuant to PRC Section 21080.3.1(b). The two tribes include the Fernandeano Tataviam Band of Mission Indians (Tataviam) and the Tejon Indian Tribe (Tejon). On February 27, 2020, DWR sent letters to Kimia Fatehi, Tribal Historic and Cultural Preservation Officer for the Tataviam, and Colin Rambo, Cultural Resource Management Technician for the Tejon. The letters included a description of the proposed project and provided a figure depicting the proposed project location.

To date, the DWR has received one response to the AB 52 notification letters. In an email dated February 27, the Tataviam responded by stating that the project is not located within their tribal boundaries.

Additionally, pursuant to the Department's Tribal Engagement Policy, DWR reached out to 25 individuals representing 17 distinct tribal organizations, in addition to sending formal invitations to consult under AB 52 to two tribes that had previously requested formal project notifications from DWR. Three responses were received:

- In an email response dated April 29, 2020, the Santa Rosa Rancheria Tachi Yokut Tribe responded requesting to monitor ground disturbance at the Pool 22 instrumentation at MP 175.16 site and the liner raise in Pool 24 between MP 199.71-200.01. The Tribe indicated that they are interested in any ground disturbing work up to Pool 15.
- In an email response dated April 17, 2020, the North Fork Mono Tribe responded that the project is not within their Tribal jurisdiction, but indicated that many roads in the area paved over Native American trails.
- In an email response dated April 21, 2020, the San Manuel Band of Mission Indians responded that the project is not within their ancestral territory.

Discussion

- a.i) No tribal cultural resources have been identified within the project area. However, it is recognized that not all tribal cultural resources that are archaeological in nature are visible on the soil surface, and there is the potential for uncovering previously unknown resources during proposed project construction. This is particularly true at the Pool 22 instrumentation at MP 175.16 site, given the Holocene-age of underlying soil, the close proximity to historical water sources, and the close proximity to Tulare Lake, an area of known Native American activity and sites, as discussed in the Cultural Resources section of this document. If encountered, such resources may be determined to be tribal cultural resources eligible for listing in the California Register, or in a local register as defined in PRC Section 5020.1(k). If project construction activities were to affect them in a manner that would damage their cultural value, a significant impact could result. In the unlikely

event that tribal cultural resources are identified during proposed project construction, implementation of the protection measures included in **Mitigation Measures CUL-1 and CUL-2** (see Checklist Section V *Cultural Resources*) would reduce potential impacts to **less than significant with mitigation incorporated**.

- a.ii) No tribal cultural resources have been identified within the project area. However, as noted above, it is recognized that tribal cultural resources that are archaeological in nature could be encountered during proposed project construction, particularly at the Pool 22 instrumentation at MP 175.16 site, which is considered sensitive for buried archaeological resources. If encountered, such resources may be determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. If project construction activities were to affect them in a manner that would damage their cultural value, a significant impact could result. In the unlikely event that tribal cultural resources are identified during proposed project construction, implementation of the protection measures included in **Mitigation Measures CUL-1 and CUL-2** (see Checklist Section V *Cultural Resources*) would reduce potential impacts to **less than significant with mitigation incorporated**.

Mitigation Measures

Implement **CUL-1 and CUL-2** (refer to Checklist Section V, *Cultural Resources*).

References

Green, Andrew, 2019. Sacred Lands File Search Results for the San Joaquin Field Division Liner Raise and Instrumentation Project, Kern and Kings Counties, prepared for Environmental Science Associates by the California Native American Heritage Commission.

Utilities and Service Systems

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XIX. UTILITIES AND SERVICE SYSTEMS —				
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The Lost Hills Water District is the nearest water supplier in the vicinity of the project and serves untreated water for irrigation from the SWP (Lost Hills Water District 2020). Other local water districts provide municipal water to surrounding areas via pump stations, pipelines, and other water storage and conveyance facilities.

Wastewater in the vicinity of the project area is treated and disposed of through on-site wastewater treatment systems (septic tanks). Septic tanks are designed with varying capacities depending upon the amount of waste generated. Kings County requires permits for septic systems be through the Environmental Health Services Department, while Kern County requires permits through their Public Health Services Department. The nearest wastewater treatment plan is the Wasco City wastewater treatment facility (WWTF) east of the project area. The average dry weather flow at this WWTP is 1.7 million gallons per day (MGD). The WWTP is a secondary biological treatment process. All of the biosolids that are produced at the WWTP are hauled to Lost Hills for disposal. The treated wastewater is used for farm irrigation on 700 acres of City property which is leased out to local farmers. The WWTP is operated by certified operators who also maintain over 38 miles of the sanitary sewer system (City of Wasco 2020).

Solid waste generated is collected by Waste Management (WM). WM offers non-hazardous and hazardous waste collection, processing, recycling and disposal, as well as construction and demolition waste processing, diversion, and transfer to a disposal facility. Solid waste collected

by WM is delivered to local landfills depending on the waste-type (WM 2020). The Kettleman Hills Hazardous Waste Facility is the nearest disposal management facility in the vicinity of the project area. This landfill had a remaining capacity of 6,000,000 cubic yards when last updated (CalRecycle 2019).

Discussion

- a) The proposed project would involve the employment of approximately 20 workers throughout the approximately 8-month construction schedule. The proposed project may require limited use of potable water during construction activities. No water or wastewater treatment facilities would be installed as part of the proposed project and there are no proposed project activities that would require new electric power, natural gas, or telecommunications facilities.

The proposed project would not substantially alter the local drainage pattern of the project sites. The proposed project does not include the construction of large structures or impervious surfaces that would substantially alter or change the rate or amount of surface runoff from the project sites (Pools 22 and 25). Therefore, the proposed project would not require the construction or expansion of new storm water drainage facilities. Therefore, there would be no construction of utility infrastructure associated with the proposed project; there would be **no impact**.

- b) Water may be needed temporarily during implementation of the proposed project. Water for dust suppression could be pumped from the Aqueduct. If that source of water is insufficient, and other sources cannot be used, the construction contractor would pay for water to be brought to the project area from local water suppliers for dust suppression. Water demand for dust suppression would be temporary, and no new or expanded entitlements would be required. Therefore, potential impacts associated with availability of water supplies would be **less than significant**.

- c) The proposed project would result in the generation of wastewater associated with temporary use of portable toilets. During project implementation, DWR or the contractor may have portable toilet facilities available on-site temporarily for use by construction workers. Given the relatively small construction workforce of a maximum of 20 workers on-site daily for the 8-month construction period, this amount of waste would be minimal. Once construction activities are concluded, such portable facilities would be removed and the wastewater properly handled and disposed in accordance with all applicable laws and regulations. Therefore, the proposed project does not require a wastewater treatment provider to serve the project. **No impact** would occur.

- d) Implementation of the proposed project would result in nominal solid waste, limited to trash and other construction-related materials. The proposed project would not demolish existing facilities on-site, but would require materials for the liner raise and water level monitoring instrumentation (see **Table 1** in Chapter 2, *Project Description*).

The Kettleman Hills Facility, which is located within 2.5 miles of the project area, has remaining capacity, should it need to be used (CalRecycle 2019). The project would

result in **less-than-significant impact** related to local infrastructure capacity and would not impair attainment of solid waste reduction goals.

- e) As stated above, implementation of the proposed project would result in nominal solid waste. Statewide policies regarding solid waste have become progressively more stringent, reflecting Assembly Bill 939, which requires local government to develop waste reduction and recycling policies and meet mandated solid waste reduction targets. For the minor amount of solid waste anticipated to be produced by the proposed project, DWR would be required to comply with all laws and regulations related to the disposal and recycling of waste. There would be **no impact**.

References

CalRecycle, 2019. Kettleman Hills. Available online at:

<https://www2.calrecycle.ca.gov/SWFacilities/Directory/16-AA-0023/Detail>, accessed January 2020.

City of Wasco, 2020. Wastewater Services. Available online at: <http://www.ci.wasco.ca.us/city-departments/public-works/wastewater-division/>, accessed January 2020.

Lost Hills Water District, 2020. Welcome. Available online at: <https://www.lhwd.org/>, accessed January 2020.

Waste Management Solutions (WM), 2020. Kettleman Hills Waste Management Facility. Available online at: <https://www.wmsolutions.com/locations/details/id/192>, accessed January 2020.

Wildfire

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XX. WILDFIRE — If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting

The project area is located within LRAs designated as moderate and unzoned by CAL FIRE (CAL FIRE 2007a; 2007b).

Discussion

- a) Implementation of the proposed project is not anticipated to substantially impair an adopted emergency response plan or evacuation plan because all liner raise activities, staging areas, and water level instrumentation would be within the boundaries of the Aqueduct and DWR right-of-way. Implementation of the proposed project would not interfere with emergency response access to the project vicinity and **no impact** would occur.
- b) The project area is located within LRA moderate and unzoned fire hazard severity zones. The project area does not include slopes that surround the Aqueduct that are susceptible to prevailing winds. Further, the surrounding vegetation and land use types have a low potential for fires. As a standard DWR safety practice, all vehicles and equipment would have fire prevention equipment on-site, including fire extinguishers and shovels, if a fire were to occur. Therefore, construction of the proposed project is not expected to expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Further, the project does not involve operation of facilities that would exacerbate fire conditions within the area or require permanent workers or occupants at the project sites. As a result, **no impact** would occur.
- c) The proposed project includes liner raise construction activities and implementation of water level monitoring instrumentation including a transmission pole and electrical

equipment that would be housed. The proposed project would not require the installation or maintenance of infrastructure that would exacerbate wildfire risks. Therefore, there would be **no impact**.

- d) As discussed in Section VII, *Geology, Soils, and Seismicity*, discussions (a)(iv) and (c), and Section X, *Hydrology and Water Quality*, discussions (c)(i) and (c)(ii) above, the project would not result in increased drainage or runoff that could contribute to landslide or flooding impacts. **No impact** would occur.
-

Mandatory Findings of Significance

<i>Issues (and Supporting Information Sources):</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
XXI. MANDATORY FINDINGS OF SIGNIFICANCE —				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

- a) The proposed project would be temporary in nature and involve construction activities to raise portions of the concrete liner of Pools 24 and 25, on each side of the Aqueduct, for approximately 1.65 miles. The proposed project would also involve the installation of water level monitoring instrumentation to provide real-time monitoring of flow and water levels in Pools 22 and 25. The proposed project would restore functionality and original design capacity in Pools 22, 24 and 25. The proposed project would not: substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; reduce or restrict the range of rare or endangered plants or animals; or, eliminate important examples of the major periods of California history or prehistory. As discussed in the analyses provided in this Initial Study, adherence to federal, State, and local regulations, and proposed **Mitigation Measures BIO-1 through BIO-6, CUL-1 through CUL-3, GHG-1, and GEO-1 and GEO-2** would reduce all potentially significant impacts to biological, cultural, greenhouse gas, energy, and geological resources as well as to other issue areas analyzed, to **less-than-significant levels with mitigation incorporated**.
- b) As noted throughout this document, the potential impacts of the proposed project are primarily temporary and short-term construction-related impacts and are site-specific. As noted above, all of the potential direct and indirect impacts of the proposed project were determined to be fully avoided or reduced to less than significant with incorporation of **Mitigation Measures BIO-1 through BIO-6, CUL-1 through CUL-3, GHG-1, and GEO-1 and GEO-2**. As a result, the potential impacts of the proposed project are not

considered cumulatively considerable, and impacts would be **less than significant with mitigation incorporated**.

- c) The potential impacts of the proposed project are temporary, short-term, and site-specific. These impacts are all localized to the proposed project area and include limited adverse effects on biological, cultural, greenhouse gas, energy and geological resources. However, the proposed project would not include any activities or uses that may cause substantial adverse effects on human beings, either directly or indirectly, or on the physical environment. Compliance with applicable local, State, and federal standards, as well as incorporation of project mitigation measures, would result in **less-than-significant impacts with mitigation incorporated**.
-

Appendix A

Air Quality: CalEEMod Outputs (Annual)

DWR San Joaquin Field Division Liner Riase and Instrumentation - San Joaquin Valley Unified APCD Air District, Annual

DWR San Joaquin Field Division Liner Riase and Instrumentation

San Joaquin Valley Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Golf Course	1.20	Acre	1.20	52,272.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.7	Precipitation Freq (Days)	45
Climate Zone	3			Operational Year	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

DWR San Joaquin Field Division Liner Riase and Instrumentation - San Joaquin Valley Unified APCD Air District, Annual

Project Characteristics -

Land Use - Work area = 1.65 mile long x 6 feet wide = 52,272 sq ft

Construction Phase - Schedule provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Off-road Equipment - Equipment list provided by client.

Trips and VMT - 20 workers for liner raise, 5 workers for instrumentation. vendor = concrete trucks and mobilization. haul = backfill import

Grading - Backfill (9700) - excavation (5700) = 4000 CY imported material. Imports and acres graded are portioned by size of pool.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	6.00
tblConstructionPhase	NumDays	200.00	6.00
tblConstructionPhase	NumDays	200.00	20.00
tblConstructionPhase	NumDays	200.00	21.00
tblConstructionPhase	NumDays	4.00	16.00
tblConstructionPhase	NumDays	4.00	16.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	10.00	6.00

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tblGrading	AcresOfGrading	6.00	0.23
tblGrading	AcresOfGrading	6.00	0.97
tblGrading	MaterialImported	0.00	759.00
tblGrading	MaterialImported	0.00	3,241.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	95.00	152.00
tblTripsAndVMT	HaulingTripNumber	405.00	648.00
tblTripsAndVMT	VendorTripNumber	0.00	1.67
tblTripsAndVMT	VendorTripNumber	0.00	1.67
tblTripsAndVMT	VendorTripNumber	9.00	0.00
tblTripsAndVMT	VendorTripNumber	0.00	1.27
tblTripsAndVMT	VendorTripNumber	9.00	0.00
tblTripsAndVMT	VendorTripNumber	9.00	2.85
tblTripsAndVMT	VendorTripNumber	0.00	1.27
tblTripsAndVMT	VendorTripNumber	9.00	11.58
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	15.00	40.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	22.00	10.00
tblTripsAndVMT	WorkerTripNumber	8.00	40.00
tblTripsAndVMT	WorkerTripNumber	15.00	40.00
tblTripsAndVMT	WorkerTripNumber	22.00	10.00
tblTripsAndVMT	WorkerTripNumber	22.00	40.00
tblTripsAndVMT	WorkerTripNumber	15.00	40.00
tblTripsAndVMT	WorkerTripNumber	8.00	40.00

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tblTripsAndVMT	WorkerTripNumber	15.00	40.00
tblTripsAndVMT	WorkerTripNumber	22.00	40.00

2.0 Emissions Summary

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2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1161	1.0067	0.8422	1.8600e-003	0.1089	0.0455	0.1544	0.0494	0.0428	0.0923	0.0000	163.6174	163.6174	0.0296	0.0000	164.3571
Maximum	0.1161	1.0067	0.8422	1.8600e-003	0.1089	0.0455	0.1544	0.0494	0.0428	0.0923	0.0000	163.6174	163.6174	0.0296	0.0000	164.3571

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1161	1.0067	0.8422	1.8600e-003	0.1089	0.0455	0.1544	0.0494	0.0428	0.0923	0.0000	163.6173	163.6173	0.0296	0.0000	164.3570
Maximum	0.1161	1.0067	0.8422	1.8600e-003	0.1089	0.0455	0.1544	0.0494	0.0428	0.0923	0.0000	163.6173	163.6173	0.0296	0.0000	164.3570

[illegible]

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	7-1-2020	9-30-2020	0.8134	0.8134
		Highest	0.8134	0.8134

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	4.9000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	2.1100e-003	0.0224	0.0195	9.0000e-005	5.0400e-003	8.0000e-005	5.1200e-003	1.3500e-003	8.0000e-005	1.4300e-003	0.0000	8.2677	8.2677	6.5000e-004	0.0000	8.2840
Waste						0.0000	0.0000		0.0000	0.0000	0.2274	0.0000	0.2274	0.0134	0.0000	0.5633
Water						0.0000	0.0000		0.0000	0.0000	0.0000	1.4558	1.4558	7.0000e-005	1.0000e-005	1.4615
Total	2.6000e-003	0.0224	0.0195	9.0000e-005	5.0400e-003	8.0000e-005	5.1200e-003	1.3500e-003	8.0000e-005	1.4300e-003	0.2274	9.7235	9.9508	0.0142	1.0000e-005	10.3088

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2.2 Overall Operational**Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	4.9000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	2.1100e-003	0.0224	0.0195	9.0000e-005	5.0400e-003	8.0000e-005	5.1200e-003	1.3500e-003	8.0000e-005	1.4300e-003	0.0000	8.2677	8.2677	6.5000e-004	0.0000	8.2840
Waste						0.0000	0.0000		0.0000	0.0000	0.2274	0.0000	0.2274	0.0134	0.0000	0.5633
Water						0.0000	0.0000		0.0000	0.0000	0.0000	1.4558	1.4558	7.0000e-005	1.0000e-005	1.4615
Total	2.6000e-003	0.0224	0.0195	9.0000e-005	5.0400e-003	8.0000e-005	5.1200e-003	1.3500e-003	8.0000e-005	1.4300e-003	0.2274	9.7235	9.9508	0.0142	1.0000e-005	10.3088

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail**Construction Phase**

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Instrumentation, Pool 22, Trenching	Trenching	7/1/2020	7/8/2020	5	6	
2	Liner Raise, Pool 24, Excavation	Trenching	7/1/2020	7/15/2020	5	11	
3	Liner Raise, Pool 24, Backfill	Grading	7/8/2020	7/29/2020	5	16	
4	Instrumentation, Pool 22, Install	Building Construction	7/8/2020	7/15/2020	5	6	
5	Liner Raise, Pool 24, Concrete Work	Building Construction	7/29/2020	8/25/2020	5	20	
6	Liner Raise, Pool 24, Paving	Paving	8/25/2020	9/1/2020	5	6	
7	Liner Raise, Pool 25, Excavation	Trenching	9/1/2020	9/15/2020	5	11	
8	Liner Raise, Pool 25, Backfill	Grading	9/8/2020	9/29/2020	5	16	
9	Liner Raise, Pool 25, Concrete Work	Building Construction	9/29/2020	10/27/2020	5	21	
10	Liner Raise, Pool 25, Paving	Paving	10/27/2020	11/2/2020	5	5	
11	Instrumentation, Pool 25, Trenching	Trenching	11/2/2020	11/9/2020	5	6	
12	Instrumentation, Pool 25, Install	Building Construction	11/9/2020	11/16/2020	5	6	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating -- sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Instrumentation, Pool 22, Trenching	Plate Compactors	1	8.00	8	0.43
Instrumentation, Pool 22, Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Liner Raise, Pool 24, Excavation	Excavators	1	6.00	158	0.38
Liner Raise, Pool 24, Excavation	Tractors/Loaders/Backhoes	2	7.00	97	0.37

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Liner Raise, Pool 24, Backfill	Excavators	1	8.00	158	0.38
Liner Raise, Pool 24, Backfill	Plate Compactors	1	6.00	8	0.43
Liner Raise, Pool 24, Backfill	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Instrumentation, Pool 22, Install	Forklifts	1	6.00	89	0.20
Instrumentation, Pool 22, Install	Generator Sets	1	8.00	84	0.74
Liner Raise, Pool 24, Concrete Work	Excavators	1	6.00	158	0.38
Liner Raise, Pool 24, Concrete Work	Generator Sets	1	8.00	84	0.74
Liner Raise, Pool 24, Paving	Pavers	1	6.00	130	0.42
Liner Raise, Pool 24, Paving	Plate Compactors	1	8.00	8	0.43
Liner Raise, Pool 25, Excavation	Excavators	1	6.00	158	0.38
Liner Raise, Pool 25, Excavation	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Liner Raise, Pool 25, Backfill	Excavators	1	6.00	158	0.38
Liner Raise, Pool 25, Backfill	Plate Compactors	1	6.00	8	0.43
Liner Raise, Pool 25, Backfill	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Liner Raise, Pool 25, Concrete Work	Excavators	1	8.00	158	0.38
Liner Raise, Pool 25, Concrete Work	Generator Sets	1	8.00	84	0.74
Liner Raise, Pool 25, Paving	Pavers	1	6.00	130	0.42
Liner Raise, Pool 25, Paving	Plate Compactors	1	8.00	8	0.43
Instrumentation, Pool 25, Trenching	Plate Compactors	1	8.00	8	0.43
Instrumentation, Pool 25, Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Instrumentation, Pool 25, Install	Forklifts	1	6.00	89	0.20
Instrumentation, Pool 25, Install	Generator Sets	1	8.00	84	0.74
Liner Raise, Pool 25, Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Liner Raise, Pool 24, Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Instrumentation, Pool 25, Install	Cranes	1	6.00	231	0.29
Instrumentation, Pool 22, Install	Cranes	1	6.00	231	0.29
Liner Raise, Pool 24, Concrete Work	Cranes	1	6.00	231	0.29

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Liner Raise, Pool 25, Concrete Work	Cranes	1	6.00	231	0.29
Liner Raise, Pool 24, Concrete Work	Forklifts	1	6.00	89	0.20
Liner Raise, Pool 25, Concrete Work	Forklifts	1	6.00	89	0.20
Liner Raise, Pool 24, Backfill	Graders	1	6.00	187	0.41
Liner Raise, Pool 25, Backfill	Graders	1	6.00	187	0.41
Liner Raise, Pool 25, Paving	Paving Equipment	1	8.00	132	0.36
Liner Raise, Pool 24, Paving	Paving Equipment	1	8.00	132	0.36
Liner Raise, Pool 25, Paving	Rollers	1	7.00	80	0.38
Liner Raise, Pool 24, Paving	Rollers	1	7.00	80	0.38
Liner Raise, Pool 24, Backfill	Rubber Tired Dozers	1	6.00	247	0.40
Liner Raise, Pool 25, Backfill	Rubber Tired Dozers	1	6.00	247	0.40
Instrumentation, Pool 25, Install	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Instrumentation, Pool 22, Install	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Liner Raise, Pool 24, Concrete Work	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Liner Raise, Pool 25, Concrete Work	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Liner Raise, Pool 25, Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Liner Raise, Pool 24, Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Instrumentation, Pool 25, Install	Welders	3	8.00	46	0.45
Instrumentation, Pool 22, Install	Welders	3	8.00	46	0.45
Liner Raise, Pool 24, Concrete Work	Welders	3	8.00	46	0.45
Liner Raise, Pool 25, Concrete Work	Welders	3	8.00	46	0.45

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Instrumentation, Pool 22, Trenching	2	10.00	1.67	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Liner Raise, Pool 24, Excavation	3	40.00	1.27	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Liner Raise, Pool 24, Backfill	6	40.00	0.00	152.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Instrumentation, Pool 22, Install	7	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Liner Raise, Pool 24, Concrete Work	8	40.00	2.85	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Liner Raise, Pool 24, Paving	6	40.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Liner Raise, Pool 25, Excavation	3	40.00	1.27	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Liner Raise, Pool 25, Backfill	6	40.00	0.00	648.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Liner Raise, Pool 25, Concrete Work	8	40.00	11.58	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Liner Raise, Pool 25, Paving	6	40.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Instrumentation, Pool 25, Trenching	2	10.00	1.67	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Instrumentation, Pool 25, Install	7	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

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3.2 Instrumentation, Pool 22, Trenching - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.5000e-004	7.0700e-003	7.4700e-003	1.0000e-005		4.3000e-004	4.3000e-004		4.0000e-004	4.0000e-004	0.0000	0.9124	0.9124	2.7000e-004	0.0000	0.9193
Total	7.5000e-004	7.0700e-003	7.4700e-003	1.0000e-005		4.3000e-004	4.3000e-004		4.0000e-004	4.0000e-004	0.0000	0.9124	0.9124	2.7000e-004	0.0000	0.9193

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	5.8000e-004	1.1000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1254	0.1254	1.0000e-005	0.0000	0.1257
Worker	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318
Total	2.0000e-004	7.1000e-004	1.3800e-003	0.0000	4.0000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.4570	0.4570	2.0000e-005	0.0000	0.4575

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3.2 Instrumentation, Pool 22, Trenching - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.5000e-004	7.0700e-003	7.4700e-003	1.0000e-005		4.3000e-004	4.3000e-004		4.0000e-004	4.0000e-004	0.0000	0.9124	0.9124	2.7000e-004	0.0000	0.9193
Total	7.5000e-004	7.0700e-003	7.4700e-003	1.0000e-005		4.3000e-004	4.3000e-004		4.0000e-004	4.0000e-004	0.0000	0.9124	0.9124	2.7000e-004	0.0000	0.9193

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	5.8000e-004	1.1000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1254	0.1254	1.0000e-005	0.0000	0.1257
Worker	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318
Total	2.0000e-004	7.1000e-004	1.3800e-003	0.0000	4.0000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.4570	0.4570	2.0000e-005	0.0000	0.4575

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3.3 Liner Raise, Pool 24, Excavation - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0300e-003	0.0302	0.0354	5.0000e-005		1.7600e-003	1.7600e-003		1.6200e-003	1.6200e-003	0.0000	4.4977	4.4977	1.4500e-003	0.0000	4.5341
Total	3.0300e-003	0.0302	0.0354	5.0000e-005		1.7600e-003	1.7600e-003		1.6200e-003	1.6200e-003	0.0000	4.4977	4.4977	1.4500e-003	0.0000	4.5341

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-005	8.1000e-004	1.5000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1749	0.1749	1.0000e-005	0.0000	0.1753
Worker	1.3000e-003	9.4000e-004	9.3000e-003	3.0000e-005	2.7300e-003	2.0000e-005	2.7500e-003	7.3000e-004	2.0000e-005	7.4000e-004	0.0000	2.4317	2.4317	7.0000e-005	0.0000	2.4334
Total	1.3300e-003	1.7500e-003	9.4500e-003	3.0000e-005	2.7700e-003	2.0000e-005	2.8000e-003	7.4000e-004	2.0000e-005	7.6000e-004	0.0000	2.6066	2.6066	8.0000e-005	0.0000	2.6086

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3.3 Liner Raise, Pool 24, Excavation - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0300e-003	0.0302	0.0354	5.0000e-005		1.7600e-003	1.7600e-003		1.6200e-003	1.6200e-003	0.0000	4.4977	4.4977	1.4500e-003	0.0000	4.5341
Total	3.0300e-003	0.0302	0.0354	5.0000e-005		1.7600e-003	1.7600e-003		1.6200e-003	1.6200e-003	0.0000	4.4977	4.4977	1.4500e-003	0.0000	4.5341

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-005	8.1000e-004	1.5000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1749	0.1749	1.0000e-005	0.0000	0.1753
Worker	1.3000e-003	9.4000e-004	9.3000e-003	3.0000e-005	2.7300e-003	2.0000e-005	2.7500e-003	7.3000e-004	2.0000e-005	7.4000e-004	0.0000	2.4317	2.4317	7.0000e-005	0.0000	2.4334
Total	1.3300e-003	1.7500e-003	9.4500e-003	3.0000e-005	2.7700e-003	2.0000e-005	2.8000e-003	7.4000e-004	2.0000e-005	7.6000e-004	0.0000	2.6066	2.6066	8.0000e-005	0.0000	2.6086

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3.4 Liner Raise, Pool 24, Backfill - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0363	0.0000	0.0363	0.0199	0.0000	0.0199	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0145	0.1562	0.0950	1.8000e-004		7.4000e-003	7.4000e-003		6.8100e-003	6.8100e-003	0.0000	15.6389	15.6389	5.0200e-003	0.0000	15.7643
Total	0.0145	0.1562	0.0950	1.8000e-004	0.0363	7.4000e-003	0.0437	0.0199	6.8100e-003	0.0267	0.0000	15.6389	15.6389	5.0200e-003	0.0000	15.7643

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.1000e-004	0.0212	3.0700e-003	6.0000e-005	1.3000e-003	7.0000e-005	1.3700e-003	3.6000e-004	7.0000e-005	4.3000e-004	0.0000	5.7743	5.7743	3.2000e-004	0.0000	5.7823
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8800e-003	1.3600e-003	0.0135	4.0000e-005	3.9800e-003	3.0000e-005	4.0000e-003	1.0600e-003	3.0000e-005	1.0800e-003	0.0000	3.5370	3.5370	1.0000e-004	0.0000	3.5395
Total	2.4900e-003	0.0225	0.0166	1.0000e-004	5.2800e-003	1.0000e-004	5.3700e-003	1.4200e-003	1.0000e-004	1.5100e-003	0.0000	9.3113	9.3113	4.2000e-004	0.0000	9.3218

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3.4 Liner Raise, Pool 24, Backfill - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0363	0.0000	0.0363	0.0199	0.0000	0.0199	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0145	0.1562	0.0950	1.8000e-004		7.4000e-003	7.4000e-003		6.8100e-003	6.8100e-003	0.0000	15.6389	15.6389	5.0200e-003	0.0000	15.7643
Total	0.0145	0.1562	0.0950	1.8000e-004	0.0363	7.4000e-003	0.0437	0.0199	6.8100e-003	0.0267	0.0000	15.6389	15.6389	5.0200e-003	0.0000	15.7643

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.1000e-004	0.0212	3.0700e-003	6.0000e-005	1.3000e-003	7.0000e-005	1.3700e-003	3.6000e-004	7.0000e-005	4.3000e-004	0.0000	5.7743	5.7743	3.2000e-004	0.0000	5.7823
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8800e-003	1.3600e-003	0.0135	4.0000e-005	3.9800e-003	3.0000e-005	4.0000e-003	1.0600e-003	3.0000e-005	1.0800e-003	0.0000	3.5370	3.5370	1.0000e-004	0.0000	3.5395
Total	2.4900e-003	0.0225	0.0166	1.0000e-004	5.2800e-003	1.0000e-004	5.3700e-003	1.4200e-003	1.0000e-004	1.5100e-003	0.0000	9.3113	9.3113	4.2000e-004	0.0000	9.3218

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3.5 Instrumentation, Pool 22, Install - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.0900e-003	0.0444	0.0396	7.0000e-005		2.3900e-003	2.3900e-003		2.3100e-003	2.3100e-003	0.0000	5.4463	5.4463	1.0100e-003	0.0000	5.4715
Total	6.0900e-003	0.0444	0.0396	7.0000e-005		2.3900e-003	2.3900e-003		2.3100e-003	2.3100e-003	0.0000	5.4463	5.4463	1.0100e-003	0.0000	5.4715

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318
Total	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318

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3.5 Instrumentation, Pool 22, Install - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.0900e-003	0.0444	0.0396	7.0000e-005		2.3900e-003	2.3900e-003		2.3100e-003	2.3100e-003	0.0000	5.4463	5.4463	1.0100e-003	0.0000	5.4715
Total	6.0900e-003	0.0444	0.0396	7.0000e-005		2.3900e-003	2.3900e-003		2.3100e-003	2.3100e-003	0.0000	5.4463	5.4463	1.0100e-003	0.0000	5.4715

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318
Total	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318

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3.6 Liner Raise, Pool 24, Concrete Work - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0221	0.1660	0.1564	2.6000e-004		8.8400e-003	8.8400e-003		8.4900e-003	8.4900e-003	0.0000	21.5570	21.5570	4.4700e-003	0.0000	21.6687
Total	0.0221	0.1660	0.1564	2.6000e-004		8.8400e-003	8.8400e-003		8.4900e-003	8.4900e-003	0.0000	21.5570	21.5570	4.4700e-003	0.0000	21.6687

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-004	3.3200e-003	6.3000e-004	1.0000e-005	1.7000e-004	2.0000e-005	1.9000e-004	5.0000e-005	2.0000e-005	7.0000e-005	0.0000	0.7135	0.7135	6.0000e-005	0.0000	0.7150
Worker	2.3500e-003	1.7000e-003	0.0169	5.0000e-005	4.9700e-003	3.0000e-005	5.0100e-003	1.3200e-003	3.0000e-005	1.3500e-003	0.0000	4.4213	4.4213	1.2000e-004	0.0000	4.4243
Total	2.4600e-003	5.0200e-003	0.0175	6.0000e-005	5.1400e-003	5.0000e-005	5.2000e-003	1.3700e-003	5.0000e-005	1.4200e-003	0.0000	5.1348	5.1348	1.8000e-004	0.0000	5.1394

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3.6 Liner Raise, Pool 24, Concrete Work - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0221	0.1660	0.1564	2.6000e-004		8.8400e-003	8.8400e-003		8.4900e-003	8.4900e-003	0.0000	21.5569	21.5569	4.4700e-003	0.0000	21.6687
Total	0.0221	0.1660	0.1564	2.6000e-004		8.8400e-003	8.8400e-003		8.4900e-003	8.4900e-003	0.0000	21.5569	21.5569	4.4700e-003	0.0000	21.6687

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-004	3.3200e-003	6.3000e-004	1.0000e-005	1.7000e-004	2.0000e-005	1.9000e-004	5.0000e-005	2.0000e-005	7.0000e-005	0.0000	0.7135	0.7135	6.0000e-005	0.0000	0.7150
Worker	2.3500e-003	1.7000e-003	0.0169	5.0000e-005	4.9700e-003	3.0000e-005	5.0100e-003	1.3200e-003	3.0000e-005	1.3500e-003	0.0000	4.4213	4.4213	1.2000e-004	0.0000	4.4243
Total	2.4600e-003	5.0200e-003	0.0175	6.0000e-005	5.1400e-003	5.0000e-005	5.2000e-003	1.3700e-003	5.0000e-005	1.4200e-003	0.0000	5.1348	5.1348	1.8000e-004	0.0000	5.1394

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3.7 Liner Raise, Pool 24, Paving - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6400e-003	0.0261	0.0273	4.0000e-005		1.4400e-003	1.4400e-003		1.3300e-003	1.3300e-003	0.0000	3.6236	3.6236	1.1300e-003	0.0000	3.6518
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.6400e-003	0.0261	0.0273	4.0000e-005		1.4400e-003	1.4400e-003		1.3300e-003	1.3300e-003	0.0000	3.6236	3.6236	1.1300e-003	0.0000	3.6518

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1000e-004	5.1000e-004	5.0700e-003	1.0000e-005	1.4900e-003	1.0000e-005	1.5000e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.3264	1.3264	4.0000e-005	0.0000	1.3273
Total	7.1000e-004	5.1000e-004	5.0700e-003	1.0000e-005	1.4900e-003	1.0000e-005	1.5000e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.3264	1.3264	4.0000e-005	0.0000	1.3273

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3.7 Liner Raise, Pool 24, Paving - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.6400e-003	0.0261	0.0273	4.0000e-005		1.4400e-003	1.4400e-003		1.3300e-003	1.3300e-003	0.0000	3.6235	3.6235	1.1300e-003	0.0000	3.6518
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.6400e-003	0.0261	0.0273	4.0000e-005		1.4400e-003	1.4400e-003		1.3300e-003	1.3300e-003	0.0000	3.6235	3.6235	1.1300e-003	0.0000	3.6518

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1000e-004	5.1000e-004	5.0700e-003	1.0000e-005	1.4900e-003	1.0000e-005	1.5000e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.3264	1.3264	4.0000e-005	0.0000	1.3273
Total	7.1000e-004	5.1000e-004	5.0700e-003	1.0000e-005	1.4900e-003	1.0000e-005	1.5000e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.3264	1.3264	4.0000e-005	0.0000	1.3273

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3.8 Liner Raise, Pool 25, Excavation - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0300e-003	0.0302	0.0354	5.0000e-005		1.7600e-003	1.7600e-003		1.6200e-003	1.6200e-003	0.0000	4.4977	4.4977	1.4500e-003	0.0000	4.5341
Total	3.0300e-003	0.0302	0.0354	5.0000e-005		1.7600e-003	1.7600e-003		1.6200e-003	1.6200e-003	0.0000	4.4977	4.4977	1.4500e-003	0.0000	4.5341

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-005	8.1000e-004	1.5000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1749	0.1749	1.0000e-005	0.0000	0.1753
Worker	1.3000e-003	9.4000e-004	9.3000e-003	3.0000e-005	2.7300e-003	2.0000e-005	2.7500e-003	7.3000e-004	2.0000e-005	7.4000e-004	0.0000	2.4317	2.4317	7.0000e-005	0.0000	2.4334
Total	1.3300e-003	1.7500e-003	9.4500e-003	3.0000e-005	2.7700e-003	2.0000e-005	2.8000e-003	7.4000e-004	2.0000e-005	7.6000e-004	0.0000	2.6066	2.6066	8.0000e-005	0.0000	2.6086

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3.8 Liner Raise, Pool 25, Excavation - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.0300e-003	0.0302	0.0354	5.0000e-005		1.7600e-003	1.7600e-003		1.6200e-003	1.6200e-003	0.0000	4.4977	4.4977	1.4500e-003	0.0000	4.5341
Total	3.0300e-003	0.0302	0.0354	5.0000e-005		1.7600e-003	1.7600e-003		1.6200e-003	1.6200e-003	0.0000	4.4977	4.4977	1.4500e-003	0.0000	4.5341

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-005	8.1000e-004	1.5000e-004	0.0000	4.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1749	0.1749	1.0000e-005	0.0000	0.1753
Worker	1.3000e-003	9.4000e-004	9.3000e-003	3.0000e-005	2.7300e-003	2.0000e-005	2.7500e-003	7.3000e-004	2.0000e-005	7.4000e-004	0.0000	2.4317	2.4317	7.0000e-005	0.0000	2.4334
Total	1.3300e-003	1.7500e-003	9.4500e-003	3.0000e-005	2.7700e-003	2.0000e-005	2.8000e-003	7.4000e-004	2.0000e-005	7.6000e-004	0.0000	2.6066	2.6066	8.0000e-005	0.0000	2.6086

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3.9 Liner Raise, Pool 25, Backfill - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0369	0.0000	0.0369	0.0200	0.0000	0.0200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0140	0.1514	0.0885	1.7000e-004		7.1700e-003	7.1700e-003		6.6000e-003	6.6000e-003	0.0000	14.7315	14.7315	4.7200e-003	0.0000	14.8496
Total	0.0140	0.1514	0.0885	1.7000e-004	0.0369	7.1700e-003	0.0441	0.0200	6.6000e-003	0.0266	0.0000	14.7315	14.7315	4.7200e-003	0.0000	14.8496

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.5800e-003	0.0903	0.0131	2.6000e-004	5.5400e-003	3.1000e-004	5.8500e-003	1.5200e-003	3.0000e-004	1.8200e-003	0.0000	24.6167	24.6167	1.3700e-003	0.0000	24.6510
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8800e-003	1.3600e-003	0.0135	4.0000e-005	3.9800e-003	3.0000e-005	4.0000e-003	1.0600e-003	3.0000e-005	1.0800e-003	0.0000	3.5370	3.5370	1.0000e-004	0.0000	3.5395
Total	4.4600e-003	0.0916	0.0266	3.0000e-004	9.5200e-003	3.4000e-004	9.8500e-003	2.5800e-003	3.3000e-004	2.9000e-003	0.0000	28.1537	28.1537	1.4700e-003	0.0000	28.1905

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3.9 Liner Raise, Pool 25, Backfill - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0369	0.0000	0.0369	0.0200	0.0000	0.0200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0140	0.1514	0.0885	1.7000e-004		7.1700e-003	7.1700e-003		6.6000e-003	6.6000e-003	0.0000	14.7315	14.7315	4.7200e-003	0.0000	14.8496
Total	0.0140	0.1514	0.0885	1.7000e-004	0.0369	7.1700e-003	0.0441	0.0200	6.6000e-003	0.0266	0.0000	14.7315	14.7315	4.7200e-003	0.0000	14.8496

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.5800e-003	0.0903	0.0131	2.6000e-004	5.5400e-003	3.1000e-004	5.8500e-003	1.5200e-003	3.0000e-004	1.8200e-003	0.0000	24.6167	24.6167	1.3700e-003	0.0000	24.6510
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8800e-003	1.3600e-003	0.0135	4.0000e-005	3.9800e-003	3.0000e-005	4.0000e-003	1.0600e-003	3.0000e-005	1.0800e-003	0.0000	3.5370	3.5370	1.0000e-004	0.0000	3.5395
Total	4.4600e-003	0.0916	0.0266	3.0000e-004	9.5200e-003	3.4000e-004	9.8500e-003	2.5800e-003	3.3000e-004	2.9000e-003	0.0000	28.1537	28.1537	1.4700e-003	0.0000	28.1905

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3.10 Liner Raise, Pool 25, Concrete Work - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0239	0.1806	0.1728	2.9000e-004		9.5800e-003	9.5800e-003		9.2000e-003	9.2000e-003	0.0000	23.8258	23.8258	5.0800e-003	0.0000	23.9528
Total	0.0239	0.1806	0.1728	2.9000e-004		9.5800e-003	9.5800e-003		9.2000e-003	9.2000e-003	0.0000	23.8258	23.8258	5.0800e-003	0.0000	23.9528

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.5000e-004	0.0142	2.6800e-003	3.0000e-005	7.3000e-004	7.0000e-005	8.0000e-004	2.1000e-004	7.0000e-005	2.8000e-004	0.0000	3.0442	3.0442	2.6000e-004	0.0000	3.0506
Worker	2.4700e-003	1.7900e-003	0.0178	5.0000e-005	5.2200e-003	4.0000e-005	5.2600e-003	1.3900e-003	3.0000e-005	1.4200e-003	0.0000	4.6423	4.6423	1.3000e-004	0.0000	4.6455
Total	2.9200e-003	0.0160	0.0204	8.0000e-005	5.9500e-003	1.1000e-004	6.0600e-003	1.6000e-003	1.0000e-004	1.7000e-003	0.0000	7.6865	7.6865	3.9000e-004	0.0000	7.6961

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3.10 Liner Raise, Pool 25, Concrete Work - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0239	0.1806	0.1728	2.9000e-004		9.5800e-003	9.5800e-003		9.2000e-003	9.2000e-003	0.0000	23.8257	23.8257	5.0800e-003	0.0000	23.9527
Total	0.0239	0.1806	0.1728	2.9000e-004		9.5800e-003	9.5800e-003		9.2000e-003	9.2000e-003	0.0000	23.8257	23.8257	5.0800e-003	0.0000	23.9527

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.5000e-004	0.0142	2.6800e-003	3.0000e-005	7.3000e-004	7.0000e-005	8.0000e-004	2.1000e-004	7.0000e-005	2.8000e-004	0.0000	3.0442	3.0442	2.6000e-004	0.0000	3.0506
Worker	2.4700e-003	1.7900e-003	0.0178	5.0000e-005	5.2200e-003	4.0000e-005	5.2600e-003	1.3900e-003	3.0000e-005	1.4200e-003	0.0000	4.6423	4.6423	1.3000e-004	0.0000	4.6455
Total	2.9200e-003	0.0160	0.0204	8.0000e-005	5.9500e-003	1.1000e-004	6.0600e-003	1.6000e-003	1.0000e-004	1.7000e-003	0.0000	7.6865	7.6865	3.9000e-004	0.0000	7.6961

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3.11 Liner Raise, Pool 25, Paving - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2000e-003	0.0218	0.0227	4.0000e-005		1.2000e-003	1.2000e-003		1.1100e-003	1.1100e-003	0.0000	3.0196	3.0196	9.4000e-004	0.0000	3.0431
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.2000e-003	0.0218	0.0227	4.0000e-005		1.2000e-003	1.2000e-003		1.1100e-003	1.1100e-003	0.0000	3.0196	3.0196	9.4000e-004	0.0000	3.0431

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.9000e-004	4.3000e-004	4.2300e-003	1.0000e-005	1.2400e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.1053	1.1053	3.0000e-005	0.0000	1.1061
Total	5.9000e-004	4.3000e-004	4.2300e-003	1.0000e-005	1.2400e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.1053	1.1053	3.0000e-005	0.0000	1.1061

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3.11 Liner Raise, Pool 25, Paving - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.2000e-003	0.0218	0.0227	4.0000e-005		1.2000e-003	1.2000e-003		1.1100e-003	1.1100e-003	0.0000	3.0196	3.0196	9.4000e-004	0.0000	3.0431
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	2.2000e-003	0.0218	0.0227	4.0000e-005		1.2000e-003	1.2000e-003		1.1100e-003	1.1100e-003	0.0000	3.0196	3.0196	9.4000e-004	0.0000	3.0431

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.9000e-004	4.3000e-004	4.2300e-003	1.0000e-005	1.2400e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.1053	1.1053	3.0000e-005	0.0000	1.1061
Total	5.9000e-004	4.3000e-004	4.2300e-003	1.0000e-005	1.2400e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.1053	1.1053	3.0000e-005	0.0000	1.1061

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3.12 Instrumentation, Pool 25, Trenching - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.5000e-004	7.0700e-003	7.4700e-003	1.0000e-005		4.3000e-004	4.3000e-004		4.0000e-004	4.0000e-004	0.0000	0.9124	0.9124	2.7000e-004	0.0000	0.9193
Total	7.5000e-004	7.0700e-003	7.4700e-003	1.0000e-005		4.3000e-004	4.3000e-004		4.0000e-004	4.0000e-004	0.0000	0.9124	0.9124	2.7000e-004	0.0000	0.9193

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	5.8000e-004	1.1000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1254	0.1254	1.0000e-005	0.0000	0.1257
Worker	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318
Total	2.0000e-004	7.1000e-004	1.3800e-003	0.0000	4.0000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.4570	0.4570	2.0000e-005	0.0000	0.4575

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3.12 Instrumentation, Pool 25, Trenching - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.5000e-004	7.0700e-003	7.4700e-003	1.0000e-005		4.3000e-004	4.3000e-004		4.0000e-004	4.0000e-004	0.0000	0.9124	0.9124	2.7000e-004	0.0000	0.9193
Total	7.5000e-004	7.0700e-003	7.4700e-003	1.0000e-005		4.3000e-004	4.3000e-004		4.0000e-004	4.0000e-004	0.0000	0.9124	0.9124	2.7000e-004	0.0000	0.9193

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0000e-005	5.8000e-004	1.1000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1254	0.1254	1.0000e-005	0.0000	0.1257
Worker	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318
Total	2.0000e-004	7.1000e-004	1.3800e-003	0.0000	4.0000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.4570	0.4570	2.0000e-005	0.0000	0.4575

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3.13 Instrumentation, Pool 25, Install - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.0900e-003	0.0444	0.0396	7.0000e-005		2.3900e-003	2.3900e-003		2.3100e-003	2.3100e-003	0.0000	5.4463	5.4463	1.0100e-003	0.0000	5.4715
Total	6.0900e-003	0.0444	0.0396	7.0000e-005		2.3900e-003	2.3900e-003		2.3100e-003	2.3100e-003	0.0000	5.4463	5.4463	1.0100e-003	0.0000	5.4715

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318
Total	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318

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3.13 Instrumentation, Pool 25, Install - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.0900e-003	0.0444	0.0396	7.0000e-005		2.3900e-003	2.3900e-003		2.3100e-003	2.3100e-003	0.0000	5.4463	5.4463	1.0100e-003	0.0000	5.4715
Total	6.0900e-003	0.0444	0.0396	7.0000e-005		2.3900e-003	2.3900e-003		2.3100e-003	2.3100e-003	0.0000	5.4463	5.4463	1.0100e-003	0.0000	5.4715

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318
Total	1.8000e-004	1.3000e-004	1.2700e-003	0.0000	3.7000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3316	0.3316	1.0000e-005	0.0000	0.3318

4.0 Operational Detail - Mobile

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4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.1100e-003	0.0224	0.0195	9.0000e-005	5.0400e-003	8.0000e-005	5.1200e-003	1.3500e-003	8.0000e-005	1.4300e-003	0.0000	8.2677	8.2677	6.5000e-004	0.0000	8.2840
Unmitigated	2.1100e-003	0.0224	0.0195	9.0000e-005	5.0400e-003	8.0000e-005	5.1200e-003	1.3500e-003	8.0000e-005	1.4300e-003	0.0000	8.2677	8.2677	6.5000e-004	0.0000	8.2840

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Golf Course	6.05	6.98	7.06	13,205	13,205
Total	6.05	6.98	7.06	13,205	13,205

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Golf Course	14.70	6.60	6.60	33.00	48.00	19.00	52	39	9

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Golf Course	0.506092	0.032602	0.169295	0.124521	0.019914	0.005374	0.021664	0.110051	0.001797	0.001623	0.005307	0.000969	0.000792

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5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

[illegible]

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5.2 Energy by Land Use - NaturalGas

Unmitigated

[illegible]

Mitigated

[illegible]

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5.3 Energy by Land Use - Electricity**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Golf Course	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail**6.1 Mitigation Measures Area**

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	4.9000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	4.9000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.9000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	4.9000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

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6.2 Area by SubCategory**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.9000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	4.9000e-004	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

7.0 Water Detail**7.1 Mitigation Measures Water**

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.4558	7.0000e-005	1.0000e-005	1.4615
Unmitigated	1.4558	7.0000e-005	1.0000e-005	1.4615

7.2 Water by Land Use**Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Golf Course	0 / 1.42978	1.4558	7.0000e-005	1.0000e-005	1.4615
Total		1.4558	7.0000e-005	1.0000e-005	1.4615

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7.2 Water by Land Use**Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Golf Course	0 / 1.42978	1.4558	7.0000e-005	1.0000e-005	1.4615
Total		1.4558	7.0000e-005	1.0000e-005	1.4615

8.0 Waste Detail**8.1 Mitigation Measures Waste****Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.2274	0.0134	0.0000	0.5633
Unmitigated	0.2274	0.0134	0.0000	0.5633

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8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Golf Course	1.12	0.2274	0.0134	0.0000	0.5633
Total		0.2274	0.0134	0.0000	0.5633

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Golf Course	1.12	0.2274	0.0134	0.0000	0.5633
Total		0.2274	0.0134	0.0000	0.5633

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

Appendix B

Biological Studies

San Joaquin Field Division Liner Raise and Instrumentation Project Survey Results Summary Report

August 2019



Prepared for: California Department of Water Resources
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1416 Ninth Street
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Background

The California Department of Water Resources (DWR) Division of Engineering proposes to install water-level instrumentation and to raise the California Aqueduct (Aqueduct) liner. The proposed San Joaquin Field Division Liner Raise and Instrumentation Project (Project) is located along the Aqueduct in Kern County. The proposed Project includes nine sites located between milepost (MP) 175.16 and MP 213.00 (**Table 1**). The northernmost site, MP 175.16, is approximately 2 miles southwest of Kettleman City. The southernmost site, MP 213.00, is approximately 8 miles southwest of the city of Lost Hills (**Figure 1**).

Table 1. Locations of Proposed Project Sites

Location	Pool	Scope
MP 175.16	22	Instrument Installation
MP 183.19	22	Instrument Installation
MP 196.58	23	Instrument Installation
MP 197.84	24	Instrument Installation
MP 199.86	24	Instrument Installation
MP 199.71 - 200.01	24	Liner Raise
MP 207.94 - 208.11	25	Liner Raise
MP 209.17 - 210.31	25	Liner Raise
MP 213.00	25	Instrument Installation

Subsidence has reduced the capacity of the Aqueduct in areas between Pools 22 and 25. The Project's goal is to repair these portions of the Aqueduct by raising approximately 3.25 miles of Aqueduct liner, which will restore Aqueduct capacity to original design specifications. The Project will also install water measuring instruments (instruments) between Pools 22 and 25 to monitor water surface elevations in areas of interest.

Project Description

Liner Raise

Liner raises are proposed at three sections of the Aqueduct: MP 199.71 to MP 200.01, MP 207.94 to MP 208.11, and MP 209.17 to MP 210.31.

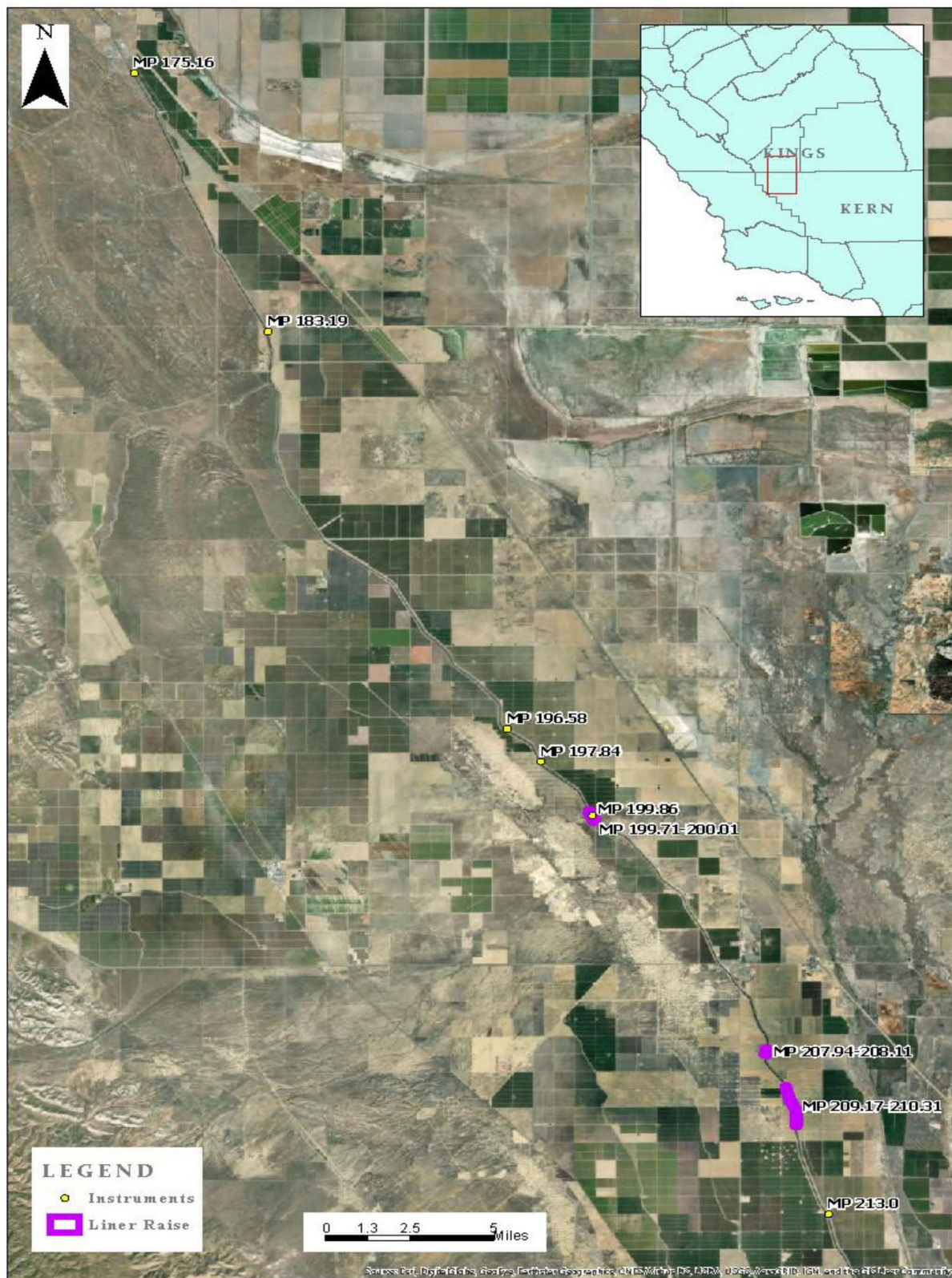
In these sections, maximum water surface elevations are below design operations as a result of subsidence. As such, there is a reduction in Aqueduct flow capacity during conveyance. To address this loss, the proposed Project element will raise the concrete liner by approximately 2 to 3 feet on the left side (L) and right side (R) of the Aqueduct to achieve the desired surface water elevation for an adequate freeboard. Slope modifications will be made to the embankment to stabilize and support the extended liner; however, embankment raises will not be necessary.

Instrument Installation

Instrument installations will occur within DWR's right-of-way (ROW) of the Aqueduct and are proposed at six sites: MP 175.16L, MP 183.19L, MP 196.58L, MP 197.84L, MP 199.86L, and MP 213.00L. Instruments will provide real-time water surface elevation data for monitoring and analysis. Each installation will include a secured antenna site, conduit, and a sensor.

Biologists from Aardvark Biological Services, Blackhawk Environmental, and Environmental Science Associates (ESA) were contracted to conduct biological surveys for special-status species at five of the instrument installation sites: MP 175.16, MP 183.19, MP 196.58, MP 197.84, and MP 213.00. Biological surveys conducted at these sites are summarized in a summary report provided by ESA and found in **Attachment A**.

Figure 1. Locations of Proposed Project Sites



Site Description

The Project area from MP 199.71 to MP 200.01 is located on the valley floor near the base of the Lost Hills range. The habitat is comprised of non-native grasslands and alkali scrub, with atriplex (*Atriplex* spp.) as the dominant shrub and foxtail brome (*Bromus madritensis*) as the dominant grass. Adjacent land use includes orchards, fallow fields, and oil extraction fields.

The Project area from MP 207.94 to MP 208.11 is located on the valley floor. The habitat throughout the Project area consists largely of valley scrub, with allscale (*Atriplex polycarpa*) and Russian thistle (*Salsola* spp.) as the dominant plants. Land use adjacent to this Project area includes orchards and fallow fields.

The Project area from MP 209.17 to 210.31 is located on the valley floor. The habitat is comprised of non-native grasslands and alkali scrub, with atriplex (*Atriplex* spp.) as the dominant shrub and foxtail brome (*Bromus madritensis*) as the dominant grass. The adjacent land use is primarily orchards and fallow fields.

Potential Special-Status Species

Three sources were consulted to generate a database list of special-status species: the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB), the California Native Plant Society (CNPS), and the United States Fish and Wildlife Services (USFWS) Information for Planning and Consultation Online System (IPaC) (**Table 2**).

A 3-mile radius search was performed using CNDDDB and CNPS data to list special-status species potentially in the Project area. The record generated from IPaC includes resources outside of the Project area that could be directly or indirectly affected by Project activities. The database list of species also revealed the potential occurrence of special-status species based on species' habitat requirements in the Project areas (**Table 2**).

Table 2. List of Special-Status Species and Potential to Occur Within the Project Areas

Scientific Name	Common Name	Status/ CNPS Ranking	Habitat	Habitat Present		
				MP 199.71 to MP 200.01	MP 207.94 to MP 208.11	MP 209.17 to MP 210.31
Mammals						
<i>Ammospermophilus nelsoni</i>	San Joaquin antelope squirrel	ST	Arid grassy open stages with atriplex scrubland.	✓	✓	✓
<i>Dipodomys ingens</i>	Giant kangaroo rat	FE/SE	Found in gentle sloped sparse native grasslands and vegetation, arid, alkaline; require loose textured sandy soils for burrowing.	✓	✓	✓
<i>Dipodomys nitratoides brevinasus</i>	Short-nosed kangaroo rat	SSC	Prefers arid, often strongly alkaline, and flat plains with sparse vegetation of grasses and alkali forbs.	✓	✓	✓
<i>Dipodomys nitratoides nitratoides</i>	Tipton kangaroo rat	FE/SE	Prefers arid, often strongly alkaline, and flat plains with sparse vegetation of grasses and alkali forbs.	✓	✓	✓
<i>Sorex ornatus relictus</i>	Buena Vista Lake ornate shrew	FE/SSC	Wetland with dense cover, abundant layer of litter such as riparian areas near water in the southern San Joaquin Valley.			
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	FE/ST	Grassland or grassy open stages with scattered shrubby vegetation; requires loose textured sandy soils for burrowing; requires suitable prey base of small rodents.	✓	✓	✓
Birds						
<i>Agelaius tricolor</i>	Tricolored blackbird	ST	Typically requires open water, protected nesting substrate, and foraging grounds within vicinity of the nesting colony. Nests in dense thickets of cattails, tules, willow, blackberry, wild rose, and other tall herbs near fresh water. Also nests in agricultural crops.			
<i>Athene cunicularia</i>	Burrowing owl	SSC	Found in open grasslands with low vegetation and disturbed/ruderal habitat in urban areas.	✓	✓	✓
<i>Buteo swainsoni</i>	Swainson’s hawk	ST	Forages in open and agricultural fields and nests in mature trees usually in riparian corridors.			
<i>Charadrius alexandrinus nivosus</i>	Western snowy plover	FT/SSC	Found in wide stretches of sand without vegetation, which is required for nesting.			
Herps						
<i>Emys marmorata</i>	Western pond turtle	SSC	Require year-round water and emergent vegetation. Requires basking sites and suitable upland habitat for egg-laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.			
<i>Gambelia sila</i>	Blunt-nosed leopard lizard	FE/SE/FP	Found in semiarid grasslands, alkali flats, and washes. Prefers flat areas with open space for running and avoids densely vegetated areas.			

<i>Masticophis flagellum ruddocki</i>	San Joaquin coachwhip	SSC	Found in open, arid, grassland, and saltbush scrub. Refugia include rodent burrows.			
<i>Rana draytonii</i>	California red-legged frog	FT/SSC	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Needs underground refuges and vernal pools or other seasonal water sources.			
<i>Spea hammondi</i>	Western spadefoot	SSC	Occurs seasonally in grasslands, prairies, chaparral, woodlands, and in and around wet sites. Breeds in shallow and temporary pools formed by winter rains. Takes refuge in burrows.			
<i>Thamnophis gigas</i>	Giant garter snake	FT/ST	Found primarily in marshes, sloughs, drainage canals, and irrigation ditches, especially around rice fields and occasionally in slow-moving creeks in California's interior.			
Fish						
<i>Hypomesus transpacificus</i>	Delta smelt	FT/SE	Endemic to the upper Sacramento-San Joaquin Estuary of California, inhabiting the freshwater-saltwater mixing zone and migrates upstream into fresh water to spawn.			
Invertebrates						
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	FT	Found in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal pools, vernal lakes, vernal swales, and other types of seasonal wetlands.			
Plants						
<i>Atriplex coronata</i> var. <i>vallicola</i>	Lost hills crownscale	1B.2	Chenopod scrub and dried alkaline pools within scrub or grassland communities.	✓		
<i>Caulanthus californicus</i>	California jewelflower	FE/SE/1B.1	Chenopod scrub, pinyon and juniper woodland, and valley and foothill grasslands with sandy soils.	✓	✓	✓
<i>Delphinium recurvatum</i>	Recurved larkspur	1B.2	Perennial herb occurring in chenopod scrub, cismontane woodland, and in alkali valley and foothill grassland.	✓		
<i>Eremalche parryi</i> ssp. <i>kernensis</i>	Kern mallow	FE/1B.2	Found on eroded hillsides, alkali flats, and with chenopod scrubs, and valley and foothill grassland.	✓	✓	✓
<i>Eriastrum hooveri</i>	Hoover's eriastrum	4.2	Chenopod scrub, woodland, and valley and foothill grasslands.		✓	
<i>Monolopia congdonii</i>	San Joaquin woollythreads	1B.2	Chenopod scrub, valley and foothill grassland with alkaline loamy to sandy soils.		✓	✓

FE = Federally Endangered; SE = State Endangered; FT = Federally Threatened; ST = State Threatened; SSC = Species of Special Concern (State); FP = Fully Protected; 1B.1 = Highly endemic, rare throughout range, and seriously threatened in California; 1B.2 = Highly endemic, rare throughout range, and moderately threatened in California; 4.2 = Limited distribution or infrequent throughout a broader area in California, moderately threatened in California.

Survey Methods

Environmental Scientists from DWR's South Central Region Office conducted biological surveys at the request of DWR's Division of Operations and Maintenance for each liner raise site and the instrument installation site at MP 199.86. A preliminary reconnaissance survey was conducted on January 22, 2019. This reconnaissance survey and the generated potential special-status species list helped DWR staff determine the types of biological surveys needed. Biological surveys began on January 24, 2019, and continued through July 10, 2019. The survey area was comprised of the proposed Project footprint and a buffer of 530 meters (approximately 0.10 miles), except in the case of small mammal trapping where only the proposed Project site and 50-foot buffer was surveyed. Surveyed areas included MP 199.61 to MP 200.11, MP 207.84 to MP 208.21, and MP 209.00 to MP 210.41. All surveyed areas included both the left and right sides of the Aqueduct. A general habitat assessment and species-specific surveys were conducted. Surveys were conducted for burrowing owl and their burrows, blunt-nosed leopard lizard, listed small mammal and their burrows, and dens for San Joaquin kit fox and American badger. Targeted surveys for additional special-status species were not performed, but incidental observations of non-focal species were recorded.

Burrowing Owl Surveys

On January 24, 2019, reconnaissance wintering burrowing owl surveys were conducted at MP 205.76 to MP 206.06 and MP 207.94 to MP 210.31. Surveys were done both by windshield and on foot; surveyors looked both for owls and burrows with any owl sign. Wintering burrowing owl surveys were not conducted at the other Project sites because of a change in site locations that occurred after the survey.

Burrowing Owl Burrows and Canid Den Surveys

Burrowing owls were assumed to be present within the Project area after the reconnaissance survey was performed. Pedestrian burrow mapping surveys were conducted in each survey area to locate and document occupied or potentially-occupied burrowing owl burrows (burrows with sign such as whitewash, pellets, prey remains, or decoration). Canid and American badger den surveys were conducted concurrently. These surveys were performed on April 26, May 6, June 19, and June 21, 2019.

Blunt-nosed Leopard Lizard Surveys

Eight days of protocol-level blunt-nosed leopard lizard surveys were conducted in the survey areas from April 22, 2019, through July 10, 2019, using the CDFW *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard* (CDFW, 2004).

San Joaquin Antelope Squirrel Surveys

Eight days of San Joaquin antelope squirrel surveys were conducted concurrently with blunt-nosed leopard lizard surveys at each site.

Small Mammal and Burrow Surveys

Small mammal burrows were located within each of the proposed Project footprints. Therefore, trapping was conducted at each site. At MP 209.17 to MP 210.31, trapping was conducted from June 24, 2017, to June 29, 2019. At MP 199.71 to MP 200.01 and MP 207.94 to MP 208.11, trapping was conducted from July 8, 2019, to July 13, 2019. Trapping was conducted following the USFWS *Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats* (USFWS, 2013) and was authorized by USFWS (Reference No. 2014-TA-0380). Trapping was also conducted in compliance with CDFW Memorandum of Understanding and Scientific Collecting Permit SC-005720.

Survey Results

Burrowing Owls

No burrowing owls were observed during our winter burrowing owl survey or during surveys for other species.

Burrowing Owl Burrows and Canid Den Surveys

No burrowing owls, San Joaquin kit foxes, or American badgers were observed during these surveys. However, potential burrowing owl burrows and dens were observed at three survey areas (**Table 4**) (**Figure 2**, **Figure 3**, **Figure 4**).

Table 4. Potential Burrowing Owl Burrows and Canid or American Badger Dens

Project Site	Number of Burrowing Owl Burrows	Number of Dens
MP 199.71 to MP 200.01	2	6
MP 207.94 to MP 208.11	2	10
MP 209.17 to 210.31	2	32

Blunt-Nosed Leopard Lizard Surveys

No blunt-nosed leopard lizards were observed during protocol-level surveys or during any other surveys. Two lizard species were identified during the protocol-level surveys at all sites and three different snake species.

A total of 83 side-blotched lizard (*Uta stansburiana elegans*) observations and 39 western whiptail (*Aspidoscelis tigris munda*) observations were made in the MP 199.71 to 200.01 survey area. One Northern Pacific rattlesnake (*Crotalus oreganus oreganus*) was also observed.

A total of 61 side-blotched lizard observations and 32 western whiptail observations were made at the MP 207.94 to MP 208.11 survey area. One Northern Pacific rattlesnake was also observed.

A total of 208 side-blotched observations and 111 western whiptail observations were made at the MP 209.17 to MP 210.31 survey area. Two kingsnakes (*Lampropeltis californiae*) and one gopher snake (*Pituophis catenifer catenifer*) were also observed.

San Joaquin Antelope Squirrels

Two San Joaquin antelope squirrel observations were made. The first observation was in DWR's ROW on May 29, 2019, at MP 210.23L. The second observation was on the Aqueduct road shoulder at MP 210.31R on June 24, 2019 (**Figure 4**).

Small Mammal Trapping

The small mammal trapping surveys did not result in the capture of any federal or State-listed species. Two species were captured during protocol-level surveys.

A total of 10 Heermann's kangaroo rats (*Dipodomys heermanni*) were captured in the MP 199.71 to 200.01 survey area. No other small mammal species were captured in this area.

A total of 75 small mammals including 39 Heermann's kangaroo rats and 36 deer mice (*Peromyscus maniculatus*) were captured at the MP 207.94 to MP 208.11 survey area.

A total of 148 small mammals including 74 Heermann's kangaroo rats and 74 deer mice were captured at the MP 209.17 to MP 210.31 survey area.

Nesting Birds

Nesting cliff swallows (*Petrochelidon pyrrhonota*) were observed on the check station at MP 207.94, in the overchute at MP 208.11, and on the bridge at MP 210.31. Nesting ravens were present in the radio tower at MP 207.93L (**Figure 3**). Nesting western kingbirds (*Tyrannus verticalis*) were observed in a mesquite tree at MP 209.21L (**Figure 4**).

Listed or Rare Plant Species

Surveys for listed or rare plant species were not conducted. The proposed construction and staging footprint will be limited to areas of disturbed bare ground, compacted gravel, or pavement. Only ruderal or noxious plant species were observed in or near these areas during the general habitat assessment.

Figure 2. MP 199.84 to 200.01 Project Footprint, BNLL Survey Area and Burrows



Figure 3. MP 207.94 to 208.11 Project Footprint, BNLL Survey Area, Burrows, and Special-Status Species

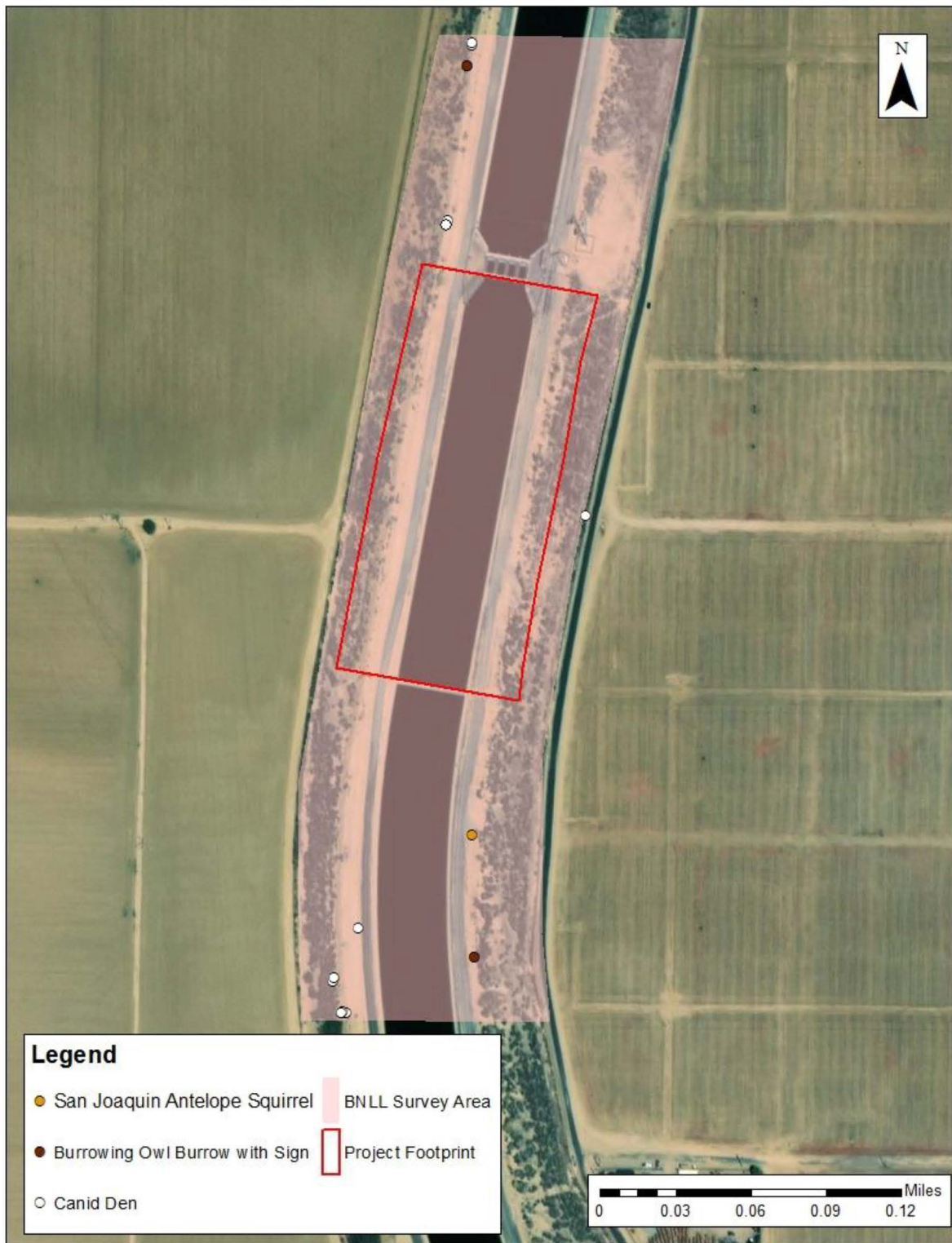
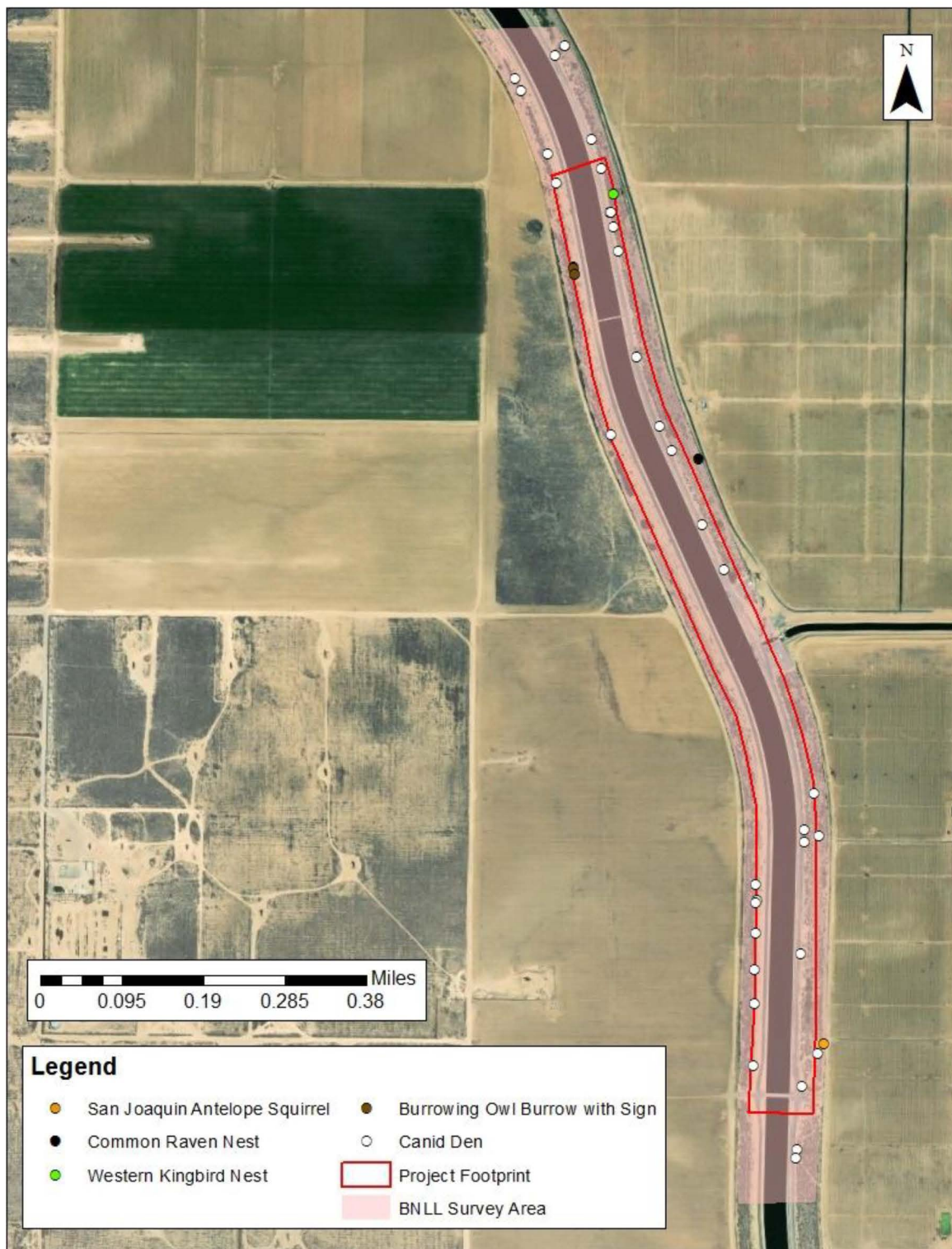


Figure 4. MP 209.17 to 210.31 Project Footprint, BNLL Survey Area, Burrows, Nesting Birds, and Special-Status Species



Discussion

Although no burrowing owls were observed, their sign was observed during winter reconnaissance surveys and summer burrowing owl surveys. According to the CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012), a burrow is considered occupied by a burrowing owl if sign was observed at the burrow within the last 3 years. Burrowing owl presence in the proposed Project sites is assumed because burrowing owl sign was observed during the surveys. Survey site MP 199.84 to 200.01 had one burrowing owl burrow adjacent to the project footprint, MP 207.94 to 208.11 had two burrowing owl burrows outside of the project footprint but still within the disturbance buffer, and MP 209.17 to 210.31 had two burrowing owl burrows within the project footprint.

Surveys for blunt-nosed leopard lizards were conducted in accordance with the CDFW approved protocol *Approved Survey Methodology for the Blunt-nosed Leopard Lizard* (CDFG 2004). It was determined that the Project falls within the “Disturbances for Maintenance Activities” provision of the protocol, therefore 8 days of adult blunt-nosed leopard lizard surveys were conducted at each site. No blunt-nosed leopard lizards or other special-status reptiles were observed.

San Joaquin antelope squirrel surveys were conducted concurrently with blunt-nosed leopard lizard surveys. Two San Joaquin antelope squirrels were observed at the MP 209.17 to MP 210.31 proposed Project site. Because the observations were made on opposite sides of the Aqueduct, it is assumed that the observations were two separate individuals.

San Joaquin kit fox and American Badger were not observed at the survey sites but a total of 48 potential dens were documented. No signs of San Joaquin kit fox or American badger such as scat, tracks, or scratch marks were observed at the den entrances.

DWR staff trapped in accordance with State and federal regulations and with approval from State and federal regulatory agencies. No threatened or endangered small mammal species were captured at any of the three proposed Project sites.

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Biological Resources Report

San Joaquin Field Division Instrumentation

Prepared for
California Department of Water Resources

September 2019



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BIOLOGICAL RESOURCES REPORT

San Joaquin Field Division Instrumentation

1.0 Introduction

Environmental Science Associates (ESA) with the support of Blackhawk Environmental and Aardvark Biological Services, LLC (Aardvark) completed vegetation mapping and focused and protocol level biological surveys for San Joaquin kit fox (*Vulpes macrotis mutica*, SJKF), San Joaquin antelope squirrel (*Ammospermophilus nelsoni*, SJAS), blunt-nosed leopard lizard (*Gambelia sila*, BNLL), burrowing owl (*Athene cunicularia*, BUOW), Tipton kangaroo rat (*Dipodomys nitratoide nitratoide*, TKR), and rare plant species. Surveys were conducted from May through July 2019 in support of California Department of Water Resources' (DWR's) subsidence instrumentation activities along the California Aqueduct in Kern and Kings County.

1.1 Project Location

The proposed project is located in Kern and Kings County (**Figure 1**). The surveys were conducted at five sites along the California Aqueduct and are located at Mile Posts (MPs) 175.16, 183.19, 196.58, 197.84, and 213.00, respectively. The project is located within the U.S. Geological Survey (USGS) Los Viejos, Avenal Gap, Antelope Plain, and Lost Hills 7.5-minute quadrangles (**Figure 2**). The survey area for each of the aforementioned species is described further in Section 2.2, Focused Field Surveys.

2.0 Methodology

2.1 Literature Review

The following literature was reviewed, and standard reference sources and databases were accessed to gather information on the natural resources and special-status species known or likely to occur in the survey area.

2.1.1 Databases and Sources

- CNDDDB database was queried for records of special-status wildlife species within 5 miles of each MP location.
- CDFW California Natural Diversity Database (CNDDDB). Database was queried for special-status plant records documented within the four United States Geological Survey (USGS) topographic quadrangles for each MP including the surrounding eight quadrangles, for a total of 22 quadrangles. These 22 quadrangles include: Antelope Plain, Lost Hills NW, Lost Hills NE, Blackwells Corner, Lost Hills, Semitropic, Carneros Rocks, Belridge, Lokern, La Cima, Kettleman City, Stratford Se, Kettleman Plain, Las Viejos, Dudley Ridge, Pyramid Hills, Avenal Gap, West Camp, Sawtooth Ridge, Emigrant Hill, Lonetree Well, and Shale Point.
- Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Database was queried for special-status plant records documented within the four United States Geological Survey (USGS) topographic quadrangles for each MP including the surrounding eight quadrangles, for a total of 22 quadrangles. These 22 quadrangles include: Antelope Plain, Lost Hills NW, Lost Hills NE, Blackwells Corner, Lost Hills, Semitropic, Carneros Rocks, Belridge, Lokern, La Cima, Kettleman City, Stratford Se, Kettleman Plain, Las Viejos, Dudley Ridge, Pyramid Hills, Avenal Gap, West Camp, Sawtooth Ridge, Emigrant Hill, Lonetree Well, and Shale Point. California Native Plant Society.
- *Probability of Occupancy of Blunt-nosed Leopard Lizards on Habitat Patches of Various Sizes in the San Joaquin Desert of California*. Western Wildlife.
- *Population ecology of Blunt-nosed Leopard Lizards in High Elevation Foothill Habitat*. Journal of Herpetology.
- *Blunt-nosed Leopard Lizard (Gambelia sila), 5-year Review, Summary and Evaluation*. USFWS.
- *Endangered Species Recovery Program. Recovery Plan for the Upland Species of the San Joaquin Valley, California. San Joaquin Antelope Squirrel (Ammospermophilus nelsoni)*. California State University Stanislaus.
- *Five-year Status Report for the San Joaquin Antelope Squirrel*. CDFW.
- *Analysis of San Joaquin Kit Fox Element Data with the California Diversity Database: A Case for Data Reliability*. Western Section of the Wildlife Society.
- *Endangered Species Recovery Program. Plan for the Upland Species of the San Joaquin Valley, California. San Joaquin Kit Fox (Vulpia macrotis mutica)*. California State University Stanislaus.

- *San Joaquin Kit Fox (Vulpes macrotis mutica) 5-Year Review: Summary and Evaluation.* USFWS.
- *Recovery Plan for the Upland Species of the San Joaquin Valley, California. Tipton Kangaroo Rat (Dipodomys nitratoide nitratoide).* California State University Stanislaus.
- *The Status of Tipton Kangaroo Rats and the Potential for their Recovery.* Western Section of the Wildlife Society.
- *Determination of the Endangered Status of the Tipton Kangaroo Rat. Final Rule.* USFWS.
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- *Biology of the Heteromyidae.* Special Publication Number 10, The American Society of Mammalogists. Brigham Young University.

2.1.2 Survey Protocols

- *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.* California Department of Fish and Wildlife (CDFW).
- *Staff Report on Burrowing Owl Mitigation.* CDFW.
- *California Department of Fish and Game Approved Survey Methodologies for Sensitive Species.* Wildlife Management Division, CDFG.
- *Approved Survey Methodology for the Blunt-nosed Leopard Lizard.* CDFG.
- *Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats.* USFWS.

2.2 Focused Field Surveys

Focused field surveys were conducted between May and July of 2019. The survey area for the vegetation mapping, rare plant surveys, and burrowing owl surveys comprise the approximately 660 feet by 165 feet project footprint plus a 500-foot buffer, excluding the California Aqueduct, areas west of the aqueduct, and areas outside of DWR's right-of-way. The survey area for SJKF,

SJAS, BNLL, and TKR at each MP includes an area within the approximately 660 feet by 165 feet project footprint and an established disturbance buffer that was determined in the field.

2.2.1 Vegetation Mapping and Rare Plants

All native and non-native plant communities and land uses were characterized and delineated on aerial photographs on-site conducted by ESA botanist Robert Sweet on June 11, 12, 13, 17, 18, 24, and 25, 2019, and then digitized on aerial maps using a Geographic Information System software (ArcGIS). Most descriptions of community and land use types were characterized in the field in accordance with *A Manual of California Vegetation-Second Edition* (Sawyer et al. 2009). The system of attributing classifications based typically on single or dual species dominance used in the *A Manual of California Vegetation-Second Edition* does not always provide specific nomenclature for communities dominated by nonnative or exotic species, or for ruderal (weedy) vegetation where several species are co-dominant or where dominance varies considerably in small patches. Therefore, as a practical consideration, vegetation communities may be described based on species dominance, as noted below in the descriptions of plant communities.

The focused rare plant survey effort comprised of seven separate field efforts taking place in June 2019. The survey area for rare plants is shown in **Figures 3a through 3e**. Rare plant surveys were performed concurrently with surveys for BNLL and BUOW. Pursuant to *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018), the initial survey completed on June 11, 2019 consisted of walking transects throughout the entire survey area to assess the quality of the habitat and to determine the potential for rare plants to occur within proposed impact areas (areas of interest). During subsequent site visits (June 12, 13, 17, 18, 24, and 25, 2019), instead of re-surveying the initial transects, the search effort was concentrated in previously noted areas of interest, where biologists determined suitable habitat for special-status plant species could be present.

2.2.2 Habitat Assessment

The quality of habitat for native wildlife was determined based on the abundance, health, and vigor of native plant communities; abundance and diversity of invasive plant species; level of disturbance from human created areas (California Aqueduct and paved and unpaved roads). A complete list of plant and animal species observed during all site visits was generated and provided in **Appendix B, Flora and Fauna Compendia**. Photos of all focused surveys are provided in **Appendix C, Photo Log**.

2.2.3 San Joaquin Kit Fox

Focused surveys for SJKF dens were conducted on June 10, 2019 at all five MPs using the CDFW *Approved Survey Methodologies for Sensitive Species* (CDFG 1989) as a guideline. The survey area for SJKF at each MP is shown in **Figures 4 through 8**. All burrow openings three inches or greater were considered potential SJKF dens. Potential SJKF dens were probed with a stick to determine if there was enough depth for occupancy, and inspected for SJKF diagnostic signs, including tracks, scat and prey remains. Between 2 to 4 biologists walked the perimeter of

the entire survey area as well as transects and stopped in areas of suitable habitat. Biologists used 10 x 42 binoculars to scan, view, and observe special-status species and vegetation. A CNDDDB query was completed for SJKF records within a five-mile radius of each MP (**Figure 9**).

2.2.4 San Joaquin Antelope Squirrel

Focused surveys for SJAS were conducted concurrently with other focused surveys on June 10 - 13, 17, 25, and 29, 2019 at each MP using the CDFW *Approved Survey Methodologies for Sensitive Species* (CDFG 1989) as a guideline. The survey area for SJAS at each MP is shown in **Figures 4 through 8**. Surveys were completed during SJAS's most active season (April 1 to September 30). A CNDDDB query was completed for SJAS records within a five-mile radius of each MP (**Figure 9**).

2.2.5 Blunt-Nosed Leopard Lizard

Surveys for BNLL were conducted on May 1 and 24 (by DWR staff) and June 10 - 13, 17, 24, and 25, 2019 and in compliance with CDFW's *Approved Survey Methodology for the Blunt-nosed Leopard Lizard* (CDFG 2004). The survey area for BNLL at each MP is shown in **Figures 4 through 8**. Survey methods and timing followed the guidelines with maintenance activities for a total of eight days at each MP between April 15 and July 15. Transects were spaced 10 to 30 meters apart depending on density of vegetation. A CNDDDB query was completed for BNLL records within a five-mile radius of each MP (**Figure 9**).

2.2.6 Tipton Kangaroo Rat

Trapping methods were conducted in accordance with the USFWS's *Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats* (USFWS 2013) from June 17 to 22 and June 24 to 29, 2019. The survey area for TKR is based on habitat suitability at each MP and shown in **Figures 10 through 14**. Sherman Extra Large Live Traps were placed around locations identified with potential kangaroo rat burrows and signs (tail drag, scat, tracks), and set with paper towels and proso millet (*Panicum miliaceum*). Giant kangaroo rats (*Dipodomys ingens*) were not surveyed for because no diagnostic giant kangaroo rat burrows were observed. A total of 117 traps (MP 175.16: 35 traps, MP 183.19: 25 traps, MP 196.58: 12 Traps, MP 197.84: 13 traps, MP 213.00: 32 traps) were set approximately one hour before sunset, checked and closed in the morning no later than one hour after sunrise each morning. A CNDDDB query was completed for TKR records within a five-mile radius of each MP (**Figure 15**).

2.2.7 Burrowing Owl

Focused surveys for BUOW were conducted on June 3, 6, 24, 25 and July 15, 2019 pursuant to guidelines provided in the *Staff Report on Burrowing Owl Mitigation* (Staff Report) (CDFG 2012) to the extent possible. The Staff Report requires 4 survey visits, with at least one site visit between February 15 and April 15, and a minimum of three survey visits at least three weeks apart between April 15 and July 15 (with at least one visit after June 15). Due to scheduling

constraints, the survey between February 15 and April 15 was not conducted, and not all surveys were conducted at least three weeks apart.

The survey area for BUOW is shown in **Figures 16a through 16e**. An initial habitat assessment was completed throughout the entire survey area to identify suitable burrowing owl habitat, and follow-up breeding season surveys were completed in an effort to further analyze presence/absence of the species onsite. As described in the staff report, line transects were conducted throughout all navigable portions of the survey area designated as suitable habitat during breeding season survey 1; transects were spaced 7 to 20 meters apart depending on site visibility. At the beginning of each transect and at least every 100 meters, the survey line was scanned, with binoculars, for sign of burrowing owls. Active/occupied burrows, or those that may be used by burrowing owls (based on size and morphology [>11 centimeters in diameter and >150 centimeters in depth]), positive sign (e.g., whitewash, feathers, prey pellets), prey species and/or burrowing owls observed during the surveys were documented using a Trimble Geo 7X Series Global Positioning System and mapped in ArcGIS. A CNDDDB query was completed for BUOW records within a five-mile radius of each MP (**Figure 17**).

3.0 Environmental Setting

The project and survey areas support disturbed habitat and developed uses including fallow land located within DWR's right-of-way, paved and unpaved roads, and orchards. DWR's right-of-way is situated on both sides of the California Aqueduct and is approximately 100-feet wide on each side. Within the survey area, the right-of-way consists of non-native herbaceous communities and natural vegetation communities which are further described below.

3.1 Vegetation Communities and Land Uses

As previously discussed in Section 2.2.1, the vegetation communities and non-vegetated areas were characterized and mapped within the survey area using *A Manual of California Vegetation-Second Edition*. The plant communities and other disturbed land use located within the survey area are described in detail below and are presented on **Figures 3a through 3e**.

Red Brome – *Bromus rubens* Herbaceous Semi-Natural Alliance. This annual grassland community is characterized as having an herbaceous layer dominated by red brome interspersed with various other species of grasses and forbs including: cheeseweed (*Malva parviflora*), Coulter's horseweed (*Laennecia coulteri*), fiddleneck (*Amsinckia* sp.), Kellogg's tarweed (*Deinandra kelloggii*), Russian thistle (*Kali tragus*), and sow thistle (*Sonchus* sp.).

Allscale scrub – *Atriplex polycarpa* Shrubland Alliance. This chenopod scrub community is characterized by a moderate to dense shrub layer dominated by allscale interspersed with a dense herbaceous layer composed of various grasses and forbes including: fiddleneck, red brome, valley spurge (*Euphorbia ocellata* ssp. *ocellata*), Kellogg's tarweed, Coulter's horseweed, cheeseweed, and Russian thistle.

Red Brome – Ripgut Brome – *Bromus rubens* – *Bromus diandrus* Herbaceous Semi-Natural Alliance. This annual grassland community is characterized as having an herbaceous layer co-dominated by red brome and ripgut brome interspersed with various other species of grasses and forbes including: cheeseweed, Coulter’s horseweed, fiddleneck, Kellogg’s tarweed, Russian thistle, and sow thistle. Allscale occurs in low numbers throughout this community as well.

Kellogg’s Tarweed Fields. This herbaceous community is characterized by an herbaceous layer dominated by Kellogg’s tarweed, interspersed throughout with various other grasses and forbs, including Coulter’s horseweed, fiddleneck, red brome, Russian thistle, and valley spurge.

Orchard. This area is described as an active orchard, primarily supporting commercial fruit and nut trees, with little other vegetative cover.

Disturbed. Disturbed areas were mapped in minimal areas throughout much of the survey area and includes paved/unpaved roadways and shoulders.

3.3 Soils

Based on the NRCS web soil survey, the survey area contains six soil series, including Cantua, Kimberlina, Milham, Panoche, Water, and Westhaven (**Figure 18a through 18e**) (NRCS 2018). A brief description of the soils mapped by NRCS within the survey area are described below.

Cantua coarse sandy loam, 5 to 15 percent slopes. This soil class consists of deep, somewhat excessively drained soils that formed in material weathered from sandstone. Cantua soils are on uplands and have slopes of 5 to 50 percent. Cantua soils are somewhat excessively drained, have medium runoff and moderately rapid permeability.

Kimberlina fine sandy loam, 0 to 2 percent slopes MLRA 17. Kimberlina soils consist of very deep, well drained soils on flood plains and recent alluvial fans. These soils formed in mixed alluvium derived dominantly from igneous and/or sedimentary rock sources. Slope is 0 to 9 percent. The soils are well drained, negligible to medium runoff and have moderately rapid and moderate permeability; however, saline-sodic phases and soils with sandy clay loam substratums have moderately slow permeability.

Milham sandy loam, 0 to 2 percent slopes MLRA 17. Milham soils consist of very deep, well drained soils on alluvial fans, plains, low terraces and fan remnants. These soils formed in mixed calcareous alluvium weathered from granitic and sedimentary rock. Slope is 0 to 9 percent. The soils are well drained, have low to high runoff (Milham soils under feedlots have very high runoff), and have moderately slow permeability (Milham soils under feedlots have very slow permeability).

Panoche loam, 0 to 2 percent slopes, MLRA 17 and Panoche clay loam, 0 to 2 percent slopes, MLRA 17. Panoche soils consist of very deep, well drained soils on alluvial fans and flood plains. These soils formed in loamy calcareous alluvium from sedimentary rock. Slope is 0

to 15 percent. Panoche soils are well drained, have negligible to medium runoff, and have moderate permeability.

Water. A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. According to the NRCS web soil survey, a map unit of “Water” is known to be comprised of water based on observations, descriptions, and transects of the map unit.

Westhaven loam, 2 to 5 percent slopes. Westhaven soils consist of very deep, well drained soils that formed in stratified mixed alluvium weathered from sedimentary and/or igneous rocks. Westhaven soils are on alluvial fans and flood plains. Slope is 0 to 5 percent. These soils are well drained, has low runoff and moderately slow permeability. These soils are subject to very rare to occasional flooding in some places, in others they are protected by dams and levees.

3.4 Special-Status Species

Special-status species are defined as those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies as under threat from human-associated actions. Some of these species receive specific protections that are defined by federal or state endangered species legislation. Others have been designated as special-status on the basis of adopted policies of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. Wildlife and plants can be designated as special-status species in several ways:

- **Federal Endangered Species Act (ESA):** Species listed or proposed for listing as “threatened” or “endangered”, or as a “candidate” for possible future listing as threatened or endangered; “critical habitat” can be designated for listed species; USFWS currently oversees the listing and protection of federally listed species in the survey area;
- **California ESA:** Species listed or proposed for listing as “threatened” or “endangered”, or are a “candidate” for possible future listing as threatened or endangered; CDFW currently oversees the listing and protection of state listed species in the survey area;
- **California Environmental Quality Act (CEQA) Guidelines, Section 15380:** Species that meet the definitions of “rare” or “endangered”, as defined in Section 15380 of the CEQA Guidelines; and/or
- **California Department of Fish and Wildlife (CDFW):** Species designated by CDFW as “species of special concern” and species on the watch list for listing to the California ESA; and species identified as “fully protected” under the California Fish and Game Code; Sections 3511, 4700, and 5050.

3.4.1 Special-Status Plants

Special-status plants are generally not expected to occur in the survey area due to the high level of habitat degradation associated with developed and maintained areas. CNDDB and CNPS records that intersect with the survey area include several special-status plants. These species are

presented in **Appendix D**. A summary of the listing status for each of these species, as well as their likelihood of occurrence in the survey and survey area is presented in **Table 1**. The “Potential for Occurrence” as described in **Table 1** is defined as follows:

- **Low Potential:** The survey area and/or immediate vicinity only provide limited habitat for a particular species. In addition, the survey area may lie outside the known range for a particular species. **Moderate Potential:** The survey area and/or immediate vicinity provide suitable habitat for a particular species.
- **High Potential:** The survey area and/or immediate vicinity provide high-quality or ideal habitat (i.e., soils, vegetation assemblage, and topography) for a particular species.

A review of the CNDDB (CDFW 2019) and the CNPS Inventory of Rare and Endangered Plants (CNPS 2019) revealed a total of 25 special-status plant species recorded within the 22 USGS quadrangles that were searched. The potential for special-status plant species to occur is based on on-site vegetation and habitat quality, topography, elevation, soils, surrounding land uses, habitat preferences, geographic ranges and visual observations made during the focused sensitive plant surveys.

As indicated in **Table 1**, a total of eight special-status plant species (moderate potential), Howell’s onion (*Allium howellii* var. *howellii*), forked fiddleneck (*Amsinckia furcata*), Earlimart orache (*Atriplex cordulata* var. *erecticaulis*), California jewelflower (*Caulanthus californicus*), San Joaquin woollythreads (*Monolopia congdonii*), California alkali grass (*Puccinellia simplex*), San Joaquin bluecurls (*Trichostema ovatum*), king’s gold (*Tropidocarpum californicum*) have a moderate potential to occur within the survey area. None of the special-status species listed on the CNDDB or CNPS have a high potential to occur within the survey area.

TABLE 1
POTENTIALLY OCCURRING SPECIAL-STATUS PLANT SPECIES

Common Name	Scientific Name	Status ¹ (Federal/State/Other)	Habitat ¹	Blooming Period	Potential to Occur within the Survey Area
Howell’s onion	<i>Allium howellii</i> var. <i>howellii</i>	None/None/4.3	Found clay or serpentinite soils and valley and foothill grasslands.	April-June	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland and herbaceous communities within survey area. The nearest occurrence was recorded in 1952 (CNPS 2019).
Forked fiddleneck	<i>Amsinckia furcata</i>	None/None/4.2	Found in cismontane woodlands and valley and foothill grasslands.	February-May	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual

¹ Cal Flora. 2019.

Common Name	Scientific Name	Status ¹ (Federal/State/Other)	Habitat ¹	Blooming Period	Potential to Occur within the Survey Area
Horn's milk vetch	<i>Astragalus hornii</i> <i>var. hornii</i>	None/None/1B.1	Found in lake margins, meadows, seeps, and playas.	May-October	grassland and herbaceous communities within survey area. The nearest occurrence was recorded in 1936 (CNPS 2019). Low potential to occur. Suitable habitat does not occur within the survey area. The nearest occurrence was recorded in 1952 near the Highway 5 and Highway 46 confluence (CNPS 2019).
Heartscale	<i>Atriplex cordulata</i> var. <i>cordulata</i>	None/None/1B.2	Found in saline or alkaline soils. Habitats include chenopod scrub, meadows, seeps, valley and foothill grasslands.	April-October	Low potential to occur. Suitable habitat within survey area. The nearest occurrence was recorded in 1995 (CNPS 2019).
Earlimart orache	<i>Atriplex cordulata</i> var. <i>erecticaulis</i>	None/None/1B.2	Found in valley and foothill grasslands.	August-September	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland and herbaceous communities within survey area. The nearest occurrence was recorded in 1995 (CNPS 2019).
Crownscale	<i>Atriplex coronata</i> var. <i>coronata</i>	None/None/4.2	Found in alkaline and clay soils. Habitats include chenopod scrub, valley and foothill grasslands, and vernal pools.	March-October	Low potential to occur. Suitable habitat exists within the survey area. The nearest occurrence was recorded in 1987 (CNPS 2019).
San Jacinto Valley crownscale	<i>Atriplex coronata</i> var. <i>notatior</i>	FE/None/1B.1	Found in alkaline soils. Habitats include playas, vernal pools, valley and foothill grassland.	April-August	Low potential to occur. Suitable habitat not within the survey area. Species is prominent in Riverside County (CNPS 2019).
Lost Hills crownscale	<i>Atriplex coronata</i> var. <i>vallicola</i>	None/None/1B.2	Found in alkaline soils. Habitats include chenopod scrub, valley and	April-September	Low potential to occur. Suitable habitat not within the survey area.

Common Name	Scientific Name	Status ¹ (Federal/State/Other)	Habitat ¹	Blooming Period	Potential to Occur within the Survey Area
lesser saltscale	<i>Atriplex minuscula</i>	None/None/1B.1	foothill grassland, and vernal pools. Found in alkaline and sandy soils. Habitats include chenopod scrub, playas, and valley and foothill grasslands.	May-October	Nearest occurrence was recorded in 1937 (CNPS 2019). Low potential to occur. Suitable habitat occurs on site. Species has not been recorded within the survey area and the nearest occurrence was in 1991.
California jewelflower	<i>Caulanthus californicus</i>	FE/CE/1B.1	Found in sandy soils. Habitats include chenopod scrub, pinyon and juniper woodland, and valley and foothill grasslands.	February-May	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland, chenopod and herbaceous communities within survey area. The nearest occurrence was in 1988 (CNPS 2019).
Recurved larkspur	<i>Delphinium recurvatum</i>	None/None/1B.2	Found in alkaline soils. Habitats include chenopod scrub, cismontane woodland, and valley and foothill grasslands.	March-June	Low potential to occur. Suitable habitat occurs within the survey area; however, no CNPS or CNDDDB occurrences have been recorded within the survey area. The nearest occurrence was in 2005 at the confluence of Highway 5 and Highway 46.
Kern mallow	<i>Eremalche parryi</i> ssp. <i>kernensis</i>	FE/None/1B.2	Found on dry, open sandy to clay soils; often at edge of balds. Habitats include chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland.	January, March, April, and May.	Low potential to occur. The nearest occurrences to the survey area were in 1954 and 1965 (CNPS 2019). Suitable habitat does not exist within the survey area.
Hoover's eriastrum	<i>Eriastrum hooveri</i>	None/None/4.2	Found sometimes in gravelly soils. Habitats include chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland.	March-July	Low potential to occur. Species falls within elevation range; however, species has not been observed within survey area.
Munz's tidy-tips	<i>Layia munzii</i>	None/None/1B.2	Habitats include chenopod scrub	March-April	Low potential to occur. Grassland

Common Name	Scientific Name	Status ¹ (Federal/State/Other)	Habitat ¹	Blooming Period	Potential to Occur within the Survey Area
			and valley and foothill grassland.		communities could potentially support this species. Species has not been observed within survey area and falls under of elevation range.
Jared's pepper-grass	<i>Lepidium jaredii</i> <i>ssp. jaredii</i>	None/None/1B.2	Habitats include valley and foothill grasslands.	March-May	Low potential to occur. One occurrence was observed and recorded in Kern County in 1989 (CNPS 2019). Survey area does not support suitable habitat.
Showy madia	<i>Madia radiata</i>	None/None/1B.1	Habitats include cismontane woodland and valley and foothill grasslands.	March-May	Low potential to occur. Suitable habitat does not occur within the survey area and there have been no CNDDDB or CNPS observations within the survey area.
San Joaquin woollythreads	<i>Monolopia congdonii</i>	FE/None/1B.2	Habitats include chenopod scrub and valley and foothill grasslands.	February-May	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland, chenopod scrub and herbaceous communities within survey area. Additionally, numerous occurrences have been recorded near the intersection of Highway 5 and Highway 46 (outside of survey area) (CNPS 2019).
California alkali grass	<i>Puccinellia simplex</i>	None/None/1B.2	Found in alkaline and vernal mesic soils; sinks, flats, and lake margins. Habitats include chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools.	March-May	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented annual grassland, chenopod scrub and herbaceous communities within survey area.
San Joaquin bluecurls	<i>Trichostema ovatum</i>	None/None/4.2	Habitats include chenopod scrub and valley and	July-October	Moderate potential to occur. Marginal suitable

Common Name	Scientific Name	Status ¹ (Federal/State/Other)	Habitat ¹	Blooming Period	Potential to Occur within the Survey Area
			foothill grasslands.		habitat is present throughout the fragmented annual grassland, chenopod scrub and herbaceous communities within survey area.
Kings gold	<i>Tropidocarpum californicum</i>	None/None/1B.1	Habitats include chenopod scrub.	February-March	Moderate potential to occur. Marginal suitable habitat is present throughout the fragmented chenopod scrub within survey area.

¹ Federal/State/Other Status: FT – federally threatened, SE – State endangered; California Native Plant Society (CNPS) Rare Plant Ranks 1B – Plants rare, threatened or endangered in California and elsewhere, 2 – Plants rare, threatened or endangered in California, but more common elsewhere, and 4 – Plants of limited distribution; CNPS Threat Ranks 0.1 – Seriously threatened in California (over 80 percent of occurrences threatened/high degree and immediacy of threat), 0.2 – Moderately threatened in California (20-80 percent of occurrences threatened/moderate degree and immediacy of threat), and 0.3 – Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known).

4.0 Results

4.1 Rare Plant Surveys

No special-status plant species were observed during the focused rare plant surveys conducted within the survey area; however, the rare plant surveys were conducted in early June of 2019, which was the appropriate blooming period for Howell's onion but not the other seven plant species with a moderate potential to occur in the survey area. The full list of observed plant species can be found in Appendix B. Dominant plant species observed during the rare plant surveys include, but are not limited to, the following: annual ragweed (*Ambrosia acanthicarpa*), alkali goldenbush (*Isocoma acradenia*), vinegarweed (*Trichostema lanceolatum*), ripgut brome (*Bromus diandrus*), red brome (*Bromus rubens*), Russian thistle (*Salsola tragus*), and cattle spinach (*Atriplex polycarpa*).

4.2 San Joaquin Kit Fox Den Surveys

No occupied SJKF dens were detected during the survey effort. A total of 24 potential dens were identified in the survey area (13 at MP 175.16, three at 183.19, four at MP 196.58, one at MP 197.84, and three at 213.00) (**Figures 4 through 8**), however, all of the potential dens either terminated within a few feet or did not have any diagnostic SJKF signs present. The survey was conducted between the hours of 7:30 am and 10:04 am. During the surveys, approximate temperatures ranged between 79-95 degrees Fahrenheit (°F) and winds averaged less than one to three miles per hour (mph). SJKF den survey results are outlined below in **Table 2**.

TABLE 2
SAN JOAQUIN KIT FOX DEN SURVEY RESULTS

Date	Location	Start Time	End Time	Ambient Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Potential Dens Observed
06/10/19	MP 213.00	0804	0837	Start: 82 End: 88	Start: 1-3 End: 1-3	80	Christa Collin Steven Chen Karina Lazo-Ordonez Karla Flores	3 (dens either terminated within a few feet or did not have any diagnostic SJKF signs present)
06/10/19	MP 197.84	0910	0939	Start: 88 End: 93	Start: 1-3 End: 1-3	80	Christa Collin Steven Chen Karina Lazo-Ordonez Karla Flores	1 (den either terminated within a few feet or did not have any diagnostic SJKF signs present)
06/10/19	MP 196.58	0946	1004	Start: 93 End: 95	Start: 1-3 End: 1-3	80	Christa Collin Steven Chen Karina Lazo-Ordonez Karla Flores	4 (dens either terminated within a few feet or did not have any diagnostic SJKF signs present)
06/10/19	MP 183.19	0835	0915	Start: 85.2 End: 87.3	Start: <1 End: <1	80	Alex Single Sean Clark	3 (dens either terminated within a few feet or did not have any diagnostic SJKF signs present)
06/10/19	MP 175.16	0730	0800	Start: 78.7 End: 83.9	Start: <1 End: <1	80	Alex Single Sean Clark	13 (dens either terminated within a few feet or did not have any diagnostic SJKF signs present)

4.3 San Joaquin Antelope Squirrel Surveys

No SJAS were detected during the survey effort. However, during the SJAS surveys, incidental wildlife observations were noted and included the same species observed during the BNLL surveys since SJAS and BNLL surveys were performed concurrently (see Section 4.4). Surveys were completed when ambient temperatures were between 68-86 °F. Transects were spaced 10-30 meters apart depending on density of vegetation. Wind speeds averaged between less than one and seven mph and cloud cover ranged from 0-80 percent. SJAS survey results are outlined below in **Tables 3-7**.

TABLE 3
MP 175.16 SAN JOAQUIN ANTELOPE SQUIRREL SURVEY RESULTS

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
06/10/19	0730	0800	Start: 78.7 End: 83.9	Start: <1 End: <1	80	Alex Single Sean Clark	2 <i>Uta stansburiana</i>
06/11/19	0800	0825	Start: 83.4 End: 90.5	Start: <1 End: <1	25	Alex Single Sean Clark	2 <i>Uta stansburiana</i>
06/12/19	0650	0715	Start: 79.2 End: 82.6	Start: 1-3 End: <1	10	Alex Single Sean Clark Robbie Sweet	1 <i>Uta stansburiana</i>

TABLE 4
MP 183.19 SAN JOAQUIN ANTELOPE SQUIRREL SURVEY RESULTS

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
06/10/19	0835	0915	Start: 85.2 End: 87.3	Start: <1 End: <1	80	Alex Single Sean Clark	None
06/11/19	0705	0735	Start: 81.2 End: 88.1	Start: <1 End: <1	25	Alex Single Sean Clark	2 <i>Uta stansburiana</i> 1 <i>Crotalus oreganus</i>
06/12/19	0735	0810	Start: 85.5 End: 91.2	Start: 1-3 End: 1-3	5	Alex Single Sean Clark Robbie Sweet	2 <i>Uta stansburiana</i>

TABLE 5
MP 196.58 SAN JOAQUIN ANTELOPE SQUIRREL SURVEY RESULTS

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
06/11/19	0705	0730	Start: 77.1 End: 79.0	Start: 1-3 End: 1-3	10	Juan Arellano Kyle Tabor Karina Lazo-Ordonez Karla Flores	4 <i>Uta stansburiana</i>
06/13/19	0752	0820	Start: 82 End: 85	Start: 4-7 End: 4-7	0	Leah Parrilla Steven Chen Karina Lazo-Ordonez Karla Flores	5 <i>Aspidoscelis tigris</i> 8 <i>Uta stansburiana</i> 1 <i>Crotalus oreganus</i>

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
06/25/19	0805	0826	Start: 80	Start: 4-7	10	Alex Single Max Weber	1 <i>Aspidoscelis tigris</i>
			End: 81	End: 1-3		Robbie Sweet	2 <i>Uta stansburiana</i>

TABLE 6
MP 197.84 SAN JOAQUIN ANTELOPE SQUIRREL SURVEY RESULTS

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
06/13/19	0717	0742	Start: 78	Start: 1-3	0	Leah Parrilla	7 <i>Aspidoscelis tigris</i>
			End: 83	End: 1-3		Steven Chen	7 <i>Uta stansburiana</i>
						Karina Lazo-Ordonez	1 <i>Crotalus oreganus</i>
						Karla Flores	
06/25/19	0735	0756	Start: 77	Start: 4-7	10	Alex Single	6 <i>Uta stansburiana</i>
			End: 80	End: 4-7		Max Weber	
						Robbie Sweet	
06/29/19	0605	0622	Start: 68.2	Start:	-	Juan Arellano	None
			End: 68.6	End:		Karla Flores	

TABLE 7
MP 213.00 SAN JOAQUIN ANTELOPE SQUIRREL SURVEY RESULTS

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
06/11/19	0841	0911	Start: 83.9	Start: 1-3	30	Juan Arellano	1 <i>Aspidoscelis tigris</i>
			End: 87.5	End: <1		Kyle Tabor	13 <i>Uta stansburiana</i>
						Karina Lazo-Ordonez	1 <i>Lampropeltis getula</i>
						Karla Flores	
06/12/19	0700	0727	Start: 78	Start: 1-3	10	Juan Arellano	5 <i>Uta stansburiana</i>
			End: 82	End: <1		Steven Chen	1 <i>Masticophis flagellum ruddocki</i>
						Karina Lazo-Ordonez	
						Karla Flores	
06/17/19	0954	1025	Start: 78	Start: 1-3	0	Alex Single	2 <i>Aspidoscelis tigris</i>
			End: 82	End: 4-7		Max Weber	5 <i>Uta stansburiana</i>
						Robbie Sweet	

4.4 Blunt-Nosed Leopard Lizard Surveys

No BNLL were detected during the survey effort. However, during the BNLL surveys, incidental wildlife observations were noted. The California species of special concern San Joaquin coachwhip (*Masticophis flagellum ruddocki*) was detected during survey efforts at MP 213.00 (35.512677°, -119.651377°). Non-special status side-blotched lizard (*Uta stansburiana*), western whiptail (*Aspidoscelis tigris*), gopher snake (*Pituophis catenifer*), Northern Pacific rattlesnake (*Crotalus oreganus*), and California kingsnake (*Lampropeltis getula*) were also detected during the survey effort. Approximate temperatures ranged between 77-95 °F and winds averaged less than one to seven mph; however, surveys were only conducted during appropriate ambient temperatures in accordance with the survey protocol. Cloud cover ranged from 0-80 percent. BNLL survey results are outlined below in **Tables 8-12**.

TABLE 8
MP 175.16 BLUNT-NOSED LEOPARD LIZARD SURVEY RESULTS

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Soil Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
05/01/19	1138	1204	Start: 83.4 End: 85.8	Start: 108 End: 113.3	Start: 1-3 End: 4-7	15	Andrew Isner Nicholas Teague Foung Vang Marina Raya	1 <i>Aspidoscelis tigris</i> 8 <i>Uta stansburiana</i>
05/24/19	1050	1105	Start: 79.9 End: 78.4	Start: 78.2 End: 86.5	Start: <1 End: 1-3	40	Alex Single Courtney Wilson Marina Raya	3 <i>Aspidoscelis tigris</i> 3 <i>Uta stansburiana</i>
06/10/19	0730	0800	Start: 78.7 End: 83.9	Start: 80 End: 81	Start: <1 End: <1	80	Alex Single Sean Clark	2 <i>Uta stansburiana</i>
06/11/19	0800	0825	Start: 83.4 End: 90.5	Start: 82 End: 85	Start: <1 End: <1	25	Alex Single Sean Clark	2 <i>Uta stansburiana</i>
06/12/19	0650	0715	Start: 79.2 End: 82.6	Start: 80 End: 80	Start: 1-3 End: <1	10	Alex Single Sean Clark Robbie Sweet	1 <i>Uta stansburiana</i>
06/13/19	0820	0845	Start: 80.9 End: 86.1	Start: 80 End: 80	Start: 1-3 End: <1	0	Alex Single Sean Clark Robbie Sweet	1 <i>Uta stansburiana</i>
06/24/19	0725	0747	Start: 77 End: 78	Start: 75 End: 75	Start: <1 End: 1-3	5	Alex Single Max Weber Robbie Sweet	4 <i>Uta stansburiana</i>

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Soil Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
06/25/19	0942	1005	Start: 84 End: 85	Start: 86 End: 88	Start: <1 End: 1-3	10	Alex Single Max Weber Robbie Sweet	1 <i>Aspidoscelis tigris</i> 2 <i>Uta stansburiana</i>

TABLE 9
MP 183.19 BLUNT-NOSED LEOPARD LIZARD SURVEY RESULTS

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Soil Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
05/01/19	1239	1250	Start: 82 End: 84.6	Start: 126.3 End: 116.6	Start: 4-7 End: 4-7	15	Andrew Isner Nicholas Teague Foung Vang Marina Raya	None
05/24/19	1058	1111	Start: 84.5 End: 84.5	Start: 100.0 End: 95.8	Start: 1-3 End: 4-7	30	Guillermo Coronado Foung Vang	2 <i>Uta stansburiana</i>
06/10/19	0835	0915	Start: 85.2 End: 87.3	Start: 83.5 End: 84.5	Start: <1 End: <1	80	Alex Single Sean Clark	None
06/11/19	0705	0735	Start: 81.2 End: 88.1	Start: 80.2 End: 82.0	Start: <1 End: <1	25	Alex Single Sean Clark	2 <i>Uta stansburiana</i> 1 <i>Crotalus oreganus</i>
06/12/19	0735	0810	Start: 85.5 End: 91.2	Start: 83.5 End: 85.6	Start: 1-3 End: 1-3	5	Alex Single Sean Clark Robbie Sweet	2 <i>Uta stansburiana</i>
06/13/19	0730	0755	Start: 77.0 End: 82.9	Start: 80 End: 80	Start: 1-3 End: 1-3	5	Alex Single Sean Clark Robbie Sweet	1 <i>Uta stansburiana</i>
06/24/19	0820	0841	Start: 81 End: 82.5	Start: 78 End: 79	Start: <1 End: 1-3	5	Alex Single Max Weber Robbie Sweet	1 <i>Uta stansburiana</i>
06/25/19	0905	0925	Start: 83 End: 84	Start: 85 End: 85	Start: 1-3 End: 1-3	10	Alex Single Max Weber Robbie Sweet	4 <i>Uta stansburiana</i>

TABLE 10
MP 196.58 BLUNT-NOSED LEOPARD LIZARD SURVEY RESULTS

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Soil Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
05/01/19	1328	1337	Start: 84.7 End: 84.2	Start: 113.9 End: 112.2	Start: 1-3 End: 1-3	15	Andrew Isner Nicholas Teague Foung Vang Marina Raya	4 <i>Uta stansburiana</i> 8 Unknown
05/24/19	1148	1205	Start: 90.7 End: 83.3	Start: 81.4 End: 90.8	Start: 1-3 End: 1-3	30	Alex Single Courtney Wilson Marina Raya	6 <i>Aspidoscelis tigris</i> 1 <i>Uta stansburiana</i> 1 Unknown
06/10/19	0946	1004	Start: 93 End: 95	Start: 104 End: 118	Start: 1-3 End: 1-3	80	Christa Collin Steven Chen Karina Lazo-Ordonez Karla Flores	9 <i>Aspidoscelis tigris</i> 10 <i>Uta stansburiana</i>
06/11/19	0705	0730	Start: 77.1 End: 79.0	Start: 80.9 End: 79.2	Start: 1-3 End: 1-3	10	Juan Arellano Kyle Tabor Karina Lazo-Ordonez Karla Flores	4 <i>Uta stansburiana</i>
06/13/19	0752	0820	Start: 82 End: 85	Start: 82 End: 89	Start: 4-7 End: 4-7	0	Leah Parrilla Steven Chen Karina Lazo-Ordonez Karla Flores	5 <i>Aspidoscelis tigris</i> 8 <i>Uta stansburiana</i> 1 <i>Crotalus oreganus</i>
06/17/19	0843	0906	Start: 77 End: 77	Start: 73 End: 74	Start: 1-3 End: 1-3	0	Alex Single Max Weber Robbie Sweet	2 <i>Aspidoscelis tigris</i> 3 <i>Uta stansburiana</i>
06/24/19	0915	0938	Start: 86 End: 87	Start: 93 End: 93	Start: <1 End: 1-3	0	Alex Single Max Weber Robbie Sweet	3 <i>Uta stansburiana</i>
06/25/19	0805	0826	Start: 80 End: 81	Start: 80 End: 84	Start: 4-7 End: 1-3	10	Alex Single Max Weber Robbie Sweet	1 <i>Aspidoscelis tigris</i> 2 <i>Uta stansburiana</i>

TABLE 11
MP 197.84 BLUNT-NOSED LEOPARD LIZARD SURVEY RESULTS

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Soil Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
05/01/19	1343	1352	Start: 86.5 End: 87.7	Start: 101.8 End: 109.2	Start: 1-3 End: <1	15	Andrew Isner Nicholas Teague Foung Vang Marina Raya	3 <i>Uta stansburiana</i> 1 Unknown
05/24/19	1146	1201	Start: 78.4 End: 82.9	Start: 105.9 End: 106.1	Start: 1-3 End: 4-7	30	Guillermo Coronado Foung Vang	2 <i>Aspidoscelis tigris</i> 2 <i>Uta stansburiana</i> 1 Unknown
06/10/19	0910	0939	Start: 88 End: 93	Start: 94 End: 101	Start: 1-3 End: 1-3	80	Christa Collin Steven Chen Karina Lazo-Ordonez Karla Flores	6 <i>Aspidoscelis tigris</i> 15 <i>Uta stansburiana</i>
06/11/19	0740	0800	Start: 85.0 End: 91.3	Start: 89.2 End: 83.6	Start: 1-3 End: 1-3	10	Juan Arellano Kyle Tabor Karina Lazo-Ordonez Karla Flores	2 <i>Aspidoscelis tigris</i> 10 <i>Uta stansburiana</i> 1 <i>Pituophis catenifer</i>
06/12/19	0910	0939	Start: 91 End: 93	Start: 110 End: 118	Start: 1-3 End: 1-3	0	Juan Arellano Steven Chen Karina Lazo-Ordonez Karla Flores	8 <i>Aspidoscelis tigris</i> 13 <i>Uta stansburiana</i>
06/13/19	0717	0742	Start: 78 End: 83	Start: 76 End: 85	Start: 1-3 End: 1-3	0	Leah Parrilla Steven Chen Karina Lazo-Ordonez Karla Flores	7 <i>Aspidoscelis tigris</i> 7 <i>Uta stansburiana</i> 1 <i>Crotalus oreganus</i>
06/24/19	0950	1010	Start: 87 End: 88	Start: 93 End: 99	Start: 1-3 End: 1-3	0	Alex Single Max Weber Robbie Sweet	2 <i>Uta stansburiana</i>
06/25/19	0735	0756	Start: 77 End: 80	Start: 80 End: 80	Start: 4-7 End: 4-7	10	Alex Single Max Weber Robbie Sweet	6 <i>Uta stansburiana</i>

TABLE 12
MP 213.00 BLUNT-NOSED LEOPARD LIZARD SURVEY RESULTS S

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Soil Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
05/02/19	1134	1144	Start: 81.6 End: 91.6	Start: 92.6 End: 101.8	Start: 1-3 End: 1-3	0	Foung Vang Nicholas Teague Guillermo Coronado Marina Raya	2 <i>Uta stansburiana</i> 2 Unknown
05/08/19	1250	1300	Start: 88.4 End: 93.9	Start: 102.7 End: 130.7*	Start: 1-3 End: 1-3	10	Foung Vang Courtney Wilson Nicholas Teague Alex Single	1 <i>Aspidoscelis tigris</i> 3 <i>Uta stansburiana</i> 2 Unknown
05/14/19	1057	1108	Start: 84.9 End: 88.3	Start: 85.4 End: 93.4	Start: 1-3 End: 1-3	15	Guillermo Coronado Foung Vang Andrew Isner Alex Single	3 <i>Aspidoscelis tigris</i> 5 <i>Uta stansburiana</i>
* End soil temperature was taken in the survey area where there was a high density of dark biocrust.								
06/10/19	0804	0837	Start: 82 End: 88	Start: 79 End: 81	Start: 1-3 End: 1-3	80	Christa Collin Steven Chen Karina Lazo-Ordonez Karla Flores	17 <i>Uta stansburiana</i>
06/11/19	0841	0911	Start: 83.9 End: 87.5	Start: 80.4 End: 81.5	Start: 1-3 End: <1	30	Juan Arellano Kyle Tabor Karina Lazo-Ordonez Karla Flores	1 <i>Aspidoscelis tigris</i> 13 <i>Uta stansburiana</i> 1 <i>Lampropeltis getula</i>
06/12/19	0700	0727	Start: 78 End: 82	Start: 76 End: 80	Start: 1-3 End: <1	10	Juan Arellano Steven Chen Karina Lazo-Ordonez Karla Flores	5 <i>Uta stansburiana</i> 1 <i>Masticophis flagellum ruddocki</i>
06/17/19	0954	1025	Start: 78 End: 82	Start: 75 End: 77	Start: 1-3 End: 4-7	0	Alex Single Max Weber Robbie Sweet	2 <i>Aspidoscelis tigris</i> 5 <i>Uta stansburiana</i>

Date	Start Time	End Time	Ambient Temperature °Fahrenheit	Soil Temperature °Fahrenheit	Wind miles per hour	Cloud Cover %	Biologists	Species Observed
06/18/19	0745	0825	Start: 78 End: 80	Start: 77 End: 78	Start: <1 End: 1-3	0	Alex Single Max Weber Robbie Sweet	6 <i>Aspidoscelis tigris</i> 8 <i>Uta stansburiana</i>

4.5 Tipton Kangaroo Rat Surveys

No TKR or other special-status species were detected during the survey effort. However, during the TKR surveys, incidental captures were noted. The non-special status Heermann's kangaroo rat (*Dipodomys heermanni*), deer mouse (*Peromyscus maniculatus*) and California kingsnake (*Lampropeltis getula*) were captured during the survey effort. Approximate temperatures ranged between 61-96 °F and winds averaged 1-18 mph. Cloud cover ranged from clear to partly cloudy. The locations of the 177 traps within the survey area is presented on **Figures 10 through 14**. Survey results are outlined below in **Table 13**. As shown in **Table 13**, Heermann's kangaroo rat and deer mouse were captured at MP 175.16; Heermann's kangaroo rat was captured at MP 183.19; and Heermann's kangaroo rat, deer mouse, and California kingsnake were captured at MP 213.00. There were no captures at MP 196.58 or MP 197.84.

TABLE 13
TIPTON KANGAROO RAT TRAPPING RESULTS

Date	Set Time	Check Time	End Time	Temperature °Fahrenheit	Wind miles per hour	Weather Condition	Moon Phase	Locations	Individuals Captured
06/17/19	1700	-	-	93.0	4-7	Partly Cloudy	Full Moon	-	-
06/18/19	-	0330	0525	71.7	4-7	Partly Cloudy	Waning Gibbous	MP 213.00 MP 197.84 MP 196.58	5 <i>Dipodomys heermanni</i> None None
06/18/19	1800	-	-	96.1	1-3	Clear	Waning Gibbous	-	-
06/19/19	-	0330	0512	73.7	1-3	Clear	Waning Gibbous	MP 213.00 MP 197.84 MP 196.58	5 <i>Dipodomys heermanni</i> 6 <i>Peromyscus maniculatus</i> None None
06/19/19	1800	-	-	96.4	1-3	Clear	Waning Gibbous	-	-
06/20/19	-	0330	0455	66.4	4-7	Partly Cloudy	Waning Gibbous	MP 213.00 MP 197.84 MP 196.58	14 <i>Dipodomys heermanni</i> 4 <i>Peromyscus maniculatus</i> None None

Date	Set Time	Check Time	End Time	Temperature 'Fahrenheit	Wind miles per hour	Weather Condition	Moon Phase	Locations	Individuals Captured
06/20/19	1800	-	-	87.4	13-18	Partly Cloudy	Waning Gibbous	-	-
06/21/19	-	0330	0505	64.4	13-18	Cloudy	Waning Gibbous	MP 213.00	14 <i>Dipodomys heermanni</i> 2 <i>Peromyscus maniculatus</i> 1 <i>Lampropeltis getula</i>
								MP 197.84	None
								MP 196.58	None
06/21/19	1800	-	-	84.5	13-18	Cloudy	Waning Gibbous	-	-
06/22/19	-	0300	0451	62.9	13-18	Partly Cloudy	Waning Gibbous	MP 213.00	16 <i>Dipodomys heermanni</i> 6 <i>Peromyscus maniculatus</i>
								MP 197.84	None
								MP 196.58	None
06/24/19	1800	-	-	95	1-3	Partly Cloudy	Full Moon	-	-
06/25/19	-	0330	0442	70.3	1-3	Partly Cloudy	Last Quarter	MP 183.19	None
								MP 175.16	None
06/25/19	1900	-	-	92	1-3	Clear	Last Quarter	-	-
06/26/19	-	0330	0438	64.0	1-3	Clear	Waning Crescent	MP 183.19	2 <i>Dipodomys heermanni</i>
								MP 175.16	3 <i>Dipodomys heermanni</i> 1 <i>Peromyscus maniculatus</i>
06/26/19	1900	-	-	86	4-7	Clear	Waning Crescent	-	-
06/27/19	-	0330	0437	61.4	4-7	Clear	Waning Crescent	MP 183.19	2 <i>Dipodomys heermanni</i>
								MP 175.16	1 <i>Dipodomys heermanni</i> 2 <i>Peromyscus maniculatus</i>
06/27/19	1900	-	-	81	1-3	Clear	Waning Crescent	-	-
06/28/19	-	0330	0433	57.8	1-3	Clear	Waning Crescent	MP 183.19	4 <i>Dipodomys heermanni</i>
								MP 175.16	1 <i>Dipodomys heermanni</i> 1 <i>Peromyscus maniculatus</i>
06/28/19	1900	-	-	85	1-3	Clear	Waning Crescent	-	-
06/29/19	-	0330	0446	61.3	1-3	Clear	Waning Crescent	MP 183.19	3 <i>Dipodomys heermanni</i>
								MP 175.16	1 <i>Dipodomys heermanni</i> 1 <i>Peromyscus maniculatus</i>

4.6 Burrowing Owl Surveys

No BUOW were detected during the survey efforts. Old whitewash and pellets were observed adjacent to a burrow at MP 196.58. The whitewash and pellets were not fresh and numerous small bones within the pellet were observed; however, it could not be determined definitively if the sign came from a BUOW. Additionally, 25 suitable burrows were observed within the survey area (15 for MP 175.16, three for MP 183.19, three for MP 196.58, zero for MP 197.84, and four for MP 213.00). Approximate temperatures ranged between 63-90 °F and winds averaged one to eight mph. Cloud cover ranged from 0-20 percent. The locations of the burrows as well as the whitewash and pellets are presented on **Figures 16a through 16e**. Survey results are outlined below in **Table 14**.

TABLE 14
BURROWING OWL BREEDING SEASON SURVEY RESULTS

Survey	Date	Location	Weather Conditions	Biologists	Notes
Survey 1	6/3/19	MP 175.16 MP 183.19 MP 196.58 MP 197.84 MP 213.00	63-78 °F, 0-8 mph, 0% cloud cover	Lily Sam Doug Gordon- Blackwood	Suitable burrows were observed at four of the five MPs. Old pellets were observed at MP 196.58.
Survey 2	6/6/19	MP 175.16 MP 183.19 MP 196.58 MP 197.84 MP 213.00	80-90 °F, 0-3 mph, 10-20% cloud cover	Karl Fairchild Christa Collin	Suitable burrows were observed at four of the five MPs; no sign was observed.
Survey 3	6/24/19	MP 175.16 MP 183.19 MP 196.58 MP 197.84	72-82 °F, 0-5 mph, 0-3% cloud cover	Robbie Sweet Alex Single	Suitable burrows were observed at four of the five MPs; no sign observed.
	6/25/19	MP 213.00	70°F, 5 mph, 5% cloud cover	Robbie Sweet Alex Single	Suitable burrows observed at MP 213.00; no sign observed.
Survey 4	7/15/19	MP 175.16 MP 183.19 MP 196.58 MP 197.84 MP 213.00	68-77°F, 3-5 mph, 5% cloud cover	Lily Sam Christa Collin	Suitable burrows observed at four of the five MPs; no sign observed.

5.0 Conclusion

5.1 Rare Plants

Based on the results of the focused rare plant surveys, Howell's onion is presumed absent from the survey area.

The site visits conducted in June 2019 fell outside of the estimated blooming period for forked fiddleneck, Earlimart orache, California jewelflower, San Joaquin woollythreads, California alkali grass, San Joaquin bluecurls, and king's gold, but by no more than one month. If these species were present within the survey area, it is probable that they would have either been detected blooming or in a vegetative state during one of the eight site visits. Therefore, it is likely that these seven plant species are absent from the survey area.

5.2 San Joaquin Kit Fox, San Joaquin Antelope Squirrel and Blunt-Nosed Leopard Lizard

Based on the results from the reconnaissance and protocol surveys, SJKF, SJAS and BNLL were determined to not be occupying the survey area. Although potential dens for SJKF were observed within the survey area at all MPs, this species was not detected in the survey area and they are not expected to occur in the area based on the survey findings and review of the most recent known CNDDB records. As shown in **Figure 9**, while there are multiple occurrences of SJKF within five miles of each MP, there are no recent (within the last 10 years) reported occurrences. The most recent SJKF CNDDB occurrence (2005) is located approximately one mile from MP 196.58 and MP 197.84 (CDFW 2019).

Although suitable habitat is also present for SJAS and BNLL, both species may not occur in the survey area due to the isolation of the habitat by the California Aqueduct to the west and agriculture to the east. No SJAS or BNLL burrows were observed; however, the 24 potential SJKF dens could provide suitable refuge for these species. As shown in **Figure 9**, while there are multiple occurrences of SJAS and BNLL within five miles of each MP, there are no recent (within the last 10 years) reported occurrences. The most recent SJAS CNDDB occurrence (1995) is located approximately one mile from MP 196.58 and MP 197.84 (CDFW 2019). The most recent BNLL CNDDB occurrence (2006) is located approximately 0.40 mile from MP 183.19 (CDFW 2019). It has been shown that BNLL require large habitat patches to support extant BNLL populations (Bailey and Germano 2015). Activities from DWR's subsidence instrumentation at MPs 175.16, 183.19, 196.58, 197.85, and 213.00 are not likely to impact SJKF, SJAS or BNLL.

5.3 Tipton Kangaroo Rat

"Live-trapping is the only method for reliable identification of kangaroo rats in the San Joaquin Valley" (USFWS 2013). As such, based on the results from the protocol surveys, burrows in the survey area were determined to not be occupied by TKR, and TKR is not likely to occur onsite, as there were no suitable diagnostic burrows observed for this species and no evidence of the species

was detected. As shown in **Figure 15**, while there are multiple occurrences of TKR within five miles of each MP, there are no recent (within the last 10 years) reported occurrences. The most recent TKR CNDDDB occurrences (1985) are located approximately one mile from MP 175.16 and four miles from MP 183.19 (CDFW 2019). Activities from DWR's subsidence instrumentation at MPs 175.16, 183.19, 196.58, 197.85, and 213.00 are not likely to impact TKR.

5.4 Burrowing Owl

No BUOW individuals were observed during the focused surveys. Due to the detection of old pellets and whitewash at MP 196.58, it is presumed that the burrow was occupied by BUOW at some point in the past. As shown in **Figure 17**, while there are multiple occurrences of BUOW within five miles of each MP, there are no recent (within the last 10 years) reported occurrences. The most recent BUOW CNDDDB occurrence (2008) is located approximately three miles from MP 183.19. Additionally, there were several occurrences of BUOW at MP 213.00 from 2004 (CDFW 2019).

Although no BUOW individuals or sign were detected at MPs 175.16, 183.19, and 213.00, suitable habitat does exist within the project footprint and BUOW could occupy these areas. However, BUOW are not expected to be impacted by DWR's subsidence instrumentation.

6.0 References

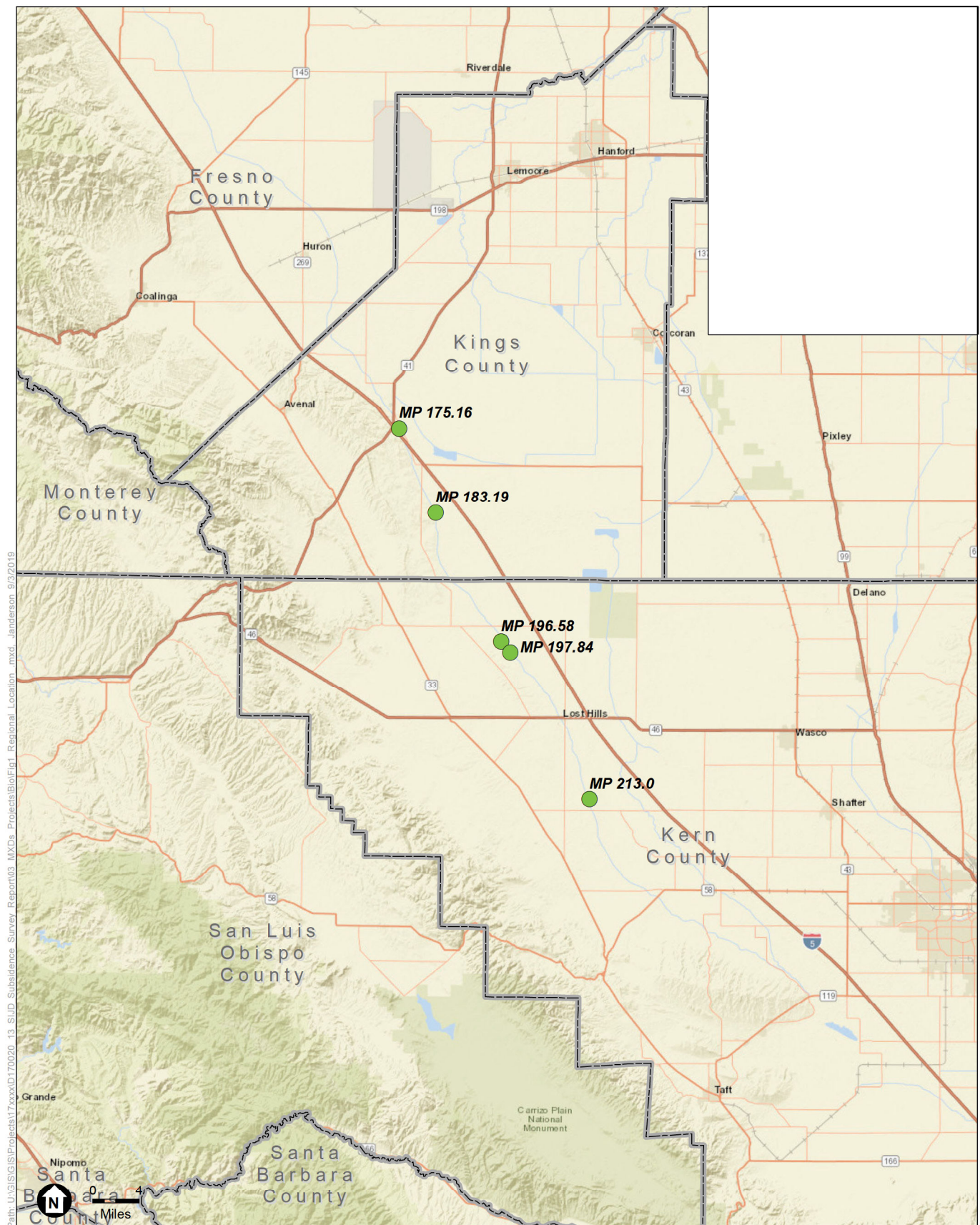
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Appendix A

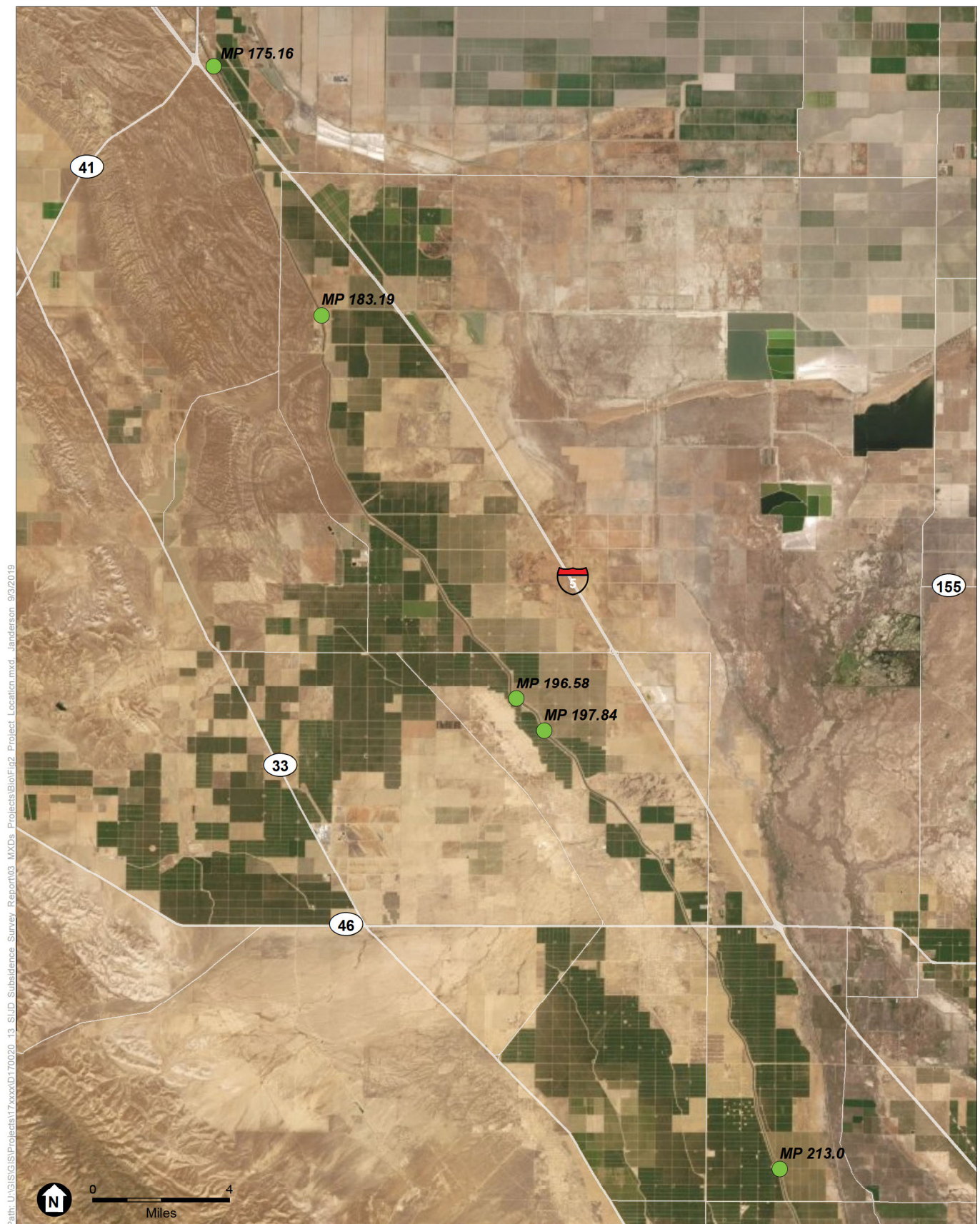
Figures



SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

Figure 1
Regional Location Map



SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

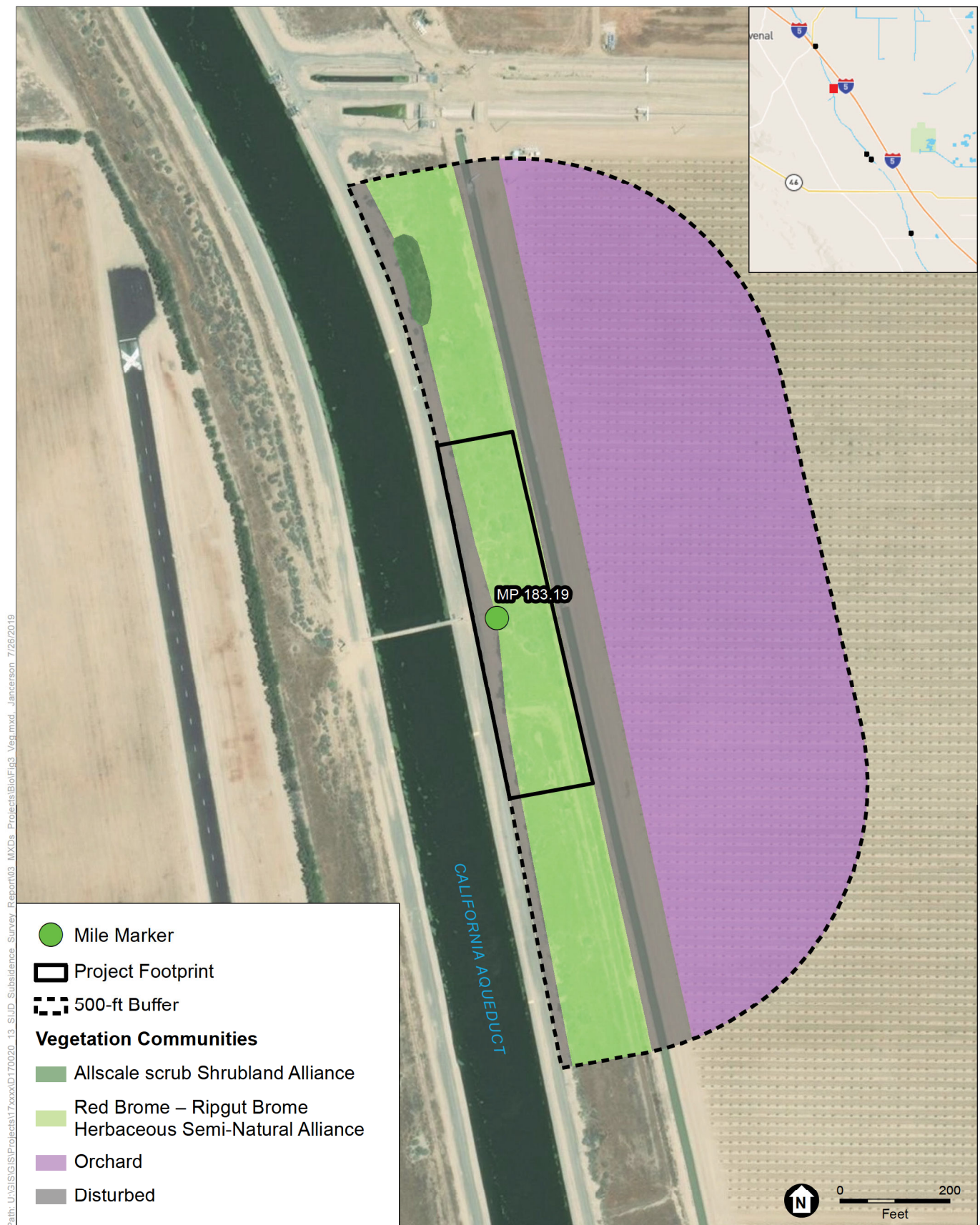
Figure 2
Project Location



SOURCE: ESRI

SJFD Subsidence Biological Resources Survey Report

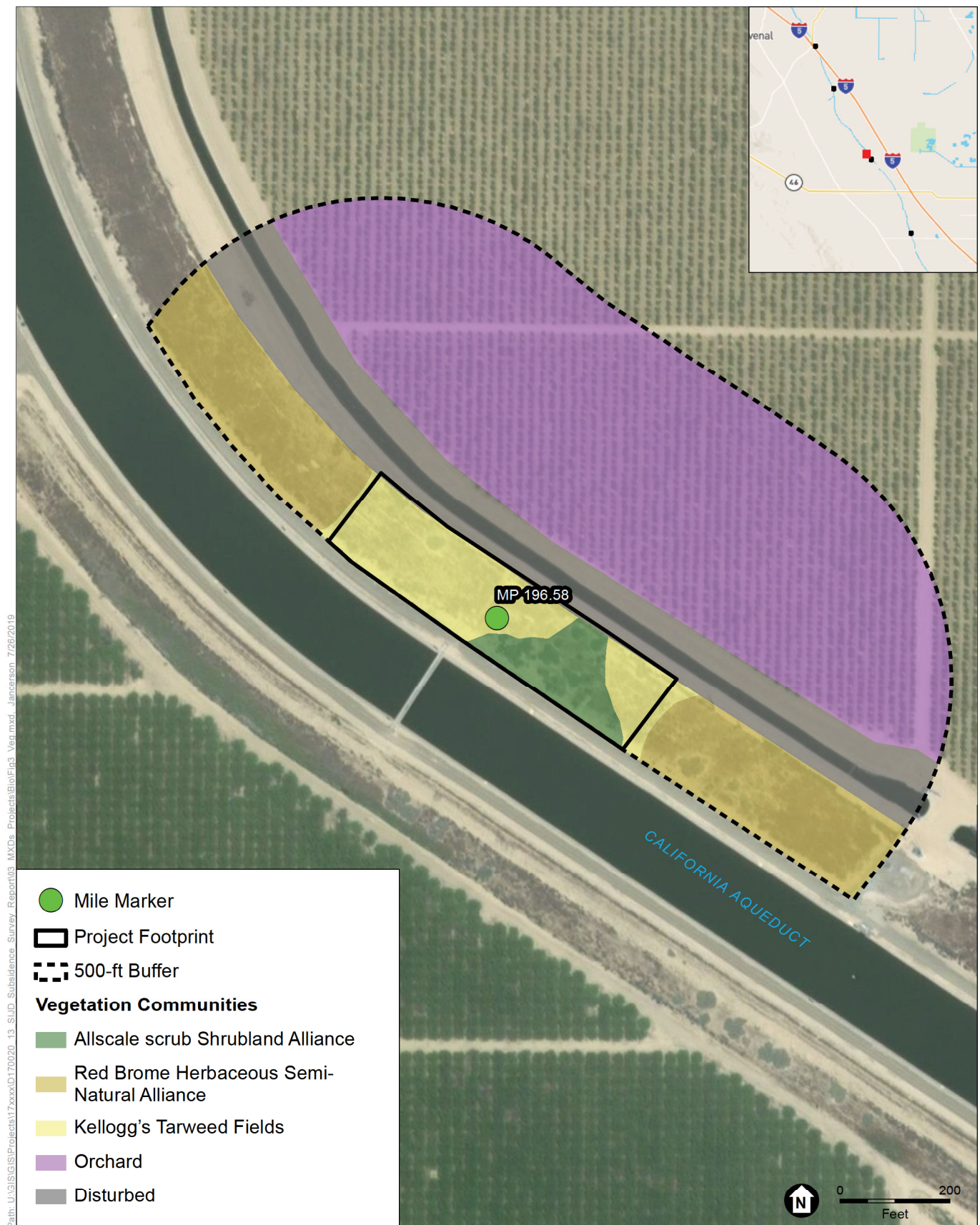
Figure 3a
Vegetation Communities and Land Cover Types



SOURCE: ESRI

SJFD Subsidence Biological Resources Survey Report

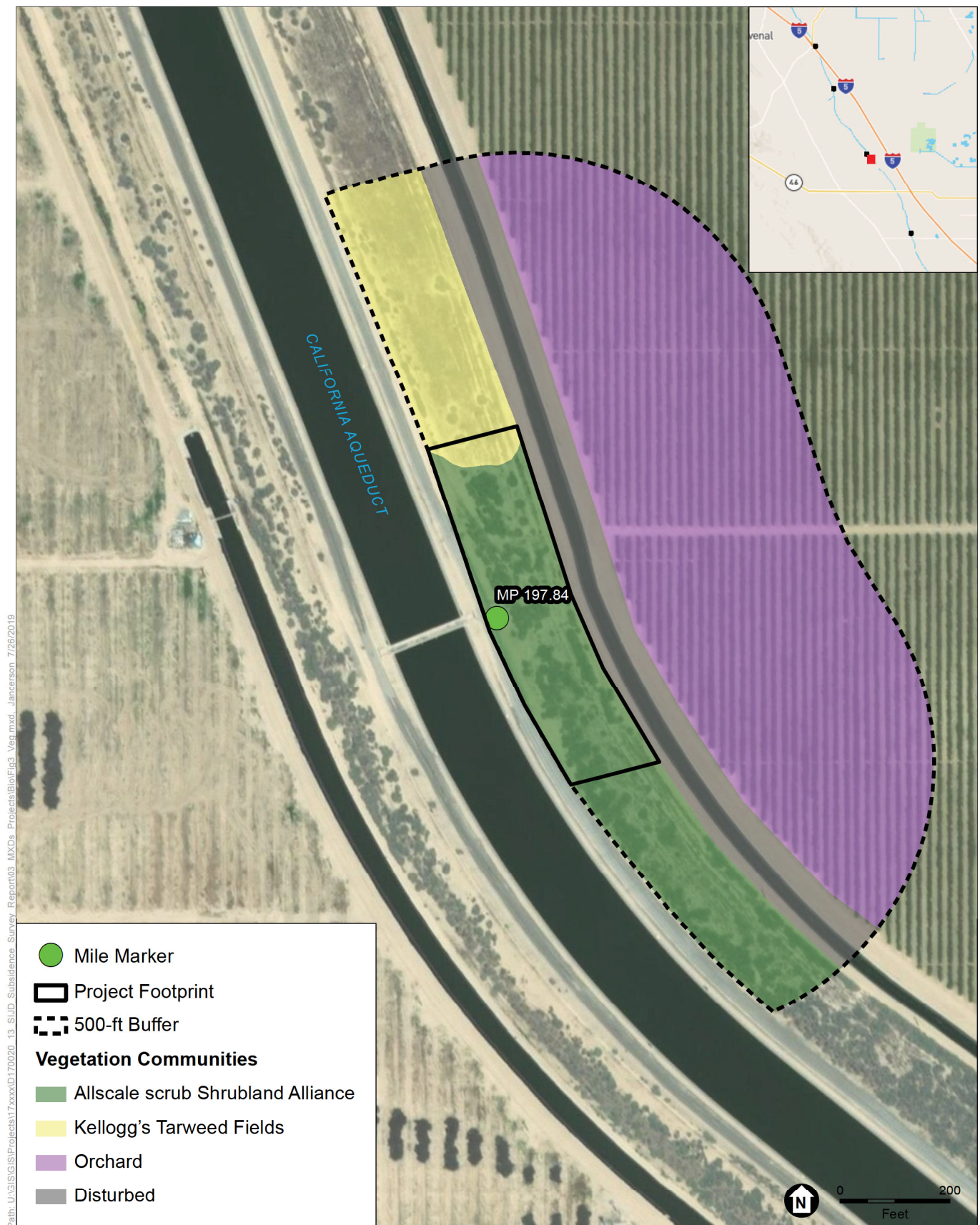
Figure 3b
Vegetation Communities and Land Cover Types



SOURCE: ESRI

SJFD Subsidence Biological Resources Survey Report

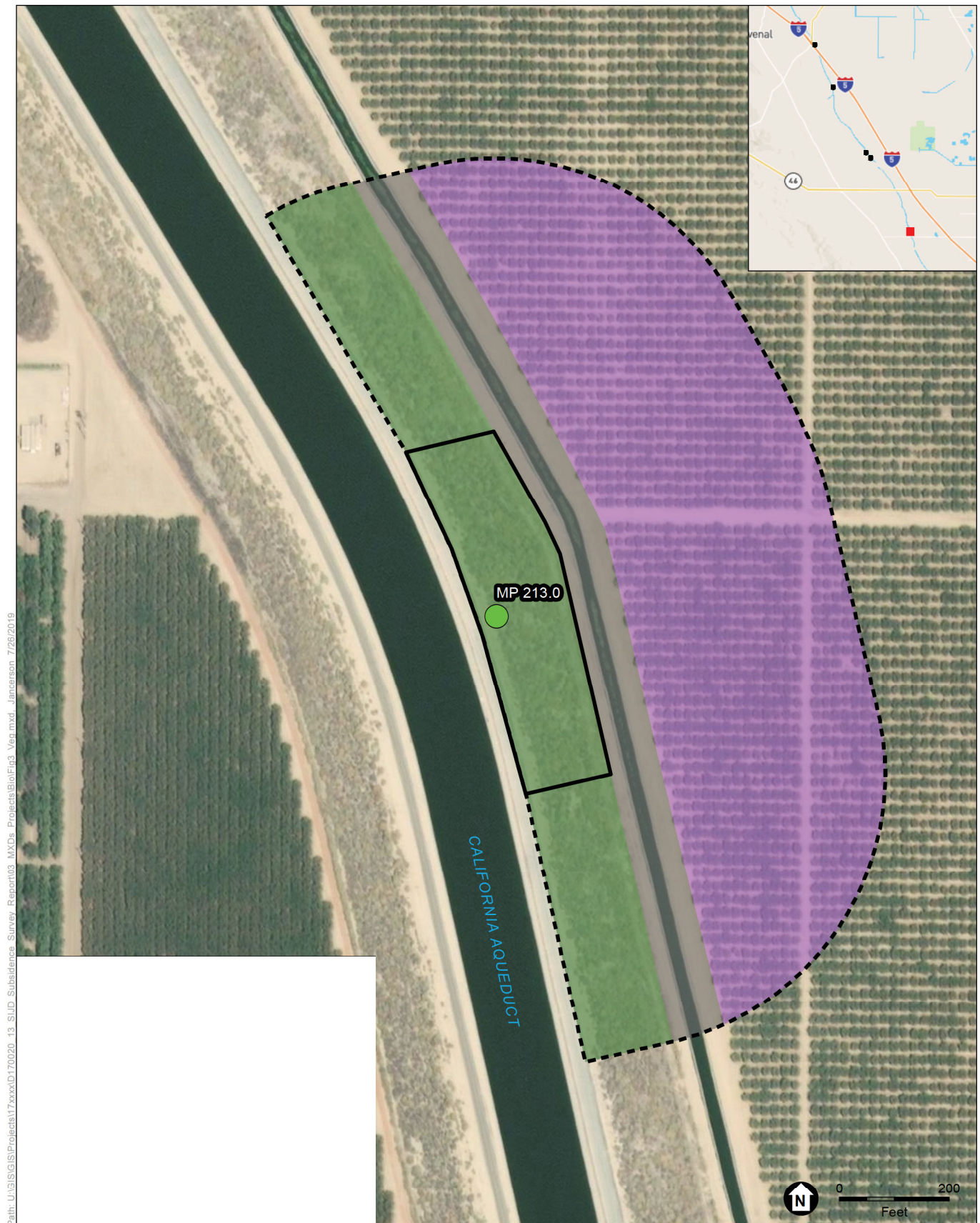
Figure 3c
Vegetation Communities and Land Cover Types



SOURCE: ESRI

SJFD Subsidence Biological Resources Survey Report

Figure 3d
Vegetation Communities and Land Cover Types



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SOURCE: ESRI

SJFD Subsidence Biological Resources Survey Report



Figure 3e
Vegetation Communities and Land Cover Types



SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

Figure 4

Thirteen potential SJKF dens were identified at MP 175.16.

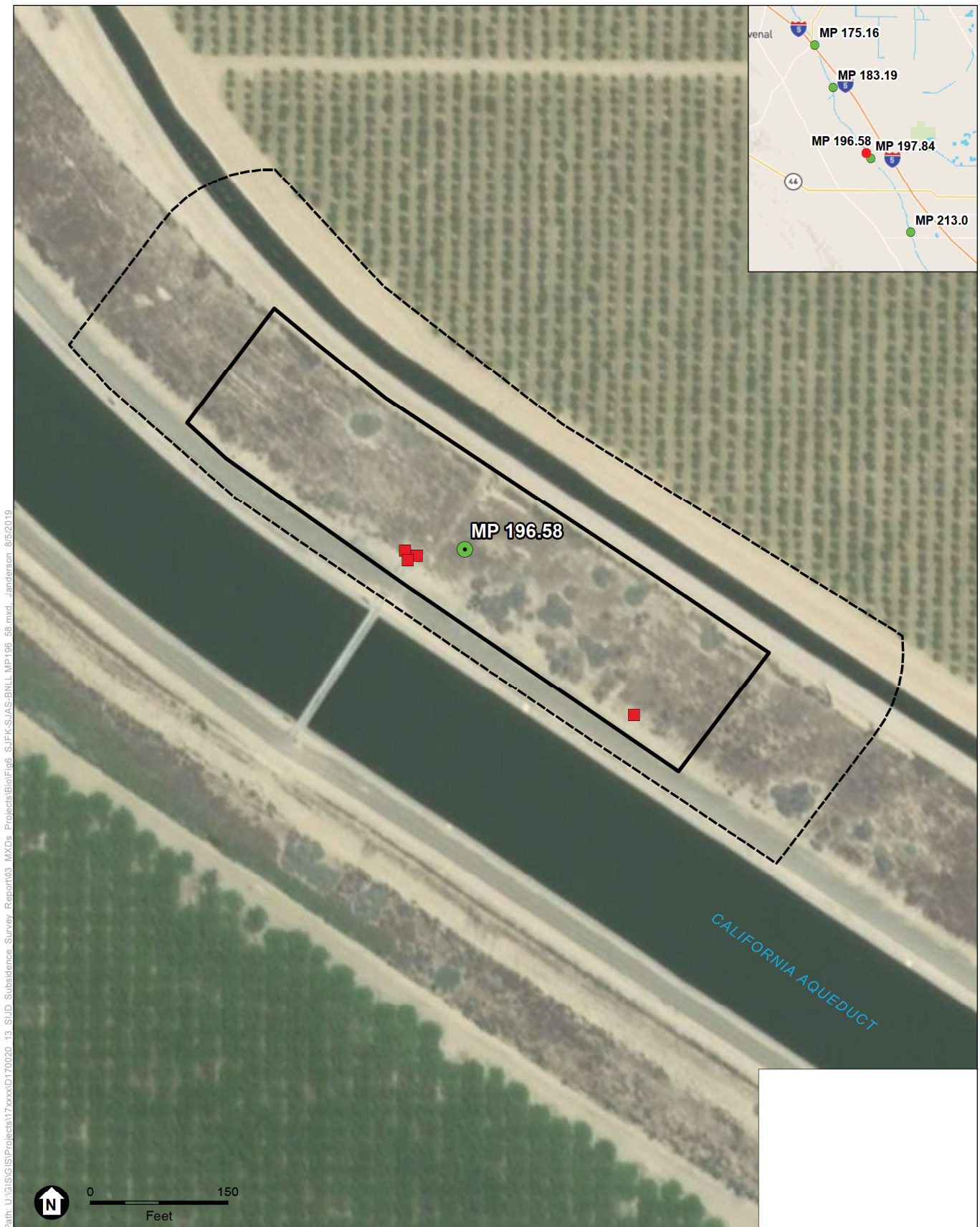


SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

Figure 5

Three potential SJKF dens were identified at MP 183.19.



SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

Figure 6

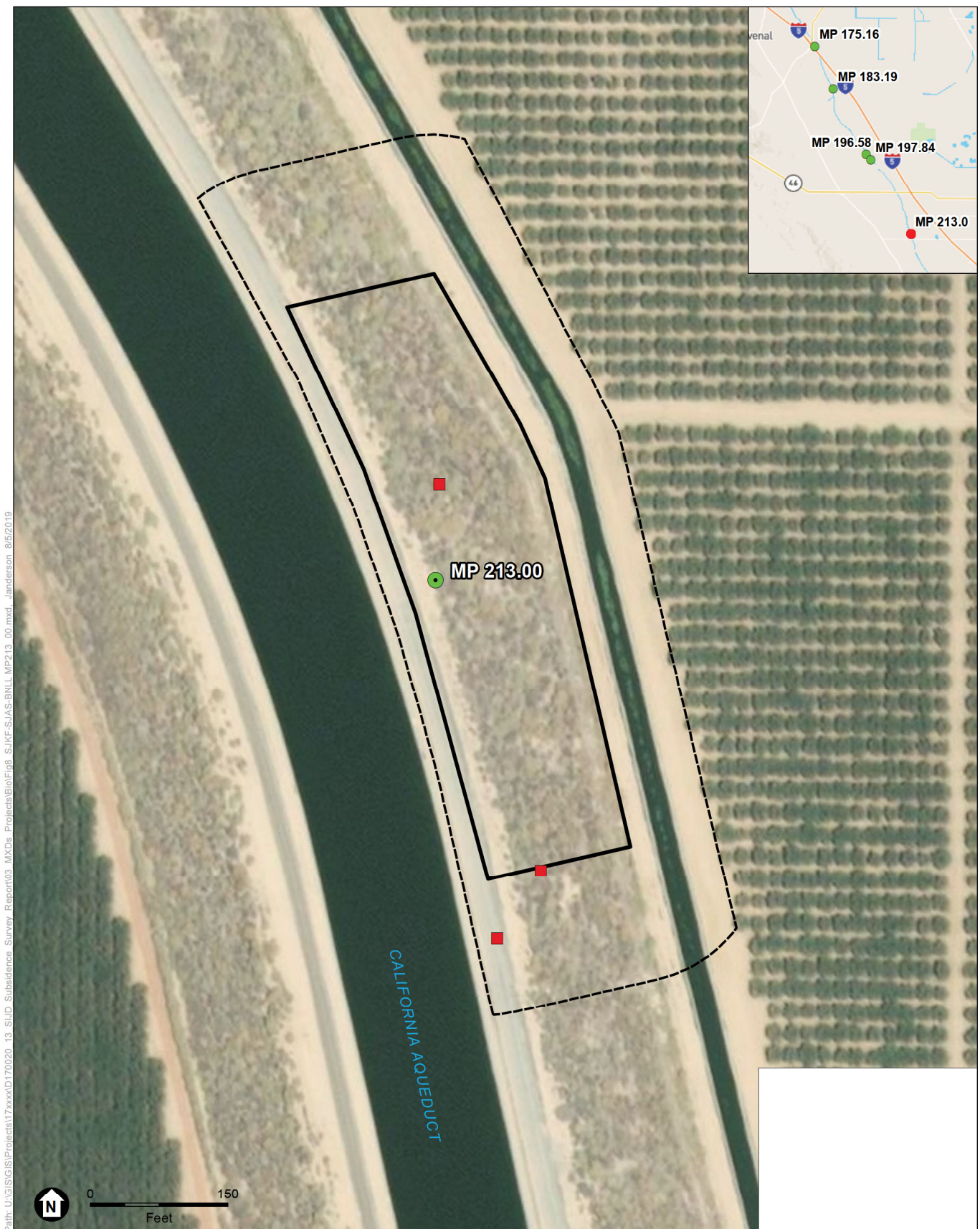
Four potential SJKF dens were identified at MP 196.58.



SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

Figure 7
One potential SJKF den was identified at MP 197.84.

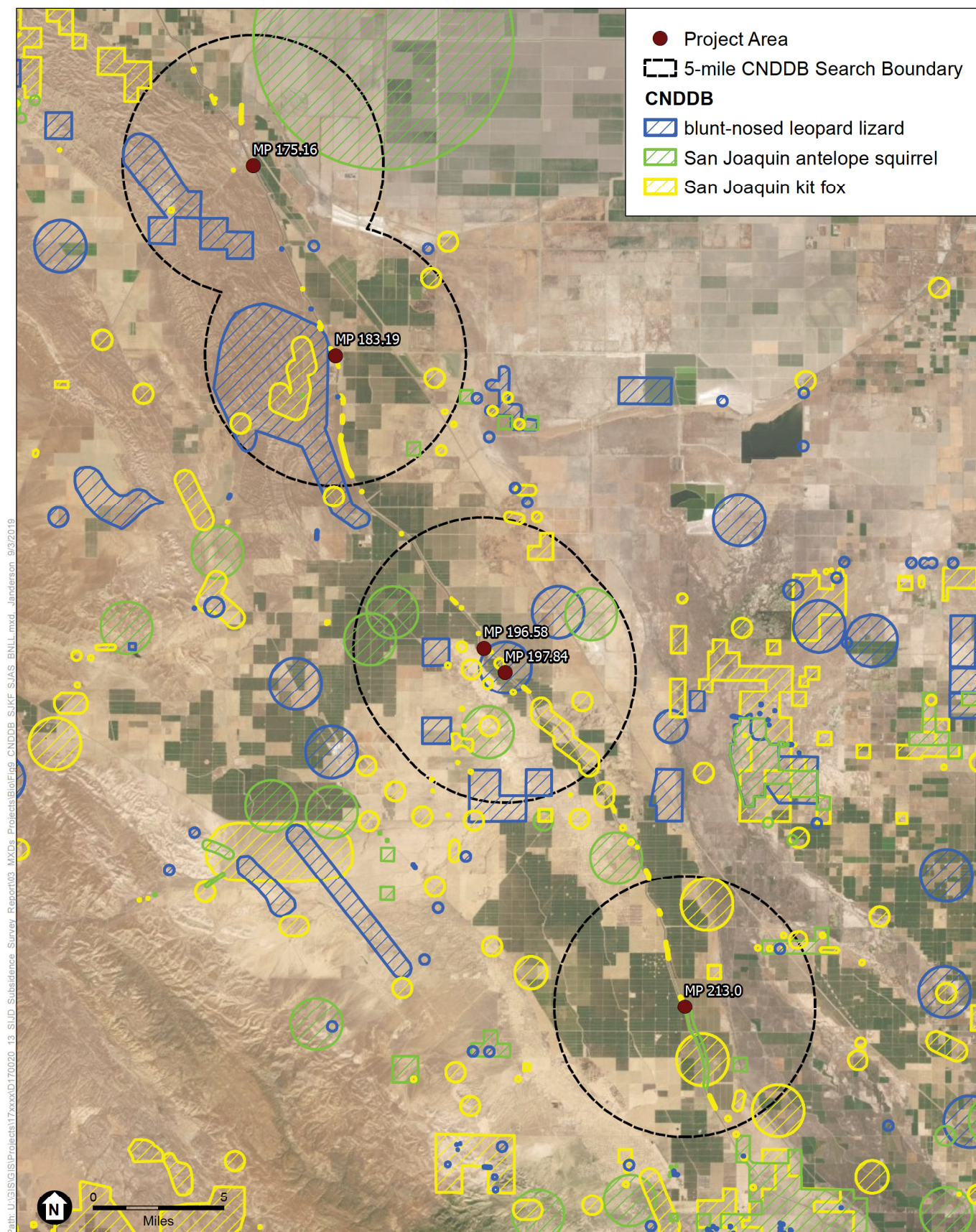


SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

Figure 8

Three potential SJKF dens were identified at MP 213.00.

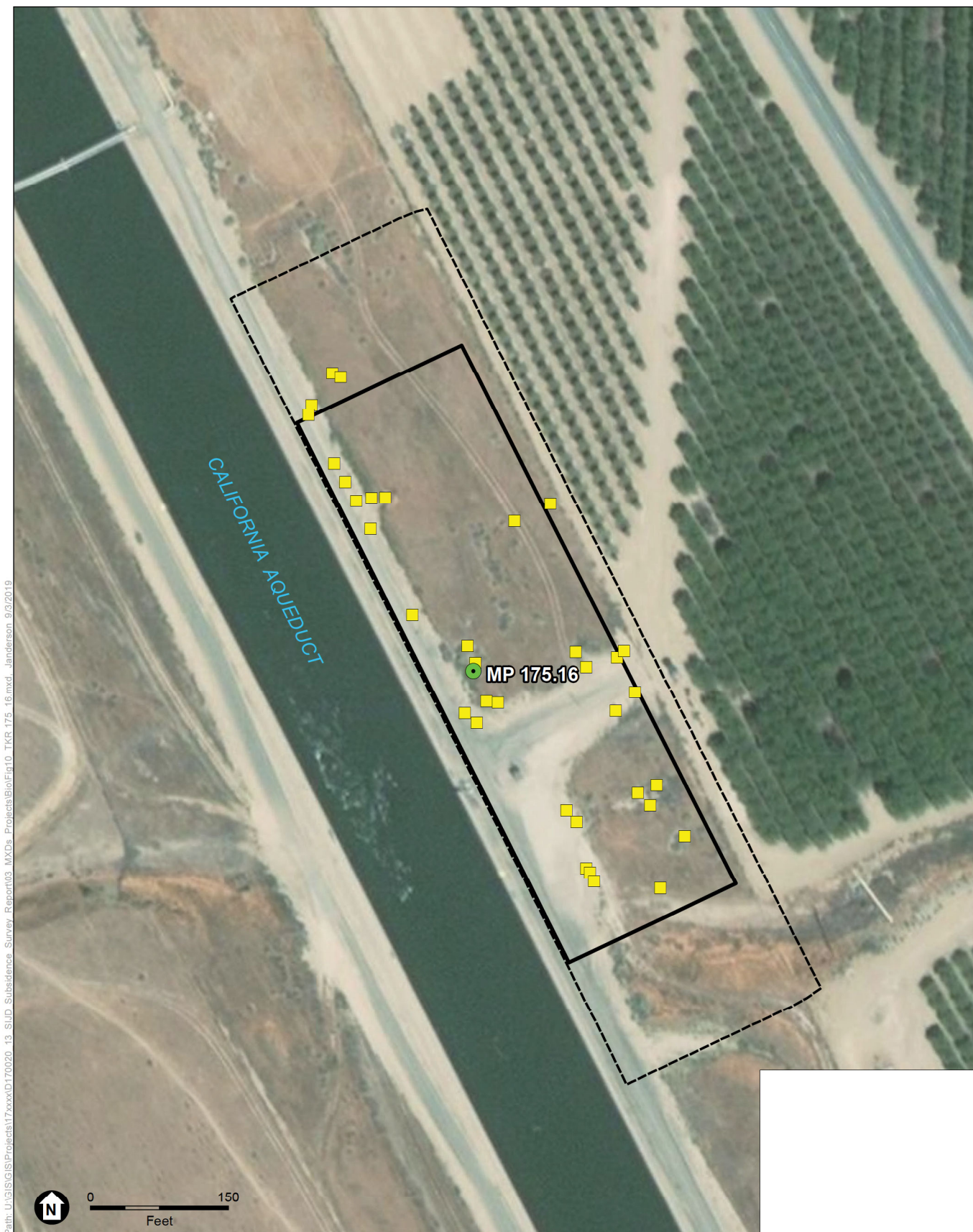


SOURCE: ESRI; California Natural Diversity Database (CNDDDB) 2019

SJFD Instrumentation Biological Resources Report

Figure 9

CNDDDB search results of the Study Area for SJKF, SJAS and BNLL



SOURCE: ESRI

SJFD Instrumentation Biological Resources Report



Figure 10
MP 175.16 consisted of 35 traps placed around potential kangaroo rat burrows and sign.



SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

Figure 11
MP 183.19 consisted of 25 traps placed around potential kangaroo rat burrows and sign.

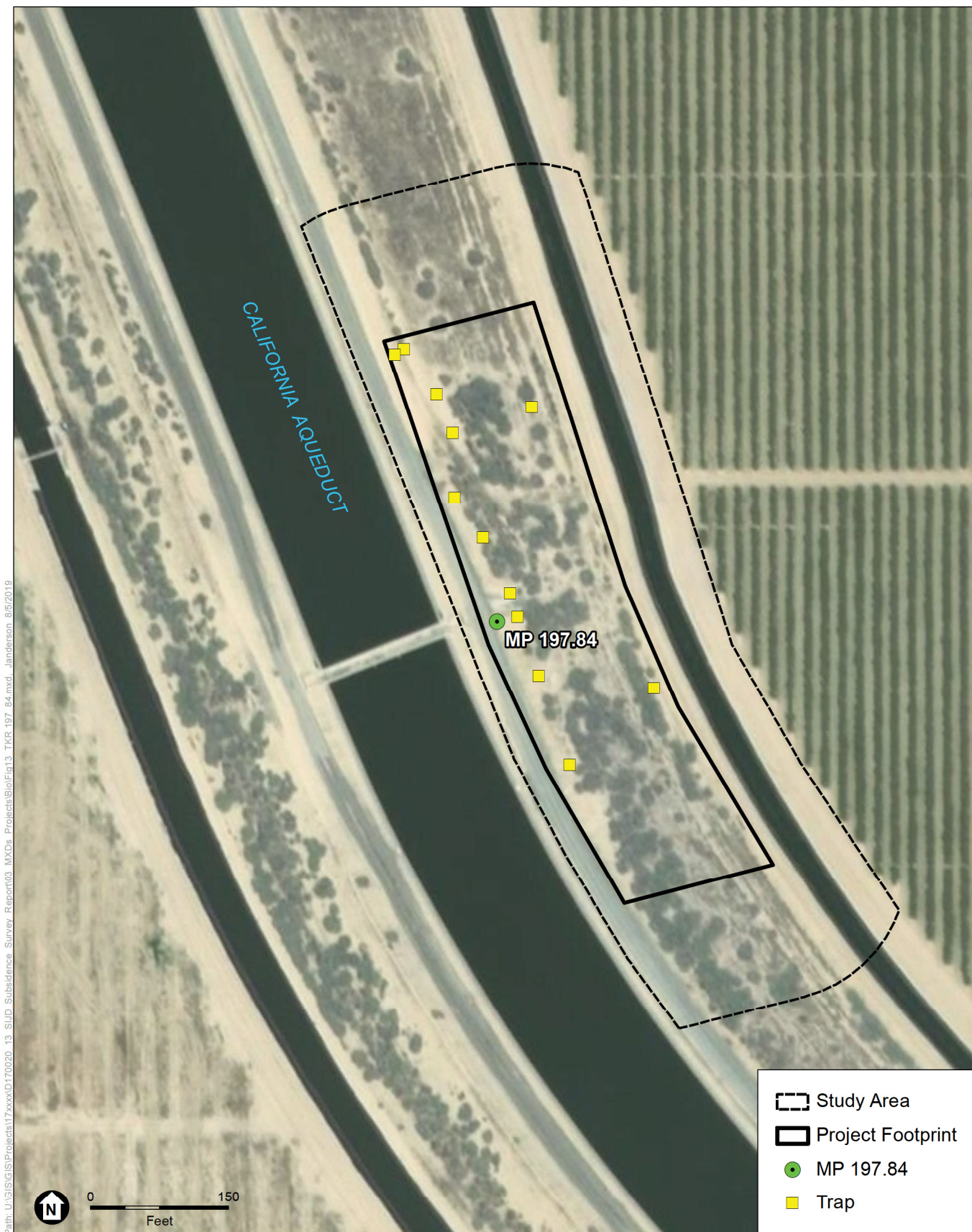


SOURCE: ESRI

SJFD Instrumentation Biological Resources Report



Figure 12
MP 183.19 consisted of 25 traps placed around potential kangaroo rat burrows and sign.

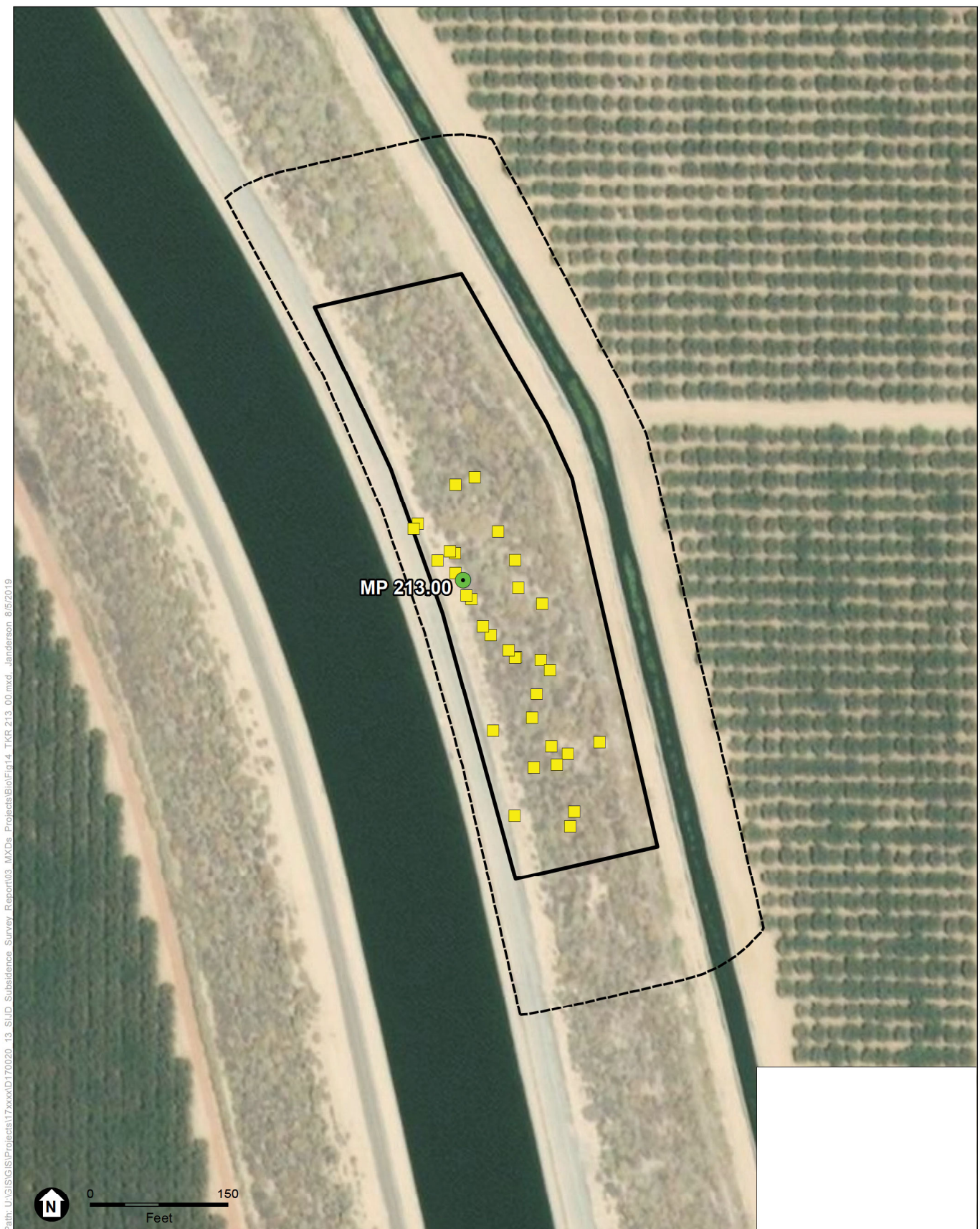


SOURCE: ESRI

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Figure 13
MP 197.84 consisted of 13 traps placed around potential kangaroo rat burrows and sign.

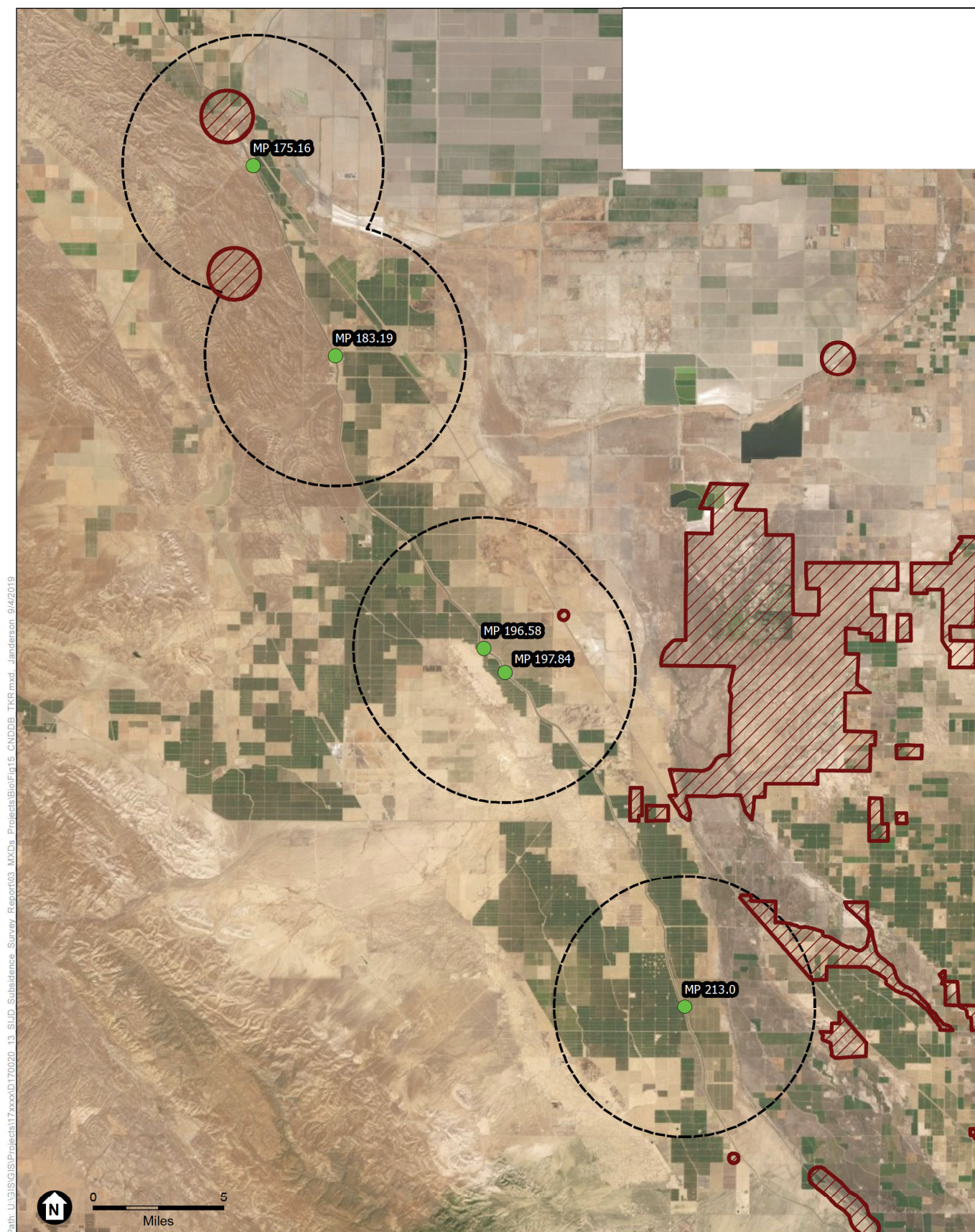


SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

Figure 14

MP 213.00 consisted of 32 traps placed around potential kangaroo rat burrows and sign.



SOURCE: ESRI; California Natural Diversity Database (CNDDDB) 2019

SJFD Instrumentation Biological Resources Report

Figure 15
CNDDDB search results of the Study Area for TKR

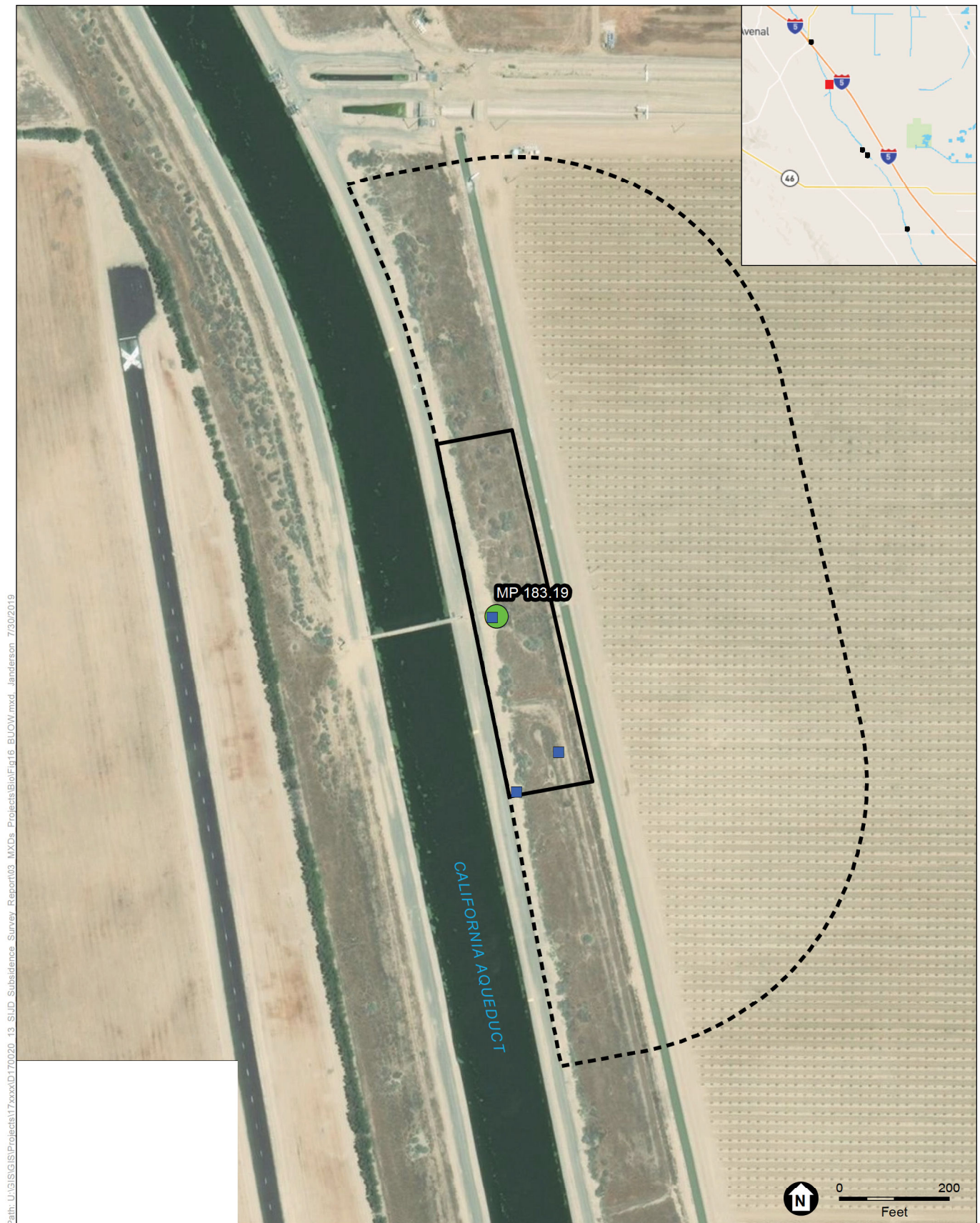


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SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

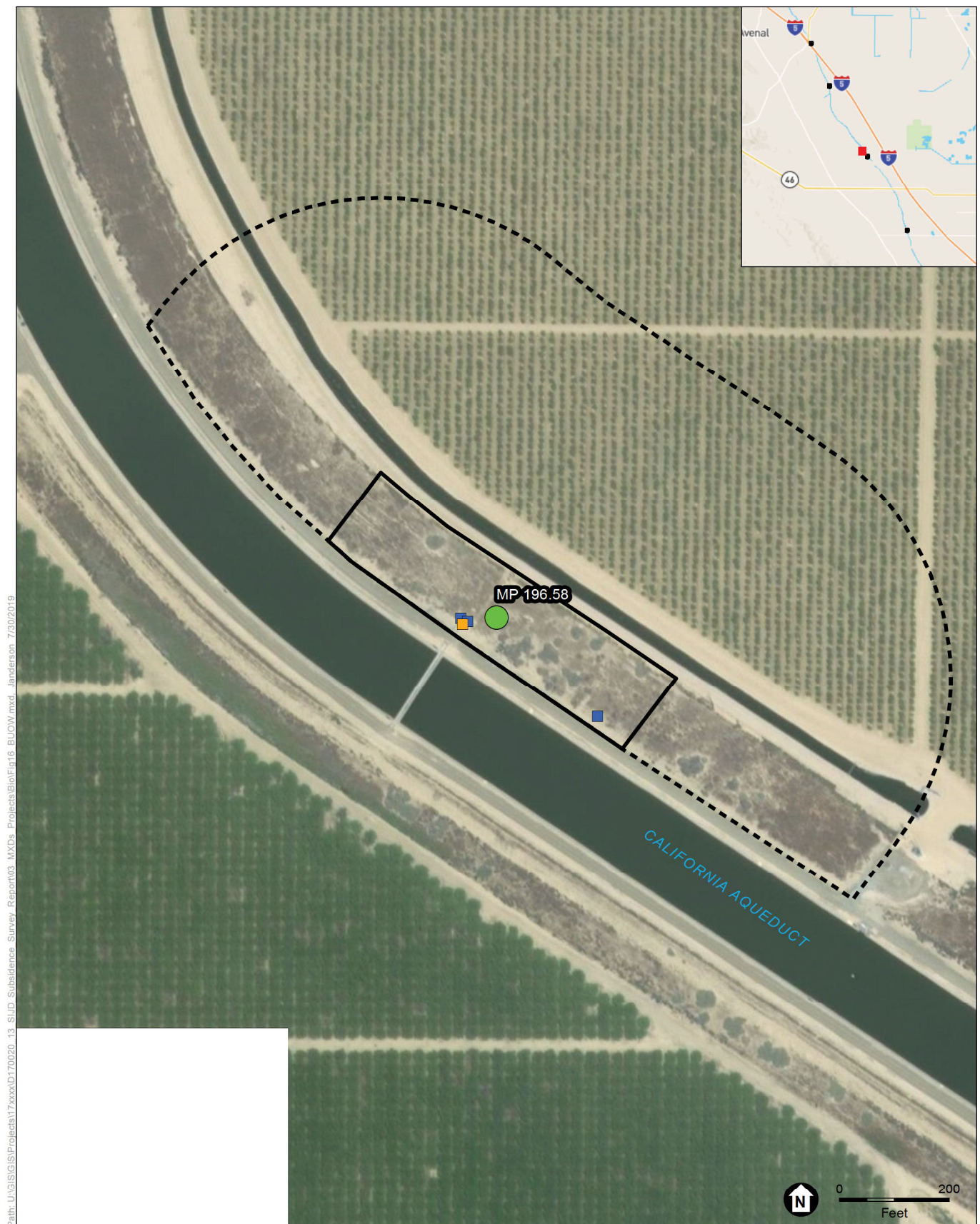
Figure 16a
Burrowing Owl Survey Results



SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

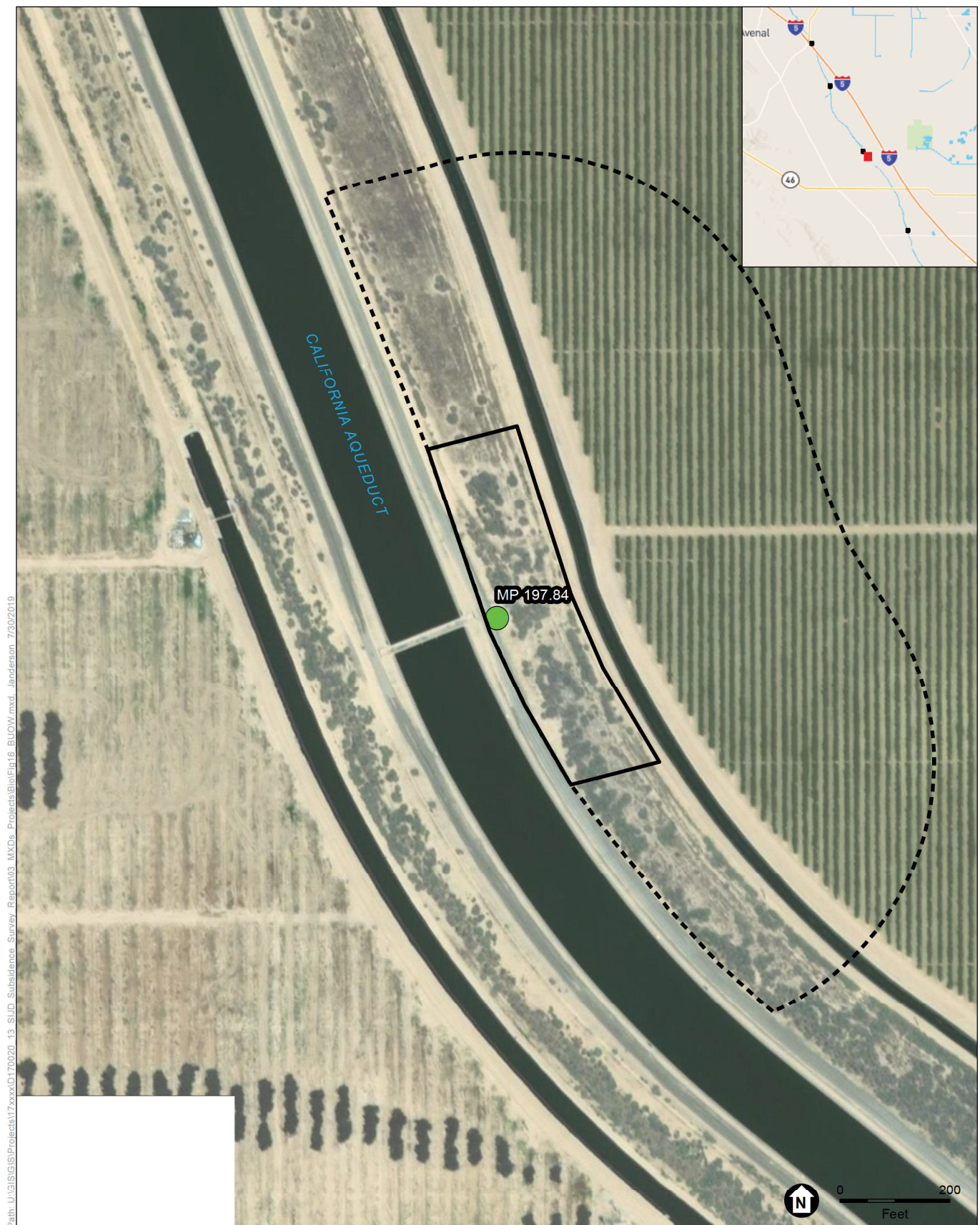
Figure 16b
Burrowing Owl Survey Results



SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

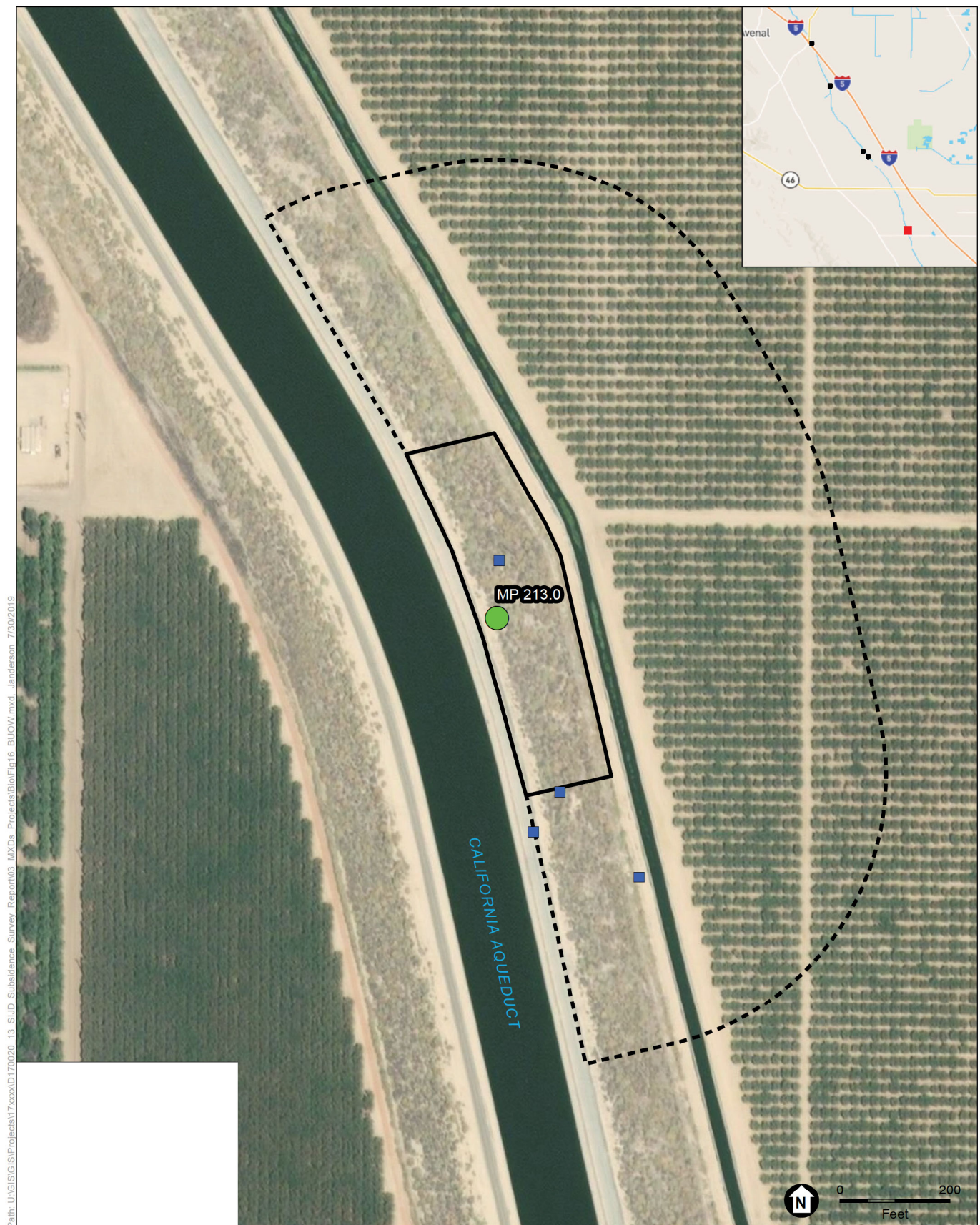
Figure 16c
Burrowing Owl Survey Results



SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

Figure 16d
Burrowing Owl Survey Results

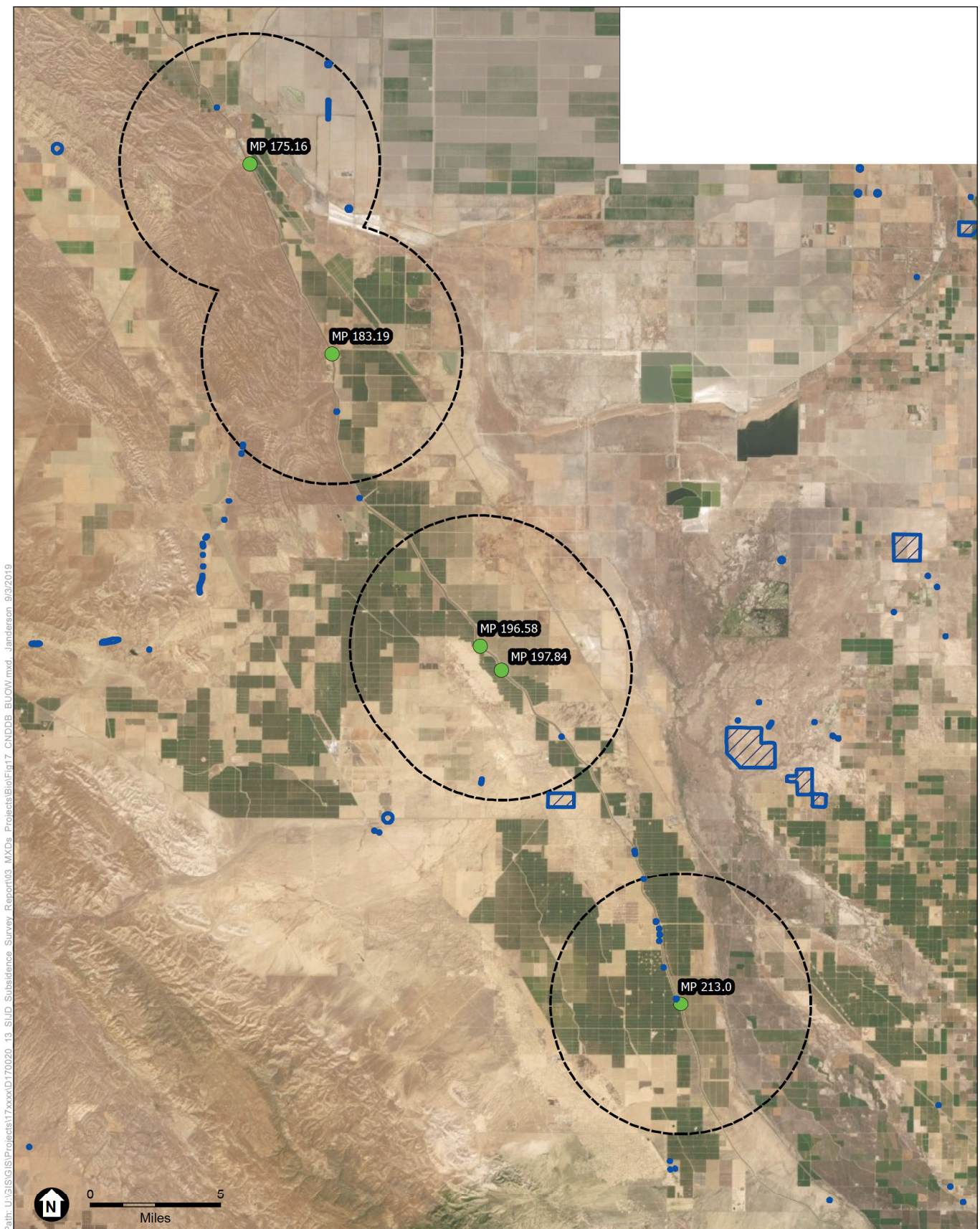


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SOURCE: ESRI

SJFD Instrumentation Biological Resources Report

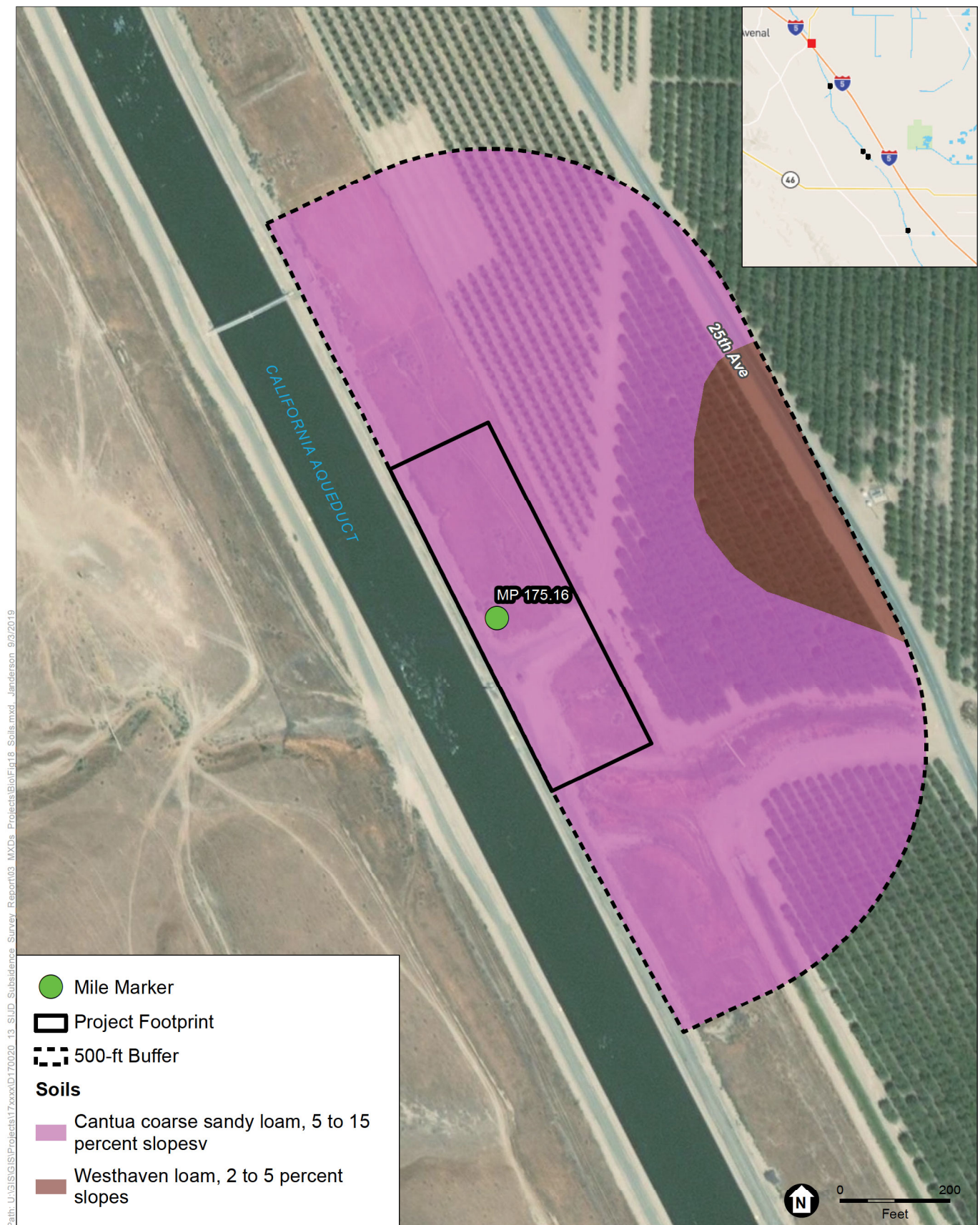
Figure 16e
Burrowing Owl Survey Results



SOURCE: ESRI; California Natural Diversity Database (CNDDDB) 2019

SJFD Subsidence Biological Resources Survey Report

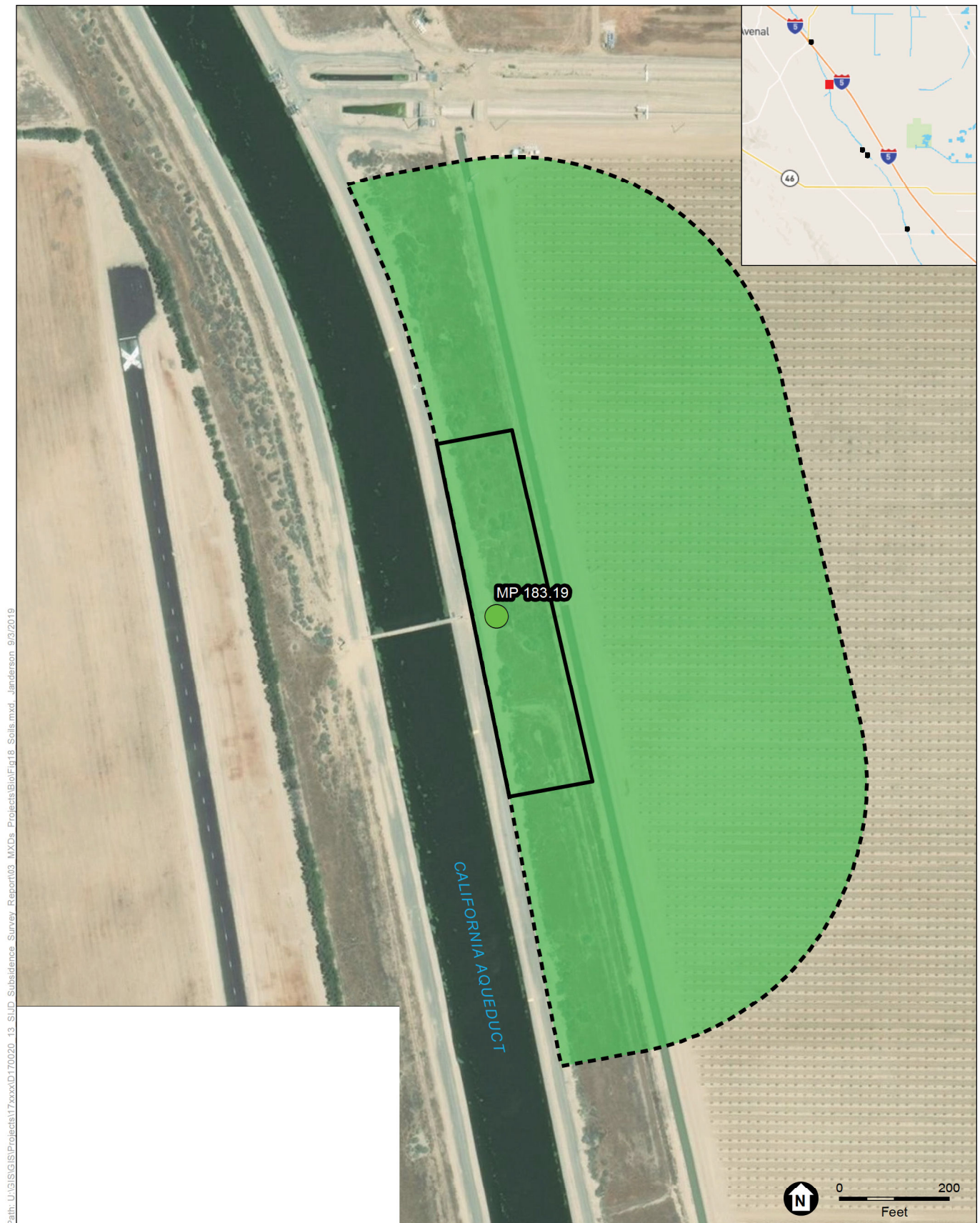
Figure 17
CNDDDB search results of the Study Area for BUOW



SOURCE: ESRI; Web Soil Survey

SJFD Instrumentation Biological Resources Report

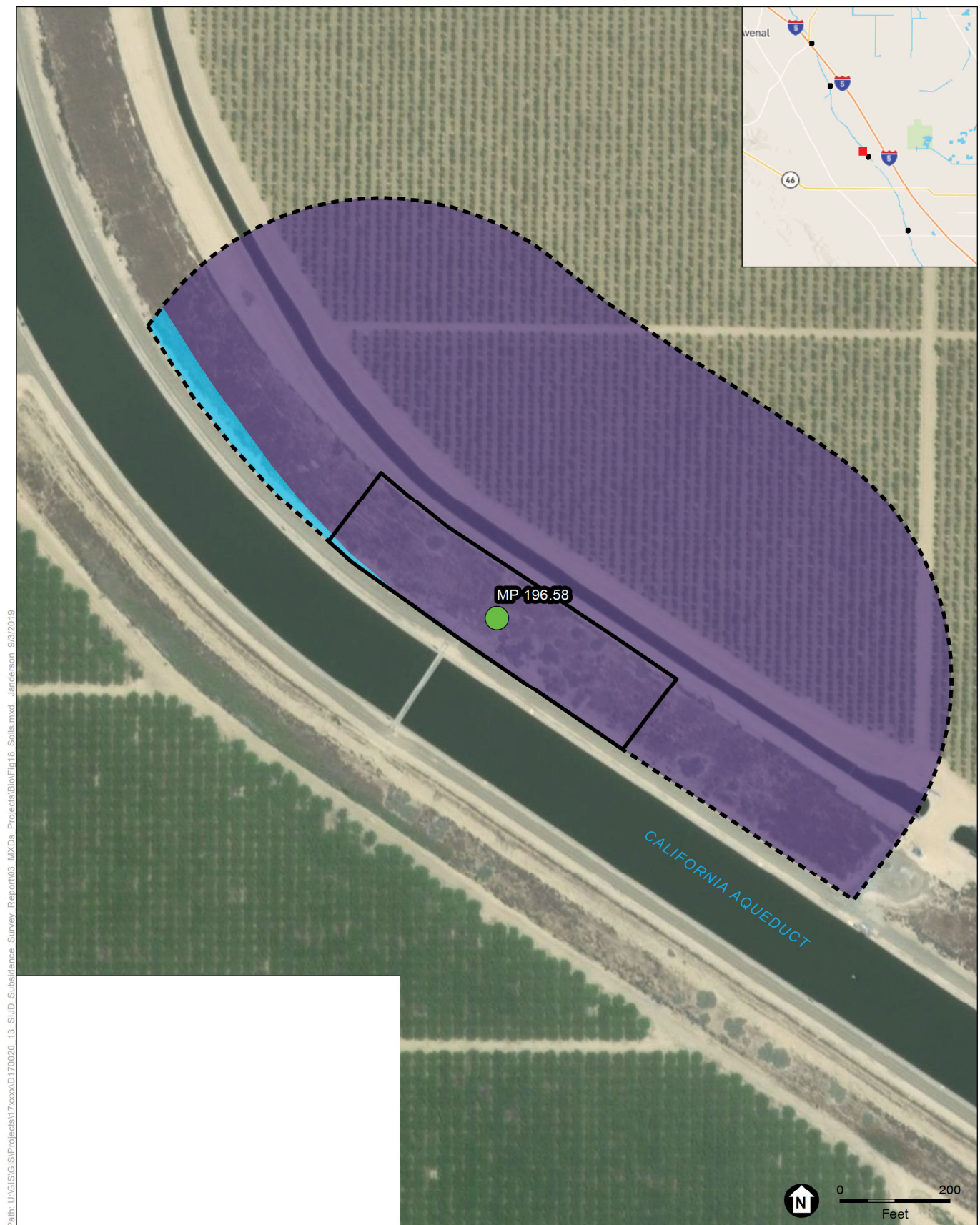
Figure 18a
Soils



SOURCE: ESRI; Web Soil Survey

SJFD Instrumentation Biological Resources Report

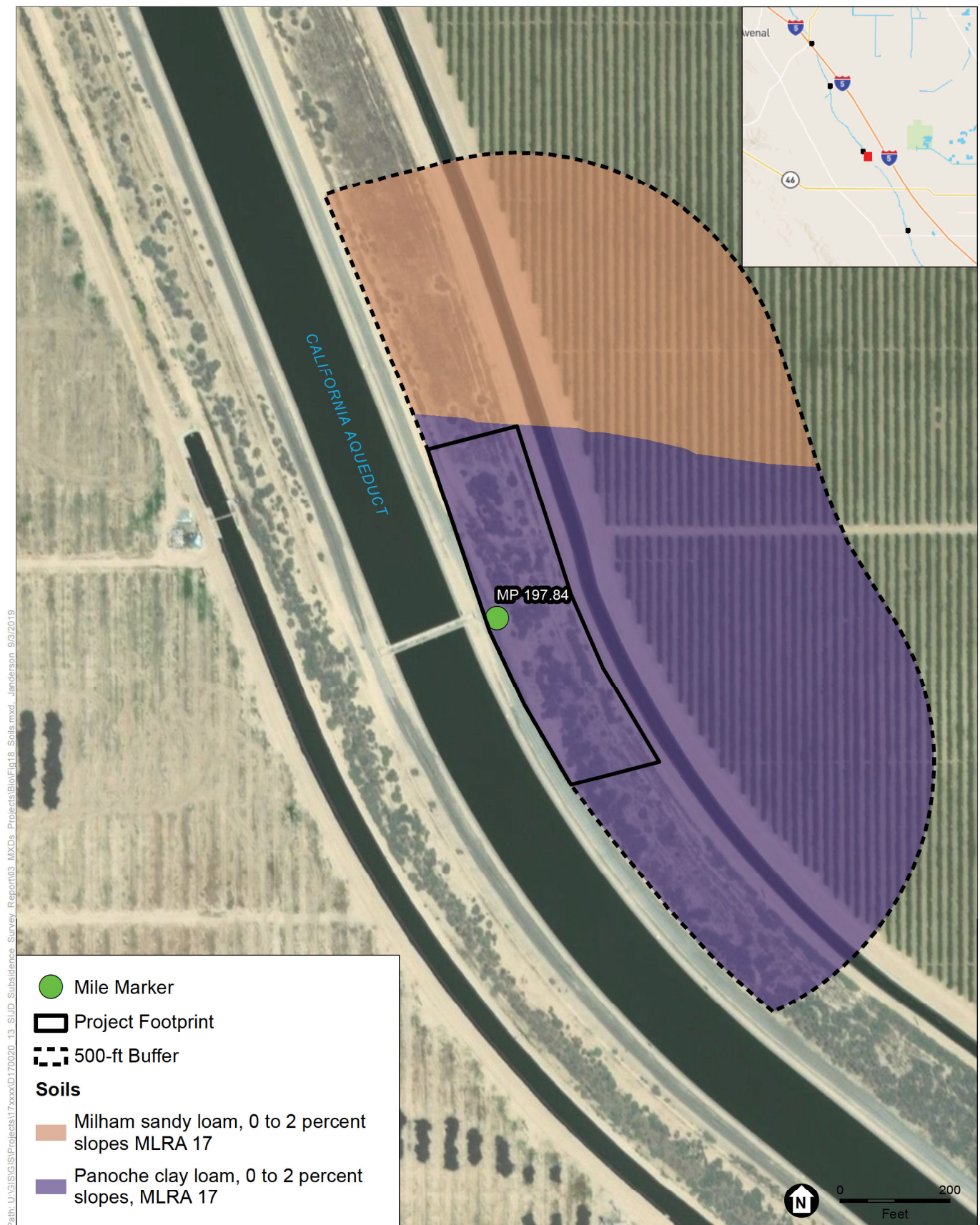
Figure 18b
Soils



SOURCE: ESRI; Web Soil Survey

SJFD Instrumentation Biological Resources Report

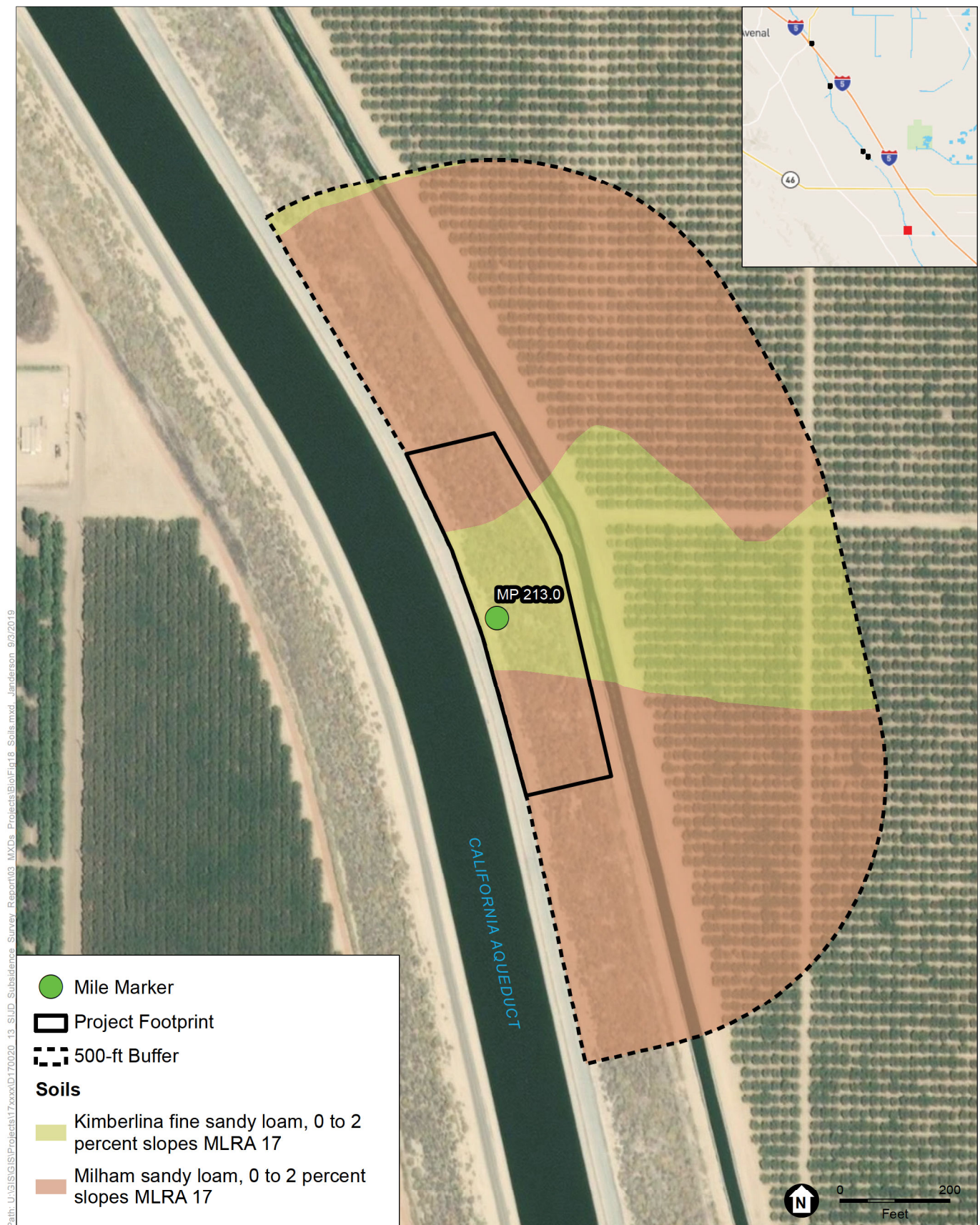
Figure 18c
Soils



SOURCE: ESRI; Web Soil Survey

SJFD Instrumentation Biological Resources Report

Figure 18d
Soils



SOURCE: ESRI; Web Soil Survey

SJFD Instrumentation Biological Resources Report

Figure 18e
Soils

Appendix B

Flora and Fauna Compendia

FLORA

EUDICOTS

Scientific Name

Amaranthaceae

Amaranthus albus

Asteraceae

Ambrosia acanthicarpa

Centaurea melitensis

Erigeron canadensis

Gutierrezia californica

Isocoma acradenia

Sonchus oleraceus

Stephanomeria pauciflora

Boraginaceae

Amsinckia sp.

Heliotropium curassavicum

Chenopodiaceae

Atriplex polycarpa

Bassia hyssopifolia

Salsola tragus

Cucurbitaceae

Citrullus colocynthis

Euphorbiaceae

Croton setiger

Euphorbia ocellata

Fabaceae

Acmispon sp.

Astragalus sp.

Geraniaceae

Erodium moschatum

Lamiaceae

Trichostema lanceolatum

Solanaceae

Datura wrightii

Solanum americanum

Common Name

Amaranth Family

Common tumbleweed

Aster Family

Annual ragweed

Maltese star-thistle

Horseweed

San Joaquin snakeweed

Alkali goldenbush

Common sowthistle

Brownplume wirelettuce

Borage Family

Fiddleneck

Salt heliotrope

Goosefoot Family

Cattle spinach

Five-horn smotherweed

Russian thistle

Gourd Family

Wild gourd

Spurge Family

Doveweed

Contura Creek sandmat

Pea Family

Bird's-foot trefoils

Milkvetch

Geranium Family

Musk Stork's-bill

Mint Family

Vinegarweed

Nightshade Family

Sacred dutra

American black nightshade

MONOCOTS

Scientific Name

Poaceae

Common Name

Grass Family

Bromus diandrus
Bromus rubens
Schismus sp.

Ripgut brome
Red brome
Mediterranean grass

FAUNA

REPTILES

Scientific Name

Phrynosomatidae

Aspidoscelis tigris ssp. *stejnegeri*
Coluber flagellum ruddocki
Crotalus oreganus
Lampropeltis getula
Sceloporus occidentalis
Uta stansburiana ssp. *elegans*

Common Name

Zebra-tailed, Side-blotched and Horned Lizards

coastal whiptail
San Joaquin coachwhip
northern Pacific rattlesnake
common kingsnake
western fence lizard
western side-blotched lizard

BIRDS

Scientific Name

Odontophoridae

Callipepla californica

Falconidae

Falco sparverius

Accipitridae

Buteo jamaicensis

Cathartidae

Cathartes aura

Columbidae

Zenaida macroura

Podicipedidae

Podilymbus podiceps

Hirundinidae

Petrochelidon pyrrhonota
Stelgidopteryx serripennis

Corvidae

Corvus brachyrhynchos
Corvus corax

Icterid

Euphagus cyanocephalus

Common Name

Quails

California quail

Falcons and caracaras

American kestrel

Hawks

red-tailed hawk

Vultures

turkey vulture

Pigeons and Doves

mourning dove

Grebes

pied-billed grebe

Swallows, martins, and saw-wings

American cliff swallow
northern rough-winged swallow

Jays and Crows

American crow
common raven

New-World passerine

Brewer's blackbird

Anatidae*Anas platyrhynchos***Alaudidae***Eremophila alpestris***Mimidae***Mimus polyglottos***Fringillidae***Haemorhous mexicanus***Tyrannidae***Tyrannus verticalis***Apodidae***Aeronautes saxatalis***Cuculidae***Geococcyx californianus***Sturnidae***Sturnus vulgaris***Charadriidae***Charadrius vociferous***Dabbling ducks**

mallard

Lark family

Horned lark

Mockingbirds and Thrashers

northern mockingbird

Finches

house finch

Tyrant Flycatchers

western kingbird

Swift Family

white-throated swift

Roadrunners

greater roadrunner

Starling family

European starling

Plovers, dotterels, and lapwings

killdeer

MAMMALS

Scientific Name**Canidae***Canis latrans***Cricetidae***Peromyscus maniculatus***Heteromyidae***Dipodomys heermanni***Leporidae***Lepus californicus**Sylvilagus bachmani***Sciuridae***Otospermophilus beecheyi***Common Name****Canines**

Coyote

New World Mice and Voles

deer mouse

Kangaroo Rats, Kangaroo Mice, Pocket Mice and Spiny Pocket Mice

Heermann's kangaroo rat

Hares and Rabbits

Black-tailed jackrabbit

California brush rabbit

Squirrels and Chipmunks

California ground squirrel

Appendix C

Photo Log



Photo 1 (NW). Photo depicts red brome – ripgut brome herbaceous semi-natural alliance at MP 175.18.



Photo 2 (SW). Photo depicts disturbed conditions (California Aqueduct and paved roadway).



Photo 3 (N). Photo depicts allscale scrub shrubland alliance located within at MP 183.19.



Photo 4 (N). Photo depicts disturbed conditions (California Aqueduct and unpaved roadway) within survey area.



Photo 5 (SE). Photo depicts allscale scrub shrubland alliance located at MP 196.58.

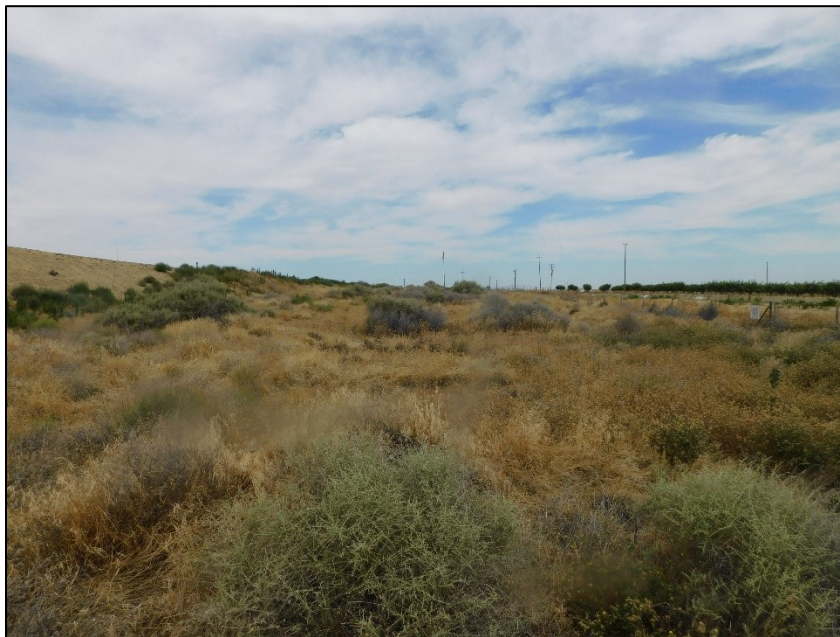


Photo 6 (SW). Photo depicts red brome herbaceous semi-natural alliance observed at MP 196.58.



Photo 7 (NW). Photo depicts an old pellet at MP 196.58. It could not be determined if pellets were from BUOW or different avian species.



Photo 8 (SW). Photo depicts an old pellet at MP 196.58. It could not be determined if pellets were from BUOW or different avian species.



Photo 9 (NW). Photo depicts a suitable BUOW burrow located under a large rock. Binoculars were used for size reference.



Photo 10 (SW). Photo depicts a suitable BUOW burrow located under a large rock. Binoculars were used for size reference.

Appendix D

CNPS Database Rare Plant List



*The database used to provide updates to the Online Inventory is under construction. [View updates and changes made since May 2019 here.](#)

Plant List

25 matches found. [Click on scientific name for details](#)

Search Criteria

California Rare Plant Rank is one of [1A, 1B, 2A, 2B, 3, 4],
 FESA is one of [Endangered, Threatened, Candidate, Not Listed],
 CESA is one of [Endangered, Threatened, Rare, Not Listed], Found in Quads 3511967, 3511966, 3511965, 3511957, 3511956, 3511955, 3511947, 3511946, 3511945, 3612011, 3611918, 3611917, 3512081, 3511988, 3511987, 3512071, 3511978, 3511977, 3512061, 3511968 3511976 and 3511958;

[Modify Search Criteria](#) [Export to Excel](#) [Modify Columns](#) [Modify Sort](#) [Display Photos](#)

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Allium howellii var. howellii	Howell's onion	Alliaceae	perennial bulbiferous herb	Mar-Apr	4.3	S3	G3G4T3
Amsinckia furcata	forked fiddleneck	Boraginaceae	annual herb	Feb-May	4.2	S4	G4
Antirrhinum ovatum	oval-leaved snapdragon	Plantaginaceae	annual herb	May-Nov	4.2	S3	G3
Astragalus hornii var. hornii	Horn's milk-vetch	Fabaceae	annual herb	May-Oct	1B.1	S1	G4G5T1T2
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex cordulata var. erecticaulis	Earlismart orache	Chenopodiaceae	annual herb	Aug-Sep(Nov)	1B.2	S1	G3T1
Atriplex coronata var. coronata	crownscale	Chenopodiaceae	annual herb	Mar-Oct	4.2	S3	G4T3
Atriplex coronata var. notatior	San Jacinto Valley crownscale	Chenopodiaceae	annual herb	Apr-Aug	1B.1	S1	G4T1
Atriplex coronata var. vallicola	Lost Hills crownscale	Chenopodiaceae	annual herb	Apr-Sep	1B.2	S2	G4T2
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	May-Oct	1B.1	S2	G2
Caulanthus californicus	California jewelflower	Brassicaceae	annual herb	Feb-May	1B.1	S1	G1
Cirsium crassicaule	slough thistle	Asteraceae	annual / perennial herb	May-Aug	1B.1	S1	G1
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	1B.2	S2?	G2?

<u>Eremalche parryi ssp. kernensis</u>	Kern mallow	Malvaceae	annual herb	Jan,Mar,Apr,May(Feb)	1B.2	S3	G3G4T3
<u>Eriastrum hooveri</u>	Hoover's eriastrum	Polemoniaceae	annual herb	(Feb)Mar-Jul	4.2	S3	G3
<u>Eriogonum temblorense</u>	Temblor buckwheat	Polygonaceae	annual herb	(Apr)May-Sep	1B.2	S2	G2
<u>Lasthenia glabrata ssp. coulteri</u>	Coulter's goldfields	Asteraceae	annual herb	Feb-Jun	1B.1	S2	G4T2
<u>Layia heterotricha</u>	pale-yellow layia	Asteraceae	annual herb	Mar-Jun	1B.1	S2	G2
<u>Layia munzii</u>	Munz's tidy-tips	Asteraceae	annual herb	Mar-Apr	1B.2	S2	G2
<u>Lepidium jaredii ssp. jaredii</u>	Jared's pepper-grass	Brassicaceae	annual herb	Mar-May	1B.2	S1S2	G2G3T1T2
<u>Madia radiata</u>	showy golden madia	Asteraceae	annual herb	Mar-May	1B.1	S3	G3
<u>Monolopia congdonii</u>	San Joaquin woollythreads	Asteraceae	annual herb	(Jan)Feb-May	1B.2	S2	G2
<u>Puccinellia simplex</u>	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
<u>Trichostema ovatum</u>	San Joaquin bluecurls	Lamiaceae	annual herb	Jul-Oct	4.2	S3	G3
<u>Tropidocarpum californicum</u>	Kings gold	Brassicaceae	annual herb	Feb-Mar	1B.1	S1	G1

Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website <http://www.rareplants.cnps.org> [accessed 11 July 2019].

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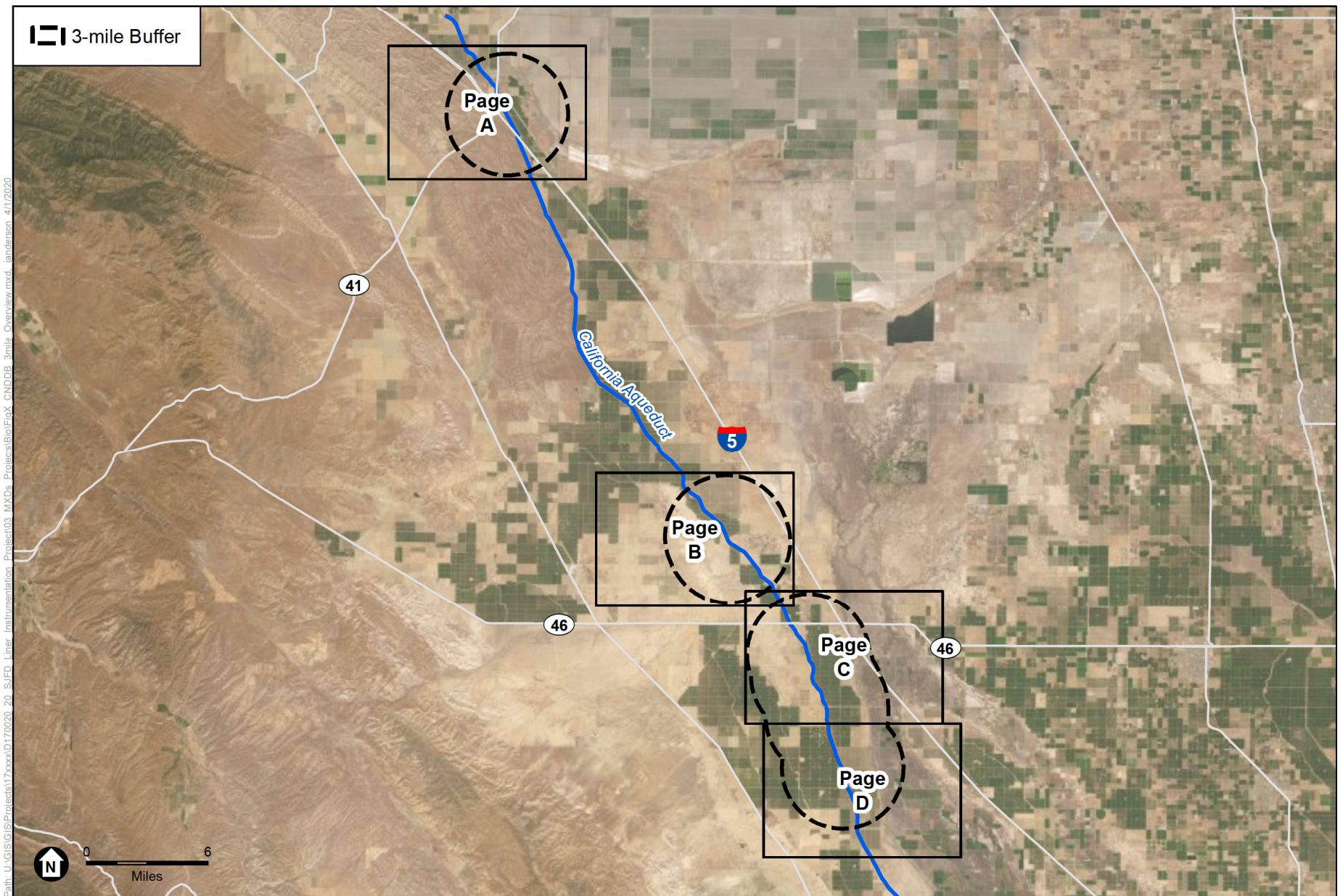
Questions and Comments

rareplants@cnps.org

Appendix C

CNDDDB Occurrences BaseMaps



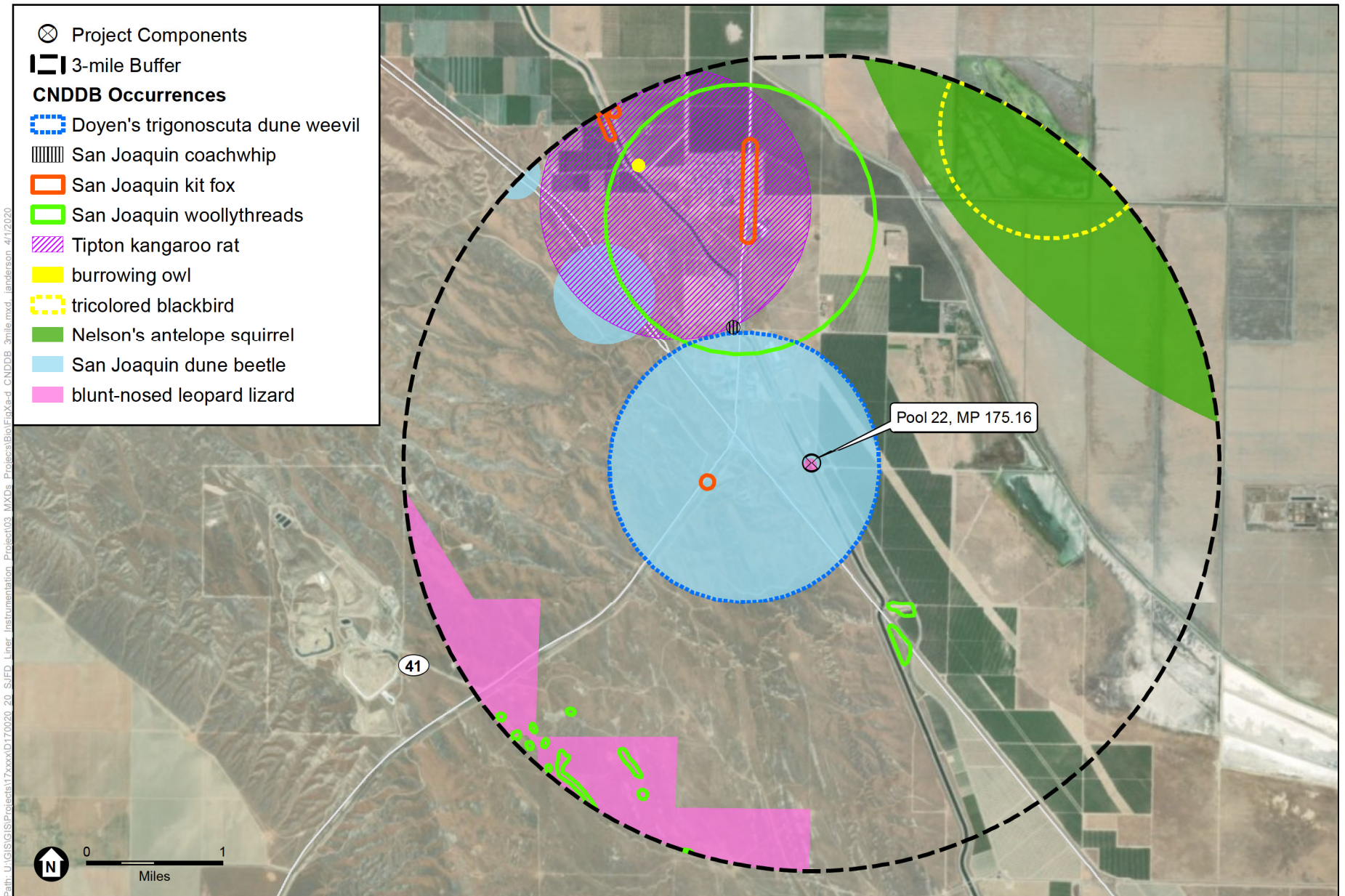


SOURCE: ESRI.

SJFD Liner and Instrumentation Project

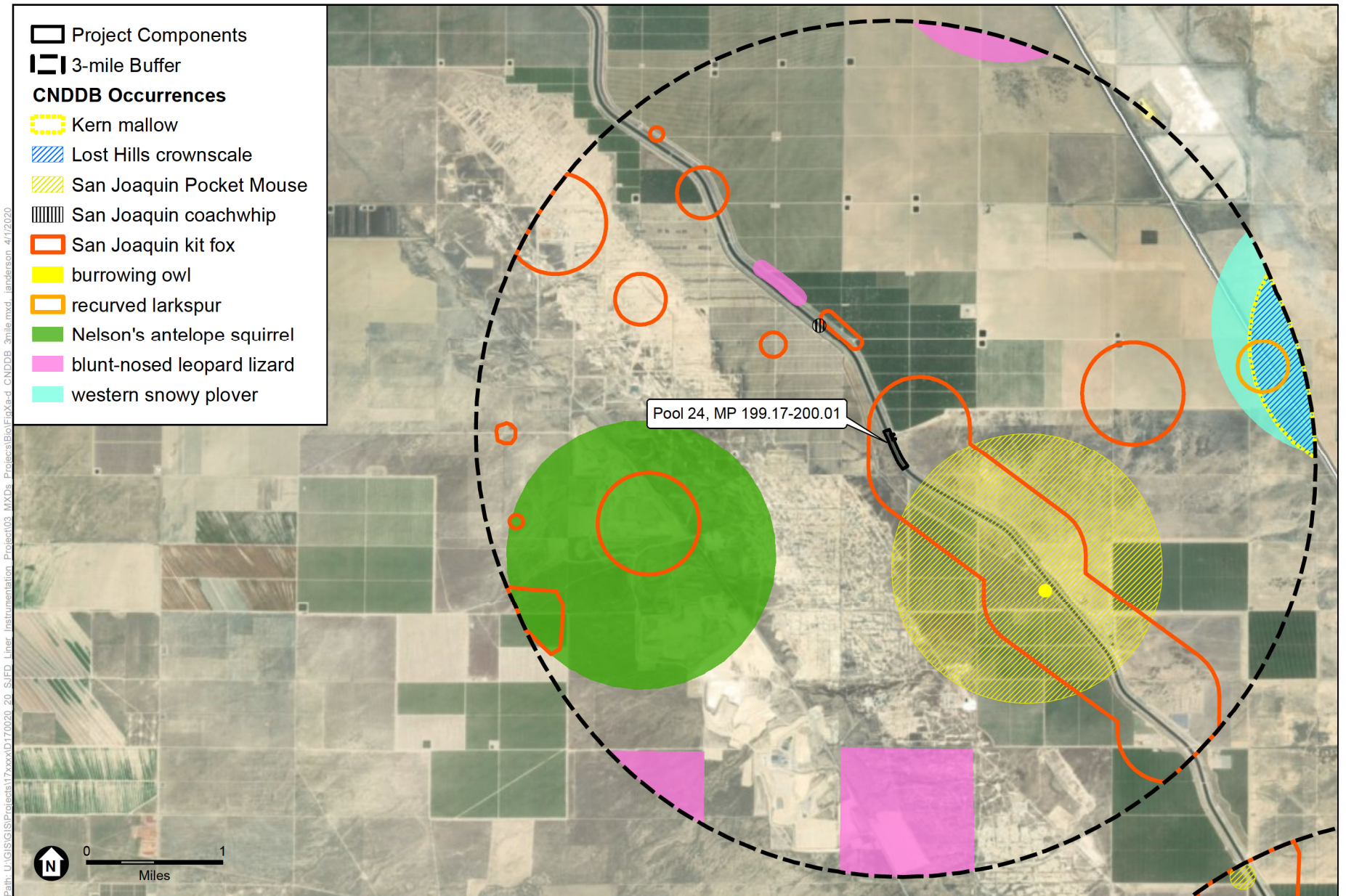


CNDDDB Occurrences Base Map



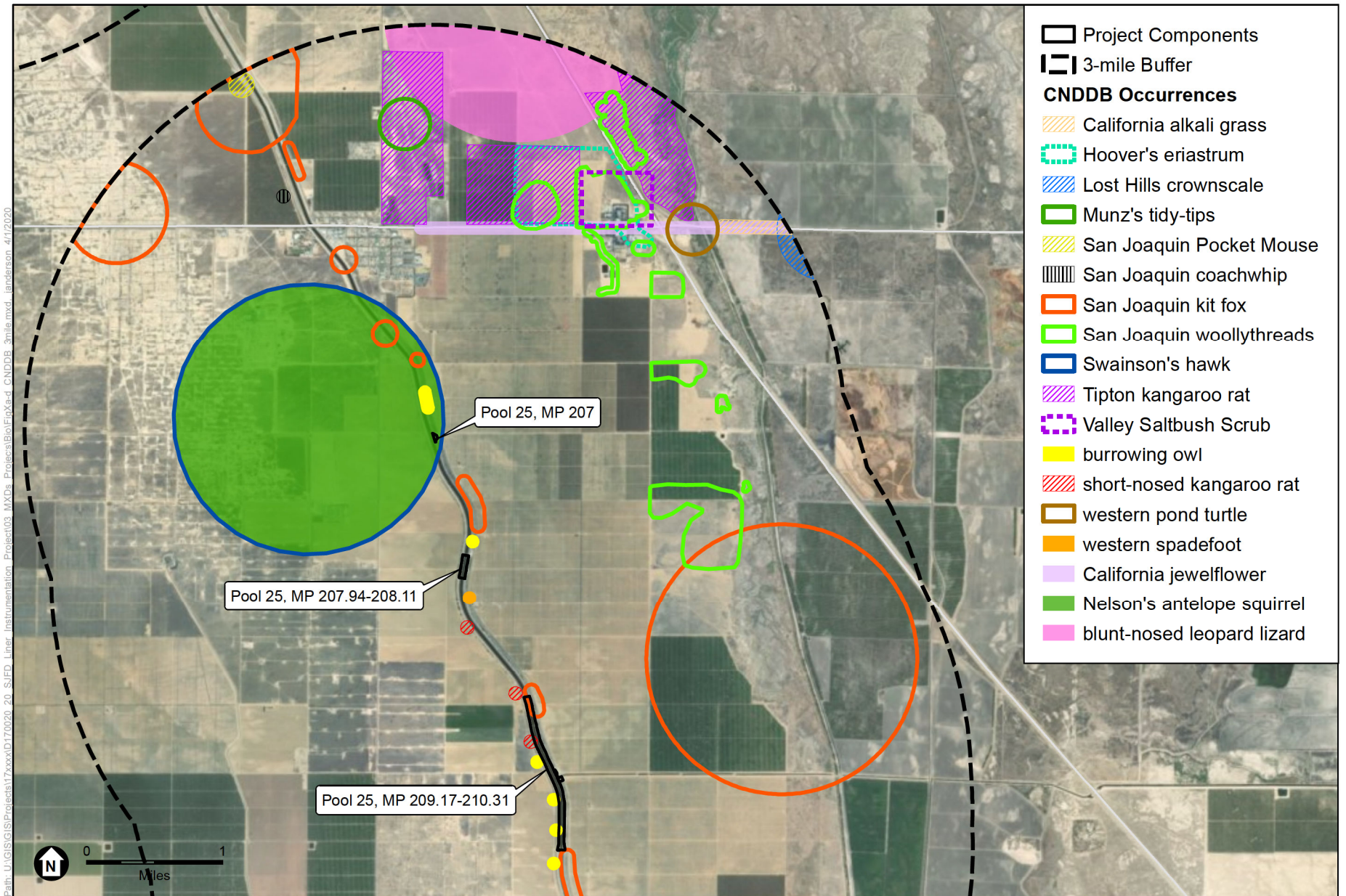
SOURCE: ESRI; CDFW.

SJFD Liner and Instrumentation Project



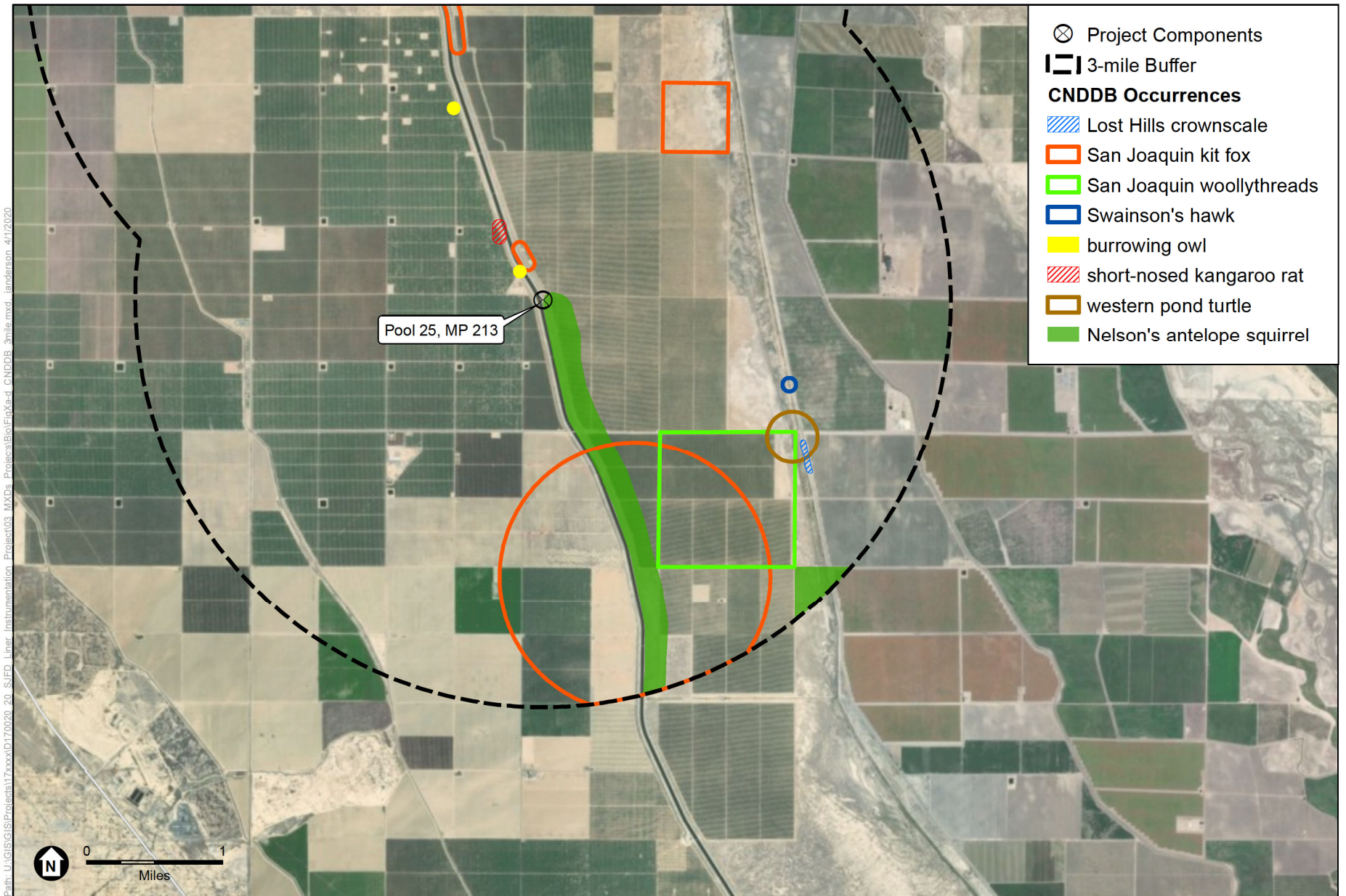
SOURCE: ESRI; CDFW.

SJFD Liner and Instrumentation Project



SOURCE: ESRI; CDFW.

SJFD Liner and Instrumentation Project



SOURCE: ESRI; CDFW.

SJFD Liner and Instrumentation Project

Appendix D

GGERP Consistency Determination Checklist



Greenhouse Gas(GHG) Emissions Reduction Plan Consistency Determination

For Projects Using Contractors or Other Outside Labor

This form is to be used by DWR project managers to document a DWR CEQA project's consistency with the DWR Greenhouse Gas Emissions Reduction Plan. This form is to be used only when DWR is the Lead Agency and when contractors or outside labor and equipment are used to implement the project.

Additional Guidance on filling out this form can be found at:

http://dwrclimatechange.water.ca.gov/guidance_resources.cfm

The DWR Greenhouse Gas Emissions Reduction Plan can be accessed at:

<https://water.ca.gov/Programs/All-Programs/Climate-Change-Program/Climate-Action-Plan>

Project Name:	San Joaquin Field Division Liner Raise & Instrumentation Project
Environmental Document Type:	IS/MND
Manager's Name:	Christine Carlton
Manager's E-mail:	Christine.Carlton@water.ca.gov
Division:	San Joaquin Field Division
Office, Branch, or Field Division:	Sacramento

Short Project Description:
Located in Kings and Kern Counties, the project would raise portions of the concrete liner on each side of Pools 24 and 25 over 1.65 miles and would install water level monitoring instrumentation to provide real-time monitoring of flow and water levels in Pools 22 and 25.

Project GHG Emissions Summary:		
Total Construction Emissions	164	mtCO ₂ e
Maximum Annual Construction Emissions	164	mtCO ₂ e
<input checked="" type="checkbox"/> All other emissions from the project not accounted for above will occur as ongoing operational, maintenance, or business activity emissions and therefore have already been accounted for and analyzed in the GGERP.		

Extraordinary Construction Project Determination:	
Do total project construction emissions exceed 25,000 mtCO ₂ e for the entire construction phase or exceed 12,500 mtCO ₂ e in any single year of construction?	
<input checked="" type="checkbox"/> No- Additional analysis not required	<input type="checkbox"/> Yes - Project specific emissions mitigation measures have been included in the environmental analysis document for the project

Project GHG Reduction Plan Checklist:

☒ All Project Level GHG Emissions Reduction Measures have been incorporated into the design or implementation plan for the project. ([Project Level GHG Emissions Reduction Measures](#))

Or

☐ All feasible Project Level GHG Emissions Reduction Measures have been incorporated into the design or implementation plan for the project and Measures not incorporated have been listed and determined not to apply to the proposed project (include as an attachment)

☒ Project does not conflict with any of the Specific Action GHG Emissions Reduction Measures ([Specific Action GHG Emissions Reduction Measures](#))

Would implementation of the project result in additional energy demands on the SWP system of 15 GWh/yr or greater?

☐ Yes ☒ No

If you answered Yes, attach a letter documenting that the project has consulted with the DWR SWP Power and Risk Office regarding the additional power requirements of the project.

Is there substantial evidence that the effects of the proposed project may be cumulatively considerable notwithstanding the proposed project's compliance with the requirements of the DWR GHG Reduction Plan?

☐ Yes ☒ No

If you answered Yes, the project is not eligible for streamlined analysis of GHG emissions using the DWR GHG Emissions Reduction Plan. (See CEQA Guidelines, section 15183.5, subdivision (b)(2).)

Based on the information provided above and information provided in associated environmental documentation completed pursuant to the above referenced project, the DWR CEQA Climate Change Committee has determined that:

- ☒ The entire proposed project is consistent with the DWR Greenhouse Gas Reduction Plan and the greenhouse gases emitted by the project are covered by the plan's analysis.
- ☐ The operational and maintenance phase of the project is consistent with the DWR Greenhouse Gas Reduction Plan and the greenhouse gases emitted by the project are covered by the plan's analysis. Emissions from the construction phase of the project are not covered by the DWR Greenhouse Gas Emissions Reduction Plan and will be mitigated as part of the project.

Project Manager Signature: Christine Carlton

Date: 3-2-2020

C4 Approval Signature: Jennifer Morales

Date: 3/18/2020

Attachments:

☐ GHG Emissions Inventory

☐ List and Explanation of excluded Project level GHG Emissions Reduction Measures

☐ SWP Power and Risk Office Consultation Letter

Links:

<https://current.water.ca.gov/programs/icc/SitePages/Home.aspx>

<https://water.ca.gov/Programs/All-Programs/Climate-Change-Program>