DRAFT

INITIAL STUDY/PROPOSED MITIGATED NEGATIVE DECLARATION

CALIFORNIA AQUEDUCT MILEPOST 230.6 TO 231.4 INVESTIGATION, DESIGN, AND REPAIR

Prepared by

California Department of Water Resources

MARCH 2022

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
BVWSD	Buena Vista Water Storage District
CAAQS	California Ambient Air Quality Standards
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resource Board
CCAP	Climate Change Action Plan
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CHRIS	California Historical Resources Information System
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CPT	cone penetrometer testing
CRHR	California Register of Historical Resources
CUPA	Certified Unified Program Agency
CVP	Central Valley Project
CWHR	California Wildlife Habitat Relationships
DOC	California Department of Conservation
DSM	deep soil mixing
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EO	Executive Order
ER	electronic resistivity
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FMMP	Farmland Mapping and Monitoring Program
GHG	Green House Gas
GWP	global warming potential
HCP	Habitat Conservation Plan
HMG	high mobility grouting
HP	horsepower
HSA	hollow stem auger
IS	Initial Study
JSA	Jones and Stokes Associates
LRA	Local Responsibility Areas
MLC	Mineral Land Classification
MND	mitigated negative declaration
MP	Milepost
MT	metric tons
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NO_2	nitrogen dioxide

Acronym/Abbreviation	Definition
NRHP	National Register of Historic Places
O_3	ozone
OES	Office of Emergency Services
PM10	particulate matter with an aerodynamic diameter less than or equal to 10 microns in size
PM2.5	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns in size
PVC	Polyvinyl chloride
RACT	Reasonably Available Control Technology
ROG	reactive organic gases
ROW	Right of Way
RTP	Regional Transportation Plan
SCS	Sustainable Community Strategy
SIP	State Implementation Plans
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLF	Sacred Lands File
SMARA	Surface Mining and Reclamation Act
SOCAL	Standard Oil California
SSJVIC	Southern San Joaquin Valley Information Center
SWP	State Water Project
SWPPP	storm water pollution prevention plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
USFWS	United States Fish and Wildlife Service
WEAP	Worker Environmental Awareness Program
WQCP	Water Quality Control Plan

Initial Study Checklist

1. **Project Title:**

   Milepost 230.6 TO 231.4 Study, Design, Repair

2. **Lead Agency Name and Address:**

   California Department of Water Resources

   Division of Operations & Maintenance

3. **Contact Person and Phone Number:**

   Gerald Snow, 916-902-7051

4. **Project Location:**

   Pool 27 of the California Aqueduct within Kern County

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 repair the embankment of the California Aqueduct on the east side of Pool 27 and repair both sides of the liner. The proposed project would also involve geotechnical investigations prior to any repairs to collect data that would be used in the design of the repair.

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, California Department of Fish and Wildlife – Incidental Take Permit; U.S. Fish and Wildlife Service – Habitat Conservation Plan.

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 9.18, *Environmental Checklist - Tribal Cultural Resources*, for details on tribal consultation.

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.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☐ Energy
☒ Geology and Soils	☒ Greenhouse Gas Emissions	☒ Hazards and Hazardous Materials
☒ Hydrology and Water Quality	☐ Land Use and Planning	☐ Mineral Resources
☐ Noise	☐ Population and Housing	☐ Public Services
☐ Recreation	☐ Transportation	☒ Tribal Cultural Resources
☐ Utilities and Service Systems	☐ Wildfire	☒ 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.

Jerry Snow	3/25/2022
Signature	Date
Jerry Snow	Environmental Assessment Manager
Print Name	Title

Notice of Intent to Adopt a Mitigated Negative Declaration

Pursuant to the provisions of Title 14, Section 15072 of the California Code of Regulations, the California Department of Water Resources (DWR) gives notice of its intent to adopt the mitigated negative declaration for the project: MILEPOST 230.6 TO 231.4 STUDY, DESIGN, REPAIR

DWR proposes to investigate, design, and repair the California Aqueduct between Milepost 230.6 and 231.44. The Project Area comprises approximately 13.5 acres in Kern County.

The mitigated negative declaration proposed for adoption for this project finds that the proposed project will not have a significant effect on the environment and that preparation of an environmental impact report is not required.

For additional information about this project or for copies of the initial study/draft mitigated negative declaration, contact Shelly Amrhein, Division of Operations and Maintenance, 916.653.6973.

A comment period for the initial study/draft mitigated negative declaration will begin March 30, 2022, and will end April 28, 2022.

Written comments should be mailed to:

Ms. Shelly Amrhein

California Department of Water Resources
Division of Operations and Maintenance
P.O. Box 942836. Sacramento, CA 94236-0001
Telephone: 916-661-1970

Electronic comments can be sent to:

Shelly.Amrhein@water.ca.gov

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1 Project Overview

The California Department of Water Resources (DWR) proposes to investigate, design, and repair the California Aqueduct (Aqueduct) between Milepost (MP) 230.6 and 231.44 (Project). The following steps will address the unstable soils in the area and secure the surrounding infrastructure:

- Conduct geotechnical exploration to determine soil behavior types, weak areas, and soil moisture contents in the area.
- Reinforce approximately 1.18 miles of Aqueduct embankment to improve soil structure and reduce seepage.
- Restore the embankment to the design elevation to reduce risk of overtopping.
- Repair any damage to the Aqueduct liner to prevent seepage.
- Raise approximately 1.4 miles of Aqueduct liner to design elevation to prevent seepage and erosion.
- Reconstruct the road on top of the restored embankment to restore access.

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2 Location

The proposed Project is approximately four miles south of Buttonwillow, in Kern County (UTM 277072.307m E and 3913732.073m N). DWR currently plans to repair the embankment on both sides of the Aqueduct, in Pool 27, from MP 230.7 to 231.05 and MP 231.2 to 231.44. DWR would also conduct geotechnical investigations and liner raises on both sides of the Aqueduct.

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3 Project Area

The proposed Project is located on the valley floor of the southwestern portion of the San Joaquin Valley. The southern portion of the San Joaquin Valley is an asymmetric basin consisting of low alluvial plains and fans, overflow lands, and old lakebeds. The Temblor Mountain Range borders the proposed Project to the west. Sediments deposited in the area are transported from the Elk Hills area of the Temblor Range and tend to be unconsolidated clayey silts. Elk Hills, one of California's most productive oil fields, is approximately one mile south.

This section of the Aqueduct is located on a series of alluvial fans, which are products of drainage from Elk Hills. The variation in topographic features at this section of the Aqueduct resulted in using both cut and fill construction to bridge between fan deposits and achieve the correct shape and elevation for the Aqueduct. Settling ponds were also used prior to the construction of the Aqueduct to promote hydrocompaction (compaction of soils and unconsolidated substrate once moisture is introduced).

The land use at the proposed Project is currently classified as disturbed land by the Department of Conservation; however, the right-of-way adjacent to the Aqueduct consists of established vegetation such as cattle saltbush (*Atriplex polycarpa*) and black mustard (*Brassica nigra*). The adjacent land use consists of farmland, grazing land, and natural vegetation. California Department of Fish and Wildlife (CDFW) Lokern Ecological Reserve is located approximately 0.5 miles west of the proposed Project area. The Reserve is known for its valley sink scrub habitat and supports native vegetation such as iodine bush (*Allenrolfea occidentalis*) and seepweed (*Suaeda* sp.).

Figure 1. Proposed Project Location.

4 Project Background and Purpose

On September 18, 2012, DWR Operations and Maintenance and Division of Engineering responded to a leak at MP 230.88 on the eastern (left side) embankment of the Aqueduct. The leak resulted in a boil in adjacent DWR property. DWR stopped the leak on September 20, 2012 by grouting the liner from within the Aqueduct prism. During that time, the response team observed cracking in the ground that extended through the Aqueduct left embankment approximately 300 to 500 linear feet north (upstream) of the leak.

Due to environmental constraints, DWR conducted limited geotechnical investigations in 2013 to determine the cause of the ground cracking and the leak. Based on that investigation, the most likely conclusion suggested that Aqueduct water had leaked through small cracks or open joints and had led to erosion of the foundation soils and further cracking of the Aqueduct liner. Larger quantities of water then began to seep through to the embankment.

It was further suggested that the leaking water then saturated the native unconsolidated fan deposits outside the original pre-consolidation pond boundaries, leading to hydrocompaction of the fan deposits. The hydrocompaction then resulted in additional panel distress and further water leakage. The leaking water became perched on a fine-grained soil layer and surfaced as a boil past the toe of the embankment. The embankment cracking upstream of the boil was likely the result of Aqueduct water leaking and causing hydrocompaction of the underlying fan deposits.

On March 1, 2016 a second leak was identified after a magnitude 4.9 earthquake occurred in the area. It also resulted in a boil about 300 feet away on DWR property. The leak was repaired over a two-day period and the boil stopped. The Aqueduct was inspected for additional leaks. Liner distress was observed; however, no additional repairs were conducted since leaks were not occurring.

Additional subsurface data is needed for the design and repair of the Aqueduct and embankment. Results and analysis from the investigations would determine the best repair option to protect this critical infrastructure. Potential options identified by DWR that are appropriate for this remediation may include deep soil mixing, grouting, cut-off walls, and combinations thereof.

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5 Description of Project Steps

5.1 Features Described

Aqueduct

The Aqueduct is a manmade channel or canal to move water. The canal is shaped like a reverse trapezoid, often referred to as a prism. Depending on the topography and elevation during the Aqueduct construction, the surface may have been excavated, or "cut," or soil may have been imported, or "filled," to create the prism.

Aqueduct Concrete Liner

The Aqueduct liner is composed of concrete panels that are inlaid into, and reinforces, the invert of the prism. The liner creates an impermeable barrier between the water and the prism walls, maintaining the integrity of the structure and reducing seepage.

Embankments

In areas where the prism was cut (formed by the removal of material), the excavated soils were placed along the west side of the Aqueduct and formed into embankments. These embankments protect the canal from damage caused by water, sediment, and debris contained in the runoff from adjacent lands. In areas where the prism was filled (formed by the adding of material), soils were placed to form the sides of the canal prism and serve a hydrologic function in containment. The Project contains both kinds of embankments.

Right of Way (ROW)

ROW is the property that DWR owns along the Aqueduct. It is typically a parallel strip, on both sides, that follows the entire length of Aqueduct and associated features. The ROW can vary in size and is sometimes delineated by a fence.

Aqueduct Roads

There are four types of Aqueduct roads. Access roads are adjacent to both sides of the Aqueduct and are usually paved but may be chip-sealed or graveled in sections. Other types of roads include embankment roads, which are located on the crown (top) of embankments; toe roads, which are located at the toe (base) of embankments; and fence line roads, which are located along the fence bordering the right of ROW. These roads are usually dirt, but may be gravel.

5.2 Geotechnical Exploration

The first activity would consist of surficial geophysical survey consisting of six electronic resistivity (ER) lines to identify potential subsurface water paths at the proposed Project. ER survey lines are tentatively located on the left and right embankment crests of the Aqueduct and beyond the toe of the left and right canal embankments. The ER lines consist of electrodes imbedded in the ground attached to a receiver cable. A low-voltage electrical current is transmitted into the ground and received by the electrodes to plot a map of high and low resistivity areas.

The voltage is not great enough to endanger local wildlife. The data collected from the ER survey would help adjust further exploration locations to target areas of lower resistivity, which can indicate groundwater movement or stratigraphic changes.

Standard and seismic cone penetrometer testing (CPT) would be conducted at approximately 86 sites centered around MP 230.75 and MP 231.3 (**Figure 2**) on both sides of the Aqueduct. DWR would use the CPT results to identify sites for more extensive exploration using hollow stem auger (HSA) drilling or trenching. DWR may use up to 18 HSA drillings and three trench explorations. DWR would determine exact locations within the proposed Project footprint of the differing exploration methods in the field around MPs 230.75 and 231.3.

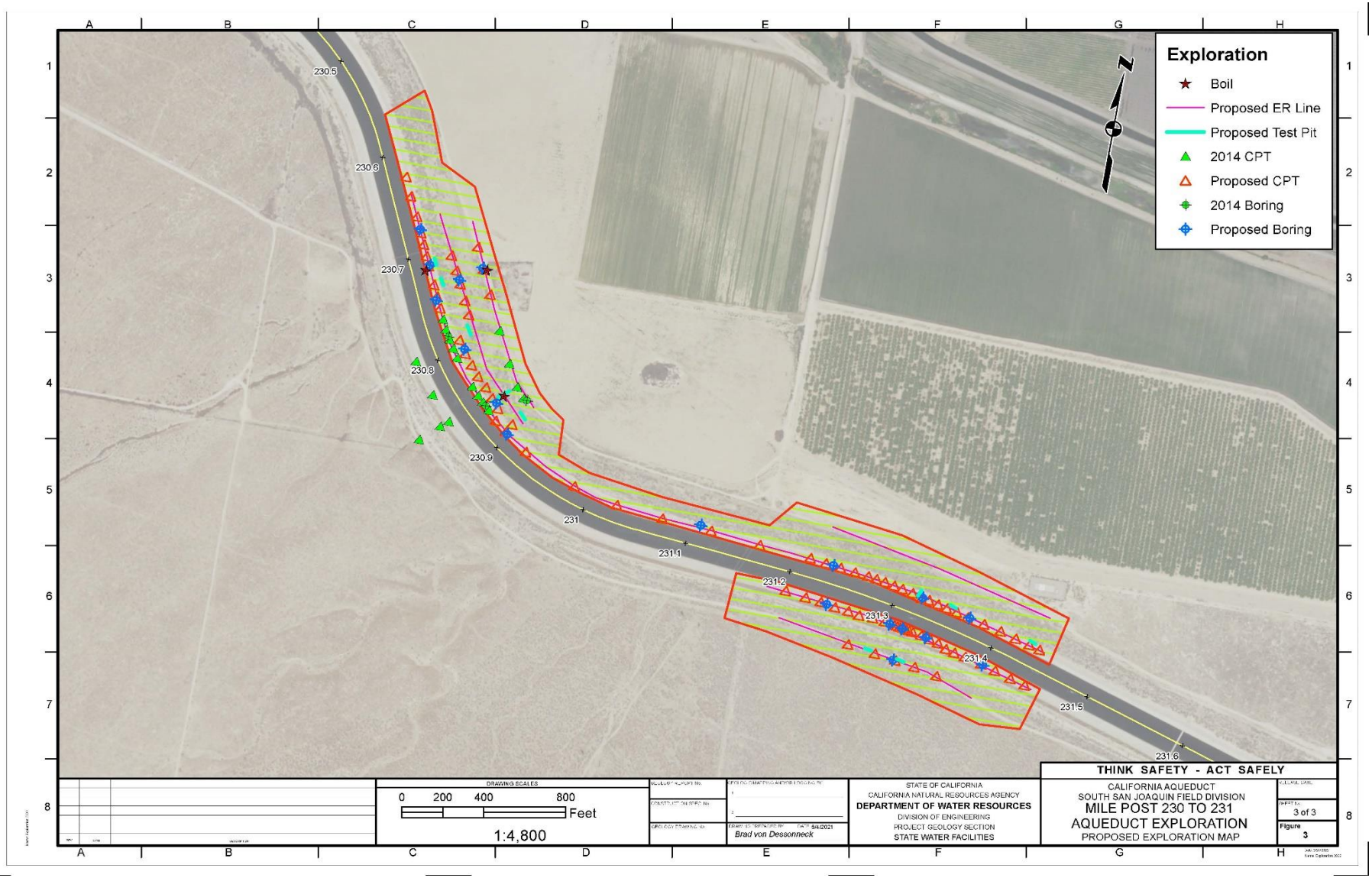
CPTs would be performed utilizing a truck (32 feet long by 8.5 feet wide footprint) or track-mounted (20 feet long by 9 feet wide) rig. Standard CPTs would be approximately 40 to 60 feet deep through the embankment and approximately 20 to 30 feet deep beyond the embankment toe. Approximately two sites would be increased to 100-foot seismic CPTs to measure compression and shear wave velocities in the embankment and underlying foundation materials.

Pore pressure dissipation tests may be conducted during the CPTs when granular materials are suggested by the collected data. The test would only be conducted when the estimated groundwater levels are found to be significantly higher than the granular material. Approximately three select CPT holes may be converted to temporary groundwater observation wells upon completion to monitor water levels in the embankment during and after repairs. The CPT holes that do not have wells installed in them would be backfilled with cement-bentonite grout.

HSA drillings would utilize a truck or track mounted drill rig with similar dimensions as the CPT rig to advance a six to eight-inch diameter HSA to a maximum depth of 60 feet, with the exception of six holes reaching a maximum of 100 feet. While drilling, DWR would periodically collect and test core soil samples at discrete depths. Spoil soils from HSA boreholes would be drummed and transported offsite for landfill disposal. All boreholes would be backfilled immediately with a cement-bentonite grout mix except the top two feet, which would be native soil.

If necessary, additional explorations would be added to the same investigation effort if data collection is insufficient. If the additional exploration is outside of the proposed scope, applicable stakeholders will be notified for review and comment.

Figure 2. Geotechnical Exploration Methods and Location Centered at Milepost 230.75 and 231.3



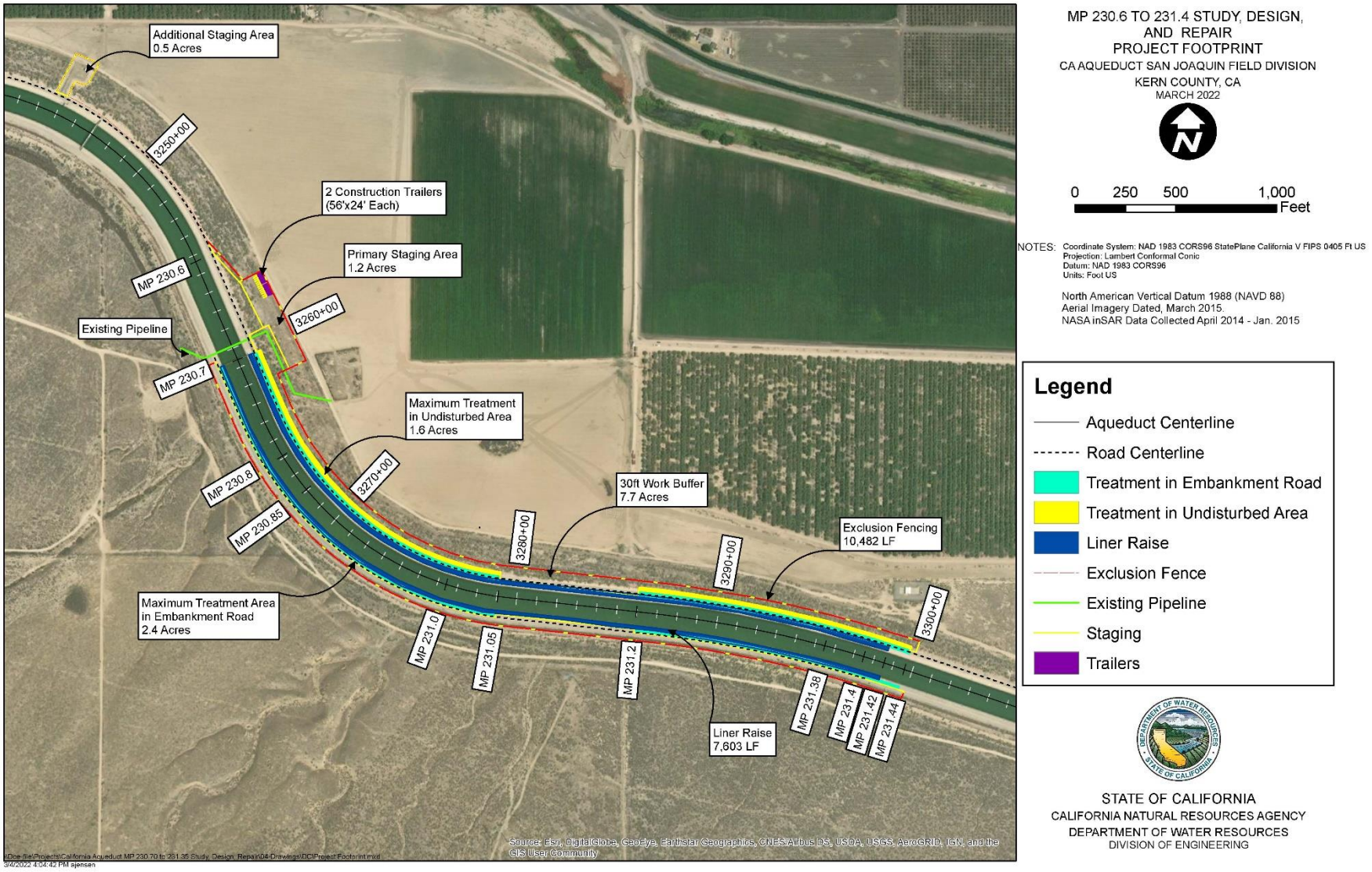
Additionally, up to ten trenches, three feet wide by 20 feet long by 15 feet deep would be excavated with a CAT 450 or similar backhoe. Excavated material would be temporarily spoiled adjacent to the trench and used to backfill. The trenches would be shored to prevent collapse and facilitate examination of the soil. After the investigation is completed, the trenches would be backfilled and compacted, returning the area to its original grade. The majority of trenches would be located on the east side with the remaining on the west side of the Aqueduct in the proposed survey area.

The results of all geotechnical exploration would be used to identify and analyze subsurface conditions and determine the best repair method for the proposed Project.

5.3 Embankment Repair

DWR proposes the following methods to repair the hydrologic embankments and secure the Aqueduct prism. The repair methods are categorized into the following three alternatives: grouting; deep soil mixing; and a cut-off wall. The alternative used would be determined by the geotechnical analysis. **Figure 3** shows the proposed Project footprint and repair footprint. The total project footprint is approximately 1.44 miles long while the total repair length is approximately 1.18 miles and includes both sides of the Aqueduct.

Figure 3. Proposed Project Footprint and Repair Areas



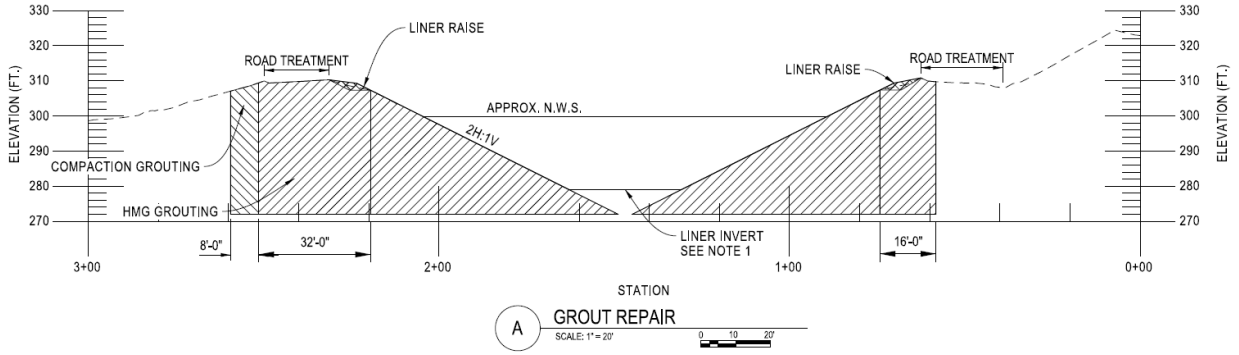
5.3.1 Grouting

The grouting alternative would be a combination of compaction grouting and high mobility grouting (HMG). **Figure 4** shows the approximate extents and depths of grouting. DWR would use HMG grouting for the embankment and compaction grouting as an outer curtain for stability. Both are ground modification techniques where mixtures of cement, water, aggregate (in the case of compaction grouting), and additives (bentonite, viscosity modifiers and stabilizers in the case of HMG) are injected into the ground. A combination of HMG and compaction grouting is being considered along the left and right sides of the Aqueduct. The purpose of the grouting is to strengthen the soil with compaction grouting and fill open voids with HMG.

At the start of construction, injection pipes would be driven into the ground using an air-track rig or drilled using a hollow stem auger drill rig. The injection pipes for HMG would have a minimum one-inch diameter while the injection pipes for compaction grouting would have a minimum three-inch diameter. The pipes would be split-spaced at 8 foot spacing for primary holes, followed by secondary and tertiary holes as needed.

Grout would be mixed onsite in high shear colloidal mixing tanks. The grout would then be injected into the soil using the pipes. Pipes would be removed once grout is in place. This would result in an increase in soil strength, and a decrease in permeability by multiple orders of magnitude.

Figure 4. Cross Section of Embankment with Grouting Alternative



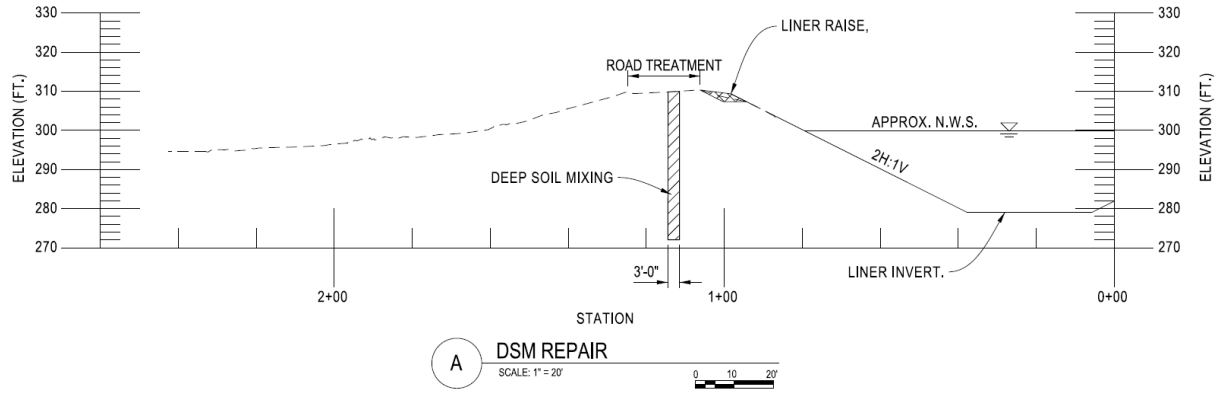
5.3.2 Deep Soil Mixing

The deep soil mixing (DSM) alternative would mix soils with cement through the embankment. The DSM area would run perpendicular to the aqueduct canal and be 3 feet wide within the center of the embankment on the left side. DSM would increase the strength and decrease the permeability of the soil. DSM is only proposed on the left embankment of the Aqueduct. HMG would be used on the right side of the Aqueduct.

A crane or excavator mounted with multiple three-foot diameter augers would be placed on the embankment to mix cement with the soil in-situ to create a grid of improved soil. Cement would be imported from offsite and batched and mixed onsite. The process would involve drilling down approximately 30 feet from the working platform while using the multi-auger system to thoroughly mix the soil with water, then cement, would be injected directly into the soil at the tip of the augers as a slurry.

After allowing the soil-cement to set, DWR would take cores to confirm the strength and permeability of the material. The embankment would be rebuilt as needed back to design elevations once the soil amendment is complete. **Figure 5** provides an overview of the DSM repair. HMG along the right side mimics **Figure 4.**

Figure 5. Cross Section of Embankment with Deep Soil Mixing Alternative



5.3.3 Cut Off Wall

The cut off wall alternative would be installing a cut off wall through the center of the embankment crest. **Figure 6** shows the approximate location of the cut off wall. The cut off wall would decrease the seepage through the embankment while not decreasing the permeability of the surrounding soil. Installation of a cut off wall is only proposed on the left embankment of the Aqueduct. HMG would occur on the right side of the Aqueduct. HMG along the right side mimics **Figure 4.**

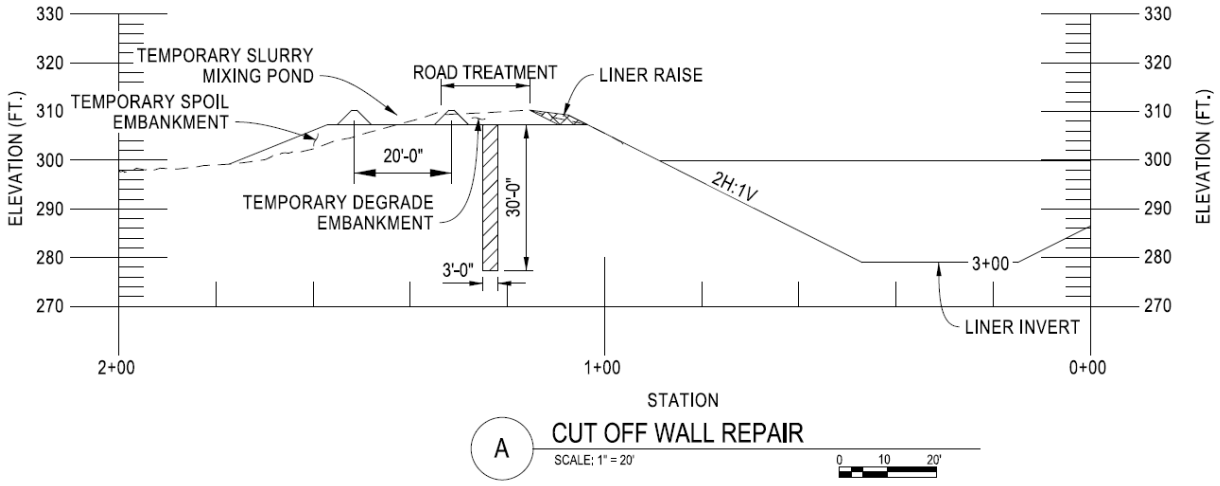
The existing embankment would be degraded by 6 to 10 feet to create a working platform width of 40 feet to construct the wall. Degraded material would be spoiled on the slope and toe of the embankment for reconstruction of the embankment when complete. A trench would be excavated 30 feet deep and approximately 3 feet wide where a bentonite slurry compound would be injected.

The bentonite slurry would be mixed onsite before being injected into the trench. To facilitate the creation of the slurry compound, a primary mixing pond, approximately 20 feet by 20 feet, would be created adjacent to the embankment by constructing earthen berms approximately 3 feet in height. The bentonite slurry serves to stabilize the trench during the excavation process. The slurry is also used in the construction of the cutoff wall, it is mixed with existing soils both in the trench and a secondary mixing pond. If additional soil is needed it will be imported from a clean source offsite.

The secondary mixing pond would be created parallel to the trench along the degraded embankment. The width of this pond would be up to 20 feet, and the length would be equal to length of trench excavated during that work period.

Using an excavator, the excavated soil would be mixed with three to six percent of dry bentonite by weight to create a semi-fluid material. The secondary mixing pond is used to continue the mixing process and create the proper consistency of soil and bentonite. Once the proper consistency is met it is placed back in the trench using the excavator. The cutoff wall is then monitored for settling through the curing process. Once the wall is complete, the degraded embankment would be rebuilt to its original design.

Figure 6. Cross Section of Embankment with Cut Off Wall Alternative



5.4 Liner Repairs

The Aqueduct concrete liner would be raised approximately two feet for the entire length of the proposed footprint on both sides of the Aqueduct. The liner raise would restore the necessary height for the required freeboard for the Aqueduct to operate. 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. Additional work to the waterside embankment would depend on the embankment repair method used. If the crown of the embankment is not degraded and rebuilt, then the existing embankment on the waterside would require fortification. The embankment would be excavated a minimum of 6 feet laterally, rebuilt, and re-compacted prior to placing the new concrete liner. Approximately 1,400 cubic yards of clean imported material would be used to build up the embankment slope to match the existing liner slope.

After the embankment has been finished, the concrete placement would start. The existing concrete liner would be cleaned by power washing to remove any debris prior to new concrete placement. Concrete forms would be built on the embankment and water-stops placed for the concrete pour along the embankment slope. Approximately 100 cubic yards of concrete would be imported, and a pump truck used to place the concrete in front of a slip form screed. The slip form screed would be pulled up the slope to finish the concrete.

Polyvinyl chloride (PVC) waterstop material would be installed at expansion and contraction joints, and strip waterstop material installed at longitudinal construction joints prior to concrete placement using hand tools. Concrete placement curing compound would be applied on the new 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.

After the completion of the embankment repairs, DWR would inspect surrounding liner panels using a dive team to identify additional liner repair needs. Liner damage has already been observed on the east side of MP 231.25. If repairs are necessary, the divers can inject grout directly into any problem areas or openings from within the

Aqueduct prism. An additional option may be the use of concrete revetment or geomembrane material that would fortify the liner.

5.5 Site Restoration

At the completion of the embankment repair, any installation features, such as mixing ponds or batch stations would be deconstructed or removed from the site, and the site would be returned to pre-construction conditions. Access roads would be repaired or repaved including patching isolated damaged areas or the placement of aggregate base, compaction, and laying asphalt or chip seal. Reseeding would occur in any areas of ground disturbance to prevent erosion and promote habitat restoration to attain pre-construction conditions. All excess material would be hauled off site and disposed of properly.

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6 Construction Activities

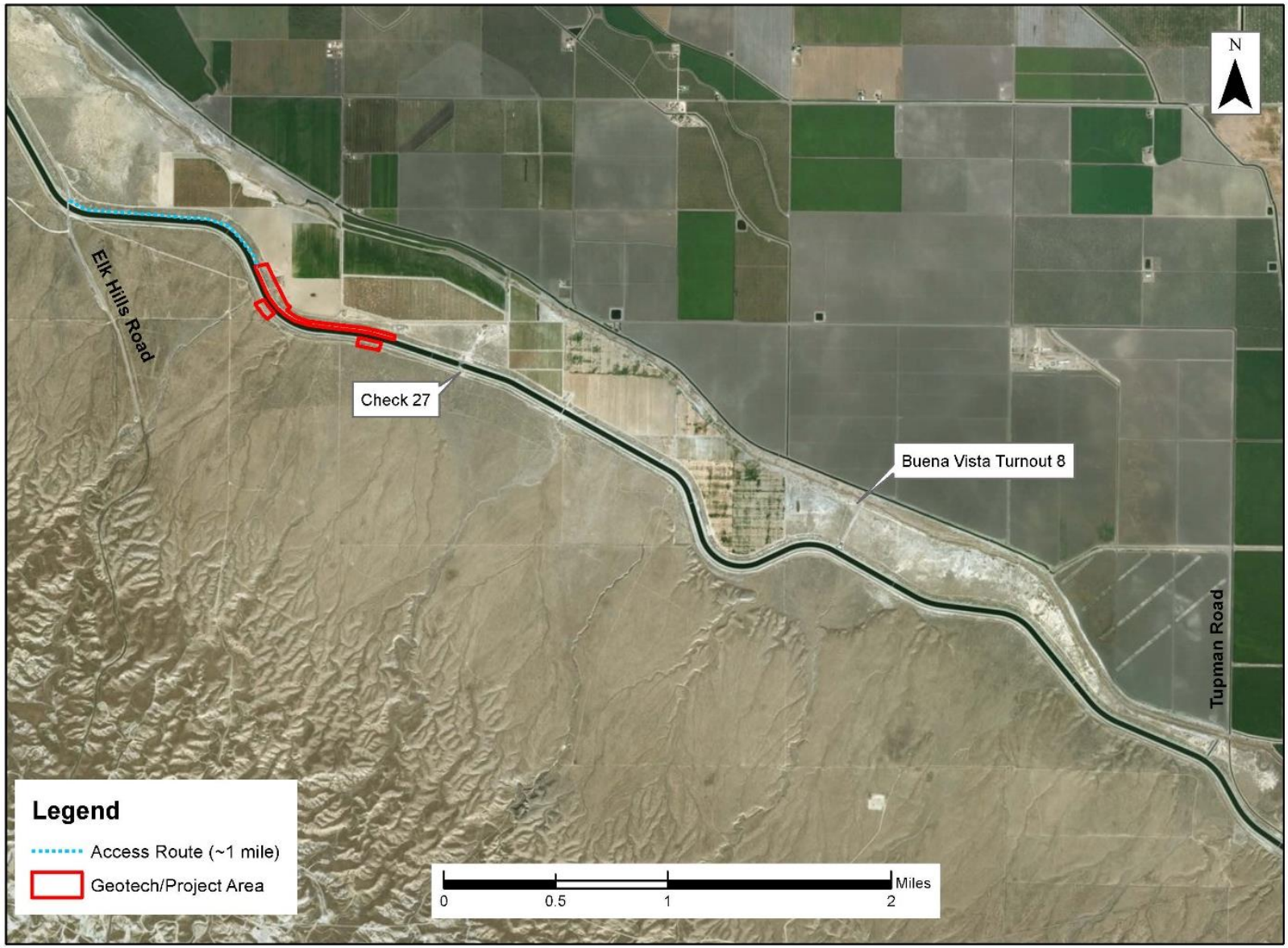
For all work, the aqueduct flow and water levels would be operated normally or temporarily reduced to accommodate embankment repair and any liner repairs necessary. Geotechnical investigations are anticipated to begin in 2023 and would take approximately 6 weeks to complete. The activities would occur approximately 2 years in advance of construction. Construction of the proposed project is anticipated to begin in the spring of 2025 and conclude within 7 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 embankment repair and up to five during geotechnical investigations.

6.1 Access

Access to the site would utilize existing roads. From Interstate 5, take Highway 58 west, towards the town of Buttonwillow. Once in Buttonwillow, take Mirasol Avenue south to Brite Road, take a right and head west. Brite Road will turn into Buttonwillow Drive, follow the road for approximately one and a half miles to the intersection with the California Aqueduct (**Figure 7**).

The existing Aqueduct access roads would be used from Buttonwillow Drive to access the Project. All construction related access would use this as the egress and ingress. Once at the proposed project area, designated routes would be established to access the right-of-way for geotechnical investigations and site preparation. Routes would be limited to established roads to the greatest extent possible.

Figure 7. Proposed Project Area Access



6.2 Materials

The proposed Project consists of alternatives for embankment repair, as well as geotechnical investigations, liner raises, and road repairs. Below are the estimates of the anticipated quantities and volumes of materials. **Table 1** presents estimates of the embankment repairs and **Table 2** presents estimates for the material needed for the liner raise. Material quantities would vary depending on the proposed use of the various alternatives for the embankment repairs. However, the list is an estimation of materials needed in geotechnical investigations, liner repair, and embankment repairs using the maximum amount from any given alternative method.

Table 1. Embankment Repair Material Estimates

Method	Construction Materials	Volume	
HMG[A]	Bentonite	tons	140
	Cement	tons	7,000
Compaction Grouting[A]	Cement	tons	10
	Aggregate	tons	2,800
DSM	Cement	tons	2,800
	Excavation and Recompaction[B]	cubic yards	5,800
	Spoil Removal	cubic yards	8,100
	Bentonite (HMG)	tons	50
	Cement (HMG)	tons	2,500
Cutoff Wall	Bentonite	tons	1,900
	Spoil Removal	cubic yards	2,100
	Excavation and Recompaction[B]	cubic yards	5,800
	Bentonite (HMG)	tons	50
	Cement (HMG)	tons	2,500

[A] Grouting calcs assume 50% of grout for secondary holes and 10% of grout for tertiary holes
[B] Only Applies to areas built in "fill" sections

Table 2. Liner Raise and Road Repairs Construction Material Estimates

Method	Construction Materials	Volume	
Liner Raise and Road Repairs	Aggregate Base	tons	2,400
	Hot Mix Asphalt	tons	2,200
	Concrete (Liner Raise Only)	cubic yards	650
	Compacted Backfill	cubic yards	4,000
	Excavation	cubic yards	2,600
	Clearing and Grubbing	cubic yards	80
	Concrete (MP 231.25 Liner Repair)	cubic yards	5

6.3 Equipment

Table 3 through 7 presents the equipment for the proposed Project methods. If exact equipment is not available, the contractor would use similar equipment, not to exceed the disclosed horsepower (HP). Equipment would vary depending on the proposed alternative for embankment repair.

Geotechnical investigations and liner repair would be present in each option.

Table 3. Geotechnical Investigations Equipment Estimates

Construction Equipment	Size	Maximum Number	Number of Days
Geotechnical Investigations			
CPT Rig	75 HP engines (2)	1	60
HSA Rig	169 HP at 2000 RPM	1	15
Support Rig	169 HP at 2000 RPM	1	75
Backhoe	150 HP	1	12

Table 4. Liner Raise Construction Equipment Estimates

Construction Equipment	Size	Maximum Number	Number of Days
Liner Raise and ConcreteRepair			
Concrete Ready-Mix Truck[A]	750 HP	6	20
Grout Batch Plant[B]	25 HP	1	5
Support Truck	350 HP	2	20
Dive Support Vehicle[C]	250 HP	1	5
Concrete Personnel Truck	250 HP	12	20
Dive and Grout Personnel Truck	250 HP	8	5
Concrete Pump Truck[D]	500 HP	1	2

[A] Concrete ready-mix truck assumes two work crews.
[B] The grout batch plant is required only to fill any voids remaining after placingconcrete.
[C] The dive support vehicle would not be required if all work is above the water.
[D] Pump truck is for underwater concrete only.

Table 5. Road Improvement Construction Equipment Estimates

Construction Equipment	Size	MaximumNumber	Number of Days
Road Improvement			
Smooth Drum Roller[A]	120 HP	2	5
Asphalt Paving Machine[B]	230 HP	1	5
Haul Trucks[C]	300 HP	35	5
Transfer Trucks[D]	500 HP	2	5

[A] Used for asphalt.
[B] Assumes 1/2 mile and 3-in thick placement per day.

C Trucking in asphalt and aggregate base.
D Transfer from pile to machine.

Table 6. Grouting Construction Equipment Estimates

Construction Equipment	Size	Maximum Number	Number of Days
HMG[A]			
Drill Rig, Marl M5 or Similar[B]	750 HP	15	97
Grout Washout Bin		10	217
Skid-Steer Loader	50 HP	10	97
Gradall Forklift	120 HP	3	217
Batch Plant Chem Grout CG-680[C]	25 HP	10	217
Flatbed Delivery Truck	300 HP	1	22
Generators	750 HP	10	217
Personnel Trucks	250 HP	100	217
Water trucks[D]	250 HP	2	217

A This is difficult to estimate without exploration since we aren't able to estimate how much grout this soil would take.
B Number of days assumes 6 holes drilled and cased per day per rig.
C Batch plan chem grout CG-680 assumes 4 holes per day at approximately 40 feet deep and a 15 min rejection confirmation. Our grout depths range from 37 feet to 80 feet.
D Water trucks are assumed to only be used for dust control.

Construction Equipment	Size	Maximum Number	Number of Days
Compaction Grouting[A]			
Drill Rig, Marl M5 or Similar[B]	750 HP	15	12
Grout Washout Bin		10	39
Skid-Steer Loader	50 HP	10	12
Gradall Forklift	120 HP	3	39
Auger Continuous Mixer[C]	25 HP	10	39
Flatbed Delivery Truck	300 HP	1	4
Generators	750 HP	10	39
Personnel Trucks	250 HP	100	39
Water Trucks[D]	250 HP	2	39

A This is difficult to estimate without exploration since we aren't able to estimate how much grout this soil would take.
B Number of days assumes 7 holes drilled and cased per day per rig.
C Auger Continuous Mixer assumes 2 holes per day at approximately 50 feet deep. Our grout depths range from 37 feet to 80 feet.
D Water trucks are assumed to only be used for dust control.

Table 7. Deep Soil Mixing Equipment Estimates

Construction Equipment	Size	Maximum Number	Number of Days
Deep Soil Mixing			
Liebherr LRB 16 or Similar Piling/Drilling Rig[A]	750 HP	2	59
Batch Plant ChemGrout CG-680	25 HP	2	59

Table 7. Deep Soil Mixing Equipment Estimates

Construction Equipment	Size	Maximum Number	Number of Days
Deep Soil Mixing			
Excavator[B]	100 HP	2	20
Dozer[B]	500 HP	2	20
Large Roller Compactor[C]	300 HP	2	20
Loader[E]	500 HP	2	59
Dump Truck[D]	300 HP	2	59
Personnel Trucks	250 HP	20	59
Water Trucks[E]	250 HP	2	59
Drill Rig, Marl M5 or Similar[F]	750 HP	15	49
Grout Washout Bin[F]		10	109
Skid-Steer Loader[F]	50 HP	10	49
Gradall Forklift[F]	120 HP	3	109
Batch Plant Chem Grout CG-680[F]	25 HP	10	109
Flatbed Delivery Truck[F]	300 HP	1	11
Generators[F]	750 HP	10	109
Personnel Trucks[F]	750 HP	100	109
Water Trucks[F]	750 HP	2	109

A Assumes that the rig can drill a single row of elements.
B Excavator and dozer used for grading the working platform.
C Roller compactor used for compacting excavated material back into the embankment.
D Loader and dump truck used to haul away spoils generated from DSM operating (cement treated soil).
E Water trucks are assumed to only be used for dust control.
F For HMG Grouting on Right Side.

Table 8. Cut Off Wall Equipment Estimates

Construction Equipment	Size	Maximum Number	Number of Days
Cut Off Wall			
Dozer D9T[A]	500 HP	2	31
Excavator 311F L RR[B]	120 HP	4	26
Loader[C]	250 HP	1	29
Dump Truck[C]	300 HP	2	29
Roller Compactor[D]	120 HP	2	26
Generators[E]	750 HP	2	26
Personnel Trucks	250 HP	20	31
Water Trucks[F]	250 HP	2	31
Drill Rig, Marl M5 or Similar[G]	750 HP	15	49
Grout Washout Bin[G]		10	109
Skid-Steer Loader[G]	50 HP	10	49
Gradall Forklift[G]	120 HP	3	109
Batch Plant Chem Grout CG-680[G]	25 HP	10	109

Table 8. Cut Off Wall Equipment Estimates

Construction Equipment	Size	Maximum Number	Number of Days
Cut Off Wall			
Flatbed Delivery Truck[G]	300 HP	1	11
Generators[G]	750 HP	10	109
Personnel Trucks[G]	750 HP	100	109
Water Trucks[G]	750 HP	2	109

A Working embankment material just ahead of the cutoff wall.
B Assumes two teams of one mixing and placing while the other excavates; assumes 150-ft per day over a 12-hour shift.
C Used for hauling off spoils.
D Used for recompaction (depending on the soil type) in addition to Road Improvement Time.
E Used for pumps.
F Water trucks are assumed to only be used for dust control.
G For HMG Grouting on Right Side.

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7 Operations 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, including 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.

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8 Project Approvals

Table 9 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 9. 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
California Department of Fish and Wildlife	Incidental Take Permit	Mitigate take of listed State species
US Fish and Wildlife Service	Habitat Conservation Plan	Mitigate take of listed federal species

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9 Initial Study and Environmental Checklist

This section briefly describes the environmental setting of the Project area, the resources that may be affected by the proposed Project, and a discussion of the potential environmental impacts. The environmental setting for each resource describes the existing conditions over the last 10 years. Data is continually being collected along the State Water Project (SWP) from environmental assessments being conducted on a case-by-case basis for annual maintenance and capital improvement projects. Existing database searches, initiated in 2019, were also used to describe existing conditions. Greater detail can be found in the following sections.

For each resource, there is a discussion of the potential environmental impacts associated with the proposed Project. Potential direct and indirect impacts of the proposed Project are analyzed in accordance with 40 CFR 1508.8. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action but are later in time or farther removed in distance. The Initial Study (IS) analyzes the direct and indirect impacts for each resource but does not specifically differentiate between direct and indirect.

California Environmental Quality Act (CEQA) Guidelines Appendix G was used as the basis for assessing the significance of potential environmental impacts, taking into account the whole of the action as required by CEQA. Agency standards, regulatory requirements, and professional judgement were also used, where appropriate.

Each of the resources was evaluated and determinations were made to describe the level of significance of impacts. The impact levels are categorized based on their level of significance and whether they can be mitigated to lessen the impact on the environment. This IS uses the following terminology based on the CEQA Guidelines to denote the significance of each environmental impact:

- **No Impact.** No impact indicates that the proposed Project would not have any direct or indirect impacts on the environment. It means that no change from existing conditions would result. This impact level does not require mitigation under CEQA.
- **Less-than-Significant Impact.** These are impacts resulting from the implementation of the proposed Project that would not have a substantial and adverse effect on the environment. This impact level does not require mitigation under CEQA.
- **Less-than-Significant Impact with Mitigation Incorporated:** These are impacts that typically would have a significant or potentially significant impact to a resource prior to implementing mitigation measures. Once mitigation measures are implemented, however, the impacts to that resource would be reduced to a less-than-significant level.
- **Potentially Significant or Significant Impact:** These are impacts that are deemed to be potentially significant or significant. Under CEQA, feasible mitigation measures or alternatives to the proposed project must be adopted, when available, to avoid, minimize, reduce, or compensate for potentially significant or significant impacts. In this IS, all potentially significant or significant impacts can be reduced to a less-than-significant impact with implementation of feasible mitigation measures.

Mitigation measures are provided to reduce potentially significant and significant impacts to less-than-significant levels, where applicable. Implementation of all mitigation measures are the responsibility of DWR.

9.1 Aesthetics

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
I. AESTHETICS – Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized area, 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?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Environmental Setting

Aqueduct Pool 27 is located within Kern County. The Project area is characterized by the concrete lined Aqueduct canal, the embankments that support the canal, access roads on the crown of the embankments, and the adjacent DWR ROW. The Project area is surrounded by open space: agriculture, fallow land, and oil production fields. Agricultural land near the Project area also includes limited associated infrastructure, such as irrigation wells, equipment, and storage areas. Topography of the Project area and surrounding vicinity is relatively flat to the east; however, to the west rolling foothills are present. The primary roadway providing access to the Project area is Highway 58 (Hwy-58). There are no designated scenic highways, trails, or parks located near the project area (Caltrans 2020).

However, Tulare Elk State Natural Reserve, a California State Park, is located approximately 5 miles southeast of the project area (State Parks 2012).

A loop route, including but limited to, State Highway 119, Elk Hill's Road, and Brite Road is considered scenic by the County of Kern General Plan EIR (County of Kern 2004).

Impact Analysis

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 Kern County (County of Kern 2009).

Activities associated with implementation of the proposed Project would be temporary and 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 levees. There is no public access to the project area and the closest viewpoint from a roadway is 0.7 miles southwest. The end result of the Project, the repaired embankment of the California Aqueduct, would not be visually significantly different from pre-Project conditions.

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 loop route near the project area. Construction activities associated with the proposed project are approximately 0.7 miles southeast and would be minimally visible to motorists traveling along Elk Hills Road 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. No impact would occur.

c) The surrounding vicinity is largely rural. Public views of the area are provided very briefly to motorists traveling along local roadways. Construction activities associated with the proposed project include equipment staging and material stockpiling within and immediately adjacent to the project area. 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 6-week investigation period and 7-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. 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 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. Furthermore, as noted in the project description, construction activities would be limited to daylight hours only. Therefore, no impact would occur.

9.2 Agriculture and Forestry Resources

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
I. **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, as updated) prepared by the California Department 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?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
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))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
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?	☐	☐	☐	☒

Environmental Setting

The California Department of Conservation (DOC) administers the Farmland Mapping and Monitoring Program (FMMP), California's statewide agricultural land inventory. Through this mapping effort, the DOC classifies farmland under four categories: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. Prime Farmland is land which has the best combination of physical and chemical features able to sustain long-term agricultural production. The Williamson Act enables governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use (DOC 2019).

The proposed project area is entirely within the Aqueduct ROW. There are no 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.

Impact Analysis

a-d) 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.

9.3 Air Quality

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
II. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied on to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
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?	☐	☒	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Environmental Setting

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants that are evaluated include reactive organic gases (ROGs) (also referred to as volatile organic compounds [VOCs]), oxides of nitrogen (NOx), carbon monoxide (CO), sulfur oxides (SOx), particulate matter with an aerodynamic diameter less than or equal to 10 microns in size (coarse particulate matter or PM10), and particulate matter with an aerodynamic diameter less than or equal to 2.5 microns in size (fine particulate matter or PM2.5). ROG and NOx are precursors to ozone (O3). Criteria air pollutant emissions associated with construction of the Project were estimated for the following emission sources: operation of off-road construction equipment, paving, on-road haul trucks, and worker vehicles.

The proposed Project is located within the San Joaquin Valley Air Basin (SJVAB) and is within the jurisdictional boundaries of San Joaquin Valley Air Pollution Control District (SJVAPCD), which has jurisdiction over the western portion of Kern County where the Project site is located.

The California Emissions Estimator Model (CalEEMod) Version 2020.4.0 was used to estimate emissions from construction of the Project (CAPCOA 2021). CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant and Green House Gas (GHG) emissions associated with construction activities and operation of a variety of land use projects, such as residential, commercial, and industrial facilities. CalEEMod input parameters—including the land use type used to represent the Project and its size, construction schedule, and anticipated use of construction equipment.

A construction assumptions scenario was developed for each of the Project components modeled based on the best available information at this time. Key construction assumptions include phase types, phase timing and

duration, off-road equipment use (e.g., type, quantity, and hours of operation per day), number of vehicle trips (e.g., haul trucks and worker vehicles) and trip distance, ground disturbance acreage, amount of demolition debris, and paving area. See Attachment A of MP 230 Air Quality, Green House Gas, and Energy Memo for complete construction assumption details (Attachment A).

For purposes of modeling the Project's emissions, geotechnical investigations are anticipated to begin in 2022 and would take approximately 15 weeks to complete. The activities would occur approximately 2 years in advance of construction. Construction of the proposed Project is anticipated to begin in the spring of 2024 and conclude within 7 months.

Off-road equipment emissions were estimated in CalEEMod based on the type of equipment, the number of pieces of each equipment, and the hours of operation. CalEEMod default values for equipment including quantity and horsepower were updated based on information provided by DWR. Construction activities would be limited to the hours between 6:00 a.m. to 6:00 p.m., Monday through Friday, to the greatest extent possible. Therefore, it was assumed that construction equipment would be in operation for up to 8 hours per day.

DWR proposes three different alternative methods to be used for the repairs: grouting, deep soil mixing with grouting, and a cut-off wall with grouting. The alternative used would be determined by the geotechnical analysis. For this assessment, the most intensive alternative (e.g., equipment quantity and duration of construction activity) was assumed to conservatively estimate the Project's emissions. This assessment estimated emissions for grouting/HMG which would occur over a maximum duration of 217 days.

DWR estimated vehicle trips associated with workers, material delivery, and haul trips. Other characteristics such as the trip distances and emission factors, CalEEMod default values were assumed (Attachment A). Worker trips were assumed to be passenger vehicles and light-duty trucks while material delivery and haul truck trips are assumed to be heavy-duty trucks. A maximum of 20 construction workers are anticipated to be required during the embankment repair and up to 5 during geotechnical investigations. Approximately 100 construction workers would be required for the treatment repairs. Each worker, vendor, and haul truck were estimated to result in two one-way trips. Haul truck trips during construction were based on the estimated quantities of imported and excavated material provided by DWR.

For purposes of this air quality analysis and consistent with SJVAPCD guidance documents, activities that exceed criteria pollutant National Ambient Air Quality Standards (NAAQS) (i.e., primary standards designed to safeguard the health of people considered to be sensitive receptors while outdoors and secondary standards designed to safeguard human welfare) would result in significant impacts. Additionally, activities that violate California Ambient Air Quality Standards (CAAQS) developed by California Air Resource Board (CARB) are considered significant. Air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and SJVAPCD develops and implements plans for future attainment of ambient air quality standards. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality. The SJVAB is a nonattainment area for O3, PM10, and PM2.5 under the NAAQS and/or CAAQS. The poor air quality in the SJVAB is the result of cumulative emissions from motor vehicles, off-road equipment, commercial and industrial facilities, and other emission sources. Projects that emit these pollutants or their precursors (i.e., ROG and NOx for O3) potentially contribute to poor air quality.

A project is non-conforming with an air quality plan if it conflicts with or delays implementation of any applicable attainment or maintenance plan. SJVAPCD has prepared plans to attain federal and state O3 and particulate matter

ambient air quality standards as required under the federal and California Clean Air Act. SJVAPCD has established thresholds of significance for criteria pollutant emissions, which are based on SJVAPCD New Source Review offset requirements for stationary sources. Stationary sources in the SJVAPCD jurisdiction are subject to some of the toughest regulatory requirements in the nation. Emission reductions achieved through implementation of SJVAPCD offset requirements are a major component of SJVAPCD's air quality plans. Thus, projects with emissions below the thresholds of significance for criteria pollutants would be determined to not conflict or obstruct implementation of SJVAPCD's air quality plan (SJVAPCD 2015b).

Impact Analysis

a) The proposed project, as discussed in the second impact criterion, below, would not exceed SJVAPCD thresholds for criteria air pollutants during construction. Therefore, the Project would not conflict with or delay the implementation of the SJVAPCD attainment plans and would result in a **less-than significant** impact.

b) The proposed project would temporarily generate ROG, NOx, CO, SOx, PM10, and PM2.5 emissions that would result in short-term impacts on ambient air quality in the area. Emissions would originate from mobile and stationary construction equipment exhaust, on-road vehicle (workers and trucks) exhaust, dust from clearing the land, and exposed soil eroded by wind. Construction-related emissions would vary substantially depending on the level of activity, length of the construction period, specific construction operations, types of equipment, number of personnel, wind and precipitation conditions, and soil moisture content. On-site sources of criteria air pollutant emissions would include off-road equipment and fugitive dust, and off-site sources would include hauling trucks and worker vehicles. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM10 and PM2.5 emissions.

   The proposed Project would be required to comply with SJVAPCD Regulation VIII (Fugitive PM10 Prohibition) by law, which specifies standard construction practices to reduce fugitive dust emissions. Pursuant to Regulation VIII, Rule 8021, the proposed Project would be required to develop, prepare, submit, obtain approval of, and implement a dust control plan, which would reduce fugitive dust impacts to less than significant for Project construction. Criteria air pollutant emissions associated with temporary construction activity were estimated using CalEEMod. Construction schedule assumptions, including phase type, duration, and sequencing, were based on information provided by DWR and is intended to represent a reasonable scenario based on the best information available. Default values provided in CalEEMod were used where detailed Project information was not available.

   Table 10 presents the estimated annual construction emissions that would be generated during construction of theproposed Project. Details of the emission calculations are provided in Attachment A.

Table 10. Estimated Annual Construction Criteria Air Pollutant Emissions - Unmitigated

Year	ROG	NOx	CO	SOx	PM10	PM2.5
	Tons per Year					
2022	0.15	1.25	1.14	<0.01	0.06	0.05
2024	3.06	23.02	25.02	0.10	1.14	0.86
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold exceeded?	**No**	**Yes**	**No**	**No**	**No**	**No**

Notes: ROG = reactive organic gas; NOx = oxides of nitrogen; CO = carbon monoxide; SOx = sulfur oxides; PM10 = coarse particulate matter; PM2.5 = fine particulate matter; SJVAPCD = San Joaquin Valley Air Pollution Control District; <0.01 = reported value less than 0.01.

See Attachment A for complete results.

As shown in **Table 11**, annual construction emissions from the unmitigated scenario would not exceed the SJVAPCDannual significance thresholds for ROG, CO, SOx, PM10 or PM2.5 during Project construction in 2022. However, NOx emissions during 2024 would exceed the annual significance threshold. Therefore, Project construction impacts would be potentially significant and thus mitigation would be required. Implementation of **mitigation measure AQ-1**, which requires diesel-powered construction equipment to meet Tier 4 emissions standards, would reduce project construction- generated NOx missions to below SJVAPCD thresholds of significance. **Mitigation measure AQ-1** further provides that the construction contractor may obtain a waiver from SJVAPCD for implementation of other measures that can be shown to reduce criteria pollutant emissions below SJVAPCD significance thresholds if it can be demonstrated thatTier 4 equipment is not available. Construction emissions after incorporation of **mitigation measure AQ-1** are presented in **Table 11** and would not exceed SJVAPCD's significant threshold.

Table 11. Estimated Annual Construction Criteria Air Pollutant Emissions - Mitigated

Year	ROG	NOx	CO	SOx	PM10	PM2.5
	Tons per Year					
2022	0.15	1.25	1.14	<0.01	0.06	0.05
2024	1.8	9.69	46.96	0.10	0.71	0.44
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: ROG = reactive organic gas; NOx = oxides of nitrogen; CO = carbon monoxide; SOx = sulfur oxides; PM10 = coarse particulate matter; PM2.5 = fine particulate matter; SJVAPCD = San Joaquin Valley Air Pollution Control District; <0.01 = reported value less than 0.01.

See Attachment A for complete results.

The proposed Project would also comply with SJVAPCD Rule 8021 to control fugitive dust emissions generated during grading activities, which would be required as a condition of approval. The following standard constructionpractices would be employed to reduce fugitive dust emissions:

- Develop a dust control plan to outline how the Project will comply with Rule 8021 and minimize fugitive dust during construction
- Minimize and cleanup trackout onto paved roads
- Cover haul trucks
- Rapid cleanup of Project-related trackout or spills on paved roads
- Minimize grading and soil movement when winds exceed 30 miles per hour
- Implement a speed limit of 15 miles per hour during all construction phases for vehicles traveling onunpaved roads

Health Effects of Criteria Air Pollutants

Construction and operational emissions of the Project would not exceed the SJVAPCD thresholds for any criteria airpollutants, including ROG, NOx, CO, SOx, PM10, and PM2.5.

Health effects associated with O3 include respiratory symptoms, worsening of lung disease leading to prematuredeath, and damage to lung tissue (CARB 2019). ROG and NOx are precursors to O3, for which the SJVAB is designated as nonattainment with respect to the NAAQS and CAAQS. The contribution of VOCs and NOx to regionalambient O3 concentrations is the result of complex photochemistry. The increases in O3 concentrations in the SJVAB due to O3 precursor emissions tend to be found downwind of the source location because of the time required forthe photochemical reactions to occur. Further, the potential for exacerbating excessive O3 concentrations would also depend on the time of year that the ROG emissions would occur, because exceedances of the O3 NAAQS andCAAQS tend to occur between April and October when solar radiation is highest. Due to the lack of quantitative methods to assess this complex photochemistry, the holistic effect of a single project's emissions of O3 precursorsis speculative. That being said, because the proposed Project would not exceed the SJVAPCD thresholds, the Project would not contribute to health effects associated with O3.

Health effects associated with NOx include lung irritation and enhanced allergic responses (CARB 2019). BecauseProject-related NOx emissions would not exceed the SJVAPCD annual significance thresholds after implementationof **mitigation measure AQ-1**, and because the SJVAB is a designated attainment area for NO_2 (and NO_2 is a constituent of NOx) andthe existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards, it is not anticipatedthat the Project would contribute to an exceedance of the NAAQS and CAAQS for NO_2 or result in potential healtheffects associated with NO_2 and NOx.

Health effects associated with CO include chest pain in patients with heart disease, headache, light-headedness, and reduced mental alertness (CARB 2019). CO tends to be a localized impact associated with congested intersections. The associated potential for CO hotspots is discussed below (in the potential to expose sensitive receptors to substantial pollutant concentrations evaluation) and determined to be less than significant. Thus, the Project's CO emissions would not contribute to significant health effects associated with CO.

Health effects associated with PM10 include premature death and hospitalization, primarily for worsening of respiratory disease (CARB 2019). Construction of the Project would not exceed thresholds for PM10 or PM2.5, wouldnot contribute to exceedances of the NAAQS and CAAQS for particulate matter, and would not obstruct the SJVABfrom coming into attainment for these pollutants. The Project would not result in substantial diesel particulate matter emissions during construction. Additionally, the Project would be required to comply with SJVAPCD Rule 8021 to control fugitive dust emissions generated during grading activities. Due to the minimal contribution of particulate matter during construction, the Project is not anticipated to result in health effects associated with PM10 or PM2.5.

In summary, construction of the Project would not result in exceedances of the SJVAPCD significance thresholds for criteria pollutants, and potential health effects associated with criteria air pollutants would be **less than significant with incorporated mitigation.**

c) SJVAPCD considers hospitals, schools, parks, playgrounds, daycare centers, nursing homes, convalescent facilities, and residential areas as sensitive receptor land uses (SJVAPCD 2015b). Land uses surrounding the proposed work areas consists primarily of agricultural land. The Project is located directly east of Elk Hills Road in unincorporated Kern County, proximate sensitive receptors are scattered rural residential land uses that are greater than 1,000 feet from the Project site.

The greatest potential for exposure of sensitive receptors to air contaminants would occur during the temporary construction phase, when soil would be disturbed and equipment would be used for site grading, materials delivery, and embankment repair. Potential exposure to emissions would vary substantially from day to day, depending onthe amount of work being conducted, weather conditions, location of receptors, and exposure time. The construction-phase emissions in this analysis are estimated conservatively based on worst-case conditions, with maximum levels of construction activity occurring simultaneously within a short period of time.

Valley Fever Exposure

There are no specific thresholds for the evaluation of potential Valley Fever exposure. The valley fever fungal spores,*Coccidioides immitis,* live in the top 2 to 12 inches of soil in many parts of the state, including parts of Kern County.When fungal spores are present, any work activity that disturbs the soil (e.g., digging, grading, or other earth-movingoperations, or vehicle operation on dirt roads) can cause the spores to become airborne, thereby increasing the riskof valley fever exposure (California Department of Industrial Relations 2013). All workers on sites where the fungus is present, and who are exposed to dusty conditions and wind-blown dusts, are at increased risk of becoming infected.

The fungal spores are too small to be seen by the naked eye, and there is no reliable way to test the soil for spores before working in a particular place. Accordingly, the valley fever analysis assumes the potential presence of the fungal spores within the Project site. The potential for valley fever exposure as a result of the Project is evaluated based on the anticipated earth-moving activities and considers compliance with Rule 8021 which requires development and implementation of a dust control plan to help control the release of the *Coccidioides immiti*s fungus during construction activities.

Health Impacts of Carbon Monoxide

Mobile source impacts occur on two scales of motion. Regionally, Project-related travel would add to regional tripgeneration and increase the vehicle miles traveled within the local airshed and the SJVAB. Locally, Project- generated traffic would be added to Kern County's roadway system near the Project site during construction. If such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles "cold- started" and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non- Project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of congested traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SJVAB is steadily decreasing.

The Project would have trip generation associated with construction worker vehicles and haul trucks. Title 40, Part93.123(c)(5) of the Code of Federal Regulations, Procedures for Determining Localized CO, PM10, and PM2 Concentrations (hot-spot analysis), states that "CO, PM10, and PM2.5 hot-spot analyses are not required to considerconstruction-related activities, which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site" (40 CFR 93.123). While Project construction would involve on-road vehicle trips from trucks and workers during construction, construction activities would span approximately 2 years, geotechnical investigationswould begin 2022 lasting 6 weeks, and construction

activities would begin spring 2024 lasting 7 months; therefore, a Project-level construction hotspot analysis would not be required.

Health Impacts of Toxic Air Contaminants

In addition to impacts from criteria pollutants, Project impacts may include emissions of pollutants identified by the state and federal government as TACs or hazardous air pollutants. State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and aimed at TACs that are a problem in California. The state has formally identified more than 200 substances as TACs, including the federal hazardous air pollutants, and is adopting appropriate control measures for sources ofthese TACs. The following measures are required by state law to reduce diesel particulate emissions:

- Fleet owners of mobile construction equipment are subject to the CARB Regulation for In-Use Off-road Diesel Vehicles (Title 13 California Code of Regulations, Chapter 9, Section 2449), the purpose of which is to reduce diesel particulate matter and criteria pollutant emissions from in-use (existing) off-road diesel- fueled vehicles.
- All commercial diesel vehicles are subject to Title 13, Section 2485 of the California Code of Regulations,limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading andunloading shall be limited to 5 minutes; electric auxiliary power units should be used whenever possible.

The greatest potential for TAC emissions during construction would be diesel particulate emissions from heavy equipment operations and heavy-duty trucks during construction of the Project and the associated health impactsto sensitive receptors. As previously discussed, sensitive receptors are located greater than 1,000 feet from the Project site. Furthermore, as shown in Table 4, the annual particulate matter emissions (PM10 or PM2.5) generated by construction equipment operation and from material delivery and haul trucks (exhaust particulate matter, or diesel particulate matter) would be well below the SJVAPCD significance thresholds. Moreover, construction activities would be temporary, after which Project-related TAC emissions would cease.

No residual TAC emissions and corresponding cancer risk are anticipated after construction. Thus, the Project would not result in a long-term (i.e., 9-year, 30-year, or 70-year) source of TAC emissions. Therefore, the exposure of Project-related TAC emission impacts to sensitive receptors would be **less than significant.**

d) Odors are a form of air pollution that is most obvious to the general public and can present problems for both the source and surrounding community. Although offensive odors seldom cause physical harm, they can be annoying and cause concern. Odors would be potentially generated from vehicles and equipment exhaust emissions during construction activities. Odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment. Such odors are temporary and generally occur at low levels that would not result in nuisance. Therefore, the proposed Project would result in an odor impact that is **less than significant**.

Mitigation Measures

AQ-1: California Air Resources Board Equipment Restrictions

To reduce the potential for criteria air pollutants, specifically oxides of nitrogen (NOx), as a result of construction of the Project, the construction contractor's contract specifications shall require all emissions to stay below SJVAPCD annual thresholds. Adherence to the emission standards may include, but is not limited to the following:

Prior to the start of construction activities, the construction contractor shall ensure that all 75 horsepower or greater diesel-powered equipment comply with California Air Resources Board (CARB)-certified Tier 4 emissions standards for off-road diesel engines.

An exemption from this requirement may be granted by the Air Pollution Control Officer if (1) theCounty documents equipment with Tier 4 Final engines are not reasonably available, and (2) other construction methods or combinations of equipment can achieve a reduction in criteria air pollutant emissions such that construction emissions would not exceed SJVAPCD significance thresholds.

9.4 Biological Resources

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
III. 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 Wildlife, U.S. Fish and Wildlife Service, or National Marine Fisheries Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?	☐	☐	☐	☒
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?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish species or with established native resident or migratory fish corridors, or impede the use of native fish nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
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?	☐	☐	☐	☒

Environmental Setting

Biological resources evaluated for the proposed project include habitat types, special-status species, species recovery areas, designated critical habitat, potential waters of the United States, and sensitive natural communities. Various biological surveys were completed from April through October 2016 through 2020.

The project is located in Kern County and includes the Aqueduct between Elk Hills Road and Tupman Road. The project area is located on the valley floor of the southwestern portion of the San Joaquin Valley. The southern portion of the San Joaquin Valley is an asymmetric basin consisting of low alluvial plains and fans, overflow lands, and old lakebeds. The Temblor Mountain Range borders the proposed Project to the west. Sediments deposited in the area

are transported from Elk Hills of the Temblor Range and tend to be unconsolidated clayey silts (DWR 2013). Elk Hills, one of California's most productive oil fields, is approximately one mile south (CRC 2021).

In the Project area, the summer temperature ranges from an average low of 62.9F to an average high of 95.8F, with an average summer temperature of 79.4F. The winter temperature ranges from an average low of 36.0F to an average high of 58.9F, with an average winter temperature of 47.6F.

Annual precipitation is 5.64 inches, with most precipitation falling as rain. The rainy season spans from January to March, with the majority of the rainfall occurring in February (Regional Climate Center 2016).

Vegetation Alliances

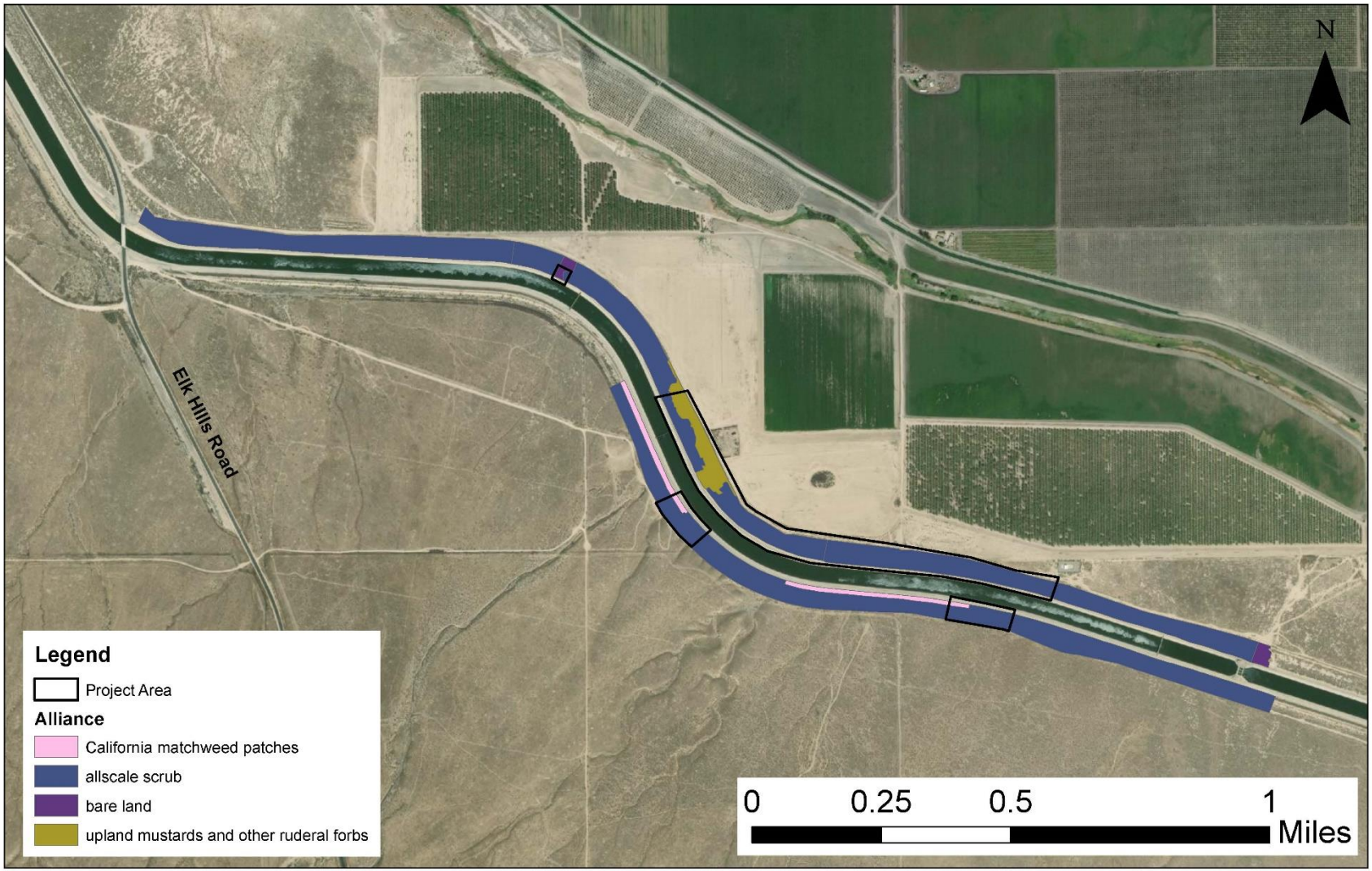
Vegetation alliances in the project area were surveyed and evaluated in 2020 and habitats defined according to the California Wildlife Habitat Relationships (CWHR) System (CWHR 2010).

A total of four habitat types occur in the project area (Table 12). The most dominant habitat in the project area is alkali desert scrub (**Figure 8**).

Table 12. Observed Vegetation Alliances and Associated Habitat Types

Vegetation Alliance	Associated CWHR Habitat Type	Description
upland mustard and other ruderal forbs	annual grassland	Characterized by open grasslands composed of annual grasses and forbs. Often occur as an understory to other habitats. Species diversity and structure depends largely on weather patterns and grazing. Great physical differences are characterized between seasons.
allscale scrub	alkali desert scrub	Characterized by open stands of very low to moderately high (0.25-2.0 m;0.8-6.6 ft) grayish, spinescent, leptophyllous to microphyllous subshrubs and shrubs, which are physically uniform, widely spaced, and occur on relatively dry soils.
California matchweed patches	coastal scrub	Characterized by less exposed sites with low to moderate sized shrubs. Different species compositions correspond with available moisture. Canopy is open to intermittent, and it may be two tiered. Herbaceous layer is open to continuous and grassy.
bare land	barren	Characterized by the absence of vegetation. Any habitat with <2% total vegetation cover by herbaceous, desert, or nonwildland species and <10% cover by tree or shrub species is defined this way. May consist of sparse growth, rock, gravel, and soil.

Figure 8. Vegetation Alliances in the Project Area



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.

The Kern River Alluvial Fan is identified as a wildlife linkage in the Recovery plan for upland species of the San Joaquin Valley. The Alluvial Fan links the city of Bakersfield in a western direction to the town of Tupman. 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. The Aqueduct runs generally north to south along California's Central Valley. The geographically lateral structure can be considered a link of native habitat adjacent to the Aqueduct between northern and southern locations on either side of the Aqueduct. However, the Aqueduct itself presents a barrier for terrestrial wildlife to move/migrate in a west-to-east direction between large open space areas.

Migratory and Nesting Birds

The scrub habitats in the project area provide adequate nesting habitat for songbirds that favor the dry conditions of the south San Joaquin Valley. The project area is dominated by varying densities of medium to large alkali shrubs. The larger shrubs provide nesting opportunity for songbird birds species in the area. Ground nesters may also utilize the site where protection is offered in vegetated areas. Bridges and other facility crossings provide nesting opportunity for structure nesting species like the swallow.

There is minimal opportunity for larger bird species and raptors. There are no large trees present in the project area. The only structures that offer nesting habitat are power poles and towers in the area. Foraging is available within the ROW and adjacent lands.

General Wildlife

During protocol level surveys, general site assessments, and reconnaissance surveys all ancillary observations of general wildlife in the area were recorded (**Table 13**).

Table 13. General Wildlife Observed in the Project Area

Scientific Name	Common Name
Mammals	
Mephitis mephitis	striped skunk
Canis latrans	coyote
Dipodomys heermanni	heermann's kangaroo rat
Lepus californicus	black tailed jack rabbit
Sylvilagus audubonii	desert cottontail
Reptiles	
Aspidoscelis tigris	western whiptail
Uta stansburiana	western side blotch lizard
Birds	
Agelaius phoeniceus	red-winged blackbird
Anas platyrhynchos	mallard
Ardea herodias	great blue heron
Artemisiospiza belli	Bell's sparrow
Artemisiospiza nevadensis	sagebrush sparrow
Aythya sp.	scaup
Buteo jamaicensis	red-tailed hawk
Callipepla californica	California quail
Calypte anna	Anna's hummingbird
Charadrius vociferus	killdeer
Corvus corax	common raven
Euphagus cyanocephalus	Brewer's blackbird
Falco sparverius	American kestral
Fulica americana	American coot
Geococcyx californianus	roadrunner
Haemorhous mexicanus	house finch
Hirundo rustica	barn swallow
Lanius ludovicianus	loggerhead shrike
Melospiza melodia	song sparrow
Mimus polyglottos	northern mockingbird
Molothrus ater	brown headed cowbird
Myiarchus cinerascens	ash-throated flycatcher
Passer domesticus	house sparrow
Petrochelidon pyrrhonota	cliff swallow
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Sterna forsteri	Forster's tern
Streptopelia decaocto	Eurasian collard dove
Sturnella neglecta	western meadowlark
Sturnus vulgaris	European starling
Thryomanes bewickii	Bewick's wren

Table 13. General Wildlife Observed in the Project Area

Scientific Name	Common Name
Tyrannus verticalis	western kingbird
Zenaida macroura	mourning dove
Zonotrichia leucophrys	white-crowned sparrow

Special-status Species

For the purposes of this document, "special-status" has been defined to include those species that meet the definitions of rare or endangered plants or animals under CEQA, including species that are:

- Listed as Threatened or Endangered by United States Fish and Wildlife Service (USFWS) pursuant to the Endangered Species Act (ESA) [50 CFR Section17.11(wildlife) and Section17.12(plants)]
- Listed as Rare, Threatened, or Endangered by the California Department of Fish and Wildlife (CDFW) pursuant to the California Endangered Species Act (CESA) (California Fish and Game Code Section 2050, et seq.)
- Designated as Fully Protected under Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code
- Designated by CDFW as California Species of Concern
- Listed as Category 1A, 1B, and 2 by the California Native Plant Society (CNPS)
- Not currently protected by statute or regulation but considered rare, threatened, or endangered under CEQA

Regionally occurring special-status species known to occur in the project area and within a three-mile radius were obtained from CDFW (2020) and CNPS (2020). Federally listed species that could occur on or be affected by the project were obtained from USFWS (2020). Habitat requirements for each special-status species were assessed and compared to the habitats occurring within the vicinity of the project area (**Table 14**).

Table 14. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
Animals				
Ammospermophilus nelsoni San Joaquin antelope squirrel	--/T/--	Found in relatively arid annual grassland and shrubland communities. Prefers areas with a sparse-to-moderate cover of shrubs such as saltbushes.	Present. Suitable habitat is present throughout the project area. This species has been observed within project area vicinity during past surveys and documented in the CNDDB.	Alkali desert scrub

Table 14. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
Dipodomys ingens giant kangaroo rat	E/E/--	Prefers arid, often strongly alkaline, flat plains with sparse vegetation of grasses and alkali forbs.	Present. Suitable habitat is present throughout the project area. This species has been observed within project area vicinity during past surveys and documented in the CNDDB.	Alkali desert scrub
Dipodomys nitratoides brevinasus short-nosed kangaroo rat	--/SCC/--	Prefers level terrain with sandy loam soils that are mildly to moderately alkaline. Found in areas of herbaceous vegetation with scattered shrubs.	Present. Suitable habitat is present throughout the project area. This species has been observed within project area vicinity during past surveys and documented in the CNDDB.	Alkali desert scrub
Dipodomys nitratoides Tipton kangaroo rat	E/E/--	Prefers level terrain with sandy loam soils that are mildly to moderately alkaline. Found in areas of herbaceous vegetation with scattered shrubs.	Present. Suitable habitat is present throughout the project area. This species has been observed within project area vicinity during past surveys and documented in the CNDDB.	Alkali desert scrub
Eumops perotis californicus western mastiff bat	--/SCC/--	Cliff-dwelling species that roosts under exfoliating rock slabs and in crevices in large boulders and buildings. Roosts are generally high above the ground, usually allowing a clear vertical drop. Most frequently encountered in broad open areas and foraging habitat includes dry desert washes, floodplains, chaparral, oak woodland, open ponderosa pine forest,	Medium. Suitable foraging habitat was noted in the project area; however, there are no recorded occurrences within the project area.	Alkali desert scrub Annual grassland Coastal Scrub

Table 14. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
		grassland, and agricultural areas.		
Onychomys torridus tularensis Tulare grasshopper mouse	--/SCC/--	Found in arid shrubland communities in hot, arid grassland and shrubland associations, such as saltbush scrub.	Present. Suitable habitat is present throughout the project area. This species has been observed within project area vicinity during past surveys and documented in the CNDDB.	Alkali desert scrub
Sorex ornatus relictus Buena Vista Lake ornate shrew	E/SCC/--	Wetland with dense cover and abundant layer of litter such as riparian areas near water in the southern San Joaquin Valley. A source of sufficient water source.	Low. Critical habitat for the species is adjacent to the project area. However, only remnant habitat is present in the project area and detection of the species has not been made during past surveys.	Annual grassland
Taxidea taxus American badger	--/SCC/--	Found in dry, open grasslands, fields, and pastures. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Present. Suitable foraging habitat is present within the project area. Active dens have not been observed during past surveys, but positive detections have been made of the species using the area to hunt or travel through.	Alkali desert scrub Annual grassland
Vulpes macrotis mutica San Joaquin kit fox	E/T/--	Grassland or grassy open stages with scattered shrubby vegetation; requires loose textured sandy soils for burrowing; requires suitable prey base of small rodents.	Present. Suitable foraging habitat is present within the project area. Active dens have not been observed during past surveys, but positive detections have been made of the species using the area to hunt.	Alkali desert scrub Annual grassland

Table 14. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
Bird				
Athene cunicularia burrowing owl	--/SCC/--	Found in open grasslands with low vegetation, golf courses, and disturbed/ruderal habitat in urban areas.	High. Suitable habitat is present within the project area. Suitable burrows have been observed, but the species has not been observed during past surveys; however, it has been detected upstream and downstream of the project area.	Alkali desert scrub Annual grassland Coastal Scrub
Reptile				
Gambelia sila blunt-nosed leopard lizard	E/FP/--	Found in semiarid grasslands, alkali flats, and washes. Prefers flat areas with open space for running, avoiding densely vegetated areas. Habitat present nearby in Lokern Ecological Reserve.	High. Suitable habitat is present within the project area; CNDDB occurrences document the species in the surrounding areas. The right side of the Aqueduct offers more suitable and connected habitat. This species has not been observed in the DWR ROW despite numerous surveys conducted within the project area.	Alkali desert scrub
Thamnophis gigas giant garter snake	T/T/--	Found primarily in marshes, sloughs, drainage canals, and irrigation ditches, especially around rice fields and occasionally in slow-moving creeks in California's interior.	None. Habitat is not present and no CNNDB occurrences have been made in the project area.	None

Table 14. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
Amphibians				
Spea hammondii western spadefoot	--/SCC/--	Occurs seasonally in grasslands, prairies, chaparral, and woodlands, in and around wet sites. Breeds in shallow, temporary pools formed by winter rains. Takes refuge in burrows.	None. Although upland habitat is present; the project area lacks the necessary wetted features for the species breeding.	Annual grassland
Rana draytonii red-legged frog	T/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.	None. Suitable habitat is not present and no CNNDB occurrences have been made in the project area.	Annual grassland
Fish				
Hypomesus transpacificus Delta smelt	T/E/--	Endemic to the upper Sacramento-San Joaquin Estuary of California, inhabiting the freshwater-saltwater mixing zone and migrates upstream into fresh water to spawn.	None. The project area does not contain suitable habitat for the species.	None
Branchiopod				
Branchinecta lynchi Vernal pool fairy shrimp	T/--/--	Ephemeral freshwater habitats, including alkaline pools, clay flats, vernal pools, vernal lakes, vernal swales, and other types of seasonal wetlands.	None. The project area does not contain suitable habitat for the species.	None
Insects				
Bombus crotchii Crotch bumble bee	--/CE/--	Occurs primarily in California. Prefers grassland and scrub areas within drier climates. They overwinter in leaf litter and soft soil.	Medium. Foraging habitat is available for the species and the species has been documented on CNDDB. However, there is lack of	Alkali desert scrub Annual grassland California matchweed patches

Table 14. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
			overwintering habitat due to low to no organic material, such as thatch, on the surface of the project area.	
Plants				
Atriplex cordulata var. cordulata heartscale	--/--/1B.2	Annual herb found in chenopod scrub, meadows and seeps, and valley and foothill grasslands with saline or alkaline soils. Blooms April-Oct. Elevation: 3 to 960 feet.	Low. Habitat is found with in project area. However, the area lacks the wetted conditions the plant is associated with.	Alkali desert scrub
Atriplex cordulata var. *valicola* Lost Hills crownscale	--/--/1B.2	Typically grows in the dried beds of alkaline pools within scrub or annual grassland communities. Blooms April-Aug. Elevation: 164 to 3,002 feet.	Low. Habitat is found with in project area. However, the area lacks the wetted condition the plant is associated with.	Alkali desert scrub Annual grassland
Delphinium recurvatum recurved larkspur	--/--/1B.2	Perennial herb occurring in chenopod scrub, cismontane woodland, and in alkali valley and foothill grassland. Blooms March-June. Elevation: 10 to 2,460 feet.	Medium. Suitable habitat is present throughout the project area. The species has been documented in CNDDB within the vicinity, however, has not been observed during surveys.	Alkali desert scrub Coastal Scrub
Eremalche parryi ssp. *kernesis* Kern mallow	E/--/1B.2	Dry, open sandy to clay soils; often at edge of balds. Chenopod scrub, pinyon and juniper woodland, valley and foothill grassland. Blooms March -May. Elevation 300 to 900 feet.	Medium. Suitable habitat is present throughout the project area. The species has been documented in CNDDB within the vicinity, however, has not been observed during surveys.	Alkali desert scrub Coastal Scrub
Eschscholzia lemmonii ssp. *Kernesis* Tejon poppy	--/--/1B.1	Chenopod scrub, valley foothill grassland. Blooms March -May.	Low. Marginal habitat is present within the project area. The species is	Alkali desert scrub Coastal Scrub

Table 14. Potentially Occurring Special-status Species

Species	Fed/ State/ CRPR Status[1]	General Habitat	Potential to Occur in the Project Area	Type of Suitable Habitat within the Project Area
		Elevation 800 to 2000 feet.	documented in the Elk Hills south east of the project. The plant is most associated with grassland hills.	
Eriastrum hooveri Hoover's eriastrum	--/--/4.2	Typically found in stabilized silty to sandy soils, a low cover of competing herbaceous vegetation. Also can be found on loamy soils in areas with dense vegetation.	Present. Suitable habitat is present throughout the project area. This species has been observed within project area vicinity during past surveys and documented in the CNDDB.	Alkali desert scrub
Stylocline citroleum oil nestraw	--/--/1B.1	Found in the valley saltbush scrub ecosystem in the sandy flats and clay soils of the San Joaquin Valley in areas developed into oil fields.	Present. Suitable habitat is present throughout the project area. This species has been observed within project area vicinity during past surveys and documented in the CNDDB.	Alkali desert scrub

Notes: CNDDB = California Natural Diversity Database; CRPR = California Rare Plant Rank, CDF-S = Department of Forestry & Fire Protection – Sensitive

Legal Status Definitions:

Federal

E Species listed as Endangered under the Federal Endangered Species Act.
T Species listed as Threatened under the Federal Endangered Species Act.
– No listing under the Federal Endangered Species Act.

State

C Species identified as a candidate species for listing as threatened or endangered under the California Endangered Species Act.
E Species listed as Endangered under the California Endangered Species Act.
T Species listed as Threatened under the California Endangered Species Act.
FP Species listed as Fully Protected under the California Fish and Game Code.
SSC Species listed as Species of Special Concern by the California Department of Fish and Wildlife.
– No listing under the California Endangered Species Act.

CRPR / California Rare Plant Rank

1B Plant species considered Rare, Threatened, or Endangered in California and elsewhere.
4 Plant species in limited distribution

California Rare Plant Rank Extensions:

.1 – Seriously threatened in California (greater than 80 percent of occurrences are threatened and/or have a high degree and immediacy of threat).
.2 – Moderately threatened in California (20 to 80 percent of occurrences are threatened and/or have a moderate degree and immediacy of threat).

Critical Habitat for Plant and Wildlife Species

The USFWS defines the term critical habitat in the ESA 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 5.25 miles to the southeast of the proposed project area.

Jurisdictional Resources

The Aqueduct is not a "Water of the United States" or "Waters of the State" subject to the jurisdictional permitting requirements of Sections 404 and 401 of the Clean Water Act. Other aquatic resources such as drainages and low-lying wetland areas have not been identified in the project area.

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.

Impact Analysis

a) The following provides analysis of potential for the proposed project to result in impacts to special status species of plants and wildlife.

Substantially Affect Special-status Plant Species

The proposed project could impact special-status plant species in alkali desert scrub and coastal scrub habitats within the construction footprint through the removal of plants and their habitat (see Table 10 and Figure 8). Habitat assessments were conducted in 2017 and 2018. More thorough vegetation diversity surveys were conducted as recent as 2021. Occurrences of oil neststraw and Hoover's eriastrum were recently documented in the project area within DWR's ROW.

However, DWR would implement **mitigation measure BIO-1** to avoid impacts to special-status plants by establishing a 50-foot buffer between construction activities and special-status plants, if feasible, or compensate for impacts through consultation with USFWS and/or CDFW if avoidance is infeasible.

Substantially Reduce Habitat or Populations of Special-status Wildlife

As further discussed below, the proposed project could impact special-status wildlife potentially occurring in the action area through removal of vegetation, embankment repairs (changes to substrate), and equipment operation. Potentially affected special-status wildlife are discussed below.

Burrowing owl. Presence is assumed for the burrowing owl. In 2018, burrowing owl surveys were conducted in accordance with the 2012 Staff Report on Burrowing Owl Mitigation breeding season survey protocol in

Appendix D (DFW 2012). No burrowing owls were observed, however, burrows with past evidence of habitation were observed in the Project area.

Project activities could directly impact occupied burrowing owl burrows if any occur in the vicinity of the construction area by disturbing nesting behavior because of construction noise and traffic (causing adult abandonment of the nest, eggs or young to be crushed, and/or reproductive failure) or removing burrows. Therefore, this impact would be potentially significant.

However, with implementation of **mitigation measures BIO-2, BIO-3**, and **BIO-4**, impacts to burrowing owl would be avoided or minimized by conducting preconstruction surveys within 30 days prior to commencement of construction activities, establishing buffers around occupied burrows, as required by the Staff Report on Burrowing Owl Mitigation (CDFG 2012), and preparing a plan in coordination with CDFW that includes mitigation measures to offset burrow and foraging habitat if impacts occur to these areas. The plan would include replacement of habitat, such as artificial burrows, at a 1:1 ratio.

Special-**s**tatus **s**mall **m**ammal. Presence is known for giant kangaroo rat, Tipton kangaroo rat, short-nosed kangaroo rat, Tulare grasshopper mouse, and San Joaquin antelope squirrel. In 2017, protocol-level small mammal trapping was conducted in the project area in accordance with the Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats (USFWS 2013). Additionally, in 2018 protocol level small mammal trapping was conducted at a neighboring proposed project at MP 229.35. San Joaquin antelope squirrel surveys were conducted concurrently with blunt-nosed leopard lizard surveys in 2016, 2017, and 2018.

Project activities could impact foraging and burrowing habitat (i.e., annual grassland and alkali desert scrub) where these habitat types occur within the footprint and where ground-disturbing activities would occur (see **Figure 8**). Therefore, this impact would be potentially significant.

However, with implementation of **mitigation measures BIO-2, BIO-5, BIO-6**, and **BIO-7**, impacts to these species would be avoided or minimized through establishing a 50-foot buffer between construction activities and burrows, if feasible. If encroachment within the buffer is required, USFWS and CDFW would be consulted to determine appropriate compensation measures for the loss of this species, as appropriate. Compensation may involve creation, preservation, and/or restoration of habitat at a 1:1 ratio or purchase of credits at a mitigation bank approved by the regulatory agencies if avoidance is infeasible.

San Joaquin **k**it **f**ox. Presence is known for San Joaquin kit fox as a hunting ground. In 2019, trail camera stations were placed in the project area and the species was observed in the area, however an active den was never observed during habitat assessment surveys.

Project activities could directly impact San Joaquin kit fox if any dens occur in the vicinity of the construction area by disturbing kit fox behavior as a result of construction noise and traffic (causing adult abandonment of the den and/or reproductive failure). Therefore, this impact would be potentially significant.

However, **mitigation measures BIO-2, BIO-8 BIO-9,** and **BIO-10**, which are consistent with U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS 2011), would be implemented to avoid and minimize potential impacts associated with the construction, operation, and maintenance activities for Project:

Blunt-nosed leopard lizard. Suitable blunt-nosed leopard lizard habitat is present. However, the species have not been observed during surveys conducted in 2016, 2017, 2018. Surveys were conducted in accordance with the CDFW Approved Survey Methodology for the Blunt-Nosed Leopard Lizard (CDFG 2004).

Project activities could impact foraging and burrowing habitat (i.e., annual grassland and alkali desert scrub) where these habitat types occur within the footprint and where ground-disturbing activities would occur (see **Figure 8**). Therefore, this impact would be potentially significant.

However, with implementation of **mitigation measures BIO-2, and BIO-11**, impacts to these species would be avoided or minimized through establishing a 50-foot buffer between construction activities and burrows, if feasible.

American badger. Presence is known for American badger as a foraging habitat. In 2019, trail camera stations were placed in the project area and the species was observed in the area, however an active den was never observed during habitat assessment surveys.

Project activities could impact American badger if dens occur in the vicinity of the construction area by disturbing badger behavior as a result of construction noise and traffic (causing adult abandonment of the den and/or reproductive failure) or by the removal of dens and foraging habitat. Therefore, this impact would be potentially significant.

However, with implementation of mitigation measures **BIO-2, BIO-12**, and **BIO-13**, impacts to these species would be avoided or minimized through establishing a 500-foot buffer between construction activities and burrows, if feasible.

Migratory or nesting birds. *N*esting and foraging habitat is presumed present in the project area. In 2018, 34 different bird species were observed during avian surveys. 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 geotechnical investigations, embankment repair, 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. Therefore, this impact would be potentially significant.

However, with implementation of **mitigation measure BIO-2** and **BIO-14** requires a preconstruction nesting bird survey and establishment of an avoidance buffer around active nests to prevent unintended impacts during project activities.

With implementation of **mitigation measures BIO-1** through **BIO-14**, 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 project site. No substantial adverse effect would occur on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service. 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 affected by the Project. Therefore, **no impact** would occur or result in substantial adverse effects to State or federal wetlands.

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 the resulting noises and vibrations 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 subsequent operation of the Project's results would not impede wildlife movement in the region, nor would it prevent migratory birds or terrestrial wildlife from using the Aqueduct.

   Therefore, the 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 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 to county ordinances protecting biological resources.

f) The proposed Project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, state, or federal habitat conservation plan. The Block 12 Development Project Habitat Conservation Plan (HCP) was finalized in December 2020 and the Natural Community Conservation Plan (NCCP) draft agreement was completed February 2020. The project is located within the Block 12 Development Project HCP/NCCP covered plan area. However, areas identified for conservation or mitigation banks where credits would be purchased are not located near the Project site (Aera Energy LLC 2020). The Project would not conflict with any adopted or approved plans. There would be **no impact**.

Mitigation Measures

BIO-1: Avoid and Minimize Effects to Special-status Plants.

Within 1 year before the commencement of ground-disturbing activities, habitat assessment surveys for special-status plants would be conducted by a qualified botanist, in accordance with the most recent USFWS and CDFW guidelines and at the appropriate time of year when the target species would be in flower or otherwise clearly identifiable. Survey results can be climate dependent; survey timing would be coordinated with USFWS and CDFW.

Locations of special-status plant populations would be clearly identified in the field by staking, flagging, or fencing a minimum 50-foot-wide buffer around them before the commencement of activities that may cause disturbance. No activity shall occur within the buffer area if feasible. If encroachment within the buffer is required, USFWS and/or

CDFW would be consulted to determine appropriate compensation measures for the loss of special-status plants. Worker awareness training and biological monitoring would be conducted to ensure that avoidance measures are being implemented.

BIO-2: Minimize Effects to All Special-status Species.

DWR would conduct a Worker Environmental Awareness Program (WEAP) prior to the start of construction. A qualified biologist would conduct a presentation on all potential special-status species to train all construction staff that will be involved with the project. This training would include:

- A description of special-status species and their habitat needs.
- Information on special-status species occurrence within the project vicinity.
- An explanation of the status of the species and their protection under the Endangered Species Act.
- A list of the measures being taken to reduce impacts to the species during construction, such as:
    - Project-related vehicles will observe a daytime speed limit of 15 mph throughout the site in all project areas, except on State and Federal highways. Night-time work, such as equipment maintenance, will be minimized to the extent possible. However, if work does occur after dark, the speed limit will be reduced to 10 mph.
    - Off-road project-related construction traffic outside of designated the project area will be prohibited. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in securely closed containers and removed at least once a day from a construction or project site.
    - No firearms will be permitted on the Project site.
    - No pets will be permitted on the Project site.
    - Use of rodenticide in the Project area will not be allowed.
- A “fact sheet” conveying all training information prepared and distributed to all construction personnel in attendance at the initial training.

On completion of the WEAP training, construction crews would sign a form stating that they attended the training, understood the information presented, and would comply with the WEAP requirements.

BIO-3: Avoid Effects to Burrowing Owl.

Preconstruction surveys for burrowing owls would be conducted by a qualified biologist in areas supporting potentially suitable habitat and within 30 days before the start of construction activities. If ground-disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the site would be resurveyed.

Occupied burrows would not be disturbed during the breeding season (February 1 through August 31), if feasible. A minimum 160-foot-wide buffer would be placed around occupied burrows during the nonbreeding season (September 1 through January 31), and a minimum 650-foot-wide buffer would be placed around occupied burrows during the breeding season. Ground-disturbing activities would not occur within the designated buffers, if feasible.

BIO-4: Minimize Effects to Burrowing Owl.

If potential burrowing owl burrows are located in the project area, burrows would be confirmed empty and excavated prior to their breeding season. The use of one-way doors may be used at burrow entrances as a precaution.

If occupied burrowing owl burrows cannot be avoided during ground disturbing activities, they would be relocated in accordance with CDFW's Staff Report on Burrowing Owl Mitigation (CDFG 2012).

If feasible the relocation would be done during the non-breeding season. A qualified biologist would verify through noninvasive methods that owls have not begun egg-laying and incubation, or that juveniles from occupied burrows are foraging independently and are capable of independent survival, a plan shall be coordinated with CDFW to offset burrow habitat and foraging areas on the project site if burrows and foraging areas are taken by the proposed project.

If destruction of occupied burrows occurs, existing unsuitable burrows would be enhanced (enlarged or cleared of debris) or new burrows created. This would be done in consultation with CDFW.

Passive owl relocation techniques would be implemented. Owls would be excluded from burrows in the immediate impact zone within a 160-foot-wide buffer zone by installing one-way doors in burrow entrances. These doors would be in place at least 48 hours before excavation to ensure the owls have departed.

The project area would be monitored daily for 1 week to confirm owl departure from burrows before any ground-disturbing activities.

Where possible, burrows would be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe would be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

BIO-5: Avoid Effects to Special-Status Small Mammals.

Prior to project activities, a qualified biologist would identify and map potential small mammal burrows and burrow complexes within the project footprint. Where burrows and complexes are present, a 50-foot-wide buffer shall be placed to avoid and minimize disturbance to the species.

If encroachment within a buffer is required, USFWS and CDFW would be consulted. If complete avoidance that would ensure no-net-loss of burrows potentially occupied by a listed species is infeasible, the project proponent shall immediately contact CDFW habitat and USFWS regarding incidental take permits and may include purchasing credits at a mitigation bank at a minimum 1:1 ratio.

BIO-6: Minimize Effects to Special-Status Small Mammals.

Before the start of project activities, approved exclusion fencing would be installed just outside the work limit. This fencing would be maintained throughout construction and would be removed at the conclusion of ground-disturbing activities. No vehicles would be allowed beyond the exclusion fencing. A USFWS- and CDFW-approved biological monitor would be present on site, during intervals recommended by USFWS and CDFW, to inspect the fencing.

The approved biological monitor would be on site each day during any ground disturbance and during initial site grading or development of sites in suitable habitat for special-status small mammals.

Before the start of work each day, the biological monitor would check for animals under any equipment to be used that day, such as vehicles or stockpiles of items such as pipes. If special-status small mammals are present, they would be allowed to leave on their own, before the initiation of construction activities for the day. To prevent inadvertent entrapment of special-status small mammals during construction, all excavated, steep-walled holes or trenches more than 1 foot deep would be covered by plywood or similar materials at the close of each working day

or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they would be thoroughly inspected for trapped animals.

Plastic monofilament netting (erosion control matting) or similar material shall not be used at the project site because special-status small mammals may become entangled or trapped. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

BIO-7: Compensate for Temporary or Permanent Loss of Special-Status Small Mammals Habitat.

If special-status kangaroo rat and San Joaquin antelope squirrel habitat would be affected by the proposed project, a compensatory mitigation plan would be developed and implemented in coordination with USFWS and CDFW, as appropriate. Unavoidable effects would be compensated through a combination of creation, preservation, and restoration of habitat or purchase of credits at an approved mitigation bank at a minimum 1:1 ratio or equivalent.

If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures would be included in and developed as part of the USFWS and CDFW coordination and consultation process. The plan would include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.

BIO-8: Avoid Effects to San Joaquin Kit Fox.

A qualified biologist would conduct pre-construction surveys no fewer than 14 days and no more than 30 days prior to the onset of any ground disturbing activity. The primary objective is to identify kit fox habitat features (e.g. potential dens and refugia) on the project site. If San Joaquin kit fox are detected at any time, all activities associated with the project would be halted immediately. The project would be placed on hold until consultation with the USFWS and CDFW is completed. Where potential dens are present, a 50-foot-wide buffer shall be placed to avoid and minimize disturbance to the species. Where known dens are present a 100-foot-wide buffer shall be placed to avoid and minimize disturbance to the species.

If natal pupping dens are present or encroachment within a buffer is required, USFWS and CDFW would be consulted with to determine appropriate compensation measures for the loss of San Joaquin kit fox. Unavoidable effects would be compensated through a combination of creation, preservation, and restoration of habitat or purchase of credits at an approved mitigation bank at a minimum 1:1 ratio or equivalent.

BIO-9: Minimize Effects to San Joaquin Kit Fox.

Project activities would be carried out in a manner that minimizes adverse effects to San Joaquin kit foxes, should they occur in the project area. Minimization measures would include:

- Construction work at night (half hour after sunset to half-hour before sunrise) will be avoided to the maximum extent possible.
- To prevent inadvertent entrapment of San Joaquin kit fox or other animals during construction, all excavated, steep-walled holes or trenches more than 1 foot deep will be covered with plywood or similar materials at the end of each workday. If the trenches cannot be closed, one or more escape ramps constructed of earthen fill or wooden planks will be installed. Before such holes or trenches are filled, they will be inspected for trapped animals.

- All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site for one or more overnight periods will be thoroughly inspected for San Joaquin kit fox before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe will not be moved until USFWS has been consulted and CDFW contacted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
- Before the start of work each day, the work site will be checked for animals under any equipment to be used that day, such as vehicles or stockpiles of items such as pipes. If a San Joaquin kit fox is found, it will be allowed to leave on its own volition. Work will be halted, and DWR contacted. USFWS and CDFW will be notified within 48 hours.
- Sightings of San Joaquin kit fox will be reported to the California Natural Diversity Data Base.

BIO-10: Compensate for Temporary or Permanent Loss of San Joaquin Kit Fox Habitat.

If San Joaquin kit fox habitat would be affected by the proposed project, a compensatory mitigation plan would be developed and implemented in coordination with USFWS and CDFW, as appropriate. Unavoidable effects would be compensated through a combination of creation, preservation, and restoration of habitat or purchase of credits at an approved mitigation bank at a minimum 1:1 ratio.

If off-site compensation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures would be included in and developed as part of the USFWS and CDFW coordination and consultation process. The plan would include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.

BIO-11: Avoid Effects to Blunt-nosed Leopard Lizard.

No more than 12 months prior to geotechnical investigations and construction activities, a habitat assessment of the project footprint would be conducted by a qualified biologist in suitable habitat for the blunt-nosed leopard lizard to identify all habitat suitable for the lizard in the project footprint. Within twelve months prior to any ground-disturbing activity, qualified biologists would conduct surveys for blunt nosed leopard lizard in blunt-nosed lizard suitable habitats (e.g., areas containing burrows) within the Project area. These surveys would be conducted in accordance with the Approved Survey Methodology for the Blunt-Nosed Leopard Lizard (CDFW 2019), or other more recent guidelines, if available. In instances where blunt-nosed leopard lizards are observed at any time during presence/absence surveys, pre-construction surveys, or construction monitoring, USFWS and CDFW would be notified of the occurrence within two business days.

BIO-12: Avoid Effects to American Badger.

Preconstruction surveys by a qualified biologist would be conducted in areas supporting potentially suitable habitat and within 30 days before the start of construction activities.

Occupied burrows would not be disturbed, if feasible. A 100-foot no-work buffer would be established around occupied maternity dens throughout the pup-rearing season (February 15 through July 1) and a 50-foot no-work buffer around occupied dens during other times of the year. If nonmaternity dens are found and cannot be avoided during construction activities, they will be monitored for badger activity. If a qualified biologist determines that dens

may be occupied, passive den exclusion measures will be implemented for three to five days to discourage the use of these dens prior to project disturbance activities.

BIO-13: Minimize Effects to American Badger.

If an occupied burrow/den cannot be avoided, the individual shall be passively relocated by exclusion. Passive relocation techniques would be implemented. Relocation shall only occur outside of the breeding period of American badger.

The project area would be monitored daily for 1 week to confirm badger departure from burrow before any ground-disturbing activities.

Where possible, burrows would be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe would be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

A plan shall be coordinated with CDFW to offset burrow habitat and foraging areas on the project site if burrows and foraging areas are taken by the proposed project.

BIO-14: Avoid and Minimize Effects to Migratory Bird Species.

If work activities occur within the bird nesting season (generally defined as February 1 through September 1), a qualified biologist shall conduct a nesting bird survey no more than 14 days prior to initiation of ground disturbance. Survey areas will reflect the species type such as 300 feet for general songbird, 500 feet for raptors, and a quarter of a mile for listed raptor species. The survey shall be limited to areas with permitted access and shall not be conducted on private property without prior authorization. These surveys would be conducted in accordance with any required protocols.

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.

If encroachment within a buffer is required, USFWS and CDFW would be consulted with to determine appropriate measures for avoidance and minimization of potential impacts. Mitigation may include presence of an on-site biologist to monitor nests during construction activities within buffers. If birds exhibit signs of stress or leave the nest for an extended period of time, construction within the buffer would halt until birds have fledged or an alternative strategy can be determined.

9.5 Cultural Resources

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
IV. CULTURAL RESOURCES – Would the project:				
a) Cause a substantial adverse change in the significance of a historical resources pursuant to in section 15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

Environmental Setting

Cultural resources encompass the tangible and intangible remains of our past and may include prehistoric and historic archaeological sites, built environment resources, structures, objects, cultural landscapes, and human remains.

Tribal cultural resources are addressed in Chapter 9.18, Tribal Cultural Resources.

Cultural resources also include "historical resources," which are:

1. Resources listed in or determined eligible for listing in the California Register of Historical Resources (CRHR);
2. Resources included in a local register of historical resources, or ones that have been identified as significant in an historical resource survey; and
3. Resources that are deemed by a lead agency to be historically or culturally significant, with regards to California's past (CEQA Guidelines Section 15064.5 ((a)).

In general, to be considered "historically significant," a resource must meet one or more of the following criteria, enumerated in PRC 5024.1 as follows:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with lives of persons important in California's past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; and
4. Has yielded, or may be likely to yield, information important in California prehistory or history.

This section relies on information and findings presented in the "Archaeological Resources Inventory Report for the Milepost 230 Liner Rise Project, Kern County, California" (Dudek 2021a), "Paleontological Resources Inventory Report for the Milepost 230 Liner Raise Project in

Kern County, California" (Dudek 2021b), and the "Built Environment Inventory and Evaluation Report for the Milepost 230 Liner Raise Project, Kern County, California" (Dudek 2021c) prepared for the Project. These reports detail the results of the cultural resources inventory, including archival research, records searches, consultation, and fieldwork. Also included in these reports are cultural overviews of the Study Area, including prehistory, ethnohistory, and history. All sections below are drawn from these documents unless otherwise cited.

Prehistory

The following Environmental Setting is summarized from the archaeological and built environment reports (Dudek 2021, Haley and Kaiser 2021) prepared for the proposed Project. The project area is situated in the southern San Joaquin Valley, an area for which the archaeology and prehistory is not well understood in part due to artifact collecting and long-term agricultural use.

Based on a general chronological framework developed by Moratto in 1984 and refined over the years as new data for the region was uncovered, the following chronology has been applied to the region: Paleoindian (Paleoindian Period), Early Archaic (Early Period), Middle Archaic (Middle Period), and Late Archaic (Late Period). A description of each of these periods is presented below.

Paleoindian Period (ca. 12,000 to 9000 BP)

Occupation of the San Joaquin Valley dates to at least 11,000 years ago and is evidenced by surface finds of fluted projectile points such as those found at the Witt Site (KIN-32) in the Tulare Lake Vicinity (Fenenga 1993; Riddell and Olsen 1969) as well as "humpies" and crescents (see Fredrickson and Grossman 1977; Sampson 1991). Humpies are a distinctive stone tool type that are oblong shaped, plano-convex in cross-section, and exhibit pointed ends. They are typically constructed from high-quality chert and appear to be a byproduct of blade manufacture and may have been used in light-duty woodworking tasks (Sampson 1991).

Early Period (ca. 9000 to 6000 BP)

Human subsistence during the Early Period was based largely on the hunting of large game and fishing (Sutton 1997:12) as evidenced by hand-molded baked clay net weights and stemmed projectile points. Implements associated with a more sedentary lifestyle, including mortars, pestles, millingstones, and handstones, appear infrequently during this time in the archaeological record. Individuals buried their dead in a fully extended position, oriented to the west, and with grave goods (e.g., quartz crystals). Cremations were rare (Moratto 1984:181–182; Sutton 1997:12). An important site from this time period is the Skyrocket site (CAL-629/930; Bieling et al. 1996; La Jeunesse and Pryor 1998), that contained eight components spanning the time between 9400 and 7000 BP, as evidenced by the radiocarbon dates and artifact assemblage (e.g., fluted, stemmed, and Pinto points). The site also contained some of the earliest evidence of mortar and pestle use in California.

Middle Period (ca. 6000 to 3000 BP)

During the Middle Period, the climate became warmer and there was substantial use of upland and foothill environments in the central Sierra Nevada. Seed processing (particularly acorns) supplemented the primary subsistence activities of hunting, fowling, and fishing. Artifacts from this period include Olivella and Haliotis beads and other ornaments, distinctive spindle-shaped charmstones, cobble mortars, chisel-ended pestles, and large projectile points (Moratto 1984:183; Sutton 1997:12). Bone tools, such as awls, fish spear tips, saws, and flakers have also been documented in the archaeological record from the Middle Period. More individuals were cremating

their dead during this period and there is an increase in violent deaths, as evidenced by disarticulated skeletons with embedded weapon points (Moratto 1984:183). Wedel's (1941) excavations at Buena Vista Lake represent the most comprehensive cultural studies in the southern San Joaquin Valley; Middle Period assemblages are the most significant components at the various sites he investigated.

Late Period (ca. 3000 to 150 BP)

The Late Period is the best represented time period in the San Joaquin Valley. It can be divided into four phases with associated marker traits: (1) the Early Late Period (3000 to 1500 BP, intensification of acorns, large corner-notched points (Elko series); (2) Late Period Phase 1 (1500 to 700 BP), introduction of bow and arrow, Rose Spring series arrow points, acorn-based economies, extensive trade; (3) Late Period Phase 2 (700 to 300 BP), large middens, Desert series arrow points (Desert Side-notched and Cottonwood types); and (4) Late Period Phase 3 (300 to 150 BP), ethnographic groups, historic trade goods.

Overall, the Late Period is defined by a focus on processing of acorns and other costly-to-process plant foods and a decrease in hunting, fowling, and fishing (Moratto 1984:183; Sutton 1997:12). Types of artifacts associated with this time period include shell ornaments and beads, stone beads and cylinders, smoking pipes, arrow shaft straighteners, flat-bottomed mortars, cylindrical pestles, and small side-notched projectile points for use with the bow and arrow. Burials are often in flexed positions and cremation is more common than during the Middle Period (Moratto 1984:183).

Ethnography

The region surrounding the Project area would have been at the southern extent of Southern Valley Yokut tribal territory. This group inhabited the lower Kings River to the Tehachapi Mountains. Southern Valley Yokut habitation areas were typically situated in close proximity to the major rivers and their tributaries (Kroeber 1925). On the western side of San Joaquin Valley, populations were much sparser and concentrated in the foothills along minor waterways. This focus on waterways can also be seen in their dietary resources which included various fish, waterfowl, antelope, elk, acorns, tule roots, and various seeds. The focus on fishing is also seen in the material culture consisting of net sinkers and harpoons, which they may have employed while on rafts constructed from tule reed bundles (Wallace 1978).

Traditional villages were located on top of low mounds on or near riverbanks. Wallace (1978:448) identifies the closest village to the project area as Hoschiu, located along the northwestern edge of the Buena Vista Lakebed, about nine miles southeast of the project area.

Southern Valley Yokut dwellings were constructed of tule reed woven mats places over a pole frame oval or round structure. They were usually 25 to 40 feet in diameter and would belong to a single family (Wallace 1978). In addition, they constructed larger multifamily dwellings. Earth-covered ceremonial sweat lodges were also constructed. There was a high level of sedentism due to abundant riverine resources, though there were times of seasonal disbandment for harvesting wild plant resources such as acorns and seeds (Gayton 1948; Kroeber 1925).

The Southern Valley Yokut population declined rapidly as a result of introduced diseases and relocation to coastal missions following Spanish contact (Osbourne 1992). This only increased with the large influx of cattle ranching and Anglo Americans onto tribal territory after the gold rush (Osbourne 1992; Cook 1976).

History

Early History and Growth

The first Spaniards arrived in the San Joaquin Valley in 1772, led by don Pedro Fages (Johnson et al. 1993) who led his soldiers through Tejon Pass to look for mission and asistencia sites, as well as military deserters, runaway Native American slaves, and horses. Over the next few decades several other Spanish expeditions would make it to the western portion of San Joaquin Valley. Later during the Mexican Period, the region was part of the Los Carrisalitos Rancho, though few ranchos were located in the San Joaquin Valley interior because the area was mostly wetland and lacked usable timber.

San Joaquin Valley fell under the control of the United States at the conclusion of the Mexican-American War of 1848. The area was relatively underused until Kern County was split from northern Los Angeles County and southern Tulare County.

By the mid-nineteenth century, Anglo American miners who had failed in the lodes to the east, began to move into the area to try their luck at cattle ranching (Clough 1986). In 1886, Henry Miller and Charles Lux, wealthy land barons who held vast land holdings and controlled much of the cattle industry throughout the state, acquired part of the Los Carrisalitos Rancho northeast of Elk Hills in the Buena Vista Slough. In 1893, Miller and Lux donated land for the townsite of Buttonwillow near their ranch headquarters. Two years later, a post office was established there when a branch of the Southern Pacific Railroad was built through the town (Hamusek-McGann et al. 1997, pp. 6–7; Romani 2013, p. 12).

Oil Exploration

The discovery of oil in the region, first in Buena Vista Hills to the south in 1864, then the Kern River Oil Field in 1899, and the Elk Hills Oil field in 1910, led to rampant land speculation. The U.S. Navy established a national oil reserve in 1912 in the Elk Hills (Naval Petroleum Reserve No. 1) and a second reserve at Buena Vista Hills in 1913.

Several companies, such as Standard Oil, Elk Hills 36 Oil, Reserve Oil, and Section 15 Oil, began drilling in the non-reserved land in Elk Hills following the establishment of the national oil reserve. While most companies headquartered in Bakersfield, workers with families settled near their worksites in the existing towns of Taft (previously Moron) and Buttonwillow. Oil production peaked during 1950s and the Korean War, when the Elk Hills Reserve was producing 20,000 barrels a day.

Oilfields around Elk Hills renewed briefly in the 1970s and came to full production in 1976. The construction of Interstate 5 through San Joaquin County in the late 1960s made it easier for oil workers to commute to the Elk Hills oil wells from Bakersfield, which led to population decline in smaller towns like Buttonwillow, Taft, Tupman, and McKittrick (FHWA 2017; Hamusek-McGann et al. 1997, p. 39–42).

Water Management

By the mid-1860s, irrigated agriculture had started to replace cattle raising and dry-farmed crops in the San Joaquin and Sacramento Valleys. In 1873, President Ulysses S. Grant directed the U.S. Army Corps of Engineers to study San Joaquin Valley and Sierra Nevada water resources for their potential as irrigation sources. The study concluded that a system of canals could transport water from the Sacramento Valley to the San Joaquin Valley for irrigation. Three years later, newly appointed State Engineer William Hammond Hall started California's first comprehensive study of water resources by launching a five-year study of Sacramento Valley rivers in 1878, the results of which

led to the first flood control plan for the Sacramento Valley in the 1880s (Cooper 1968, pp. 42–43; JRP and Caltrans 2000, pp. 12–13; USACE 1990, pp. 4–5).

California cities continued to grow, using surface water and groundwater as sources for municipal water supply. Cities such as Los Angeles and San Francisco contracted with private water suppliers to provide water to their citizens, smaller rural communities and groups of farmers formed mutual water companies. With the passage of the Wright Irrigation Act in 1887, local irrigation districts finally had the legal toolkit to fund, build, and operate conveyance systems for themselves.

By the turn of the twentieth century, California cities were outpacing what was readily available and as a result, the state and federal government also began making efforts to ensure water supplies, as well as regulate water rights. The U.S. Congress passed the Reclamation Act in 1902, beginning large-scale federal investment in dams and reservoir projects for irrigation in the American west. The California legislature created the State Reclamation Board in 1911 to assist in management of the San Joaquin and Sacramento rivers. The State Water Commission (later the State Water Resources Control Board) was formed in 1915 to oversee permits and diversion claims for surface water throughout the state (Cooper 1968, p. 50; Hanak et al. 2011, pp. 32, 38; Herbert et al. 2004, p. 2-4). In 1917, a major drought that left San Joaquin Valley farmers without enough surface water for irrigation, led the USGS to publish a study analyzing moving water from the northern Sacramento Valley to the southern San Joaquin Valley by way of an interconnected system of reservoirs and canals. Due to a lack of state funding, this plan was not implemented until the mid-1930s, when it became known as the Central Valley Project (CVP). The CVP was based on State Engineer Edward Hyatt's State Water Plan (SWP), which included the development of seven management units based upon the geographic regions of the state (e.g., Great Central Valley, San Francisco Bay Basin), and involved the construction of 24 reservoirs. The project had shortfalls, however, including acreage limitations which were opposed by larger municipal and industrial users. Although construction of the CVP began in 1937, it was hampered by the diversion of resources to the war effort and the first water deliveries were not made until 1944.

State Water Plan and the California Aqueduct

To complement the CVP and address some of its deficiencies, the State Water Resource Control Board, formerly the State Water Resource Board was formed in 1945 to conduct investigations of the water resources of California. The California Water Plan was developed in 1957 and presented a plan for the practical development of California's water resources, including a conveyance system named the "California Aqueduct System." The plan detailed that the California Aqueduct System would include "large dams, canals, tunnels, streamways, hydroelectric power plants, pumping plants, drainage ways, and other structures," with the goal of developing "22 million acre-feet" on average, with half coming from the North Coastal Area and the other half from the Sacramento River Basin (DWR 1957, p. 166). Much of the SWP was funded through the California Water Resources Development Bond Act (Burns-Porter Act) which included $1.75 billion in general obligation bond funds for the first phase of construction of the SWP, to be paid by water and power users.

The main route of the California Aqueduct System was to include parallel concrete-lined canals extending between the Delta Pumping Plants and the Buena Vista Forebay. The California was the primary means by which SWP water from Northern California was distributed. It is a 444-mile-long concrete, trapezoidal-shaped canal with pipelines, tunnels, pumping plants and power plants that convey water from the Delta to various terminal reservoirs and secondary aqueducts. The California Aqueduct is divided into seven sections (formerly divisions) for construction and management purposes: North San Joaquin, South San Joaquin, San Luis, Tehachapi, the Mojave and Santa

Ana sections, the Coastal Branch, and the West Branch. Construction of the California Aqueduct began in 1960 and was completed in 1974.

Cultural Resource Inventory Methods

In an effort to identify any cultural resources present within the Project site, the following steps were conducted, unless otherwise noted:

- Reviewed a records search conducted by the California Historical Resources Information System (CHRIS) Southern San Joaquin Valley Information Center (SSJVIC) at California State University Bakersfield on November 11, 2020 (IC File 20-421). The records search included a one-mile buffer around the Project site.
- Reviewed historic-era maps and aerial photographs of the Project site and surrounding properties to better understand the land use history.
- Requested a Native American Heritage Commission (NAHC) Sacred Lands File (SLF) search on July 23, 2019, for the Project site. The NAHC maintains a confidential file, which contains sites of traditional, cultural, or religious value to the Native American community.
- Requested an updated Native American Heritage Commission (NAHC) Sacred Lands File (SLF) search on December 30, 2020 for the Project site, to verify that the previous list of California Native American tribal contacts was still accurate.
- Conducted an intensive pedestrian survey of the Project site on December 17, 2020. Survey methods consisted of using parallel transects spaced no more than five meters (15 feet) apart over the entire Project site.
- Reviewed information on soils, geology, and topography of the Project site to assess the potential for buried archaeological deposits.

For information on tribal consultation and outreach, please see Chapter 9.18. Tribal Cultural Resources.

Cultural Resources Inventory Results

Cultural resources inventory for the project resulted in the identification of two previously recorded cultural resources within the Project site: the California Aqueduct (P-15-015820) and an historic-age oil pipeline (P-15-009671). No newly-recorded resources were identified as a result of cultural resources inventory efforts for the current project.

Record Search Results

The SSJVIC records search results indicated that 13 previous cultural resources studies had been conducted within a one-mile radius of the Project site. Seven of these studies intersect with the project site (**Table 15**).

Table 15. Previous Cultural Resources Studies within the Project Site

IC Number	Authors	Year	Title
KE-00809	Parr, R.E., and M.Q. Sutton	1989	An Archaeological Assessment of 178 Acres of Land South of Buttonwillow, Kern County, California

Table 15. Previous Cultural Resources Studies within the Project Site

IC Number	Authors	Year	Title
KE-02268	Jackson, T.L., L.A. Shapiro, and J.H. King	1998	Prehistoric Archaeological Resources Inventory and Evaluation at Naval Petroleum Reserve No. 1 (Elk Hills), Kern County, California
KE-02584	Christy, J.	2001	Archaeological Investigation of the Energy Works Buttonwillow Project, Kern County, CA
KE-03508	Jackson, T.L., and L.A. Shapiro	1997	Cultural Resources Management Plan Naval Petroleum Reserve No. 1, Elk Hills, Kern County, California
KE-03508A	Jackson, T.L.	1997	National Register of Historic Places Eligibility Evaluation of Archaeological Sites CA-KER-3079, CA-KER-3080, CA-KER-3082, and CA-KER-3085/H, Naval Petroleum Reserve No. 1, Elk Hills, Kern County, California
KE-04512	Romani, G.R.	2013	Archaeological Survey Report Improvements to Elk Hills Road, Skyline Road to State Route 58, Kern County, California
KE-00809	Parr, R.E., and M.Q. Sutton	1989	An Archaeological Assessment of 178 Acres of Land South of Buttonwillow, Kern County, California

Previous cultural resources studies of the Project site identified 13 cultural resources within a one-mile radius of the Project site (**Table 16**). Two cultural resources have been previously recorded within the Project site and include the California Aqueduct (P-15-015820) and an historic-age oil pipeline (P-15-009671).

Table 16. Previously Recorded Cultural Resources within a One-Mile Radius of the Project Site

Primary ID	Trinomial	Name	Type	Age	Attributes
P-15-002485	CA-KER-002485	—	Site	Prehistoric	Lithic scatter
P-15-003257	CA-KER-003257H	EP8/1	Site	Historic	Trash scatter
P-15-003258	CA-KER-003258H	EP5/1	Site	Historic	Trash scatter
P-15-006777	CA-KER-005402	EP8/ISO 1; NS-3	Site	Prehistoric	Lithic scatter; Shell scatter
P-15-010238	—	Isolate Record	Other	Prehistoric	Lithic scatter; Burned bone
P-15-015819	CA-KER-008697H	West Side Canal	Structure	Historic	Canal
P-15-017681	CA-KER-009771	Elk Hills Road #1	Site	Prehistoric	Lithic scatter; Standing structures
P-15-017685	—	Florida Drain	Structure	Historic	Water conveyance system
P-15-020184	CA-KER-011045	LOKERN-SITE-3	Site	Prehistoric	Lithic scatter

Table 16. Previously Recorded Cultural Resources within a One-Mile Radius of the Project Site

Primary ID	Trinomial	Name	Type	Age	Attributes
P-15-020185	CA-KER-011046/H	LOKERN-SITE-5; Clambake Site	Site	Prehistoric, Historic	Lithic scatter; Habitation debris, historic-era refuse
P-15-020189	CA-KER-011050	LOKERN-SITE-12	Site	Prehistoric	Lithic scatter; Habitation debris
P-15-020190	CA-KER-011051	LOKERN-SITE-13	Site	Prehistoric	Lithic scatter
P-15-020191	CA-KER-011052	LOKERN-SITE-14	Site	Prehistoric	Lithic scatter

P-15-009671 – Standard Oil Pipeline

This resource is a 528-foot segment of the Standard Oil Pipeline that intersects and crosses over the California Aqueduct in a double barrel overchute pipeline at MP 230.70. It was initially recorded by Jones and Stokes Associates (JSA) in 1999. The pipeline was constructed as part of the expansion of Standard Oil California (SOCAL) in the early part of the twentieth century. Jones & Stokes concluded that the SOCAL pipeline system "is potentially eligible for listing in the NRHP and in the CRHR as a historic district" (Jones & Stokes 1999, p. 31) due to the role the company played in the federal anti-trust case that dissolved J.D. Rockefeller's Standard Oil Company, and for innovative technology that created infrastructure that supplied and dominated the California oil market. Jones and Stokes argued that, since the ferrous pipeline was no longer in use and does not retain sufficient integrity, it could be considered a non-contributing element of the potential district (Jones & Stokes 1999, p. 31).

P-15-015820 – California Aqueduct

This resource is a 6,230-foot (1.18-mile) segment of the California Aqueduct. Various segments of the California Aqueduct have been previously recorded in 2008, 2009, 2011, 2012, and 2013. The California Aqueduct is a 444-mile-long water conveyance system that extends from the Sacramento-San Joaquin Delta in the north to Lake Perris, Riverside County, in the south. It was constructed between 1960 and 1974 by the California Department of Water Resources as part of the State Water Project (Ehringer 2013).

In 2012, the California Aqueduct was determined to be eligible for listing in the National Register of Historic Places (NRHP) under Criterion A as the "largest and most significant of the water conveyance systems developed as part of the State Water Project (SWP)" and under Criterion C for its "complex design necessary to redistribute water throughout the state of California on such a massive level" (Donaldson 2012). The California Aqueduct was also determined eligible under Criterion Consideration G (properties that have achieved significance within the past 50 years), for its remarkable engineering aspects, and its role in shaping the development of much of California following the mid-20th century. Its period of significance is from 1960 to 1974, the years during which it was constructed.

Character-defining features of the Aqueduct include: 1) its trapezoidal design; 2) concrete lining; 3) its planned alignment and arrangement in relation to natural features and obstructions; and 4) ancillary infrastructure, including (but not limited to) power plants, pumping plants, canal check structures, siphons, reservoirs and dams, bridges, culverts, and overchutes, constructed as part of the California Aqueduct between 1960 and 1974 (Ehringer 2013).

The 1.18-mile segment of the California Aqueduct within the Project site is being treated as an historical resource for the purposes of this project under CEQA for criteria 1 and 3 due to its important role in delivering water to Southern California and for its innovative engineering design.

Review of Historical Maps and Imagery

Research on maps dating from 1932 through 2018 (NETR 2021) and aerial photographs dating from 1952 to 2016 (NETR 2021) indicated that there were no prior developments on the Project site before the construction of the California Aqueduct.

NAHC Sacred Lands File Search

DWR requested an NAHC search of the SLF on July 23, 2019 for the Project site. Results were returned on August 22, 2019 and were negative for cultural and tribal cultural resources in and near the Project. The NAHC provided a list of contacts for 15 individuals (representing 10 tribes) with traditional cultural affiliation with the Project area and whom may have knowledge of resources within or near the Project site. DWR reached out to these tribes as part of their Tribal Engagement Policy and for AB 52. Additional tribal consultation information is discussed in Chapter 9.18. Tribal Cultural Resources.

A second request for an updated NAHC search of the SLF on December 30, 2020 for the Project site. Results were returned on January 25, 2021 and were negative for cultural and tribal cultural resources in and near the Project site. The NAHC provided a list of contacts for 19 individuals (representing 14 tribes) with traditional cultural affiliation with the Project area and whom may have knowledge of resources within or near the Project site. DWR reached out to these tribes as part of their Tribal Engagement Policy and for AB 52. Additional tribal consultation information is discussed in Chapter 9.18. Tribal Cultural Resources.

Pedestrian Survey

The two previously-recorded built environment resources, P-15-015820 (California Aqueduct) and P-15-009671 (Standard Oil Pipeline), were relocated. The pipeline would not be impacted by the project and was therefore not rerecorded or reevaluated (see Discussion below for more information regarding no impacts to the Standard Oil Pipeline).

The segment of the aqueduct within the Study Area (between MP 230.4 and 231.4) falls within the Southern San Joaquin Division's 7th Standard Road to Tupman Road Reach (MP 220.1 to MP 239.0) and was constructed between 1967 and 1971 by general contractor Peter Kiewit Sons' Company. It is a concrete-lined, trapezoidal-shaped aqueduct, open to the air on top. It measures 32 feet wide at the bottom, roughly 145–160 feet wide at the crest of the embankment, and approximately 21 to 26 feet deep with some variation along its length.

There are two overchute features (cross-drainage structures that span over the top of the aqueduct) in the Project site. One is a double barrel metal oil pipeline (Standard Oil pipeline [P-15-009761]) at MP 230.70 and the other is a drainage overchute structure at MP 230.44.

There are also several additional structures on the banks of the aqueduct, including metal ladders descending into the aqueduct and a survey marker and sign.

The California Aqueduct has previously been determined eligible for listing in the NRHP under criteria A and C with a period of significance from 1960-1974, the years during which it was constructed (Donaldson 2012). The California Aqueduct was also determined eligible under Criterion Consideration G (properties that have achieved

significance within the past 50 years). The segment within the project area was constructed from 1967-1969, which falls within the period of significance for the California Aqueduct. Additionally, this segment retains sufficient integrity to convey its significance as part of the California Aqueduct under criteria A/1 and C/3, and is considered an historical resource for the purposes of this project under CEQA.

No new built environment resources were identified during pedestrian survey of the Project site.

No archaeological resources were identified during pedestrian survey of the Project site. Visibility was approximately 90% across the Project site. Archaeologists noted that the area showed heavy disturbance from the creation and maintenance of the California Aqueduct.

Buried Site Sensitivity

The Project site is located in an area with heavy disturbance due to construction and maintenance of the California Aqueduct. Surrounding soils consist of well-draining clay loams derived from alluvial fans and floodplains (USDA 2021). They are considered prime farmland if irrigated. No previously recorded archaeological resources are located within the Project site and no newly recorded archaeological resources were located during pedestrian survey of the Project site. However, tribal consultation indicated that the overall area was sensitive for cultural resources. Therefore, the Project site is considered to have a moderate potential for intact buried prehistoric archaeological resources and a low-to-moderate potential for intact historical archaeological deposits.

Impact Analysis

a) The Proposed Project as designed would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 of the CEQA guidelines. The two resources within the Project site include the California Aqueduct (P-15-015820) and an historic-age oil pipeline (P-15-009671). As part of the proposed Project, the pipeline may be exposed so its location underground is daylighted, but it would not be disturbed. The pipeline will remain intact and be reburied following construction. Consequently, the Standard Oil pipeline (P-15-009671) will not sustain any direct or indirect impacts due to Project construction.

   The Proposed Project would not alter the existing alignment of the California Aqueduct, nor would it involve any new additions, exterior alterations, or related new construction that would impact the character-defining features of the aqueduct. All repairs would be done using in-kind materials that match the original materials and design of the California Aqueduct. There will be no damaging physical or chemical treatments to the aqueduct. As such, the potential impacts to the California Aqueduct would be **less than significant**.

b) No archaeological resources have been identified in the Project site. Therefore, no known archaeological resources that may qualify as historical resources (as defined in CEQA Guidelines Section 15064.5) are present in the Project site. The Proposed Project as designed would not cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines section 15064.5. The proposed project is not anticipated to impact any archaeological resource pursuant to CEQA Guidelines Section 15064.5.

   Although the proposed project is not anticipated to impact any archaeological resources, the proposed project would involve ground-disturbing activities that may extend into undisturbed soil. It is possible that such activities could unearth, expose, or disturb subsurface archaeological resources, that have not been identified on the

surface. Because previously unrecorded archaeological deposits could be present in the Project site, and they could be found to qualify as archaeological resources pursuant to CEQA Guidelines Section 15064.5, impacts of the proposed project on archaeological resources could be potentially significant.

Such potentially significant impacts would be reduced to **less than significant with mitigation incorporated** by implementing **mitigation measures CUL-1 to CUL-3**.

c) No known locations of human remains are located within the Project site. The Proposed Project would not disturb any human remains with known locations, including those interred outside of formal cemeteries. Incorporation of **mitigation measure CUL-1** through **mitigation measure CUL-3** would ensure that any potential impacts to known and previously undiscovered human remains. Therefore, impacts would be reduced to **less than significant with mitigation incorporated**.

Mitigation Measures

CUL-1: Archaeological Discovery Procedures

Should any unexpected cultural resources be exposed during project activities, all work would temporarily stop in the immediate vicinity (e.g. 100 feet) of the find until it can be evaluated by a qualified archaeologist and an appropriate plan of action can be determined in consultation with DWR.

If the resource is associated with Native American contexts or is a potential Tribal Cultural Resource and is within a region specified as an area of interest/concern by a consulting tribe/tribes, the appropriate consulting tribal entity/entities would be contacted and consulted with to produce an appropriate plan of action.

CUL-2: Health and Safety During a Discovery

Should human remains be discovered during the course of project activities, all work would stop immediately in the vicinity (e.g. 100 feet) of the finds until they can be verified. The coroner would be contacted in accordance with Health and Safety Code section 7050.5(b). Protocol and requirements outlined in Health and Safety Code sections 7050.5(b) and 7050.5(c) as well as Public Resources Code section 5097.98 will be followed.

CUL-3: Prepare and Implement Cultural Awareness Training

Prior to project construction, a qualified archaeologist, defined as one meeting the U.S. Secretary of the Interior's Professional Qualifications Standards for Archeology and with expertise in California archaeology, in coordination with culturally affiliated California Native American Tribes, shall develop a Cultural Resources Awareness and Sensitivity Training Program for all construction and field workers involved in project ground-disturbing activities. The program shall include a presentation that covers, at a minimum, the types of cultural resources common to the area, regulatory protections for cultural resources, and the protocol for unanticipated discovery of archaeological resources (see Mitigation Measure CUL-2). Personnel working in areas of project ground-disturbing activities shall receive the training prior to working in these areas.

9.6 Energy

Environmental Issue (CEQA-only)	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
V. 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?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Environmental Setting

Construction activities would result in a temporary increase in energy resources. A full list of construction equipment for use for geotechnical investigations and each proposed alternative for embankment repair is included above in Section 6.2, Materials.

The State Water Project produces hydroelectric power to operate pumping facilities required to move water from Northern to Southern California. The conveyance system was designed to utilize gravity to the greatest extent possible, however along the system there are topographical features that require pumping to move the water to a higher elevation. DWR is the fourth largest producer of energy in the State, but the largest single consumer as well (DWR 2020).

Impact Analysis

a) 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.

Electricity

Temporary electric power for as-necessary lighting and electronic equipment (such as computers inside temporaryconstruction trailers, and heating, ventilation, and air conditioning) would be required for Project construction. Theamount of electricity used during construction would be minimal; typical demand would stem from the use of electrically powered hand tools and several construction trailers by managerial staff during the hours of construction activities. Most of the energy used during construction would be from petroleum. The electricity used for construction activities would be temporary and minimal; therefore, impacts would be **less than significant**.

Natural Gas

Natural gas is not anticipated to be required during construction of the Project. Fuels used for construction wouldprimarily consist of diesel and gasoline, which are discussed under the subsection “Petroleum,” below.

Any minor amounts of natural gas that may be consumed as a result of Project construction would be temporary and negligible, and would not have an adverse effect; therefore, impacts would be **less than significant**.

Petroleum

Petroleum would be consumed throughout construction of the Project. Fuel consumed by construction equipmentwould be the primary energy resource expended over the course of construction, and vehicle miles traveled associated with the transportation of construction materials and construction worker commutes would also resultin petroleum consumption. Heavy-duty construction equipment associated with construction activities and on-sitehaul trucks involved in relocating dirt around the Project site would rely on diesel fuel. Construction workers wouldtravel to and from the Project location throughout the duration of construction. It is assumed that construction workers would travel to and from the Project in gasoline-powered vehicles.

Heavy-duty construction equipment of various types would be used during construction. CalEEMod was used to estimate construction equipment usage; results are included in Attachment A. Based on that analysis, diesel-fueled construction equipment would operate for an estimated 94,144 hours, as summarized in Table 17.

Table 17. Hours of Operation for Construction Equipment

Year	Hours of Equipment Use
2022	4,552
2024	89,592
Total	**94,144**

Note: See Attachment A.

Fuel consumption from construction equipment was estimated by converting the total CO2 emissions from each construction phase to gallons using conversion factors for CO2 to gallons of gasoline or diesel. The conversion factor for gasoline is 8.78 kilograms per MT of CO2 per gallon, and the conversion factor for diesel is 10.21 kilograms perMT of CO2 per gallon (The Climate Registry 2020). The estimated diesel fuel use from construction equipment is shown in Table 18.

Table 18. Construction Equipment Diesel Demand

Year	Pieces of Equipment	Equipment CO2 (MT)	kg CO2/Gallon[a]	Gallons
2022	36	288.82	10.21	28,287.79
2024	118	9,700.46	10.21	950,094.14
			Total	**978,381.93**

Notes: CO_2 = carbon dioxide; MT = metric tons; kg = kilogram. [a]Source: The Climate Registry 2020.See Attachment A.

Fuel consumption from worker and haul trips was estimated by converting the total CO2 emissions from the construction phase to gallons using the conversion factors for CO2 to gallons of gasoline or diesel. Worker vehiclesare assumed to be gasoline fueled, and haul vehicles are assumed to be diesel fueled. Calculations for total workerand haul truck fuel consumption are provided in Table 19.

Table 19. Construction Vehicle Fuel Demand

Year	Trips	Vehicle CO2 (MT)	kg CO2/Gallon[a]	Gallons
Construction Worker Vehicle Gasoline Demand				
2022	1,470	24.02	8.78	2,735.50
2024	51,200	243.84	8.78	27,772.49
			Subtotal	*30,507.99*
Construction Vendor Truck Diesel Demand				
2022	0	0.00	10.21	0.00
2024	1,024	8.88	10.21	869.85
			Subtotal	*869.85*
Construction Haul Truck Diesel Demand				
2022	14	0.41	10.21	40.24
2024	995	27.49	10.21	2,692.59
			Subtotal	*2,732.83*
			Petroleum Total	**34,110.67**

As shown in Tables 8 and 9, the Project is estimated to consume 1,012,493 gallons of petroleum during construction. By comparison, approximately 28 billion gallons of petroleum are consumed in California annually (EIA 2020). Thus, the proposed Project's petroleum consumption would constitute less than 0.004% of the statewide annual petroleum consumption. Overall, because the proposed Project would not be unusual as compared to overall local and regional demand for energy resources and would not involve characteristics that require equipment that would be less energy-efficient than at comparable construction sites in the region or state, the proposed Project construction would not result in wasteful, inefficient, or unnecessary consumption of petroleum.

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. The repaired embankment and restored storage capacity in Pool 27 would allow DWR to operate the Aqueduct normally and to meet downstream demand. The Project 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. Therefore, impacts would be less than significant.

b) The proposed Project entails the construction and repair of an existing portion of the California Aqueduct. Thus, the Project is not designed to facilitate or encourage renewable energy project development and would not impede the development of renewable energy projects. Construction of the proposed Project would involve energy for use of construction equipment and transportation (e.g., worker vehicles and haul trips). These uses would involve a standard amount of energy resources similar to other construction activities. Overall, the Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency; therefore, impacts during construction and operation of the Project would be **less than significant.**

9.7 Geology and Soils

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VI. 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 California Geological Survey Special Publication 42.)	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
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?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
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?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

Environmental Setting

Regional Geology

The proposed Project is located on the west side of the Great Valley Geomorphic Province, which encompasses the Sacramento and San Joaquin Valleys. It is an alluvial plain about 50 miles wide and 400 miles long, stretching from Redding to just south of Bakersfield. Marine and continental deposits of Tertiary age underlie much of the Central

Valley Province. The San Joaquin Valley is a structural trough into which sediments have been deposited as much as 6 miles deep and is drained by the San Joaquin River. The proposed project is along the east flank of the Elk Hills which are a series of anticlines which act as oil and gas traps. Dibblee and Minch (2005) mapped the project area as Quaternary alluvium with the Pleistocene Tulare Formation of the Elk Hills to the west.

Local Soils

A review of U.S. Natural Resources Conservation Service (NRCS 2016) soil survey data indicates that the project elements would be constructed in several soil types consisting primarily of sands, silts, and clays. Relevant characteristics of each soil are presented in Table 20.

Topographically, the proposed project area is on the border of several incised alluvial fans and the ancestral Kern River channel. Based on subsurface exploration data obtained by DWR, the foundation soils in the proposed project area consist of older alluvium derived from the Elk Hills in the alluvial fans and younger alluvial deposits between the alluvial fans. The older alluvium is composed of low to medium plasticity, clayey and silty sands and silt and clay with varying amounts of sand. The younger alluvium is composed of arkosic sand with scattered fine-grained layers.

Seismicity and Neotectonics

Both the Coast Ranges and Central Valley geologic provinces are subject to tectonic activity because they are near the San Andreas, which is a component of a broad tectonically active belt that accommodates motion between the North American plate to the east and the Pacific plate to the west. The nearest "active" fault (i.e., evidence of displacement during the Holocene epoch) is the San Andreas fault, located in the Coast Ranges to the south west. The San Andreas fault runs in a northwest to southeast direction through the Coast Ranges. Under the Alquist-Priolo Act, active faults are considered to have a relatively high potential for surface rupture. The Buena Vista fault is zoned under the Alquist-Priolo Act (California Geological Survey [CGS] 1976), and considered a creeping thrust fault along bedding planes. However, the creep was considered likely attributed to fluid withdraw. Two unnamed faults are located approximately 2.5 miles west of the project site. However, the unnamed faults are Quaternary in age and are not zoned under the Alquist-Priolo Act.

The intensity of ground shaking depends on the distance from the earthquake epicenter to the site, the magnitude of the earthquake, and site soil conditions. Ground motions from seismic activity can be estimated by probabilistic method at specified hazard levels and by site-specific design calculations using a computer model. The CGS Probabilistic Seismic Hazards Assessment Model (CGS 2008) indicates there is a 1-in-10 probability that an earthquake would occur within 50 years that would result in a peak horizontal ground acceleration exceeding 0.315 g (where g is the percentage of gravity). This indicates that a relatively low to moderate level of seismic ground shaking would be anticipated in the project area.

A liquefaction risk exists throughout the Central Valley in areas where unconsolidated, Holocene-age sediments and a high water table coincide such as near rivers and in wetland areas.

Table 20. Project Site Soil Types and Characteristics

Soil Type	Shrink-Swell Potential[1]	Permeability[2]	Drainage Class	Wind Erosion Hazard[3]
Granoso loamy sand, 0 to 2 percent slopes	Low	Very High	Somewhat excessively drained	2

Table 20. Project Site Soil Types and Characteristics

Soil Type	Shrink-Swell Potential[1]	Permeability[2]	Drainage Class	Wind Erosion Hazard[3]
Granoso loamy sand, 2 to 5 percent slopes	Low	Very High	Somewhat excessively drained	2
Garces silt loam	Moderate	Moderately High	Well Drained	5

Source: NRCS 2016
Notes: N/A = not applicable; NRCS = U.S. Natural Resources Conservation Service
1 Based on percentage of linear extensibility; shrink-swell potential ratings of "moderate" to "very high" can result in damage to buildings, roads, and other structures.
2 Based on standard NRCS saturated hydraulic conductivity (Ksat) class limits. Ksat refers to the ease with which pores in a saturated soil transmit water.
3 Soils assigned to wind erodibility group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.
4 Based on the erosion factor "Kw whole soil," which is a measurement of relative soil susceptibility to sheet and rill erosion by water.

Paleontology and Unique Features

The Project site is mapped as being underlain by Holocene (younger than approximately 11,700 years) Quaternary alluvium (map unit Qa), according to published, surficial geological mapping at a 1:24,000 scale and as observed during the pedestrian field survey (Dibblee and Minch 2005; Dudek 2021b, Confidential Attachment C). Older Pleistocene (approximately 11,700 years to 2.58 million years old) and possibly latest Pliocene age (2.58 to 3.60 million years old) sedimentary deposits mapped as the Tulare Formation (map unit QTt) are shown as occurring southwest of the Project site and may underlie the younger Quaternary alluvial deposits at an unknown depth within the Project site (Dibblee and Minch 2005; Cohen et al. 2013). The younger alluvial deposits have a low paleontological resource sensitivity at the surface and at shallow depths; however, older, unnamed Pleistocene-age alluvial deposits and/or Tulare Formation (Pleistocene and latest Pliocene age) potentially underlie younger alluvium at an unknown depth within the Project area. These Pleistocene-age alluvial deposits and the Tulare Formation would have a high paleontological resource sensitivity.

Paleontological resources have been recovered from correlative Pleistocene and latest Pliocene-age sedimentary deposits elsewhere in Kern County and include recorded fossil-collecting localities. These localities have yielded fossils of terrestrial mammals (e.g., mammoths, mastodons, ground sloths, dire wolves, sabre-toothed cats, large and small horses, large and small camels, and bison), in addition to plant macro- and micro-fossils and microvertebrate fossils (Jefferson 1991a, 1991b; Jefferson 2010).

Older Quaternary alluvial deposits, characteristically reddish-brown in color, have been known to contain Ice Age mammals in the Project vicinity and throughout Kern County, as confirmed by the records search results obtained from the LACM (Dudek 2021b, Confidential Attachment C). According to the LACM, the closest fossil localities to the Project site include LACM VP (Vertebrate Paleontology) locality 3720, which produced a fossil specimen of bone-crushing dog ("Hyaenognathus" [Borophagus] pachyodon), in the McKittrick Valley, possibly from the Tulare Formation. Also, near the town of McKittrick, LACM VP-CIT (California Institute of Technology) locality 138 yielded an assemblage of fossil plants, invertebrates, and vertebrates (including reptiles, birds, and mammals) recorded from asphaltic deposits within the McKittrick Formation. Southeast of Maricopa, locality LACM VP 6731, Pleistocene-age deposits consisting of clay with some asphalt yielded an assemblage of unspecified vertebrates. A fourth locality, LACM VP 3722, was discovered during a sewer excavation in Pleistocene-age deposits in Tehachapi and yielded the remains of an extinct horse, Equus.

Impact Analysis

a.i) The project site is located approximately 13 miles from the Buena Vista thrust fault which is zoned under the Alquist-Priolo Act. The Buena Vista fault shows creep movement along bedding planes, which is thought to be caused by fluid extraction. The San Andreas fault zone is about 18.5 miles southwest of the project site. However, the project site is not located within an Alquist-Priolo Earthquake Fault Zone Map, and surface fault rupture generally involves an area that is only a few yards wide. Therefore, this impact would be **less than significant**.

a.ii) The 1857 Fort Tejon earthquake had a magnitude 7.9 occurred approximately 54 miles northwest of the project site. The Fort Tejon earthquake occurred on the Cholame Section of the San Andreas fault zone. The 1952 earthquake located approximately 36 miles southeast of the project site. The earthquake had a magnitude of 7.5 and occurred along the Pleito fault zone. The proposed project would be strengthening the existing California Aqueduct and seismic shaking is considered low to moderate. Therefore, this impact would be **less than significant.**

a.iii) Soil liquefaction occurs when ground shaking from an earthquake causes a sediment layer saturated with groundwater to lose strength and take on the characteristics of a fluid, thus becoming similar to quicksand. Saturated, uncompacted fill material located close to an active fault has a higher potential to liquefy. Liquefaction poses a hazard to engineered structures. The loss of soil strength can result in bearing capacity insufficient to support foundation loads, increased lateral pressure on retaining walls, and slope instability.

Subsurface materials encountered during a 2014 investigation indicated sand, silt, and clay in the near surface soils and sand with minor silt in deeper soils. Groundwater was not encountered in the borings which were 60 feet deep. Therefore, impacts would be **less than significant**.

a.iv) The low hills present south and southwest of the project site are unlikely to represent a landslide hazard, and the land to the north and west has low topographic relief. Thus, there would be **no impact**.

b) As discussed in Chapter 2, "Project Description," the spoils pile would be seeded with native vegetation at the completion of grading activities; therefore, substantial soil erosion would not occur following completion of the project. However, project implementation would involve grading at the spoils pile to remove existing cover soils and then replacement of soil cover and regrading. Localized soil loss from wind and water erosion during grading could occur. Therefore, the impact associated with construction-related erosion would be potentially significant.

Implementing **mitigation measure GEO-1** would reduce the impact associated with construction-related soil erosion to a less-than-significant level because a storm water pollution prevention plan (SWPPP) would be prepared and associated BMPs that are specifically designed to reduce erosion would be implemented. Therefore, impacts would be **less than significant with mitigation incorporated**.

c) Site grading would create stable temporary construction slopes. Final slopes would be engineered to be stable. The low hills present south and southwest of the project site are unlikely to represent a stability hazards, and the land to the north and west has low topographic relief. Therefore impacts would be **less than significant.**

d) Subsurface materials encountered during a 2014 investigation indicated sand, silt, and low to medium plasticity clay in the near surface soils and sand with minor silt in deeper soils. Therefore the Project is not located on expansive soils and would not pose a risk to life or property and there would be **no impact**.

e) Portable restroom facilities would be used by project construction workers. Drilling activities will drum drill cuttings and remove them from the site to be disposed at an appropriate landfill. The proposed construction project itself, does not involve wastewater treatment. Therefore, **no impact** would occur.

f) No paleontological resources were identified within the Project site as a result of the institutional records search, desktop geological review, or site survey. However, intact paleontological resources may be present below the original layer of younger, Holocene-age alluvial deposits. Given the proximity of past fossil discoveries in the surrounding area and the underlying older Pleistocene to latest Pliocene-age deposits, the Project site is highly sensitive for supporting paleontological resources at depth. Mitigation measures GEO-2 and GEO-3 would require construction worker paleontological 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 Measure

GEO-1: Prepare and Implement a Storm Water Pollution Prevention Plan.

DWR shall obtain coverage under the State Water Resources Control Board's National Pollutant Discharge Elimination System stormwater permit for general construction activity (Order 2009-0009-DWQ). If applicable, a project specific Storm Water Pollution Prevention Plan (SWPPP) would be prepared and submitted at the time the notice of intent to discharge is filed. If the project does not require the creation of a SWPPP under the CGP, a Water Quality Control Plan (WQCP) written by a Qualified Stormwater Developer and will be submitted by the contractor. The SWPPP/WQCP would identify and specify the following details:

- the use of an effective combination of robust erosion and sediment control BMPs for use on the project site at the time of construction that would reduce the potential for runoff and the release, mobilization, and exposure of pollutants from project-related construction sites (may include but would not be limited to temporary erosion control and soil stabilization measures, sedimentation ponds, check dams, and silt fences);
- the pollutants likely to be used during construction that could be present in stormwater runoff and those that could be present in the dredged sediments;
- spill prevention and contingency measures, including measures to prevent or clean up spills of hazardous waste and of hazardous materials used for equipment operation, and emergency procedures for responding to spills;
- the means of waste disposal;
- personnel training requirements and procedures that would be used to ensure that workers are aware of permit requirements and proper installation methods for BMPs specified in the SWPPP; and
- the appropriate personnel responsible for supervisory duties related to implementation of the SWPPP.

Where applicable, BMPs identified in the SWPPP/WQCP shall be in place throughout all site work and construction activities. BMPs may include but would not be limited to the following measures:

- Implement temporary erosion and sediment control measures in disturbed areas to minimize discharge of sediment into nearby drainage conveyances, in compliance with state standards in effect at the time of construction. These measures may include silt fences, staked straw bales or wattles, sediment/silt basins and traps, geofabric, sandbag dikes, and temporary vegetation.
- Establish permanent vegetative cover to reduce erosion in areas disturbed by construction by slowing runoff velocities, trapping sediment, and enhancing filtration and transpiration.
- Use drainage swales, ditches, and earth dikes to control erosion and runoff by conveying surface runoff down sloping land, intercepting and diverting runoff to a watercourse or channel, preventing sheet flow over sloped surfaces, preventing runoff accumulation at the base of a grade, and avoiding flood damage along roadways used to transport sediment.

A copy of the approved SWPPP/WQCP shall be available at all times on the construction site.

GEO-2: Paleontological Sensitivity Training

Prior to any ground disturbing activities associated with the proposed Project, DWR shall retain and direct a Qualified Paleontologist, 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-3). 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-3: Unanticipated Discoveries of Paleontological Resources

In the event of the unanticipated discovery of paleontological resources at the proposed Project, 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.

9.8 Greenhouse Gas Emissions

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VII. GREENHOUSE GAS EMISSIONS– Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☒	☐	☐

Environmental Setting

The California Air Pollution Control Officers Association (CAPCOA) considers GHG impacts to be exclusively cumulative impacts (CAPCOA 2008); therefore, assessment of significance is based on a determination of whether the GHG emissions from a project would represent a cumulatively considerable contribution to the global atmosphere. The SJVAPCD has adopted the Climate Change Action Plan (CCAP), which directed the Air Pollution Control Officer to develop guidance documents to assist land use and other permitting agencies in addressing GHG emissions as part of the CEQA process. The SJVAPCD has adopted the Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD 2009a) and the policy Addressing GHG Emission Impacts for Stationary Source Projects under CEQA When Serving as the Lead Agency (SJVAPCD 2009c). The guidance and policy rely on the use of performance-based standards, otherwise known as Best Performance Standards to assess significance of project-specific GHG emissions on global climate change during the environmental review process. However, SJVAPCD's adopted Best Performance Standards are specifically directed at reducing GHG emissions from stationary sources; therefore, the adopted Best Performance Standards would not generally be applicable to the Project. The SJVAPCD guidance does not limit a lead agency's authority in establishing its own process and guidance for determining significance of project-related impacts on global climate change. Notably, SJVAPCD supports the use of interim thresholds as established by the CAPCOA when adopted thresholds are not applicable (SJVAPCD 2009c). SJVAPCD also recommends that construction emissions be amortized over a 30- year project lifetime. Thus, the total construction GHG emissions were calculated for the Project, amortized over 30 years, and compared with the CAPCOA GHG significance threshold of 900 MT CO2e per year. This threshold is consistent with California's climate-stabilization target (identified in Assembly Bill [AB] 32).

The 900 MT CO2e per year threshold was developed based on various land use densities and future discretionary project types to determine the size of projects that would likely have a less than cumulatively considerable contribution to climate change. The CAPCOA threshold was developed to ensure capture of 90% or more of likely future discretionary developments with the objective to set the emissions threshold low enough to capture a substantial fraction of future development while setting the emission threshold high enough to exclude small development projects that would contribute a relatively small fraction of cumulative statewide GHG emissions. CAPCOA's 900 MT CO2e per year threshold was developed to meet the target identified by AB 32 of reducing emissions to 1990 levels by year 2020. Subsequent to CAPCOA identifying the 900 MT CO2e per year threshold, Senate Bill (SB) 32 was passed and set a revised statewide reduction target to reduce emissions to 40% below

1990 levels by year 2030. Though the CAPCOA threshold does not consider the reduction targets set by SB 32, the CAPCOA threshold was developed with an aggressive project-level GHG emission capture rate of 90%. Due to the aggressive GHG emission capture rate, the CAPCOA threshold has been determined to be a viable threshold to reduce project GHG emissions and meet SB 32 targets beyond 2020. Furthermore, more stringent state legislative requirements such as Building Energy Efficiency Standards and transportation-related efficiency measures would act to reduce future project GHG emissions and help in meeting state emissions reduction targets. Projects that generate emissions beyond the 900 MT CO2e per year screening level threshold are required to implement feasible on-site mitigation measures to reduce their impacts on climate change. Projects that meet or fall below CAPCOA's screening level threshold of 900 MT CO2e per year of GHG emissions require no further analysis and are not required to implement mitigation measures to reduce GHG emissions. As such, the CAPCOA threshold of 900 MT CO2e per year is used as a quantitative threshold for the analysis of impacts related to GHG emissions generated by the proposed Project.

Impact Analysis

a) Construction of the Project would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road haul trucks, and worker vehicles. CalEEMod was used to calculate the annual GHGemissions based on the construction scenario described in Section 2. Geotechnical investigations would begin in 2022lasting 6 weeks, and construction activities would begin spring 2024 lasting 7 months. On-site sources of GHG emissions include off-road equipment and off-site sources, including haul trucks and worker vehicles. **Table 21** presentsconstruction emissions for the Project in 2022 and 2024 from on-site and off-site emission sources.

Table 21. Estimated Annual Construction GHG Emissions

Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons			
2022	296.71	0.09	<0.01	299.13
2024	9,980.68	1.20	0.01	10,014.10
			Total	**10,313.23**
			Amortized over 30 years	**343.77**

Notes: GHG = greenhouse gas; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; <0.01 = reported value less than 0.01.
See Attachment A for complete results.

As shown in Table 21, the estimated total GHG emissions during construction would be approximately 299 MT CO2e in 2022 and 10,014 MT CO2e in 2024, for a total of approximately 10,313 MT CO2e over the construction period. Estimated Project-generated construction emissions amortized over 30 years would be approximately 344 MT CO2eper year. As with Project-generated construction air quality pollutant emissions, GHG emissions generated duringconstruction of the Project would be short-term in nature, lasting only for the duration of the construction period, andwould not represent a long-term source of GHG emissions. Amortized construction emissions would be below thescreening GHG threshold of 900 MT CO2e per year. Therefore, the Project's GHG emissions **would be less than significant.**

b) The following plans are consistent with the proposed Project:

Project Consistency with the Kern Council of Governments' 2018 RTP/SCS

Kern County does not have an applicable GHG reduction plan. Under SJVAPCD's CEQA thresholds for GHG, a project would not have a significant GHG impact if it is consistent with an applicable plan to reduce GHG emissions, and a CEQA-compliant analysis was completed for the GHG reduction plan. The Kern Council of Governments' Regional Transportation Plan (RTP)/Sustainable Community Strategy (SCS) is an applicable plan adopted for the purpose of reducing GHGs from the land use and transportation sectors in Kern County. CARB approved the RTP/SCS in 2019. The Project could result in a significant impact due to a conflict with an applicable plan, policy, or regulation if it would be inconsistent with the adopted RTP/SCS. Therefore, the Project could have a potential conflict with the RTP/SCS if it were to be found inconsistent based on a qualitative assessment of its consistency with Kern Council of Governments' RTP/SCS policies. The proposed Project is consistent with the 2018 RTP/SCS as the Project would not conflict with the Kern County General Plan. The 2018 RTP/SCS incorporates local land use projections and circulation networks in city and county general plans. The 2018 RTP/SCS is not directly applicable to the Project because the underlying purpose of the document is to provide direction and guidance by making the best transportation and land use choices for future development; still, the Project would not conflict with the goals and policies of the 2018 RTP/SCS. Additionally, the Project would not impact local transportation and land use during construction.

Project Consistency with CARB's Scoping Plan

The Scoping Plan (approved by CARB in 2008 and updated in 2014 and 2017) provides a framework for activities toreduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. The Scoping Plan is not directly applicable to specific projects, and it is not intended tobe used for project-level evaluations.[5] Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., Low Carbon Fuel Standard), among others. To the extent that these regulations are applicable to the proposed Project, the Project would comply with all regulations adopted in furtherance of the Scoping Plan to the extent required by law.

Project Consistency with Senate Bill 32 and Executive Order S-3-05

The Project would not impede the attainment of the most recent state GHG reduction goals identified in SB 32 and Executive Order (EO) S-3-05 and. SB 32 establishes a statewide goal of reducing GHG emissions to 40% below 1990 levels by 2030, while EO S-3-05 establishes a statewide goal of reducing GHG emissions to 80% below 1990 levels by 2050. While there are no established protocols or thresholds of significance for that future year analysis, CARB forecasts that compliance with the current Scoping Plan puts the state on a trajectory of meeting these long- term GHG goals, although the specific path to compliance is unknown (CARB 2014).

CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the First Update to the Climate Change Scoping Plan that "California is on track to meet the near-term 2020 GHG emissions limit and iswell positioned to maintain and continue reductions beyond 2020 as required by AB 32" (CARB

2014, p. ES2). With regard to the 2050 target for reducing GHG emissions to 80% below 1990 levels, the First Update to the ClimateChange Scoping Plan states the following (CARB 2014, p. 34):

This level of reduction is achievable in California. In fact, if California realizes the expected benefitsof existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020,net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world andto stay on track to reduce emissions to 80% below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

In other words, CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targetsset forth in AB 32, EO B-30-15, and EO S-3-05. This is confirmed in the 2017 Scoping Plan, which states the following (CARB 2017):

The Scoping Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while also identifying new, technologically feasible, and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environmentand public health, including in disadvantaged communities.

As discussed previously, the proposed Project is consistent with CARB's 2017 Scoping Plan and would not conflictwith the state's trajectory toward future GHG reductions. In September 2018, EO B-55-18 was signed, which commits the state to total carbon neutrality by 2045. However, since the specific path to compliance for the statein regard to the long-term goals would likely require development of technology or other changes that are not currently known or available, specific additional reduction measures for the proposed Project would be speculative and cannot be identified at this time.

With respect to future GHG targets under SB 32 and EO S-3-05, CARB has also made clear that its legal interpretation is that it has the requisite authority to adopt whatever regulations are necessary, beyond the AB 32horizon year of 2020, to meet SB 32's 40% reduction target by 2030 and EO S-3-05's 80% reduction target by 2050; this legal interpretation by an expert agency provides evidence that future regulations would be adopted to continue the state on its trajectory toward meeting these future GHG targets.

Project Consistently with DWR's GGERP

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.

All BMPs required by the GGERP for a project of this nature are included in mitigation measure GHG-1. Based on the analysis provided and the implementation of mitigation measure GHG-1, 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 Measure

GHG-1: Green House Gas Reductions

Green House Gas reduction 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 would 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.

9.9 Hazards and Hazardous Materials

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
VIII. 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?	☐	☐	☒	☐
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?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
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?	☐	☐	☐	☒
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?	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

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 (CalOSHA) 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 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 one DTSC site approximately 5 miles north and one open hazardous clean-up site 3.9 miles northeast of the project area (DTSC 2020b; SWRCB 2015).

The nearest school is Buttonwillow Union School located approximately 4.6 miles north of the project area. Elk Hills Buttonwillow Airport is located approximately one mile west of the project area.

Impact Analysis

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 regulations such as those described above that would reduce the risk of accidental release. and provide Protocols and notification requirements would be provided should an accidental release occur. By complying with relevant federal, and State 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 project implementation. 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 State Water Resources Control Board's Construction General Permit, which requires the preparation and implementation of a SWPPP for construction activities with over one acre of ground disturbance that do not qualify for an erosivity waiver. **Mitigation measure HYD-1** would be implemented. The SWPPP/WQCP 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/WQCP 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 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 with mitigation incorporated.**

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) Elk Hills Buttonwillow Airport is located within two miles of the project area. However, the airport has no tower and is unmanned and has a single wheel weight limit of 10,000 pounds (AOPA 2020). The isolated nature, absence of structures and fuel, and no staff present indicates the airport is not in high use and cannot facilitate large aircrafts. Therefore, potential safety hazards and excessive noise impacts to people working in the Project area would be **less than significant.**

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 geotechnical investigations, embankment repair activities, staging areas, and liner repairs 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), Project area is located within Local Responsibility Areas (LRAs) of Kern County and designated as an area with no fire severity zone association (CAL FIRE 2007). A majority of the construction activities would occur within existing maintained access roads and Aqueduct embankment, composed of compacted soils with little to no vegetation. The surrounding vegetation is sparse 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 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**.

9.10 Hydrology and Water Quality

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
IX. 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?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
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;	☐	☐	☒	☐
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
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	☐	☐	☒	☐
iv. impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

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).

The groundwater table in the project area is approximately 120 feet below surface elevations according to the Buena Vista Water Storage District (BVWSD) (BVWSD 2015).

Impact Analysis

a) The proposed project would include earthwork activities such as site preparation, excavation, grading, and stockpiling of soils, which would involve the disturbance and exposure of surface soils. All of the project alternatives would involve injecting grout and/or a bentonite compound into soil. 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 would be used during installation of the liner.

Implementation of the SWPPP/WQCP 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 with mitigation incorporated.**

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. The maximum depth that grouting or trenching would occur is approximately 35 feet deep and geotechnical investigates would not exceed 60 feet in depth, since the groundwater table is well below, **no impact** to groundwater recharge would occur.

c.i) The proposed project would introduce ground improvement in a maximum area of approximately 4.03 acres. However, there are no streams or rivers identified with in the project area. The acreage is part of the California Aqueduct embankment and adjacent ROW. The proposed embankment repairs would stabilize the substrate and semi-impervious structures would prevent or reduce horizontal movement of water, but not lateral.

Temporary earth-moving activities would slightly alter the topography of the project area to facilitate the embankment repairs. 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 Section 5.4, 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-iii) The proposed project would not substantially alter the local drainage pattern of the Project area. The California Aqueduct by default bisects the valley from the east and west affecting any drainages when it was installed initially. The Project would not change the drainage any more than the current condition. The proposed project would not substantially change the rate or amount of surface runoff from the project sites.

The project would require implementation of a SWPPP or WQCP, including BMPs for erosion control and for proper handling of chemicals. As such, the proposed project would not result in flooding on-site or off-site or 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 Project area 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 in a 100-year flood zone, nor is it located near 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. Geotechnical investigations would penetrate soil levels while drilling. At the completion of drilling the space will be backfilled with a bentonite and native soil mixture to preserve the soil levels and any perched water in the area. Once geo exploration and embankment repair is complete operations of the project area/Aqueduct would not change. **No impact** to water quality control plans or sustainable groundwater management plans would occur.

Mitigation Measure

HYD-1: Water Quality Best Management Practices

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. If a SWPPP is not required under the Construction General Permit, the contractor would prepare a Water Quality Control Plan. The objective of a SWPPP/WQCP 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.

Erosion control BMPs would be used to prevent the degradation of water quality. Examples of erosion control BMPs are installing a silt fence, 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 fueling away from waterways 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.

During subsurface exploration, no equipment would be allowed to drip oil or fluids onto the ground. Visqueen or a similar type of plastic sheeting would be placed under any leaky or potentially leaky equipment to prevent contact with the ground. Any contaminated soil or rock resulting from leaking equipment would be removed.

Straw wattles, berms, and visqueen would be used to control any runoff from exploration operations or precipitation during exploration.

9.11 Land Use and Planning

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
X. LAND USE AND PLANNING – Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Environmental Setting

The proposed geotechnical investigations, embankment repair, and liner repair are between Aqueduct MP 230.6 to MP 231.4. The proposed Project is approximately four miles south of Buttonwillow and six miles northwest of the community of Tupman, in Kern County. There are no communities within the project area.

Kern County Zone Maps indicate that Aqueduct Project area is zoned A and A-1 (Exclusive Agriculture and Limited Agriculture) (Kern County Public Works Department 2020). The Aqueduct and existing access roads are within the DWR right-of-way. However, lands immediately surrounding the Aqueduct and right-of-way are subject to Kern County land use plans, policies, and regulations. Thus, plans, policies and regulations applicable to these lands have the potential to be impacted by the proposed project.

The Kern County (Western Section) Land Use, Open Space, and Conservation Element map designates land adjacent to the east side of the pool as 8.3: Extensive Agriculture (min. 20-acre parcel size) and west side as 8.3 and 8.4: Mineral and Petroleum (min. 5-acre parcel size) (Kern County Planning Department 2009).

Impact Analysis

a) Buttonwillow and Tupman, are approximately four miles northwest and six miles southeast of the proposed project, respectively. The proposed project includes geotechnical investigations and repairs to the existing Aqueduct and would not introduce additional structures, such as roads or freeways, with the potential to physically divide a community. Therefore, **no impact** would occur.

b) All geotechnical investigations, embankment repair, and liner repair would be limited to the previously disturbed footprint of the Aqueduct and ROW. 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 activities 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.

9.12 Mineral Resources

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XI. 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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

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).

Impact Analysis

a) The proposed project is not included on any CGS maps or reports identifying potentially important mineral resources. Kern County land use map does not identify any valuable mineral resources in the project area. Additionally, excavation activity would be confined to the previously disturbed areas on the Aqueduct access road, embankment, and ROW. Therefore, **no impact** would occur.

b) Kern County land use map does not delineate locally important mineral resources lands near the proposed project sites, and as described in (a), excavation activity would be confined to the previously disturbed areas. Therefore, **no impact** to locally important mineral resources would occur.

9.13 Noise

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XII. NOISE – Would the project:				
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?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
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?	☐	☐	☒	☐

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).[1]

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

[1] All noise levels reported herein reflect A-weighted decibels unless otherwise stated.

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 nearest occupied residence is approximately 4,000 feet to the northeast. Therefore, the above code would not apply to the proposed project.

The Kern County General Plan does not contain any goals are 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).

Impact Analysis

a) The proposed project is located Kern County. The proposed project would occur over approximately eight and a half 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. The nearest resident is approximately 4,000 feet northeast of the proposed project.

The County codes nor the County General Plans establish quantitative noise exposure standards that apply to construction activity. 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. Therefore, the project would result in less than significant noise impacts during operation.

b) Drilling rigs that would be used during geotechnical investigations and construction would create outputs of 90 to 120 dBA L_{dn} underground. The proposed project would not result in a substantial temporary or permanent increase in groundborne vibrations or noise levels, it would be kept below the accepted dBA for human tolerance. Therefore, the project would result in **less than significant** noise impacts during operation.

c) Elk Hills Buttonwillow Airport is located within two miles of the project area. However, the airport has no tower and is unmanned and has a single wheel weight limit of 10,000 pounds (AOPA 2020). The isolated nature, absence of structures and fuel, and no staff present indicates the airport is not in high use and cannot facilitate large aircrafts. Therefore, potential excessive noise impacts to people working in the project area would be **less than significant**.

9.14 Population and Housing

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIII. 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)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Environmental Setting

The proposed project is located in Kern County, whose population, according to the U.S. Census Bureau's (Bureau) 2019 population estimates, contains approximately 900,202 residents (Bureau 2019). 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 2019 estimates, Kern County's growth rate is 7.2 percent. Most of the growth in Kern County is due to its geographical location, resource-based sectors, and the promotion commercial and industrial developments (Milken Institute 2015). As of 2019, Kern County contained 302,898 housing units with an owner-occupied housing unit rate of 58 percent.

Impact Analysis

a) 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 and a half months investigative and 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. The repairs to the liner and storage capacity of the Aqueduct would bring the structure back to design capacity. There would be no increase in water deliveries and would not induce population growth. Therefore, **no impact** would occur.

b) There is a total of two residence in the area, one 4,000 feet and the other 6,000 feet from proposed project activities. 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.

9.15 Public Services

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIV. PUBLIC SERVICES – Would the project:				
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 public services:				
i. Fire protection?	☐	☐	☒	☐
ii. Police protection?	☐	☐	☒	☐
iii. Schools?	☐	☐	☐	☒
iv. Parks?	☐	☐	☐	☒
v. Other public facilities	☐	☐	☐	☒

Environmental Setting

Kern County Fire Department stations would serve the project sites in Kern County. Battalion 2 serves all Western Kern with six stations. The stations closest to the proposed project sites are Buttonwillow and McKittrick (Kern County Fire Department 2020). The Kern County Sheriff Station in Buttonwillow, approximately 4 miles north of proposed project sites, would service the proposed project sites. The nearest schools are Elk Hills Elementary and Buttonwillow Union School approximately six and four miles away from the project, respectively. The nearest public park is Buttonwillow Recreation Park, also located on the east side of Buttonwillow.

Impact Analysis

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 County 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.

9.16 Recreation

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XV. RECREATION – Would the project:				
a) 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?	☐	☐	☐	☒
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒

Environmental Setting

There are no existing neighborhood or regional parks or other recreational facilities near the proposed project area, the closest park is 4 miles north. Although DWR does allow fishing along segments of the Aqueduct, there are no designated fishing near the proposed project.

Impact Analysis

a-b) The proposed project would not increase the need to construct or expand recreational facilities or opportunities near Buttonwillow, 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.

9.17 Transportation

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVI. TRANSPORTATION – Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☐	☒
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

Environmental Setting

Kern County has 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 (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 county's roads, such as Elk Hills Road; some unpaved agricultural roads; and State Route 58 and Interstate 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.

Impact Analysis

a) Direct impacts to the local circulation system would not occur during geotechnical investigations. A drill rig and support truck would be the only vehicles accessing the site for a 6-week period. Direct impacts to the local circulation system would occur due to the temporary addition of project-related vehicles to local roadways over the 7-month construction 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 a 7-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 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 would be temporary, and therefore, would not result in any long-term degradation in operating conditions on local roadways used for the project.

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. Impacts to the local circulation system would be **less than significant**.

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 7-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.

9.18 Tribal Cultural Resources

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVII. TRIBAL CULTURAL RESOURCES – Would the project:				
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	☐	☒	☐	☐
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 Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Environmental Setting

The following Environmental Setting is summarized from the archaeological report (Dudek 2021b) prepared for the Proposed Project. The region surrounding the Project area would have been at the southern extent of Southern Valley Yokut tribal territory. This group inhabited the lower Kings River to the Tehachapi Mountains. Southern Valley Yokut habitation areas were typically situated in close proximity to the major rivers and their tributaries (Kroeber 1925). On the western side of San Joaquin Valley, populations were much sparser and concentrated in the foothills along minor waterways. This focus on waterways can also be seen in their dietary resources which included various fish, waterfowl, antelope, elk, acorns, tule roots, and various seeds. The focus on fishing is also seen in the material culture consisting of net sinkers and harpoons, which they may have employed while on rafts constructed from tule reed bundles (Wallace 1978).

Traditional villages were located on top of low mounds on or near riverbanks. Wallace (1978:448) identifies the closest village to the project area as Hoschiu, located along the northwestern edge of the Buena Vista Lakebed, about nine miles southeast of the project area.

Southern Valley Yokut dwellings were constructed of tule reed woven mats places over a pole frame oval or round structure. They were usually 25 to 40 feet in diameter and would belong to a single family (Wallace 1978). In addition, they constructed larger multifamily dwellings. Earth-covered ceremonial sweat lodges were also constructed. There was a high level of sedentism due to abundant riverine resources, though there were times of seasonal disbandment for harvesting wild plant resources such as acorns and seeds (Gayton 1948; Kroeber 1925).

The Southern Valley Yokut population declined rapidly as a result of introduced diseases and relocation to coastal missions following Spanish contact (Osbourne 1992). This only increased with the large influx of cattle ranching and Anglo Americans onto tribal territory after the gold rush (Osbourne 1992; Cook 1976).

Tribal Cultural Resource Inventory Methods

Efforts to identify tribal cultural resources present within the Project site include records searches, review of historical maps and aerial photographs, and pedestrian survey of the Project site.

In addition, DWR contacted seven tribes via certified mail on November 12, 2019 as part of their Tribal Engagement Policy. These tribes included, the Chumash Council of Bakersfield, the Kern Valley Indian Community, Kitanemuk & Yowlumne Tejon Indians, Santa Rosa Rancheria Tachi Yokut Tribe, Tubatulabal of Kern Valley, Tule River Indian Tribe, and the Wuksache Indian Tribe/Eshom Valley Band.

DWR contacted three tribes under AB 52 on November 12, 2019. These tribes included the Big Pine Paiute Tribe of the Owens Valley, San Manuel Band of Mission Indians, and the Tejon Indian Tribe.

On November 17, 2021 DWR sent updated consultation letters to all 10 tribes who were originally contacted in November 2019. These letters included a revised project description and notification of the anticipated CEQA document circulation. In addition to re-contacting these 10 tribes, DWR sent letters to four additional tribes - yak tityu yak tiłhini - Northern Chumash Tribe, San Fernando Band of Mission Indians, Coastal Band of the Chumash Nation, and the Fernandeño Tataviam Band of Mission Indians, as part of their Tribal Engagement Policy. These letters included the project description and notification of the anticipated CEQA document circulation.

Tribal Cultural Resources Inventory Results

Record searches, ethnographic research, and pedestrian survey of the Project site did not result in the identification of any TCRs. In addition, a search of the NAHC SLF came back negative and none of the 14 tribes notified by DWR expressed any concerns about the project or knowledge of TCRs in the Project area.

The results of the inventory efforts for TCRs are summarized below.

Record Search Results

The SSJVIC records search results indicated that 13 previous cultural resource studies had been conducted within a one-mile radius of the Project site. Seven of these studies intersect with the project site. Please see Chapter 9.5, Cultural Resources for more information on these studies.

Previous cultural resource studies of the Project site identified 13 cultural resources within a one-mile radius of the Project site. Of these 13 resources, nine are prehistoric archaeological sites, this includes one multicomponent site. Please see Chapter 9.5, Cultural Resources for more information on these resources.

NAHC Sacred Lands File Search

DWR requested an NAHC search of the SLF on July 23, 2019 for the Project site. Results were returned on August 22, 2019 and were negative for cultural and tribal cultural resources in and near the Project. The NAHC provided a list of contacts for 15 individuals (representing 10 tribes) with traditional cultural affiliation with the Project area and whom may have knowledge of resources within or near the Project site. DWR reached out to these tribes as part of their Tribal Engagement Policy and for AB 52 (see previous discussion).

An additional request was made for an NAHC search of the SLF on December 30, 2020 for the Project site. Results were returned on January 25, 2021 and were negative for cultural and tribal cultural resources in and near the Project site. The NAHC provided a list of contacts for 19 individuals (representing 14 tribes) with traditional cultural affiliation with the Project area and whom may have knowledge of resources within or near the Project site. DWR reached out to these tribes as part of DWR's Tribal Engagement Policy (see previous discussion).

Tribal Consultation Results

Only one of the seven tribes contacted as part of DWR's Tribal Engagement Policy responded - the Santa Rosa Rancheria Tachi Yokut Tribe responded via email on December 12, 2019, deferring DWR to the Tejon Indian Tribe for further information.

Of the three tribes contacted as part of AB 52 two responded – the San Manuel Band of Mission Indians and the Tejon Indian Tribe. The San Manuel Band of Mission Indians responded in an email dated November 26, 2019, stating that the project is outside their ancestral area and that no further consultation was needed. The Tejon Indian Tribe responded via email on December 20, 2019, stating that they would like to initiate consultation. DWR responded via phone call on the same day stating that they would keep the Tribe apprised of project details and milestones.

On November 17, 2021, DWR sent updated consultation letters to all 10 tribes who were originally contacted in November 2019. These letters included a revised project description and notification of the anticipated CEQA document circulation. In addition to re-contacting these 10 tribes, DWR sent letters to four additional tribes - yak tityu tityu yak tiłhini - Northern Chumash Tribe, San Fernando Band of Mission Indians, Coastal Band of the Chumash Nation, and the Fernandeño Tataviam Band of Mission Indians. These letters included the project description and notification of the anticipated CEQA document circulation.

Two tribes contacted under AB 52 responded to the 2021 outreach letters. The Big Pine Paiute Tribe responded via email on December 15, 2021, asking where the project is located. DWR provided this information on December 15, 2021. Colin Rambo, Cultural Resources Manager for the Tejon Indian Tribe, responded via email on December 20, 2021, and asked that his master's thesis be referenced in the archaeological resources inventory report that Dudek prepared for the Project. Rambo's master thesis, which discusses the results of archaeological investigations of prehistoric sites near the California Aqueduct (Rambo 2019), is cited in Dudek's report. Rambo also requested that the Tejon Indian Tribe have a monitor for the initial groundbreaking portion of the Project and wanted to know the origin of the soils. DWR will consider the request for a tribal monitor during the initial groundbreaking portion of the Project,

A phone call meeting was held with Christa Collin (DWR), Shelly Amrhein (DWR), Sarah Heffner (DWR), Colin Rambo (Tejon Indian Tribe), and Dudek archaeologist Adam Giacinto on January 13, 2022. Mr. Rambo reiterated his earlier requests and highlighted the sensitivity of the overall Project area. He mentioned that the Tribe has a Public Entity

Agreement for Tribal services with DWR. He also asked that DWR bring in soils from outside the project vicinity, due to the sensitivity of the overall area. If additional soils are needed for fill, they will be imported from a clean source offsite.

Four non-AB 52 tribes responded to the 2021 outreach letters. The Fernandeño Tataviam Band of Mission Indians responded via email on December 15, 2021, asking that DWR defer to local tribes for specialized knowledge of the project area. San Manuel Band of Mission Indians responded on December 15, 2021, stating that the project was outside their ancestral area. Tribal Chairperson Robert L. Gomez, Jr. with the Tubatulabals of Kern Valley responded via email on December 15, 2021, and stated that the Tribe defers to the Tejon Indian Tribe. Mona Olivas Tucker, Chairperson with the yak tityu tityu yak tiłhini - Northern Chumash Tribe, stated via email on December 16, 2021, that she had no comments about the project and that she defers DWR to the Tejon Indian Tribe.

Copies of all non-confidential tribal consultation documentation, including detailed consultation log, NAHC SLF requests and responses, and tribal outreach letters and email correspondence, is available upon request.

Pedestrian Survey

No archaeological resources were identified during pedestrian survey of the Project site.

Buried Site Sensitivity

The Project site is located in an area with heavy disturbance due to construction and maintenance of the California Aqueduct. Surrounding soils consist of well-draining clay loams derived from alluvial fans and floodplains (USDA 2021). They are considered prime farmland if irrigated. No previously recorded archaeological resources are located within the Project site and no newly recorded archaeological resources were located during pedestrian survey of the Project site. Consultation with the Tejon Indian Tribe indicated that the overall area is sensitive for cultural resources. Therefore, the Project site is considered to have a moderate potential for intact buried prehistoric archaeological resources and a low-to-moderate potential for intact historical archaeological deposits.

Impact Analysis

a.i-ii) Record searches and archival research, an NAHC search of the SLF, pedestrian survey, and tribal consultation conducted for the proposed project, did not result in the identification of any TCRs in or adjacent to the Project site. The Project site has been heavily disturbed by construction of, and continued maintenance of, the California Aqueduct. Tribal consultation indicates that the overall area is sensitive for cultural resources; therefore the Project site and surrounding area is considered to have a moderate potential for intact buried prehistoric archaeological resources, which may be considered TCRs.

Although no TCRs have been identified within the vicinity of the Project site, there is the potential for uncovering previously unknown TCRs during proposed project construction. Such resources may be determined significant pursuant to PRC Section 5024.1. If project construction activities were to affect previously unknown TCRs in a manner that would damage their cultural value, a significant impact could result. Implementation of the protection measures included in **mitigation measures CUL-1** and **CUL-3** (refer to the Cultural Resources section) and mitigation measure TCR-1 (below) would reduce impacts to previously unknown TCRs to less than significant with incorporated mitigation.

Mitigation Measures

TCR-1: Tribal Monitoring

A tribal monitor would be considered during the initial ground-disturbing activities of the project and in other instances as determined by DWR. The tribal monitor may be selected by the consulting tribe (s). If, during the course of ground-disturbing activities, the tribal monitor identifies a potential TCR, work in the immediate area would halt until the find is assessed by the monitor and a qualified archaeologist. An appropriate plan of action would be determined in consultation with DWR.

9.19 Utilities and Service Systems

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVIII. 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?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider that 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?	☐	☐	☐	☒
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?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

Environmental Setting

The Buena Vista Water Storage District is the nearest water supplier in the vicinity of the project and serves untreated water for irrigation from the SWP and Kern River entitlements (Buena Vista Water Storage District 2020). Buttonwillow County Water District provides 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. Kern County requires permits for septic systems through the Public Health Services Department. The nearest wastewater treatment plant is the Buttonwillow Wastewater Plant east of the project area.

Solid waste generated is collected by Westside Waste (Westside Waste 2020). Westside Waste offers non-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 is transported to Shafter-Wasco Landfill.

Impact Analysis

a) 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 includes the installation of semi-impervious surfaces, however, that would not substantially alter or change the rate or amount of surface runoff from the project area. 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 geotechnical investigation and the proposed project. Water for dust suppression, grout, or slurry mixing would be secured by the contractor from local water suppliers. Water demand for geotechnical investigations, dust suppression, and construction 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 7-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 repair. 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**.

9.20 Wildfire

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIX. 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?	☐	☐	☐	☒
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

Environmental Setting

The project area is located within Local Responsibility Areas (LRA) designated as no fire severity zone by CAL FIRE (CAL FIRE 2008). The proposed project area and adjacent land is classified as primarily open space. The habitat in the area is sparse alkali scrub. The habitat type and lack of vegetation is not known to produce fuel for high intensity wildfires.

Impact Analysis

a) Implementation of the proposed project is not anticipated to substantially impair an adopted emergency response plan or evacuation plan because all geotechnical investigations, embankment repairs, and liner repairs 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 a no fire hazard severity zone. The project area does not include slopes 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 geotechnical investigations and repairs to the Aqueduct and associated embankment. 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 9.10 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.

9.21 Mandatory Findings of Significance

Environmental Issue	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
XX. MANDATORY FINDINGS OF SIGNIFICANCE – Would the project:				
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 an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
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)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Impact Analysis

a) The proposed project is not expecting to create any highly controversial environmental effects. It is a project focused on the repair of 1.44 miles of the California Aqueduct, located in a non-populous area. The proposed project would maintain the operations of the State Water Project, bringing it back to design capacity.

The proposed Project is temporary in nature. In addition, the geotechnical investigations in the area would assure that the most appropriate long term fix is applied during the repair effort. This would reduce the possibility of multiple repairs occurring with multiple potential impact scenarios.

No critical habitat is within the proposed project footprint. The nearest critical habitat to the proposed project is 6 miles southeast and is designated for the Buena Vista Lake Shrew. Trapping for the species was conducted in 2018 and no detections were made.

Full protocol level surveys for blunt-nosed leopard lizard were conducted for adult and juvenile species in 2016, 2017, and 2018 and no detections were made.

Giant kangaroo rat, Tipton kangaroo rat, Tulare grasshopper mouse, San Joaquin antelope squirrel, and burrowing owl were detected during the 2017 and 2018 surveys. A species relocation and exclusion plan

would be developed in coordination with USFWS and CDFW to safely relocate and exclude listed species out of the proposed project area and minimize potential impacts.

The Project site is located in an area with heavy disturbance due to construction and maintenance of the California Aqueduct. Surrounding soils consist of well-draining clay loams derived from alluvial fans and floodplains (USDA 2021). They are considered prime farmland if irrigated. No previously recorded archaeological resources are located within the Project site and no newly recorded archaeological resources were located during pedestrian survey of the Project site. Therefore, the Project site is considered to have a low potential for intact buried archaeological resources and a low-to-moderate potential for intact historical archaeological deposits.

All applicable mitigation measures discussed in the impact analysis would be incorporated to avoid Therefore, impacts would be **less than significant with mitigation incorporated.**

b) Substantial work in the area had not occurred since the construction of the aqueduct in the 1960's. However, in 2012 DWR completed an emergency repair of the liner as a response to a boil and damaged liner. The liner was grouted as an effort to fix the symptom of a larger issue with the most minimal impact to the area. In 2013 geotechnical work was proposed to collect data on the substrate below the liner. Borings were conducted only in disturbed areas where burrows would not be impacted.

The proposed project includes a study phase to facilitate the design. Substantial geotechnical investigations are planned to fully understand the repair needs of this section of Aqueduct. The potential impact of the proposed project is being looked at as a whole, with the effects of geotechnical investigations, repairs, site restoration, and mitigation. Conservation strategy of potentially impact species in the area is being considered as a whole to minimize potential negative impacts and improve conservation success.

No additional work has occurred in the area. Therefore, impacts would be **less than significant**.

c) The proposed Project would ensure that water deliveries to the public will not be impacted. The proposed project would restore the water conveyance infrastructure to design capacity and avoid disruptions that may be caused by a failed liner or deficient capacity. Therefore, **no impact** would occur.

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Attachment A

Air Quality Memorandum

MEMORANDUM

To:	Shelly Amrhein, Department of Water Resources
From:	Ian McIntire, Dudek
Subject:	Air Quality, Greenhouse Gas Emissions, and Energy Analysis Technical Memorandum for the Milepost 230 Liner Raise Project, Kern County, California
Date:	July 22, 2021
cc:	Markus Lang, Dudek
Attachment(s):	A – CalEEMod Emission and Energy Calculations

Dudek is pleased to submit this air quality, greenhouse gas (GHG) emissions, and energy assessment to assist the California Department of Water Resources (DWR) with initial environmental planning requirements for the proposed Milepost 230 Liner Raise Project (Project) in Kern County, California.

The purpose of this memorandum is to assess the air quality, GHG, and energy impacts of the Project. Accordingly, this assessment uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.) and is based on the emissions-based significance thresholds recommended by the San Joaquin Valley Air Pollution Control District (SJVAPCD).

The contents and organization of this memorandum are as follows: project description, general analysis and methodology, regulatory setting, thresholds of significance and impact analyses for the air quality assessment, GHG emissions assessment, energy assessment, conclusions, and references cited.

1 Project Description

1.1 Location and Regional Setting

The proposed Milepost 230 Liner Raise Project (Project) is located on the California Aqueduct between milepost (MP) 230.4 and 231.4, directly east of Elk Hills Road in unincorporated Kern County. The Project site is within DWR's Division of Operations and Maintenance San Joaquin Field Division, approximately 4 miles south of the unincorporated community of Buttonwillow and approximately 20 miles west of the City of Bakersfield in Sections 1 and 12 of Township 30 South, Range 23 East and in Section 7 of Township 30 South, Range 24 East of the East Elk Hills U.S. Geological Survey 7.5-minute quadrangle. The Project site is located on the floor of the southwestern portion of the San Joaquin Valley. The southern portion of the valley is an asymmetric basin consisting of low alluvial plains and fans, overflow lands, and old lakebeds. The Temblor Mountain Range borders the Project site to the west. Sediments deposited in the area are transported from the Elk Hills, which are part of the Temblor Mountain Range, and tend to be unconsolidated clayey silts. Elk Hills is approximately 1 mile south and is one of California's most productive oil fields.

1.2 Project Description

DWR proposes to investigate, design, and repair the California Aqueduct between MP 230.4 and MP 231.4. The following steps are proposed and would address unstable soils in the area and secure the surrounding infrastructure:

- Conduct geotechnical exploration to collect soil samples for lab testing and determine soil behavior types, weak areas, and soil moisture contents in the area, assuming exploration depth is less than 100 feet.
    - There is an existing pipeline that crosses over the aqueduct at MP 230.7. The pipe may be exposed so its location underground is daylighted, but it will not be disturbed. The purpose of exposing the pipe is so the location underground is visible, and it will not be disturbed as a result of geotechnical exploration and construction. The pipeline will remain intact and be reburied following construction.
- Reinforce approximately 0.75 miles of aqueduct embankment to improve soil structure and reduce seepage.
- Restore the embankment to the design elevation to reduce risk of overtopping.
- Repair any damage to the aqueduct liner to prevent seepage.
- Raise approximately 0.8 miles of aqueduct liner to design elevation to prevent seepage and erosion.
- Reconstruct the road on top of the restored embankment to restore access.

2 General Analysis and Methodology

The proposed Project is located within the San Joaquin Valley Air Basin (SJVAB) and is within the jurisdictional boundaries of SJVAPCD, which has jurisdiction over the western portion of Kern County where the Project site is located. The California Emissions Estimator Model (CalEEMod) Version 2020.4.0 was used to estimate emissions from construction of the Project (CAPCOA 2021). CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant and GHG emissions associated with construction activities and operation of a variety of land use projects, such as residential, commercial, and industrial facilities. CalEEMod input parameters—including the land use type used to represent the Project and its size, construction schedule, and anticipated use of construction equipment—were based on information provided by DWR or default model assumptions if Project specifics were unavailable.

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants that are evaluated include reactive organic gases (ROGs) (also referred to as volatile organic compounds [VOCs]), oxides of nitrogen (NO_x), carbon monoxide (CO), sulfur oxides (SO_x), particulate matter with an aerodynamic diameter less than or equal to 10 microns in size (coarse particulate matter or PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to 2.5 microns in size (fine particulate matter or $PM_{2.5}$). ROG and NO_x are precursors to ozone (O_3). Criteria air pollutant emissions associated with construction of the Project were estimated for the following emission sources: operation of off-road construction equipment, paving, on-road haul trucks, and worker vehicles.

GHGs are gases that absorb infrared radiation in the atmosphere. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature. Global climate change concerns are focused on whether human activities are leading to an enhancement of the greenhouse effect. Principal GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), O_3, and water vapor. If the atmospheric concentrations of GHGs rise, the average temperature of the lower atmosphere will gradually increase. Globally, climate change has the potential to impact numerous environmental resources. Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. Climate change is already affecting California: average temperatures have increased, leading to more extreme hot days and fewer cold nights; shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year; sea levels have risen; and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

The effect each GHG has on climate change is measured as a combination of the mass of its emissions and the potential of a gas or aerosol to trap heat in the atmosphere, known as its global warming potential (GWP), which varies among GHGs. Total GHG emissions are expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG emissions are typically measured in terms of metric tons (MT) of CO_2 equivalent (CO_2e). The CO_2e for a gas is derived by multiplying the mass of the gas by the associated GWP, such that MT of CO_2e = (MT of a GHG) × (GWP of the GHG). CalEEMod assumes that the GWP for CH_4 is 25, which means that emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2, and the GWP for N_2O is 298, based on the Intergovernmental Panel on Climate Change's Fourth Assessment Report (IPCC 2007).

GHG emissions associated with construction of the Project were estimated for the following emission sources: operation of off-road construction equipment, on-road haul trucks, and worker vehicles. The detailed Project assumptions are included in Attachment A. CalEEMod was used to estimate potential Project-generated GHG emissions during construction, which were then used to estimate energy consumption. The estimated GHGs were back-calculated based on carbon content (i.e., kilograms of CO_2 per gallon) in order to estimate fuel usage during Project construction. The conversion factor for gasoline is 8.78 kilograms per MT of CO_2 per gallon, and the conversion factor for diesel is 10.21 kilograms per MT of CO_2 per gallon (The Climate Registry 2020).

2.1 Construction

Emissions from the construction phase of the Project were estimated using CalEEMod Version 2020.4.0. CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant emissions associated with construction activities from a variety of land use projects, such as residential, commercial, and industrial facilities.

A construction assumptions scenario was developed for each of the Project components modeled based on the best available information at this time. Key construction assumptions include phase types, phase timing and duration, off-road equipment use (e.g., type, quantity, and hours of operation per day), number of vehicle trips (e.g., haul trucks and worker vehicles) and trip distance, ground disturbance acreage, amount of demolition debris, and paving area. See Attachment A for complete construction assumption details.

For purposes of modeling the Project's emissions, geotechnical investigations are anticipated to begin in 2022 and would take approximately 15 weeks to complete. The activities would occur approximately 2 years in advance of

construction. Construction of the proposed Project is anticipated to begin in the spring of 2024 and conclude within 7 months.

Off-road equipment emissions were estimated in CalEEMod based on the type of equipment, the number of pieces of each equipment, and the hours of operation. CalEEMod default values for equipment including quantity and horsepower were updated based on information provided by DWR. Construction activities would be limited to the hours between 6:00 a.m. to 6:00 p.m., Monday through Friday, to the greatest extent possible. Therefore, it was assumed that construction equipment would be in operation for up to 8 hours per day.

DWR proposes three different methods or a combination of them may be used for the repairs. The methods are combined into the following three alternatives: deep soil mixing; grouting; and a cut-off wall with grouting. The alternative used would be determined by the geotechnical analysis. For this assessment, the most intensive alternative (e.g., equipment quantity and duration of construction activity) was assumed in order to conservatively estimate the Project's emissions. Treatment Area 3 could include a combination of methods including deep soil mixing/HMG, cut-off wall with grouting/HMG, or grouting/HMG. This assessment estimated emissions for grouting/HMG which would occur over a maximum duration of 217 days in 2024. Vehicle trips associated with workers, material delivery, and haul trips were provided by DWR. Other characteristics such as the trip distances and emission factors, CalEEMod default values were assumed. Worker trips were assumed to be passenger vehicles and light-duty trucks while material delivery and haul truck trips are assumed to be heavy-duty trucks. A maximum of 20 construction workers are anticipated to be required during the embankment repair and up to 5 during geotechnical investigations. Approximately 100 construction workers would be required for the treatment repairs in 2024. Each worker, vendor, and haul truck was estimated to result in two one-way trips. Haul truck trips during construction were based on the estimated quantities of imported and excavated material provided by DWR. Construction equipment was also based on input from DWR, which take into account the type of activity and duration of construction.

The maximum potential construction equipment mix for each of the proposed methods are shown in Table 1.

Table 1. Anticipated Equipment Required for Construction of Embankment Repair Methods

Construction Phase	Equipment	Quantity	Hours Per Day
Geotechnical Investigations	Truck-Mounted CPT Rig	1	8
	HSA Drill Rig	1	8
	Support Rig	1	8
	Backhoe	1	8
Liner Raise and Concrete Repair	Concrete Delivery Truck	6	8
	Grout Batch Plant	1	8
	Support Truck	2	8
	Dive Support Vehicle	1	8
	Concrete Personnel Truck	12	8
	Dive and Grout Personal Truck	8	8

Table 1. Anticipated Equipment Required for Construction of Embankment Repair Methods

Construction Phase	Equipment	Quantity	Hours Per Day
	Concrete Pump Truck	1	8
Road Improvement	Smooth Drum Roller	2	8
	Asphalt Paving Machine	1	8
	Haul Truck	57	8
	Transfer Truck	2	8
Deep Soil Mixing	Piling/Drilling Rig	2	8
	Batch Plant	2	8
	Excavator	2	8
	Dozer	2	8
	Large Roller Compactor	2	8
	Loader	2	8
	Dump Truck	2	8
	Water Truck	2	8
	Drill Rig	15	8
	Grout Washout Bin	10	8
	Skid Steer Loader	10	8
	Forklift	3	8
	Batch Plant Chem Grout CG-680	10	8
	Flatbed Delivery Truck	1	8
	Generator	10	8
	Personal Truck	100	8
	Water Truck	2	8
HMG	Drill Rig	15	8
	Skid-Steer Loader	10	8
	Forklift	3	8
	Batch Plant	10	8
	Flatbed Delivery Truck	1	8
	Generator	10	8
	Personal Truck	100	8
	Water Truck	2	8
Compaction Grouting	Drill Rig	15	8
	Skid-Steer Loader	10	8
	Forklift	3	8
	Auger Continuous Mixer	10	8
	Flatbed Delivery Truck	1	8
	Generators	10	8
	Personal Delivery Truck	100	8
	Water Trucks	2	8

Table 1. Anticipated Equipment Required for Construction of Embankment Repair Methods

Construction Phase	Equipment	Quantity	Hours Per Day
Cut Off Wall	Dozer	2	8
	Excavator	4	8
	Loader	1	8
	Dump Truck	2	8
	Roller Compactor	2	8
	Generators	2	8
	Personal Truck	20	8
	Water Trucks	2	8
	Drill Rig	15	8
	Grout Washout Bin	10	8
	Skid Steer Loader	10	8
	Forklift	3	8
	Batch Plant Chem Grout CG-680	10	8
	Flatbed Delivery Truck	1	8
	Generator	10	8
	Personal Truck	100	8
	Water Truck	2	8

Note: See Attachment A.

CalEEMod Version 2020.4.0 was used to estimate emissions from construction of the Project. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and for particulate matter, the prevailing weather conditions. Therefore, such emission levels can only be approximately estimated. Details of the emission calculations are provided in Attachment A.

3 Regulatory Setting

San Joaquin Valley Air Pollution Control District

SJVAPCD is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the SJVAB. SJVAPCD jurisdiction includes all of Merced, San Joaquin, Stanislaus, Madera, Fresno, Kings, and Tulare Counties, and the San Joaquin Valley portion of Kern County.

SJVAPCD has prepared several air quality attainment plans to achieve the O_3 and particulate matter standards, the most recent of which include the following:

- 2016 Plan for the 2008 8-Hour Ozone Standard (SJVAPCD 2016a)
- 2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan (SJVAPCD 2014)

- 2013 Plan for the Revoked 1-Hour Ozone Standard (SJVAPCD 2013)
- 2007 PM_{10} Maintenance Plan and Request for Redesignation (SJVAPCD 2007a)
- 2012 $PM_{2.5}$ Plan (SJVAPCD 2012)
- 2015 Plan for the 1997 $PM_{2.5}$ Standard (SJVAPCD 2015a)
- 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard (SJVAPCD 2016b)

The following summarizes key elements of these and other recent air quality attainment plans.

Extreme 1-Hour Ozone Attainment Demonstration Plan

The Extreme 1-Hour Ozone Attainment Demonstration Plan, adopted by the SJVAPCD Governing Board October 8, 2004, sets forth measures and emission-reduction strategies designed to attain the federal 1-hour O_3 standard by November 15, 2010, as well as an emissions inventory, outreach, and rate of progress demonstration (SJVAPCD 2004). This plan was approved by the U.S. Environmental Protection Agency (EPA) on March 8, 2010; however, EPA's approval was subsequently withdrawn effective November 26, 2012, in response to a decision issued by the U.S. Court of Appeals for the Ninth Circuit (*Sierra Club v. EPA*, 671 F.3d 955) remanding EPA's approval of these state implementation plan revisions. Concurrent with EPA's final rule, the California Air Resources Board (CARB) withdrew the 2004 plan. SJVAPCD developed a new plan for the 1-hour O_3 standard, the 2013 Plan for the Revoked 1-Hour Ozone Standard (see below), which it adopted in September 2013.

2007 8-Hour Ozone Plan

The 2007 8-Hour Ozone Plan, adopted by the SJVAPCD Governing Board on April 30, 2007, sets forth measures and a "dual path" strategy to attain the federal 1997 8-hour O_3 standard by 2023 for the SJVAB by reducing emissions of O_3 and particulate matter precursors (SJVAPCD 2007b). The plan also includes provisions for improved pollution control technologies for mobile and stationary sources, as well as an increase in state and federal funding for incentive-based measures to reduce emissions. All local measures would be adopted by SJVAPCD before 2012. This plan was approved by EPA on April 30, 2012. On November 26, 2012, however, EPA withdrew its determination that the plan satisfied the federal Clean Air Act requirements regarding emissions growth caused by growth in vehicle miles traveled. All other determinations in EPA's March 1, 2012, rule approving the plan remain unchanged and in effect. SJVAPCD is currently in the process of developing an O_3 plan to address EPA's 2008 8-hour O_3 standard, with attainment required by 2032.

2009 RACT SIP

On April 16, 2009, the SJVAPCD Governing Board adopted the Reasonably Available Control Technology Demonstration for Ozone State Implementation Plans (2009 RACT SIP) (SJVAPCD 2009a). In part, the 2009 RACT SIP satisfied the commitment by SJVAPCD for a new Reasonably Available Control Technology (RACT) analysis for the 1-hour O_3 plan (see discussion of the EPA withdrawal of approval in the Extreme 1-Hour Ozone Attainment Demonstration Plan summary above), and was intended to prevent all sanctions that could be imposed by EPA for failure to submit a required SIP revision for the 1-hour O_3 standard. With respect to the 8-hour standard, the plan also assesses SJVAPCD's rules based on the adjusted major source definition of 10 tons per year (due to the SJVAB's designation as an extreme O_3 nonattainment area), evaluates SJVAPCD rules against new Control

Techniques Guidelines promulgated since August 2006, and reviews additional rules and rule amendments that had been adopted by the Governing Board since August 17, 2006, for RACT consistency.

2013 Plan for the Revoked 1-Hour Ozone Standard

SJVAPCD developed a plan for EPA's revoked 1-hour O_3 standard after EPA withdrew its approval of the 2004 Extreme 1-Hour Ozone Attainment Demonstration Plan as a result of litigation. As a result of the litigation, EPA reinstated previously revoked requirements for 1-hour O_3 attainment plans. The 2013 plan addresses those requirements, including a demonstration of implementation of Reasonably Available Control Measures and a demonstration of a rate of progress averaging 3% annual reductions of ROG or NO_x emissions every 3 years. The 2013 Plan for the Revoked 1-Hour Ozone Standard was approved by the SJVAPCD Governing Board on September 19, 2013 (SJVAPCD 2013). In 2017, the SJVAB became the first and only region in the nation classified as "Extreme" nonattainment to reach attainment for the 1-hour O_3 standard.

2014 RACT SIP

On June 19, 2014, the SJVAPCD Governing Board adopted the 2014 Reasonably Available Control Technology Demonstration for the 8-Hour Ozone State Implementation Plan (2014 RACT SIP) (SJVAPCD 2014). The 2014 RACT SIP includes a demonstration that the SJVAPCD rules implement RACT. The plan reviews each of the NO_x reduction rules and concludes that they satisfy requirements for stringency, applicability, and enforceability, and meet or exceed RACT. The plan's analysis of further ROG reductions through modeling and technical analyses demonstrates that added ROG reductions will not advance SJVAB's O_3 attainment. Each ROG (i.e., VOC) rule evaluated in the 2009 RACT SIP, however, has been subsequently approved by EPA as meeting RACT within the last 2 years. The O_3 attainment strategy, therefore, focuses on further NO_x reductions.

2020 RACT Demonstration for the 2015 8-Hour Ozone Standard

SJVAPCD adopted the 2020 Reasonably Available Control Technology Demonstration for the 2015 8-Hour Ozone Standard (2020 RACT Demonstration) on June 18, 2020. San Joaquin Valley is classified as an extreme nonattainment area for the 2015 O_3 standard. The 2020 RACT Demonstration includes a comprehensive evaluation of all NO_x and ROG SJVAPCD rules to ensure that each rule meets or exceeds RACT (SJVAPCD 2020). The 2020 RACT Demonstration fulfills Clean Air Act requirements and demonstrates that all federal RACT requirements continue to be satisfied in the San Joaquin Valley.

2016 Plan for the 2008 8-Hour Ozone Standard

On June 16, 2016, the SJVAPCD Governing Board adopted the 2016 Plan for the 2008 8-Hour Ozone Standard (SJVAPCD 2016a). The comprehensive stationary and mobile source control strategy included in this plan will reduce NO_x emissions by 60% between 2012 and 2031 and will bring the San Joaquin Valley into attainment of EPA's 2008 8-hour O_3 standard as expeditiously as possible, no later than December 31, 2031. To ensure that the plan is approvable with the necessary federal Clean Air Act contingencies, the plan includes "black box" provisions under the federal Clean Air Act, Section 182(e)(5).

2007 PM_{10} Maintenance Plan and Request for Redesignation

On September 20, 2007, the SJVAPCD Governing Board approved the 2007 PM_{10} Maintenance Plan and Request for Redesignation (SJVAPCD 2007a). After achieving compliance with the annual and 24-hour National Ambient Air Quality Standards (NAAQS) for PM_{10} during the period from 2003 to 2006,[1] SJVAPCD prepared the 2007 PM_{10} Maintenance Plan and Request for Redesignation. The plan includes future emission estimates through 2020, and based on modeling, projects that SJVAB will continue to attain the PM_{10} NAAQS through 2020. The plan does not call for adoption of new control measures. Measures called for in the 2007 8-Hour Ozone Plan (discussed above) and 2008 $PM_{2.5}$ Plan (discussed below) will also produce PM_{10} benefits; however, the plan does include a contingency plan if future PM_{10} levels were to exceed the NAAQS. It also includes a request that EPA redesignate the SJVAB to attainment status for the PM_{10} NAAQS. On October 25, 2007, CARB approved SJVAPCD's plan with modifications to the transportation conformity budgets. On September 25, 2008, EPA redesignated the SJVAB to attainment for the PM_{10} NAAQS and approved the PM_{10} maintenance plan.

2008 $PM_{2.5}$ Plan

The SJVAPCD Governing Board adopted the 2008 $PM_{2.5}$ Plan on April 30, 2008 (SJVAPCD 2008). This plan is designed to assist the SJVAB in attaining all $PM_{2.5}$ standards, including the 1997 federal standards, the 2006 federal standards, and the state standard, as soon as possible. On July 13, 2011, EPA issued a proposed rule partially approving and disapproving the 2008 $PM_{2.5}$ Plan. Subsequently, on November 9, 2011, EPA issued a final rule approving most of the plan with an effective date of January 9, 2012. However, EPA disapproved the plan's contingency measures because they would not provide sufficient emissions reductions.

2012 $PM_{2.5}$ Plan

Approved by the Governing Board on December 20, 2012, the 2012 $PM_{2.5}$ Plan addresses attainment of EPA's 24-hour $PM_{2.5}$ standard of 35 micrograms per cubic meter ($\mu g/m^3$) established in 2006. In addition to reducing direct emissions of $PM_{2.5}$, this plan focuses on reducing emissions of NO_x, which is a predominant pollutant in the formation of $PM_{2.5}$ in the SJVAB. The plan relies on a multilevel approach to reducing emissions through SJVAPCD efforts (industry, the general public, employers, and small businesses) and state/federal efforts (passenger vehicles, heavy-duty trucks, and off-road sources), as well as SJVAPCD and state/federal incentive programs to accelerate replacement of on- and off-road vehicles and equipment. Through compliance with this attainment plan, the SJVAB would achieve attainment of the federal $PM_{2.5}$ standard by the attainment deadline of 2019, with the majority of the SJVAB actually experiencing attainment well before the deadline. EPA lowered the $PM_{2.5}$ standard again in 2012 and is in the process of completing attainment designations.

2015 Plan for the 1997 $PM_{2.5}$ Standard

The SJVAPCD Governing Board adopted the 2015 Plan for the 1997 $PM_{2.5}$ Standard on April 16, 2015 (SJVAPCD 2015a). This plan addresses EPA's annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ and 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$ established in 1997. While nearly achieving the 1997 standards, the SJVAB experienced higher $PM_{2.5}$ levels in winter 2013–2014 due to the extreme drought, stagnation, strong inversions, and historically dry conditions; thus, SJVAPCD was unable to meet the attainment date of December 31, 2015. Accordingly, this plan also contains a request for a one-time extension of the attainment deadline for the 24-hour standard to 2018 and the annual

[1] Attainment is achieved if the 3-year annual average PM_{10} concentration is less than or equal to 50 $\mu g/m^3$ and the expected 24-hour exceedance days is less than or equal to 1.0.

standard to 2020. The plan builds on past development and implementation of effective control strategies. Consistent with EPA regulations for $PM_{2.5}$ plans to achieve the 1997 standards, the plan contains Most Stringent Measures, Best Available Control Measures, additional enforceable commitments for further reductions in emissions, and ensures expeditious attainment of the 1997 standard.

2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard

On September 15, 2016, the SJVAPCD Governing Board adopted the 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard (SJVAPCD 2016b). This plan addresses the federal mandates for areas classified as "moderate nonattainment" for the 2012 $PM_{2.5}$ NAAQS of 12 µg/m^3. Consistent with EPA's $PM_{2.5}$ Implementation Rule, the plan satisfies the mandate to submit a moderate nonattainment plan to EPA by October 2016, demonstrates impracticability of attaining the 2012 $PM_{2.5}$ standard by the moderate nonattainment deadline of 2021, includes a request to reclassify the San Joaquin Valley to a "serious nonattainment" area for the 2012 $PM_{2.5}$ standard, satisfies all federal Clean Air Act requirements for moderate nonattainment areas, and demonstrates that emissions are continuing to be reduced in the San Joaquin Valley.

2018 Particulate Matter Plans

SJVAPCD has drafted an attainment strategy to address the 1997, 2006, and 2012 $PM_{2.5}$ standards and a plan to demonstrate maintenance of the 1987 PM_{10} standard, as required under the federal Clean Air Act (SJVAPCD 2018). The plan builds upon the SJVAPCD's 1-hour O_3, 8-hour O_3, and particulate matter strategies. Air quality modeling for this plan demonstrates that the San Joaquin Valley will attain the standard by 2025, but only if the most stringent feasible control measures are implemented. The plan goes beyond the requirements for a Serious area attainment plan to include the most stringent measures feasible for implementation in the San Joaquin Valley. The SJVAPCD Governing Board adopted the plan on November 15, 2018.

Applicable Rules

SJVAPCD's primary means of implementing air quality plans is by adopting and enforcing rules and regulations. Stationary sources within the jurisdiction are regulated by SJVAPCD's permit authority over such sources and through its review and planning activities. Unlike stationary source projects, which encompass very specific types of equipment, process parameters, throughputs, and controls, air emissions sources from land use development projects are mainly mobile sources (traffic) and area sources (small dispersed stationary and other non-mobile sources), including exempt (i.e., no permit required) sources such as consumer products, landscaping equipment, furnaces, and water heaters. Mixed-use land development projects may include nonexempt sources including devices such as small to large boilers, stationary internal combustion engines, gas stations, or asphalt batch plants.

Notwithstanding nonexempt stationary sources, which would be permitted on a case-by-case basis, SJVAPCD Regulations VIII generally apply to land use development projects and are described below:

Regulation VIII – Fugitive PM_{10} Prohibition

- Rule 8021: Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities
- Rule 8031: Bulk Materials

- Rule 8041: Carryout and Trackout
- Rule 8051: Open Areas
- Rule 8061: Paved And Unpaved Roads
- Rule 8071: Unpaved Vehicle/Equipment Traffic Areas

Pursuant to Rule 8021, the Project would be required to develop, prepare, submit, obtain approval of, and implement a dust control plan, which would reduce fugitive dust impacts to less than significant during Project construction.

4 Air Quality Assessment

4.1 Thresholds of Significance

The significance criteria used to evaluate the Project impacts to air quality is based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this air quality analysis, a significant impact would occur if the Project would (14 CCR 15000 et seq.):

1. Conflict with or obstruct implementation of the applicable air quality plan.

2. 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.

3. Expose sensitive receptors to substantial pollutant concentrations.

4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or pollution control district may be relied upon to determine whether a project would have a significant impact on air quality. The SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts has established emissions-based thresholds of significance for criteria pollutants (SJVAPCD 2015a), which are depicted in Table 2. As shown in Table 2, SJVAPCD has established significance thresholds for construction emissions and operational permitted and non-permitted equipment and activities, and it recommends evaluating impact significance for these categories separately. These thresholds of significance are based on a calendar-year basis, although construction emissions are assessed on a rolling 12-month period.

A project would result in a substantial contribution to an existing air quality violation of the NAAQS or California Ambient Air Quality Standards (CAAQS) for O_3, which is a nonattainment pollutant, if its construction or operational emissions would exceed the SJVAPCD ROG, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ thresholds shown in Table 2. The emission-based thresholds for O_3 precursors are intended to serve as a surrogate for an "ozone significance threshold" (i.e., the potential for adverse O_3 impacts to occur) because O_3 itself is not emitted directly and the effects of an individual project's emissions of O_3 precursors (ROG and NO_x) on O_3 levels in ambient air cannot be determined through air quality models or other quantitative methods.

Table 2. SJVAPCD Air Quality Significance Thresholds

Criteria Pollutants Mass Daily Thresholds	
Pollutant	Construction and Operations (tons per year)
ROG	10
NO_x	10
CO	100
SO_x	27
PM_{10}	15
$PM_{2.5}$	15

Source: SJVAPCD 2015a.
Notes: SJVAPCD = San Joaquin Valley Air Pollution Control District; ROG = reactive organic gas; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.

In addition to the annual emissions mass thresholds described in Table 2, SJVAPCD has also established screening criteria to determine whether a project would result in a CO hotspot at affected roadway intersections (SJVAPCD 2015a). If neither of the following criteria are met at any of the intersections affected by a project, the project would result in no potential to create a violation of the CO standard:

- A traffic study for the project indicates that the level of service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F.
- A traffic study indicates that the project will substantially worsen an already existing LOS F on one or more streets or at more or more intersections in the project vicinity.

Toxic Air Contaminants

SJVAPCD has established thresholds of significance for combined toxic air contaminant (TAC) emissions from the operations of both permitted and non-permitted sources (SJVAPCD 2015a). Projects that have the potential to expose the public to TACs in excess of the following thresholds would be considered to have a significant air quality impact:

- Probability of contracting cancer for the maximally exposed individual equals or exceeds 20 in 1 million people.[2]
- Hazard Index[3] for acute and chronic noncarcinogenic TACs equals or exceeds 1 for the maximally exposed individual.

[2] The cancer risk threshold was increased from 10 to 20 in 1 million with approval of APR 1906 (Framework for Performing Health Risk Assessments) on June 30, 2015.

[3] Non-cancer adverse health impact, both for acute (short-term) and chronic (long-term) health effects, is measured against a hazard index, which is defined as the ratio of the predicted incremental exposure concentration from the project to a published reference exposure level that could cause adverse health effects as established by the Office of Environmental Health Hazard Assessment. The ratio (referred to as the hazard quotient) of each noncarcinogenic substance that affects a certain organ system is added together to produce an overall hazard index for that organ system.

Odors

As described in the Guidance for Assessing and Mitigating Air Quality Impacts, due to the subjective nature of odor impacts, there are no quantitative thresholds to determine if potential odors would have a significant impact (SJVAPCD 2015a). Projects must be assessed for odor impacts on a case-by-case basis for the following two situations:

- **Generators:** Projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate.
- **Receivers:** Residential or other sensitive receptor projects or other projects built for the intent of attracting people located near existing odor sources.

SJVAPCD has identified some common types of facilities that have been known to produce substantial odors, as well as screening distances between these odor sources and receptors. These are depicted in Table 3.

Table 3. Screening Levels for Potential Odor Sources

Type of Facility	Screening Distance (miles)
Wastewater Treatment Facility	2
Sanitary Landfill	1
Transfer Station	1
Composting Facility	1
Petroleum Facility	2
Asphalt Batch Plant	1
Chemical Manufacturing	1
Fiberglass Manufacturing	1
Painting/Coating (i.e., auto body shop)	1
Food Processing Facility	1
Feed Lot/Dairy	1
Rendering Plant	1

Source: SJVAPCD 2015a.

If a project would result in an odor source and sensitive receptors being located within these screening distances, additional analysis would be required. For projects involving new receptors locating near an existing odor source where there is currently no nearby development and for new odor sources locating near existing receptors, SJVAPCD recommends the analysis be based on a review of odor complaints for similar facilities, with consideration also given to local meteorological conditions, particularly the intensity and direction of prevailing winds. Regarding the complaint record of the odor source facility (or similar facility), the facility would be considered to result in significant odors if there has been:

- More than one confirmed complaint per year averaged over a 3-year period, or

- Three unconfirmed complaints[4] per year averaged over a 3-year period.

Cumulative

A project's emissions may be individually limited but cumulatively considerable when taken in combination with past, present, and future development within the SJVAB. If a project would result in a significant impact based on the SJVAPCD annual thresholds of significance for criteria pollutants, then the project would also be considered cumulatively significant. However, if the project emissions are below the annual significance thresholds for criteria pollutants, the impact may still be cumulatively significant. For instance, if a Project results in criteria pollutant concentrations that exceed any of the federal health-based ambient air concentration standards or causes a worsening of areas already exceeding those standards, the project's impacts would be considered individually significant and cumulatively significant. In addition, the combined emissions of the project and cumulative development located within the same area could potentially cause or worsen an exceedance of the concentration standards, whereby the project would have a cumulatively significant impact (SJVAPCD 2015b).

In regard to TACs, because impacts are localized and the SJVAPCD thresholds of significance for TACs have been established at an extremely conservative level, risks that equal or exceed the individual thresholds of significance are also considered cumulatively significant (SJVAPCD 2015b). No other cumulative risk thresholds would apply.

SJVAPCD has not established cumulative significance thresholds regarding odor impacts.

4.2 Air Quality Impact Analysis

Would the Project conflict with or obstruct implementation of the applicable air quality plan?

A project is non-conforming with an air quality plan if it conflicts with or delays implementation of any applicable attainment or maintenance plan. SJVAPCD has prepared plans to attain federal and state O_3 and particulate matter ambient air quality standards as required under the federal and California Clean Air Act. SJVAPCD has established thresholds of significance for criteria pollutant emissions, which are based on SJVAPCD New Source Review offset requirements for stationary sources. Stationary sources in the SJVAPCD jurisdiction are subject to some of the toughest regulatory requirements in the nation. Emission reductions achieved through implementation of SJVAPCD offset requirements are a major component of SJVAPCD's air quality plans. Thus, projects with emissions below the thresholds of significance for criteria pollutants would be determined to not conflict or obstruct implementation of SJVAPCD's air quality plan (SJVAPCD 2015b). As discussed in the second impact criterion, below, the Project would not exceed SJVAPCD thresholds for criteria air pollutants during construction. Therefore, the Project would not conflict with or delay the implementation of the SJVAPCD attainment plans and would result in a less-than-significant impact.

Mitigation Measures

No mitigation measures are required.

[4] An unconfirmed complaint means that either the odor/air contaminant release could not be detected or the source/facility cannot be determined (SJVAPCD 2015a).

Level of Significance after Mitigation

Impacts would be less than significant; therefore, no mitigation is required.

Would the Project 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?

For purposes of this air quality analysis and consistent with SJVAPCD guidance documents, actions that exceed criteria pollutant NAAQS (i.e., primary standards designed to safeguard the health of people considered to be sensitive receptors while outdoors and secondary standards designed to safeguard human welfare) would result in significant impacts. Additionally, actions that violate CAAQS developed by CARB are considered significant.

Air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and SJVAPCD develops and implements plans for future attainment of ambient air quality standards. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality.

The SJVAB is a nonattainment area for O_3, PM_{10}, and $PM_{2.5}$ under the NAAQS and/or CAAQS. The poor air quality in the SJVAB is the result of cumulative emissions from motor vehicles, off-road equipment, commercial and industrial facilities, and other emission sources. Projects that emit these pollutants or their precursors (i.e., ROG and NO_x for O_3) potentially contribute to poor air quality.

Construction of Project components would temporarily generate ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions that would result in short-term impacts on ambient air quality in the area. Emissions would originate from mobile and stationary construction equipment exhaust, on-road vehicle (workers and trucks) exhaust, dust from clearing the land, and exposed soil eroded by wind. Construction-related emissions would vary substantially depending on the level of activity, length of the construction period, specific construction operations, types of equipment, number of personnel, wind and precipitation conditions, and soil moisture content. On-site sources of criteria air pollutant emissions would include off-road equipment and fugitive dust, and off-site sources would include hauling trucks and worker vehicles. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. The proposed Project would be required to comply with SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibition) by law, which specifies standard construction practices to reduce fugitive dust emissions. Pursuant to Regulation VIII, Rule 8021, the proposed Project would be required to develop, prepare, submit, obtain approval of, and implement a dust control plan, which would reduce fugitive dust impacts to less than significant for Project construction.

Criteria air pollutant emissions associated with temporary construction activity were estimated using CalEEMod. Construction schedule assumptions, including phase type, duration, and sequencing, were based on information provided by DWR and is intended to represent a reasonable scenario based on the best information available. Default values provided in CalEEMod were used where detailed Project information was not available.

Table 4 presents the estimated annual construction emissions that would be generated during construction of the proposed Project. Details of the emission calculations are provided in Attachment A.

Table 4. Estimated Annual Construction Criteria Air Pollutant Emissions - Unmitigated

Year	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2022	0.15	1.25	1.14	<0.01	0.06	0.05
2024	3.06	23.02	25.02	0.10	1.14	0.86
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold exceeded?	**No**	**Yes**	**No**	**No**	**No**	**No**

Notes: ROG = reactive organic gas; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides;PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SJVAPCD = San Joaquin Valley Air Pollution Control District; <0.01 = reported value less than 0.01.
See Attachment A for complete results.

As shown in Table 4, annual construction emissions from the unmitigated scenario would not exceed the SJVAPCD annual significance thresholds for ROG, CO, SO_x, PM_{10} or $PM_{2.5}$ during Project construction in 2022. However, NO_x emissions during 2024 would exceed the annual significance threshold. Therefore, Project construction impacts would be potentially significant and thus mitigation would be required. Implementation of MM-AQ-1, which requires diesel-powered construction equipment to meet Tier 4 emissions standards, would reduce project construction-generated NO_x missions to below SJVAPCD thresholds of significance. MM-AQ-1 further provides that the construction contractor may obtain a waiver from SJVAPCD for implementation of other measures that can be shown to reduce criteria pollutant emissions below SJVAPCD significance thresholds if it can be demonstrated that Tier 4 equipment is not available. Construction emissions after incorporation of MM-AQ-1 are presented in Table 5 and would not exceed SJVAPCD's significant threshold.

Table 5. Estimated Annual Construction Criteria Air Pollutant Emissions - Mitigated

Year	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
2022	0.15	1.25	1.14	<0.01	0.06	0.05
2024	1.8	9.69	46.96	0.10	0.71	0.44
SJVAPCD Threshold	*10*	*10*	*100*	*27*	*15*	*15*
Threshold exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: ROG = reactive organic gas; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides;PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SJVAPCD = San Joaquin Valley Air Pollution Control District; <0.01 = reported value less than 0.01.
See Attachment A for complete results.

The proposed Project would also comply with SJVAPCD Rule 8021 to control fugitive dust emissions generated during grading activities, which would be required as a condition of approval. The following standard construction practices would be employed to reduce fugitive dust emissions:

- Develop a dust control plan to outline how the Project will comply with Rule 8021 and minimize fugitive dust during construction
- Minimize and cleanup trackout onto paved roads
- Cover haul trucks

- Rapid cleanup of Project-related trackout or spills on paved roads
- Minimize grading and soil movement when winds exceed 30 miles per hour
- Implement a speed limit of 15 miles per hour during all construction phases for vehicles traveling on unpaved roads

Health Effects of Criteria Air Pollutants

Construction and operational emissions of the Project would not exceed the SJVAPCD thresholds for any criteria air pollutants, including ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$.

Health effects associated with O_3 include respiratory symptoms, worsening of lung disease leading to premature death, and damage to lung tissue (CARB 2019). ROG and NO_x are precursors to O_3, for which the SJVAB is designated as nonattainment with respect to the NAAQS and CAAQS. The contribution of VOCs and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the SJVAB due to O_3 precursor emissions tend to be found downwind of the source location because of the time required for the photochemical reactions to occur. Further, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the ROG emissions would occur, because exceedances of the O_3 NAAQS and CAAQS tend to occur between April and October when solar radiation is highest. Due to the lack of quantitative methods to assess this complex photochemistry, the holistic effect of a single project's emissions of O_3 precursors is speculative. That being said, because the proposed Project would not exceed the SJVAPCD thresholds, the Project would not contribute to health effects associated with O_3.

Health effects associated with NO_x include lung irritation and enhanced allergic responses (CARB 2019). Because Project-related NO_x emissions would not exceed the SJVAPCD annual significance thresholds after implementation of MM-AQ-1, and because the SJVAB is a designated attainment area for NO_2 (and NO_2 is a constituent of NO_x) and the existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards, it is not anticipated that the Project would contribute to an exceedance of the NAAQS and CAAQS for NO_2 or result in potential health effects associated with NO_2 and NO_x.

Health effects associated with CO include chest pain in patients with heart disease, headache, light-headedness, and reduced mental alertness (CARB 2019). CO tends to be a localized impact associated with congested intersections. The associated potential for CO hotspots is discussed below (in the potential to expose sensitive receptors to substantial pollutant concentrations evaluation) and determined to be less than significant. Thus, the Project's CO emissions would not contribute to significant health effects associated with CO.

Health effects associated with PM_{10} include premature death and hospitalization, primarily for worsening of respiratory disease (CARB 2019). Construction of the Project would not exceed thresholds for PM_{10} or $PM_{2.5}$, would not contribute to exceedances of the NAAQS and CAAQS for particulate matter, and would not obstruct the SJVAB from coming into attainment for these pollutants. The Project would not result in substantial diesel particulate matter emissions during construction. Additionally, the Project would be required to comply with SJVAPCD Rule 8021 to control fugitive dust emissions generated during grading activities. Due to the minimal contribution of particulate matter during construction, the Project is not anticipated to result in health effects associated with PM_{10} or $PM_{2.5}$.

In summary, construction of the Project would not result in exceedances of the SJVAPCD significance thresholds for criteria pollutants, and potential health effects associated with criteria air pollutants would be less than significant.

Mitigation Measures

The following mitigation measures would reduce potentially significant impacts to air quality to a level below significance.

MM-AQ-1: To reduce the potential for criteria air pollutants, specifically oxides of nitrogen (NO_x), as a result of construction of the Project, the construction contractor's contract specifications shall require compliance with the following:

Prior to the start of construction activities, the construction contractor shall ensure that all 75 horsepower or greater diesel-powered equipment comply with California Air Resources Board (CARB)-certified Tier 4 emissions standards for off-road diesel engines.

An exemption from this requirement may be granted by the Air Pollution Control Officer if (1) the County documents equipment with Tier 4 Final engines are not reasonably available, and (2) other construction methods or combinations of equipment can achieve a reduction in criteria air pollutant emissions such that construction emissions would not exceed San Joaquin Valley Air Pollution Control District (SJVAPCD) significance thresholds. Before an exemption may be granted, the construction contractor shall: (1) demonstrate that at least two construction fleet owners/operators in Kern County were contacted and that those owners/operators confirmed Tier 4 Final equipment could not be located within the County during the desired construction schedule; and (2) the proposed replacement equipment has been evaluated using California Emissions Estimator Model (CalEEMod) or other industry standard emission estimation method and documentation provided to the Air Pollution Control Officer to confirm that project-generated emissions of criteria pollutants would remain below SJVAPCD significance thresholds.

Level of Significance after Mitigation

Impacts would be less than significant after mitigation.

Would the Project expose sensitive receptors to substantial pollutant concentrations?

SJVAPCD considers hospitals, schools, parks, playgrounds, daycare centers, nursing homes, convalescent facilities, and residential areas as sensitive receptor land uses (SJVAPCD 2015b). Land uses surrounding the proposed work areas consists primarily of agricultural land. The Project is located directly east of Elk Hills Road in unincorporated Kern County, proximate sensitive receptors are scattered rural residential land uses that are greater than 1,000 feet from the Project site.

The greatest potential for exposure of sensitive receptors to air contaminants would occur during the temporary construction phase, when soil would be disturbed and equipment would be used for site grading, materials delivery,

and turbine installation. Potential exposure to emissions would vary substantially from day to day, depending on the amount of work being conducted, weather conditions, location of receptors, and exposure time. The construction-phase emissions in this analysis are estimated conservatively based on worst-case conditions, with maximum levels of construction activity occurring simultaneously within a short period of time.

Valley Fever Exposure

There are no specific thresholds for the evaluation of potential Valley Fever exposure. The valley fever fungal spores, *Coccidioides immitis,* live in the top 2 to 12 inches of soil in many parts of the state, including parts of Kern County. When fungal spores are present, any work activity that disturbs the soil (e.g., digging, grading, or other earth-moving operations, or vehicle operation on dirt roads) can cause the spores to become airborne, thereby increasing the risk of valley fever exposure (California Department of Industrial Relations 2013). All workers on sites where the fungus is present, and who are exposed to dusty conditions and wind-blown dusts, are at increased risk of becoming infected.

The fungal spores are too small to be seen by the naked eye, and there is no reliable way to test the soil for spores before working in a particular place. Accordingly, the valley fever analysis assumes the potential presence of the fungal spores within the Project site. The potential for valley fever exposure as a result of the Project is evaluated based on the anticipated earth-moving activities, and considers compliance with Rule 8021 which requires development and implementation of a dust control plan to help control the release of the *Coccidioides immitis* fungus during construction activities.

Health Impacts of Carbon Monoxide

Mobile source impacts occur on two scales of motion. Regionally, Project-related travel would add to regional trip generation and increase the vehicle miles traveled within the local airshed and the SJVAB. Locally, Project-generated traffic would be added to Kern County's roadway system near the Project site during construction. If such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non-Project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of congested traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SJVAB is steadily decreasing.

The Project would have trip generation associated with construction worker vehicles and haul trucks. Title 40, Part 93.123(c)(5) of the Code of Federal Regulations, Procedures for Determining Localized CO, PM_{10}, and PM_2 Concentrations (hot-spot analysis), states that "CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities, which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site" (40 CFR 93.123). While Project construction would involve on-road vehicle trips from trucks and workers during construction, construction activities would span approximately 2 years, geotechnical investigations would begin 2022 lasting 6 weeks, and construction activities would begin spring 2024 lasting 7 months; therefore, a Project-level construction hotspot analysis would not be required.

Health Impacts of Toxic Air Contaminants

In addition to impacts from criteria pollutants, Project impacts may include emissions of pollutants identified by the state and federal government as TACs or hazardous air pollutants. State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and aimed at TACs that are a problem in California. The state has formally identified more than 200 substances as TACs, including the federal hazardous air pollutants, and is adopting appropriate control measures for sources of these TACs. The following measures are required by state law to reduce diesel particulate emissions:

- Fleet owners of mobile construction equipment are subject to the CARB Regulation for In-Use Off-road Diesel Vehicles (Title 13 California Code of Regulations, Chapter 9, Section 2449), the purpose of which is to reduce diesel particulate matter and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles.
- All commercial diesel vehicles are subject to Title 13, Section 2485 of the California Code of Regulations, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading shall be limited to 5 minutes; electric auxiliary power units should be used whenever possible.

The greatest potential for TAC emissions during construction would be diesel particulate emissions from heavy equipment operations and heavy-duty trucks during construction of the Project and the associated health impacts to sensitive receptors. As previously discussed, sensitive receptors are located greater than 1,000 feet from the Project site. Furthermore, as shown in Table 4, the annual particulate matter emissions (PM_{10} or $PM_{2.5}$) generated by construction equipment operation and from material delivery and haul trucks (exhaust particulate matter, or diesel particulate matter) would be well below the SJVAPCD significance thresholds. Moreover, construction activities would be temporary, after which Project-related TAC emissions would cease.

No residual TAC emissions and corresponding cancer risk are anticipated after construction. Thus, the Project would not result in a long-term (i.e., 9-year, 30-year, or 70-year) source of TAC emissions. Therefore, the exposure of Project-related TAC emission impacts to sensitive receptors would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance after Mitigation

Impacts would be less than significant; therefore, no mitigation is required.

Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Odors are a form of air pollution that is most obvious to the general public and can present problems for both the source and surrounding community. Although offensive odors seldom cause physical harm, they can be annoying and cause concern. Odors would be potentially generated from vehicles and equipment exhaust emissions during construction activities. Odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment. Such odors are temporary and generally occur at low levels that would not result in nuisance. Therefore, the proposed Project would result in an odor impact that is less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance after Mitigation

Impacts would be less than significant; therefore, no mitigation is required.

5 Greenhouse Gas Emissions Assessment

5.1 Thresholds of Significance

The California Natural Resources Agency adopted amendments to the CEQA Guidelines on December 30, 2009, which became effective on March 18, 2010. With respect to GHG emissions, the amended CEQA Guidelines state in Section 15064.4(a) that lead agencies should "make a good faith effort, to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions. Section 15064.7(c) of the CEQA Guidelines specifies that "[w]hen adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence." Similarly, the revisions to Appendix G, Environmental Checklist Form, which is often used as a basis for lead agencies' selection of significance thresholds, do not prescribe specific thresholds.

Rather, the CEQA Guidelines establish two CEQA thresholds related to GHGs, which will be used in this memorandum to discuss the significance of the Project's impacts. For the purposes of this GHG analysis, a significant impact would occur if the Project would (14 CCR 15000 et seq., Appendix G):

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Regarding impacts from GHGs, the California Air Pollution Control Officers Association (CAPCOA) considers GHG impacts to be exclusively cumulative impacts (CAPCOA 2008); therefore, assessment of significance is based on a determination of whether the GHG emissions from a project would represent a cumulatively considerable contribution to the global atmosphere. The SJVAPCD has adopted the Climate Change Action Plan (CCAP), which directed the Air Pollution Control Officer to develop guidance documents to assist land use and other permitting agencies in addressing GHG emissions as part of the CEQA process. The SJVAPCD has adopted the Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD 2009a) and the policy Addressing GHG Emission Impacts for Stationary Source Projects under CEQA When Serving as the Lead Agency (SJVAPCD 2009c). The guidance and policy rely on the use of performance-based standards, otherwise known as Best Performance Standards to assess significance of project-specific GHG emissions on global climate change during the environmental review process. However, SJVAPCD's adopted Best Performance Standards are specifically directed at reducing GHG emissions from stationary sources; therefore, the adopted Best Performance Standards would not generally be applicable to the Project. The SJVAPCD guidance does not limit a lead agency's authority in establishing

its own process and guidance for determining significance of project-related impacts on global climate change. Notably, SJVAPCD supports the use of interim thresholds as established by the CAPCOA when adopted thresholds are not applicable (SJVAPCD 2009c). SJVAPCD also recommends that construction emissions be amortized over a 30-year project lifetime. Thus, the total construction GHG emissions were calculated for the Project, amortized over 30 years, and compared with the CAPCOA GHG significance threshold of 900 MT CO_2e per year. This threshold is consistent with California's climate-stabilization target (identified in Assembly Bill [AB] 32).

The 900 MT CO_2e per year threshold was developed based on various land use densities and future discretionary project types to determine the size of projects that would likely have a less than cumulatively considerable contribution to climate change. The CAPCOA threshold was developed to ensure capture of 90% or more of likely future discretionary developments with the objective to set the emissions threshold low enough to capture a substantial fraction of future development while setting the emission threshold high enough to exclude small development projects that would contribute a relatively small fraction of cumulative statewide GHG emissions. CAPCOA's 900 MT CO_2e per year threshold was developed to meet the target identified by AB 32 of reducing emissions to 1990 levels by year 2020. Subsequent to CAPCOA identifying the 900 MT CO_2e per year threshold, Senate Bill (SB) 32 was passed and set a revised statewide reduction target to reduce emissions to 40% below 1990 levels by year 2030. Though the CAPCOA threshold does not consider the reduction targets set by SB 32, the CAPCOA threshold was developed with an aggressive project-level GHG emission capture rate of 90%. Due to the aggressive GHG emission capture rate, the CAPCOA threshold has been determined to be a viable threshold to reduce project GHG emissions and meet SB 32 targets beyond 2020. Furthermore, more stringent state legislative requirements such as Building Energy Efficiency Standards and transportation-related efficiency measures will act to reduce future project GHG emissions and help in meeting state emissions reduction targets. Projects that generate emissions beyond the 900 MT CO_2e per year screening level threshold are required to implement feasible on-site mitigation measures to reduce their impacts on climate change. Projects that meet or fall below CAPCOA's screening level threshold of 900 MT CO_2e per year of GHG emissions require no further analysis and are not required to implement mitigation measures to reduce GHG emissions. As such, the CAPCOA threshold of 900 MT CO_2e per year is used as a quantitative threshold for the analysis of impacts related to GHG emissions generated by the proposed Project.

5.2 GHG Emissions Impact Analysis

Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction of the Project would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road haul trucks, and worker vehicles. CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described in Section 2, geotechnical investigations would begin 2022 lasting 6 weeks, and construction activities would begin spring 2024 lasting 7 months. On-site sources of GHG emissions include off-road equipment and off-site sources, including haul trucks and worker vehicles. Table 6 presents construction emissions for the Project in 2022 and 2024 from on-site and off-site emission sources.

Table 6. Estimated Annual Construction GHG Emissions

Year	CO_2	CH_4	N_2O	CO_2e
	Metric Tons			
2022	296.71	0.09	<0.01	299.13
2024	9,980.68	1.20	0.01	10,014.10
			Total	10,313.23
			Amortized over 30 years	343.77

Notes: GHG = greenhouse gas; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; <0.01 = reported value less than 0.01.
See Attachment A for complete results.

As shown in Table 6, the estimated total GHG emissions during construction would be approximately 299 MT CO_2e in 2022 and 10,014 MT CO_2e in 2024, for a total of approximately 10,313 MT CO_2e over the construction period. Estimated Project-generated construction emissions amortized over 30 years would be approximately 344 MT CO_2e per year. As with Project-generated construction air quality pollutant emissions, GHG emissions generated during construction of the Project would be short-term in nature, lasting only for the duration of the construction period, and would not represent a long-term source of GHG emissions. Amortized construction emissions would be below the screening GHG threshold of 900 MT CO_2e per year. Therefore, the Project's GHG emissions would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance after Mitigation

Impacts would be less than significant; therefore, no mitigation is required.

Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Project Consistency with the Kern Council of Governments' 2018 RTP/SCS

Kern County does not have an applicable GHG reduction plan. Under SJVAPCD's CEQA thresholds for GHG, a project would not have a significant GHG impact if it is consistent with an applicable plan to reduce GHG emissions, and a CEQA-compliant analysis was completed for the GHG reduction plan. The Kern Council of Governments' Regional Transportation Plan (RTP)/Sustainable Community Strategy (SCS) is an applicable plan adopted for the purpose of reducing GHGs from the land use and transportation sectors in Kern County. CARB approved the RTP/SCS in 2019. The Project could result in a significant impact due to a conflict with an applicable plan, policy, or regulation if it would be inconsistent with the adopted RTP/SCS. Therefore, the Project could have a potential conflict with the RTP/SCS if it were to be found inconsistent based on a qualitative assessment of its consistency with Kern Council of Governments' RTP/SCS policies. The proposed Project is consistent with the 2018 RTP/SCS as the Project would not conflict with the Kern County General Plan. The 2018 RTP/SCS incorporates local land use projections and circulation networks in city and county general plans. The 2018 RTP/SCS is not directly applicable

to the Project because the underlying purpose of the document is to provide direction and guidance by making the best transportation and land use choices for future development; still, the Project would not conflict with the goals and policies of the 2018 RTP/SCS. Additionally, the Project would not impact local transportation and land use during construction.

Project Consistency with CARB's Scoping Plan

The Scoping Plan (approved by CARB in 2008 and updated in 2014 and 2017) provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. The Scoping Plan is not directly applicable to specific projects, and it is not intended to be used for project-level evaluations.[5] Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., Low Carbon Fuel Standard), among others. To the extent that these regulations are applicable to the proposed Project, the Project would comply with all regulations adopted in furtherance of the Scoping Plan to the extent required by law.

Project Consistency with Senate Bill 32 and Executive Order S-3-05

The Project would not impede the attainment of the most recent state GHG reduction goals identified in SB 32 and Executive Order (EO) S-3-05 and. SB 32 establishes a statewide goal of reducing GHG emissions to 40% below 1990 levels by 2030, while EO S-3-05 establishes a statewide goal of reducing GHG emissions to 80% below 1990 levels by 2050. While there are no established protocols or thresholds of significance for that future year analysis, CARB forecasts that compliance with the current Scoping Plan puts the state on a trajectory of meeting these long-term GHG goals, although the specific path to compliance is unknown (CARB 2014).

CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the First Update to the Climate Change Scoping Plan that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32" (CARB 2014, p. ES2). With regard to the 2050 target for reducing GHG emissions to 80% below 1990 levels, the First Update to the Climate Change Scoping Plan states the following (CARB 2014, p. 34):

> This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80% below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions.

[5] The Final Statement of Reasons for the amendments to the CEQA Guidelines reiterates the statement in the Initial Statement of Reasons that "[t]he Scoping Plan may not be appropriate for use in determining the significance of individual projects because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping Plan" (CNRA 2009).

In other words, CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, EO B-30-15, and EO S-3-05. This is confirmed in the 2017 Scoping Plan, which states the following (CARB 2017):

> The Scoping Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while also identifying new, technologically feasible, and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities.

As discussed previously, the proposed Project is consistent with CARB's 2017 Scoping Plan and would not conflict with the state's trajectory toward future GHG reductions. In September 2018, EO B-55-18 was signed, which commits the state to total carbon neutrality by 2045. However, since the specific path to compliance for the state in regard to the long-term goals will likely require development of technology or other changes that are not currently known or available, specific additional reduction measures for the proposed Project would be speculative and cannot be identified at this time.

With respect to future GHG targets under SB 32 and EO S-3-05, CARB has also made clear that its legal interpretation is that it has the requisite authority to adopt whatever regulations are necessary, beyond the AB 32 horizon year of 2020, to meet SB 32's 40% reduction target by 2030 and EO S-3-05's 80% reduction target by 2050; this legal interpretation by an expert agency provides evidence that future regulations will be adopted to continue the state on its trajectory toward meeting these future GHG targets. This impact would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance after Mitigation

Impacts would be less than significant; therefore, no mitigation is required.

6 Energy Analysis

6.1 Thresholds of Significance

The significance criteria used to evaluate the Project impacts to energy is based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this energy analysis, a significant impact would occur if the Project would (14 CCR 15000 et seq.):

1. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation.
2. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

6.2 Energy Impact Analysis

Would the Project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?

Electricity

Temporary electric power for as-necessary lighting and electronic equipment (such as computers inside temporary construction trailers, and heating, ventilation, and air conditioning) would be required for Project construction. The amount of electricity used during construction would be minimal; typical demand would stem from the use of electrically powered hand tools and several construction trailers by managerial staff during the hours of construction activities. The majority of the energy used during construction would be from petroleum. The electricity used for construction activities would be temporary and minimal; therefore, impacts would be less than significant.

Natural Gas

Natural gas is not anticipated to be required during construction of the Project. Fuels used for construction would primarily consist of diesel and gasoline, which are discussed under the subsection "Petroleum," below. Any minor amounts of natural gas that may be consumed as a result of Project construction would be temporary and negligible, and would not have an adverse effect; therefore, impacts would be less than significant.

Petroleum

Petroleum would be consumed throughout construction of the Project. Fuel consumed by construction equipment would be the primary energy resource expended over the course of construction, and vehicle miles traveled associated with the transportation of construction materials and construction worker commutes would also result in petroleum consumption. Heavy-duty construction equipment associated with construction activities and on-site haul trucks involved in relocating dirt around the Project site would rely on diesel fuel. Construction workers would travel to and from the Project location throughout the duration of construction. It is assumed that construction workers would travel to and from the Project in gasoline-powered vehicles.

Heavy-duty construction equipment of various types would be used during construction. CalEEMod was used to estimate construction equipment usage; results are included in Attachment A. Based on that analysis, diesel-fueled construction equipment would operate for an estimated 94,144 hours, as summarized in Table 7.

Table 7. Hours of Operation for Construction Equipment

Year	Hours of Equipment Use
2022	4,552
2024	89,592
Total	**94,144**

Note: See Attachment A.

Fuel consumption from construction equipment was estimated by converting the total CO_2 emissions from each construction phase to gallons using conversion factors for CO_2 to gallons of gasoline or diesel. The conversion factor

for gasoline is 8.78 kilograms per MT of CO_2 per gallon, and the conversion factor for diesel is 10.21 kilograms per MT of CO_2 per gallon (The Climate Registry 2020). The estimated diesel fuel use from construction equipment is shown in Table 8.

Table 8. Construction Equipment Diesel Demand

Year	Pieces of Equipment	Equipment CO_2 (MT)	kg CO_2/Gallon[a]	Gallons
2022	36	288.82	10.21	28,287.79
2024	118	9,700.46	10.21	950,094.14
			Total	**978,381.93**

Notes: CO_2 = carbon dioxide; MT = metric tons; kg = kilogram.
[a] Source: The Climate Registry 2020.
See Attachment A.

Fuel consumption from worker and haul trips was estimated by converting the total CO_2 emissions from the construction phase to gallons using the conversion factors for CO_2 to gallons of gasoline or diesel. Worker vehicles are assumed to be gasoline fueled, and haul vehicles are assumed to be diesel fueled. Calculations for total worker and haul truck fuel consumption are provided in Table 9.

Table 9. Construction Vehicle Fuel Demand

Year	Trips	Vehicle CO_2 (MT)	kg CO_2/Gallon[a]	Gallons
Construction Worker Vehicle Gasoline Demand				
2022	1,470	24.02	8.78	2,735.50
2024	51,200	243.84	8.78	27,772.49
			Subtotal	*30,507.99*
Construction Vendor Truck Diesel Demand				
2022	0	0.00	10.21	0.00
2024	1,024	8.88	10.21	869.85
			Subtotal	*869.85*
Construction Haul Truck Diesel Demand				
2022	14	0.41	10.21	40.24
2024	995	27.49	10.21	2,692.59
			Subtotal	*2,732.83*
			Petroleum Total	**34,110.67**

Notes: CO_2 = carbon dioxide; MT = metric tons; kg = kilogram.
[a] Source: The Climate Registry 2020.

As shown in Tables 8 and 9, the Project is estimated to consume 1,012,493 gallons of petroleum during construction. By comparison, approximately 28 billion gallons of petroleum are consumed in California annually (EIA 2020). Thus, the proposed Project's petroleum consumption would constitute less than 0.004% of the statewide annual petroleum consumption. Overall, because the proposed Project would not be unusual as compared to overall local and regional demand for energy resources and would not involve characteristics that require equipment that would be less energy-efficient than at comparable construction sites in the region or state,

the proposed Project construction would not result in wasteful, inefficient, or unnecessary consumption of petroleum.

Mitigation Measures

No mitigation measures are required.

Level of Significance after Mitigation

Impacts would be less than significant; therefore, no mitigation is required.

Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The proposed Project entails the construction and repair of an existing portion of the California Aqueduct. Thus, the Project is not designed to facilitate or encourage renewable energy project development and would not impede the development of renewable energy projects. Construction of the proposed Project would involve energy for use of construction equipment and transportation (e.g., worker vehicles and haul trips). These uses would involve a standard amount of energy resources similar to other construction activities. Overall, the Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency; therefore, impacts during construction and operation of the Project would be less than significant.

Mitigation Measures

No mitigation measures are required.

Level of Significance after Mitigation

Impacts would be less than significant; therefore, no mitigation is required.

7 Conclusions

Criteria air pollutant emissions generated during construction of the Project would not exceed SJVAPCD's significance thresholds for ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions. In addition, the Project would not conflict with the air quality plan. Other potential impacts related to TACs and odors would be less than significant.

Estimated total GHG emissions generated during construction would be approximately 10,313 MT CO_2e, equating to approximately 344 MT CO_2e per year when amortized over 30 years, which is below the CAPCOA screening threshold of 900 MT CO_2e per year. The Project would not conflict with applicable GHG reduction plans. Accordingly, potential cumulative GHG impacts would be less than significant.

Energy use associated with construction and operation of the Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources. The Project would also not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, the Project's energy use would result in a less-than-significant impact.

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Attachment A

CalEEMod Emission and Energy Calculations

CalEEMod Version: CalEEMod.2020.4.0

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Geotechnical Investigations and Rehab Work

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
User Defined Industrial	1.00	User Defined Unit	1.00	43,560.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Milepost 230 Liner Raise Project. SJVAPCD.

Land Use - 24 sites centered around MP 230.75 and 30 sites centered around MP 231.30.

Construction Phase - Geotechnical investigations would begin 2022, lasting 6 weeks.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Based on information from applicant.

Trips and VMT - Updated trips per information from applicant. Haul trips based on CPT and trenching activities. 20 workers during repair and 5 workers for geotech.

On-road Fugitive Dust - Assume 99% paved.

Construction Off-road Equipment Mitigation - Water twice daily and maintain vehicle speeds of 15 mph on unpaved roads. Use of Tier 4 Final equipment.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	2.00	3.00
tblConstructionPhase	NumDays	2.00	12.00
tblConstructionPhase	NumDays	2.00	15.00
tblConstructionPhase	NumDays	2.00	18.00
tblConstructionPhase	NumDays	2.00	60.00
tblConstructionPhase	NumDays	2.00	75.00
tblLandUse	LandUseSquareFeet	0.00	43,560.00
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	HorsePower	85.00	25.00
tblOffRoadEquipment	HorsePower	402.00	250.00
tblOffRoadEquipment	HorsePower	402.00	500.00
tblOffRoadEquipment	HorsePower	130.00	230.00

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tblOffRoadEquipment	HorsePower	80.00	120.00
tblOffRoadEquipment	HorsePower	402.00	500.00
tblOffRoadEquipment	HorsePower	402.00	750.00
tblOffRoadEquipment	HorsePower	402.00	350.00
tblOffRoadEquipment	HorsePower	402.00	250.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	38.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	50.00	40.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	10.00

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tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

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					
2022	0.1557	1.2992	1.0995	3.3700e-003	9.2600e-003	0.0517	0.0610	2.4600e-003	0.0476	0.0500	0.0000	296.7073	296.7073	0.0936	2.7000e-004	299.1295
Maximum	**0.1557**	**1.2992**	**1.0995**	**3.3700e-003**	**9.2600e-003**	**0.0517**	**0.0610**	**2.4600e-003**	**0.0476**	**0.0500**	**0.0000**	**296.7073**	**296.7073**	**0.0936**	**2.7000e-004**	**299.1295**

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					
2022	0.1512	1.2463	1.1438	3.3700e-003	9.2600e-003	0.0498	0.0590	2.4600e-003	0.0458	0.0483	0.0000	296.7069	296.7069	0.0936	2.7000e-004	299.1292
Maximum	**0.1512**	**1.2463**	**1.1438**	**3.3700e-003**	**9.2600e-003**	**0.0498**	**0.0590**	**2.4600e-003**	**0.0458**	**0.0483**	**0.0000**	**296.7069**	**296.7069**	**0.0936**	**2.7000e-004**	**299.1292**

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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	N20	CO2e
Percent Reduction	2.83	4.07	-4.03	0.00	0.00	3.69	3.15	0.00	3.66	3.48	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	3 Day Equipment	Grading	6/14/2022	6/16/2022	5	3	
2	2 Day Equipment	Grading	6/14/2022	6/15/2022	5	2	
3	12 Day Equipment	Grading	3/1/2022	3/16/2022	5	12	
4	15 Day Equipment	Grading	3/1/2022	3/21/2022	5	15	
5	18 Day Equipment	Grading	6/14/2022	7/7/2022	5	18	
6	60 Day Equipment	Grading	3/1/2022	5/23/2022	5	60	
7	75 Day Equipment	Grading	3/1/2022	6/13/2022	5	75	

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)

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
3 Day Equipment	Crushing/Proc. Equipment	1	8.00	25	0.78
3 Day Equipment	Off-Highway Trucks	9	8.00	250	0.38
3 Day Equipment	Off-Highway Trucks	2	8.00	500	0.38
3 Day Equipment	Pavers	1	8.00	230	0.42
3 Day Equipment	Rollers	2	8.00	120	0.38
2 Day Equipment	Off-Highway Trucks	1	8.00	500	0.38
12 Day Equipment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
15 Day Equipment	Bore/Drill Rigs	2	8.00	221	0.50
18 Day Equipment	Off-Highway Trucks	6	8.00	750	0.38
18 Day Equipment	Off-Highway Trucks	2	8.00	350	0.38
18 Day Equipment	Off-Highway Trucks	12	8.00	250	0.38
60 Day Equipment	Bore/Drill Rigs	1	8.00	221	0.50
75 Day Equipment	Other Construction Equipment	1	8.00	172	0.42

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Trips and VMT

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
3 Day Equipment	15	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
2 Day Equipment	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
12 Day Equipment	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
15 Day Equipment	2	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
18 Day Equipment	20	40.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
60 Day Equipment	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
75 Day Equipment	1	10.00	0.00	14.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 3 Day Equipment - 2022

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9300e-003	0.0642	0.0524	1.8000e-004		2.5700e-003	2.5700e-003		2.3700e-003	2.3700e-003	0.0000	16.0984	16.0984	5.2100e-003	0.0000	16.2285
Total	**7.9300e-003**	**0.0642**	**0.0524**	**1.8000e-004**	**0.0000**	**2.5700e-003**	**2.5700e-003**	**0.0000**	**2.3700e-003**	**2.3700e-003**	**0.0000**	**16.0984**	**16.0984**	**5.2100e-003**	**0.0000**	**16.2285**

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	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
Total	**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**

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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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7900e-003	0.0629	0.0533	1.8000e-004		2.5200e-003	2.5200e-003		2.3200e-003	2.3200e-003	0.0000	16.0984	16.0984	5.2100e-003	0.0000	16.2285
Total	**7.7900e-003**	**0.0629**	**0.0533**	**1.8000e-004**	**0.0000**	**2.5200e-003**	**2.5200e-003**	**0.0000**	**2.3200e-003**	**2.3200e-003**	**0.0000**	**16.0984**	**16.0984**	**5.2100e-003**	**0.0000**	**16.2285**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 2 Day Equipment - 2022

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6000e-004	4.9900e-003	4.1800e-003	2.0000e-005		1.8000e-004	1.8000e-004		1.7000e-004	1.7000e-004	0.0000	1.4431	1.4431	4.7000e-004	0.0000	1.4548
Total	**6.6000e-004**	**4.9900e-003**	**4.1800e-003**	**2.0000e-005**	**0.0000**	**1.8000e-004**	**1.8000e-004**	**0.0000**	**1.7000e-004**	**1.7000e-004**	**0.0000**	**1.4431**	**1.4431**	**4.7000e-004**	**0.0000**	**1.4548**

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	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
Total	**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**

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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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.4000e-004	4.8700e-003	4.2700e-003	2.0000e-005		1.8000e-004	1.8000e-004		1.6000e-004	1.6000e-004	0.0000	1.4431	1.4431	4.7000e-004	0.0000	1.4548
Total	**6.4000e-004**	**4.8700e-003**	**4.2700e-003**	**2.0000e-005**	**0.0000**	**1.8000e-004**	**1.8000e-004**	**0.0000**	**1.6000e-004**	**1.6000e-004**	**0.0000**	**1.4431**	**1.4431**	**4.7000e-004**	**0.0000**	**1.4548**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 12 Day Equipment - 2022

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9000e-004	0.0101	0.0134	2.0000e-005		5.4000e-004	5.4000e-004		5.0000e-004	5.0000e-004	0.0000	1.6397	1.6397	5.3000e-004	0.0000	1.6529
Total	**9.9000e-004**	**0.0101**	**0.0134**	**2.0000e-005**	**0.0000**	**5.4000e-004**	**5.4000e-004**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**1.6397**	**1.6397**	**5.3000e-004**	**0.0000**	**1.6529**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9000e-004	0.0101	0.0134	2.0000e-005		5.4000e-004	5.4000e-004		5.0000e-004	5.0000e-004	0.0000	1.6397	1.6397	5.3000e-004	0.0000	1.6529
Total	**9.9000e-004**	**0.0101**	**0.0134**	**2.0000e-005**	**0.0000**	**5.4000e-004**	**5.4000e-004**	**0.0000**	**5.0000e-004**	**5.0000e-004**	**0.0000**	**1.6397**	**1.6397**	**5.3000e-004**	**0.0000**	**1.6529**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 15 Day Equipment - 2022

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3600e-003	0.0340	0.0306	1.4000e-004		1.0900e-003	1.0900e-003		1.0000e-003	1.0000e-003	0.0000	12.4315	12.4315	4.0200e-003	0.0000	12.5320
Total	**3.3600e-003**	**0.0340**	**0.0306**	**1.4000e-004**	**0.0000**	**1.0900e-003**	**1.0900e-003**	**0.0000**	**1.0000e-003**	**1.0000e-003**	**0.0000**	**12.4315**	**12.4315**	**4.0200e-003**	**0.0000**	**12.5320**

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	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
Total	**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**

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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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8300e-003	0.0253	0.0417	1.4000e-004		8.1000e-004	8.1000e-004		7.5000e-004	7.5000e-004	0.0000	12.4315	12.4315	4.0200e-003	0.0000	12.5320
Total	**2.8300e-003**	**0.0253**	**0.0417**	**1.4000e-004**	**0.0000**	**8.1000e-004**	**8.1000e-004**	**0.0000**	**7.5000e-004**	**7.5000e-004**	**0.0000**	**12.4315**	**12.4315**	**4.0200e-003**	**0.0000**	**12.5320**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 18 Day Equipment - 2022

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1186	0.9713	0.7578	2.4100e-003		0.0376	0.0376		0.0346	0.0346	0.0000	211.9876	211.9876	0.0686	0.0000	213.7016
Total	**0.1186**	**0.9713**	**0.7578**	**2.4100e-003**	**0.0000**	**0.0376**	**0.0376**	**0.0000**	**0.0346**	**0.0346**	**0.0000**	**211.9876**	**211.9876**	**0.0686**	**0.0000**	**213.7016**

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	1.6100e-003	1.2300e-003	0.0141	4.0000e-005	4.4800e-003	2.0000e-005	4.5000e-003	1.1900e-003	2.0000e-005	1.2100e-003	0.0000	3.6628	3.6628	1.0000e-004	1.0000e-004	3.6959
Total	**1.6100e-003**	**1.2300e-003**	**0.0141**	**4.0000e-005**	**4.4800e-003**	**2.0000e-005**	**4.5000e-003**	**1.1900e-003**	**2.0000e-005**	**1.2100e-003**	**0.0000**	**3.6628**	**3.6628**	**1.0000e-004**	**1.0000e-004**	**3.6959**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1159	0.9460	0.7677	2.4100e-003		0.0366	0.0366		0.0337	0.0337	0.0000	211.9874	211.9874	0.0686	0.0000	213.7014
Total	**0.1159**	**0.9460**	**0.7677**	**2.4100e-003**	**0.0000**	**0.0366**	**0.0366**	**0.0000**	**0.0337**	**0.0337**	**0.0000**	**211.9874**	**211.9874**	**0.0686**	**0.0000**	**213.7014**

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	1.6100e-003	1.2300e-003	0.0141	4.0000e-005	4.4800e-003	2.0000e-005	4.5000e-003	1.1900e-003	2.0000e-005	1.2100e-003	0.0000	3.6628	3.6628	1.0000e-004	1.0000e-004	3.6959
Total	**1.6100e-003**	**1.2300e-003**	**0.0141**	**4.0000e-005**	**4.4800e-003**	**2.0000e-005**	**4.5000e-003**	**1.1900e-003**	**2.0000e-005**	**1.2100e-003**	**0.0000**	**3.6628**	**3.6628**	**1.0000e-004**	**1.0000e-004**	**3.6959**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 60 Day Equipment - 2022

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.7200e-003	0.0680	0.0612	2.8000e-004		2.1800e-003	2.1800e-003		2.0100e-003	2.0100e-003	0.0000	24.8631	24.8631	8.0400e-003	0.0000	25.0641
Total	**6.7200e-003**	**0.0680**	**0.0612**	**2.8000e-004**	**0.0000**	**2.1800e-003**	**2.1800e-003**	**0.0000**	**2.0100e-003**	**2.0100e-003**	**0.0000**	**24.8631**	**24.8631**	**8.0400e-003**	**0.0000**	**25.0641**

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	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
Total	**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**

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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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.6600e-003	0.0506	0.0835	2.8000e-004		1.6200e-003	1.6200e-003		1.5000e-003	1.5000e-003	0.0000	24.8630	24.8630	8.0400e-003	0.0000	25.0641
Total	**5.6600e-003**	**0.0506**	**0.0835**	**2.8000e-004**	**0.0000**	**1.6200e-003**	**1.6200e-003**	**0.0000**	**1.5000e-003**	**1.5000e-003**	**0.0000**	**24.8630**	**24.8630**	**8.0400e-003**	**0.0000**	**25.0641**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 75 Day Equipment - 2022

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0141	0.1431	0.1508	2.3000e-004		7.4600e-003	7.4600e-003		6.8700e-003	6.8700e-003	0.0000	20.3549	20.3549	6.5800e-003	0.0000	20.5195
Total	**0.0141**	**0.1431**	**0.1508**	**2.3000e-004**	**0.0000**	**7.4600e-003**	**7.4600e-003**	**0.0000**	**6.8700e-003**	**6.8700e-003**	**0.0000**	**20.3549**	**20.3549**	**6.5800e-003**	**0.0000**	**20.5195**

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	3.0000e-005	1.0700e-003	2.0000e-004	0.0000	1.2000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.4109	0.4109	0.0000	6.0000e-005	0.4302
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	1.6800e-003	1.2800e-003	0.0147	4.0000e-005	4.6600e-003	3.0000e-005	4.6900e-003	1.2400e-003	2.0000e-005	1.2600e-003	0.0000	3.8154	3.8154	1.0000e-004	1.1000e-004	3.8499
Total	**1.7100e-003**	**2.3500e-003**	**0.0149**	**4.0000e-005**	**4.7800e-003**	**4.0000e-005**	**4.8200e-003**	**1.2700e-003**	**3.0000e-005**	**1.3000e-003**	**0.0000**	**4.2263**	**4.2263**	**1.0000e-004**	**1.7000e-004**	**4.2801**

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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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0141	0.1431	0.1508	2.3000e-004		7.4600e-003	7.4600e-003		6.8700e-003	6.8700e-003	0.0000	20.3549	20.3549	6.5800e-003	0.0000	20.5194
Total	**0.0141**	**0.1431**	**0.1508**	**2.3000e-004**	**0.0000**	**7.4600e-003**	**7.4600e-003**	**0.0000**	**6.8700e-003**	**6.8700e-003**	**0.0000**	**20.3549**	**20.3549**	**6.5800e-003**	**0.0000**	**20.5194**

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	3.0000e-005	1.0700e-003	2.0000e-004	0.0000	1.2000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.4109	0.4109	0.0000	6.0000e-005	0.4302
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	1.6800e-003	1.2800e-003	0.0147	4.0000e-005	4.6600e-003	3.0000e-005	4.6900e-003	1.2400e-003	2.0000e-005	1.2600e-003	0.0000	3.8154	3.8154	1.0000e-004	1.1000e-004	3.8499
Total	**1.7100e-003**	**2.3500e-003**	**0.0149**	**4.0000e-005**	**4.7800e-003**	**4.0000e-005**	**4.8200e-003**	**1.2700e-003**	**3.0000e-005**	**1.3000e-003**	**0.0000**	**4.2263**	**4.2263**	**1.0000e-004**	**1.7000e-004**	**4.2801**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Geotechnical Investigations and Rehab Work

San Joaquin Valley Unified APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	43,560.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Milepost 230 Liner Raise Project. SJVAPCD.

Land Use - 24 sites centered around MP 230.75 and 30 sites centered around MP 231.30.

Construction Phase - Geotechnical investigations would begin 2022, lasting 6 weeks.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

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Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Based on information from applicant.

Trips and VMT - Updated trips per information from applicant. Haul trips based on CPT and trenching activities. 20 workers during repair and 5 workers for geotech.

On-road Fugitive Dust - Assume 99% paved.

Construction Off-road Equipment Mitigation - Water twice daily and maintain vehicle speeds of 15 mph on unpaved roads. Use of Tier 4 Final equipment.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	2.00	3.00
tblConstructionPhase	NumDays	2.00	12.00
tblConstructionPhase	NumDays	2.00	15.00
tblConstructionPhase	NumDays	2.00	18.00
tblConstructionPhase	NumDays	2.00	60.00
tblConstructionPhase	NumDays	2.00	75.00
tblLandUse	LandUseSquareFeet	0.00	43,560.00
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	HorsePower	85.00	25.00
tblOffRoadEquipment	HorsePower	402.00	250.00
tblOffRoadEquipment	HorsePower	402.00	500.00
tblOffRoadEquipment	HorsePower	130.00	230.00

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tblOffRoadEquipment	HorsePower	80.00	120.00
tblOffRoadEquipment	HorsePower	402.00	500.00
tblOffRoadEquipment	HorsePower	402.00	750.00
tblOffRoadEquipment	HorsePower	402.00	350.00
tblOffRoadEquipment	HorsePower	402.00	250.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	38.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	50.00	40.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	10.00

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tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2022	19.3214	155.8366	125.1796	0.4117	0.5109	6.0781	6.5890	0.1355	5.5918	5.7273	0.0000	39,873.3184	39,873.3184	12.7501	0.0120	40,195.6495
Maximum	**19.3214**	**155.8366**	**125.1796**	**0.4117**	**0.5109**	**6.0781**	**6.5890**	**0.1355**	**5.5918**	**5.7273**	**0.0000**	**39,873.3184**	**39,873.3184**	**12.7501**	**0.0120**	**40,195.6495**

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	lb/day										lb/day					
2022	18.9141	152.0424	126.9850	0.4117	0.5109	5.9268	6.4377	0.1355	5.4542	5.5897	0.0000	39,873.3184	39,873.3184	12.7501	0.0120	40,195.6495
Maximum	**18.9141**	**152.0424**	**126.9850**	**0.4117**	**0.5109**	**5.9268**	**6.4377**	**0.1355**	**5.4542**	**5.5897**	**0.0000**	**39,873.3184**	**39,873.3184**	**12.7501**	**0.0120**	**40,195.6495**

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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	N20	CO2e
Percent Reduction	2.11	2.43	-1.44	0.00	0.00	2.49	2.30	0.00	2.46	2.40	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	3 Day Equipment	Grading	6/14/2022	6/16/2022	5	3	
2	2 Day Equipment	Grading	6/14/2022	6/15/2022	5	2	
3	12 Day Equipment	Grading	3/1/2022	3/16/2022	5	12	
4	15 Day Equipment	Grading	3/1/2022	3/21/2022	5	15	
5	18 Day Equipment	Grading	6/14/2022	7/7/2022	5	18	
6	60 Day Equipment	Grading	3/1/2022	5/23/2022	5	60	
7	75 Day Equipment	Grading	3/1/2022	6/13/2022	5	75	

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)

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OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
3 Day Equipment	Crushing/Proc. Equipment	1	8.00	25	0.78
3 Day Equipment	Off-Highway Trucks	9	8.00	250	0.38
3 Day Equipment	Off-Highway Trucks	2	8.00	500	0.38
3 Day Equipment	Pavers	1	8.00	230	0.42
3 Day Equipment	Rollers	2	8.00	120	0.38
2 Day Equipment	Off-Highway Trucks	1	8.00	500	0.38
12 Day Equipment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
15 Day Equipment	Bore/Drill Rigs	2	8.00	221	0.50
18 Day Equipment	Off-Highway Trucks	6	8.00	750	0.38
18 Day Equipment	Off-Highway Trucks	2	8.00	350	0.38
18 Day Equipment	Off-Highway Trucks	12	8.00	250	0.38
60 Day Equipment	Bore/Drill Rigs	1	8.00	221	0.50
75 Day Equipment	Other Construction Equipment	1	8.00	172	0.42

Trips and VMT

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
3 Day Equipment	15	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
2 Day Equipment	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
12 Day Equipment	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
15 Day Equipment	2	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
18 Day Equipment	20	40.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
60 Day Equipment	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
75 Day Equipment	1	10.00	0.00	14.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

CalEEMod Version: CalEEMod.2020.4.0

Date: 7/14/2021 9:41 AM

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 3 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	5.2876	42.7967	34.9404	0.1222		1.7152	1.7152		1.5780	1.5780		11,830.2782	11,830.2782	3.8262		11,925.9320
Total	**5.2876**	**42.7967**	**34.9404**	**0.1222**	**0.0000**	**1.7152**	**1.7152**	**0.0000**	**1.5780**	**1.5780**		**11,830.2782**	**11,830.2782**	**3.8262**		**11,925.9320**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	5.1903	41.9352	35.5490	0.1222		1.6807	1.6807		1.5467	1.5467	0.0000	11,830.2782	11,830.2782	3.8262		11,925.9320
Total	**5.1903**	**41.9352**	**35.5490**	**0.1222**	**0.0000**	**1.6807**	**1.6807**	**0.0000**	**1.5467**	**1.5467**	**0.0000**	**11,830.2782**	**11,830.2782**	**3.8262**		**11,925.9320**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 2 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6572	4.9922	4.1775	0.0164		0.1815	0.1815		0.1670	0.1670		1,590.7777	1,590.7777	0.5145		1,603.6400
Total	**0.6572**	**4.9922**	**4.1775**	**0.0164**	**0.0000**	**0.1815**	**0.1815**	**0.0000**	**0.1670**	**0.1670**		**1,590.7777**	**1,590.7777**	**0.5145**		**1,603.6400**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6436	4.8686	4.2734	0.0164		0.1769	0.1769		0.1628	0.1628	0.0000	1,590.7777	1,590.7777	0.5145		1,603.6400
Total	**0.6436**	**4.8686**	**4.2734**	**0.0164**	**0.0000**	**0.1769**	**0.1769**	**0.0000**	**0.1628**	**0.1628**	**0.0000**	**1,590.7777**	**1,590.7777**	**0.5145**		**1,603.6400**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 12 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1647	1.6756	2.2379	3.1100e-003		0.0901	0.0901		0.0829	0.0829		301.2390	301.2390	0.0974		303.6746
Total	**0.1647**	**1.6756**	**2.2379**	**3.1100e-003**	**0.0000**	**0.0901**	**0.0901**	**0.0000**	**0.0829**	**0.0829**		**301.2390**	**301.2390**	**0.0974**		**303.6746**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1647	1.6756	2.2379	3.1100e-003		0.0901	0.0901		0.0829	0.0829	0.0000	301.2390	301.2390	0.0974		303.6746
Total	**0.1647**	**1.6756**	**2.2379**	**3.1100e-003**	**0.0000**	**0.0901**	**0.0901**	**0.0000**	**0.0829**	**0.0829**	**0.0000**	**301.2390**	**301.2390**	**0.0974**		**303.6746**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 15 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4482	4.5328	4.0823	0.0189		0.1455	0.1455		0.1339	0.1339		1,827.1217	1,827.1217	0.5909		1,841.8949
Total	**0.4482**	**4.5328**	**4.0823**	**0.0189**	**0.0000**	**0.1455**	**0.1455**	**0.0000**	**0.1339**	**0.1339**		**1,827.1217**	**1,827.1217**	**0.5909**		**1,841.8949**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3775	3.3714	5.5649	0.0189		0.1078	0.1078		0.1000	0.1000	0.0000	1,827.1217	1,827.1217	0.5909		1,841.8949
Total	**0.3775**	**3.3714**	**5.5649**	**0.0189**	**0.0000**	**0.1078**	**0.1078**	**0.0000**	**0.1000**	**0.1000**	**0.0000**	**1,827.1217**	**1,827.1217**	**0.5909**		**1,841.8949**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 18 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	13.1757	107.9204	84.2040	0.2682		4.1787	4.1787		3.8444	3.8444		25,964.0364	25,964.0364	8.3973		26,173.9688
Total	**13.1757**	**107.9204**	**84.2040**	**0.2682**	**0.0000**	**4.1787**	**4.1787**	**0.0000**	**3.8444**	**3.8444**		**25,964.0364**	**25,964.0364**	**8.3973**		**26,173.9688**

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	lb/day										lb/day					
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
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
Worker	0.2009	0.1273	1.8576	4.8300e-003	0.5109	2.6800e-003	0.5136	0.1355	2.4700e-003	0.1380		488.2261	488.2261	0.0121	0.0120	492.1088
Total	**0.2009**	**0.1273**	**1.8576**	**4.8300e-003**	**0.5109**	**2.6800e-003**	**0.5136**	**0.1355**	**2.4700e-003**	**0.1380**		**488.2261**	**488.2261**	**0.0121**	**0.0120**	**492.1088**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	12.8793	105.1114	85.3051	0.2682		4.0665	4.0665		3.7422	3.7422	0.0000	25,964.0364	25,964.0364	8.3973		26,173.9688
Total	**12.8793**	**105.1114**	**85.3051**	**0.2682**	**0.0000**	**4.0665**	**4.0665**	**0.0000**	**3.7422**	**3.7422**	**0.0000**	**25,964.0364**	**25,964.0364**	**8.3973**		**26,173.9688**

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	lb/day										lb/day					
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
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
Worker	0.2009	0.1273	1.8576	4.8300e-003	0.5109	2.6800e-003	0.5136	0.1355	2.4700e-003	0.1380		488.2261	488.2261	0.0121	0.0120	492.1088
Total	**0.2009**	**0.1273**	**1.8576**	**4.8300e-003**	**0.5109**	**2.6800e-003**	**0.5136**	**0.1355**	**2.4700e-003**	**0.1380**		**488.2261**	**488.2261**	**0.0121**	**0.0120**	**492.1088**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 60 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.2241	2.2664	2.0411	9.4400e-003		0.0728	0.0728		0.0669	0.0669		913.5608	913.5608	0.2955		920.9474
Total	**0.2241**	**2.2664**	**2.0411**	**9.4400e-003**	**0.0000**	**0.0728**	**0.0728**	**0.0000**	**0.0669**	**0.0669**		**913.5608**	**913.5608**	**0.2955**		**920.9474**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1887	1.6857	2.7825	9.4400e-003		0.0539	0.0539		0.0500	0.0500	0.0000	913.5608	913.5608	0.2955		920.9474
Total	**0.1887**	**1.6857**	**2.7825**	**9.4400e-003**	**0.0000**	**0.0539**	**0.0539**	**0.0000**	**0.0500**	**0.0500**	**0.0000**	**913.5608**	**913.5608**	**0.2955**		**920.9474**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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3.8 75 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3760	3.8151	4.0203	6.1800e-003		0.1991	0.1991		0.1831	0.1831		598.3313	598.3313	0.1935		603.1691
Total	**0.3760**	**3.8151**	**4.0203**	**6.1800e-003**	**0.0000**	**0.1991**	**0.1991**	**0.0000**	**0.1831**	**0.1831**		**598.3313**	**598.3313**	**0.1935**		**603.1691**

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	lb/day										lb/day					
Hauling	7.2000e-004	0.0271	5.4000e-003	1.1000e-004	3.2700e-003	2.9000e-004	3.5600e-003	9.0000e-004	2.8000e-004	1.1700e-003		12.0736	12.0736	7.0000e-005	1.9000e-003	12.6409
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
Worker	0.0502	0.0318	0.4644	1.2100e-003	0.1277	6.7000e-004	0.1284	0.0339	6.2000e-004	0.0345		122.0565	122.0565	3.0300e-003	3.0000e-003	123.0272
Total	**0.0510**	**0.0589**	**0.4698**	**1.3200e-003**	**0.1310**	**9.6000e-004**	**0.1320**	**0.0348**	**9.0000e-004**	**0.0357**		**134.1301**	**134.1301**	**3.1000e-003**	**4.9000e-003**	**135.6681**

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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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3760	3.8151	4.0203	6.1800e-003		0.1991	0.1991		0.1831	0.1831	0.0000	598.3313	598.3313	0.1935		603.1691
Total	**0.3760**	**3.8151**	**4.0203**	**6.1800e-003**	**0.0000**	**0.1991**	**0.1991**	**0.0000**	**0.1831**	**0.1831**	**0.0000**	**598.3313**	**598.3313**	**0.1935**		**603.1691**

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	lb/day										lb/day					
Hauling	7.2000e-004	0.0271	5.4000e-003	1.1000e-004	3.2700e-003	2.9000e-004	3.5600e-003	9.0000e-004	2.8000e-004	1.1700e-003		12.0736	12.0736	7.0000e-005	1.9000e-003	12.6409
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
Worker	0.0502	0.0318	0.4644	1.2100e-003	0.1277	6.7000e-004	0.1284	0.0339	6.2000e-004	0.0345		122.0565	122.0565	3.0300e-003	3.0000e-003	123.0272
Total	**0.0510**	**0.0589**	**0.4698**	**1.3200e-003**	**0.1310**	**9.6000e-004**	**0.1320**	**0.0348**	**9.0000e-004**	**0.0357**		**134.1301**	**134.1301**	**3.1000e-003**	**4.9000e-003**	**135.6681**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Geotechnical Investigations

San Joaquin Valley Unified APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	43,560.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Milepost 230 Liner Raise Project. SJVAPCD.

Land Use - 24 sites centered around MP 230.75 and 30 sites centered around MP 231.30.

Construction Phase - Geotechnical investigations would begin 2022, lasting 6 weeks.

Off-road Equipment - Based on information from applicant.

Off-road Equipment - Based on information from applicant.

Trips and VMT - Updated trips per information from applicant. 5 workers per day and haul trips based on CPT and trenching activities.

On-road Fugitive Dust - Assume 99% paved.

Construction Off-road Equipment Mitigation - Water twice daily and maintain vehicle speeds of 15 mph on unpaved roads.

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Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	30.00
tblConstructionPhase	NumDays	1.00	30.00
tblFleetMix	HHD	0.00	0.03
tblFleetMix	LDA	0.00	0.51
tblFleetMix	LDT1	0.00	0.05
tblFleetMix	LDT2	0.00	0.17
tblFleetMix	LHD1	0.00	0.03
tblFleetMix	LHD2	0.00	7.8800e-003
tblFleetMix	MCY	0.00	0.02
tblFleetMix	MDV	0.00	0.17
tblFleetMix	MH	0.00	3.7190e-003
tblFleetMix	MHD	0.00	0.01
tblFleetMix	OBUS	0.00	6.6400e-004
tblFleetMix	SBUS	0.00	1.5050e-003
tblFleetMix	UBUS	0.00	3.1700e-004
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	8.00
tblTripsAndVMT	HaulingTripNumber	0.00	6.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	10.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2022	1.1777	9.5303	8.4936	0.0353	2.7445	0.3295	3.0740	0.2963	0.3031	0.5994	0.0000	3,427.4846	3,427.4846	1.0670	8.1000e-003	3,456.5742
Maximum	**1.1777**	**9.5303**	**8.4936**	**0.0353**	**2.7445**	**0.3295**	**3.0740**	**0.2963**	**0.3031**	**0.5994**	**0.0000**	**3,427.4846**	**3,427.4846**	**1.0670**	**8.1000e-003**	**3,456.5742**

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	lb/day										lb/day					
2022	1.1777	9.5303	8.4936	0.0353	1.7326	0.3295	2.0620	0.1951	0.3031	0.4982	0.0000	3,427.4846	3,427.4846	1.0670	8.1000e-003	3,456.5742
Maximum	**1.1777**	**9.5303**	**8.4936**	**0.0353**	**1.7326**	**0.3295**	**2.0620**	**0.1951**	**0.3031**	**0.4982**	**0.0000**	**3,427.4846**	**3,427.4846**	**1.0670**	**8.1000e-003**	**3,456.5742**

	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	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**36.87**	**0.00**	**32.92**	**34.16**	**0.00**	**16.88**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Standard and Seismic Cone Penetrometr Testing (CPT)	Site Preparation	3/1/2022	4/11/2022	5	30	
2	Trenching	Grading	3/1/2022	4/11/2022	5	30	

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
Standard and Seismic Cone Penetrometr Testing (CPT)	Off-Highway Trucks	1	12.00	402	0.38
Trenching	Bore/Drill Rigs	1	12.00	221	0.50

Trips and VMT

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
Standard and Seismic Cone Penetrometr	1	10.00	0.00	6.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	1	0.00	0.00	8.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

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3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Standard and Seismic Cone Penetrometr Testing (CPT) - 2022

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	lb/day										lb/day					
Off-Road	0.7926	6.0206	5.0381	0.0198		0.2189	0.2189		0.2014	0.2014		1,918.4779	1,918.4779	0.6205		1,933.9898
Total	**0.7926**	**6.0206**	**5.0381**	**0.0198**		**0.2189**	**0.2189**		**0.2014**	**0.2014**		**1,918.4779**	**1,918.4779**	**0.6205**		**1,933.9898**

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	lb/day										lb/day					
Hauling	7.4000e-004	0.0311	5.9200e-003	1.2000e-004	0.0624	3.1000e-004	0.0627	6.8300e-003	3.0000e-004	7.1200e-003		12.9448	12.9448	7.0000e-005	2.0400e-003	13.5531
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
Worker	0.0472	0.0376	0.3800	1.0700e-003	2.5990	6.7000e-004	2.5997	0.2803	6.2000e-004	0.2809		108.4609	108.4609	3.1600e-003	3.3500e-003	109.5394
Total	**0.0479**	**0.0687**	**0.3860**	**1.1900e-003**	**2.6614**	**9.8000e-004**	**2.6624**	**0.2872**	**9.2000e-004**	**0.2881**		**121.4057**	**121.4057**	**3.2300e-003**	**5.3900e-003**	**123.0925**

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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	lb/day										lb/day					
Off-Road	0.7926	6.0206	5.0381	0.0198		0.2189	0.2189		0.2014	0.2014	0.0000	1,918.4779	1,918.4779	0.6205		1,933.9898
Total	**0.7926**	**6.0206**	**5.0381**	**0.0198**		**0.2189**	**0.2189**		**0.2014**	**0.2014**	**0.0000**	**1,918.4779**	**1,918.4779**	**0.6205**		**1,933.9898**

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	lb/day										lb/day					
Hauling	7.4000e-004	0.0311	5.9200e-003	1.2000e-004	0.0395	3.1000e-004	0.0398	4.5500e-003	3.0000e-004	4.8400e-003		12.9448	12.9448	7.0000e-005	2.0400e-003	13.5531
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
Worker	0.0472	0.0376	0.3800	1.0700e-003	1.6404	6.7000e-004	1.6410	0.1845	6.2000e-004	0.1851		108.4609	108.4609	3.1600e-003	3.3500e-003	109.5394
Total	**0.0479**	**0.0687**	**0.3860**	**1.1900e-003**	**1.6799**	**9.8000e-004**	**1.6809**	**0.1890**	**9.2000e-004**	**0.1899**		**121.4057**	**121.4057**	**3.2300e-003**	**5.3900e-003**	**123.0925**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Trenching - 2022

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	lb/day										lb/day					
Off-Road	0.3362	3.3996	3.0617	0.0142		0.1091	0.1091		0.1004	0.1004		1,370.3412	1,370.3412	0.4432		1,381.4211
Total	**0.3362**	**3.3996**	**3.0617**	**0.0142**		**0.1091**	**0.1091**		**0.1004**	**0.1004**		**1,370.3412**	**1,370.3412**	**0.4432**		**1,381.4211**

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	lb/day										lb/day					
Hauling	9.9000e-004	0.0415	7.8900e-003	1.6000e-004	0.0831	4.1000e-004	0.0835	9.1100e-003	3.9000e-004	9.5000e-003		17.2597	17.2597	9.0000e-005	2.7100e-003	18.0708
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
Worker	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
Total	**9.9000e-004**	**0.0415**	**7.8900e-003**	**1.6000e-004**	**0.0831**	**4.1000e-004**	**0.0835**	**9.1100e-003**	**3.9000e-004**	**9.5000e-003**		**17.2597**	**17.2597**	**9.0000e-005**	**2.7100e-003**	**18.0708**

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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	lb/day										lb/day					
Off-Road	0.3362	3.3996	3.0617	0.0142		0.1091	0.1091		0.1004	0.1004	0.0000	1,370.3412	1,370.3412	0.4432		1,381.4211
Total	**0.3362**	**3.3996**	**3.0617**	**0.0142**		**0.1091**	**0.1091**		**0.1004**	**0.1004**	**0.0000**	**1,370.3412**	**1,370.3412**	**0.4432**		**1,381.4211**

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	lb/day										lb/day					
Hauling	9.9000e-004	0.0415	7.8900e-003	1.6000e-004	0.0527	4.1000e-004	0.0531	6.0600e-003	3.9000e-004	6.4600e-003		17.2597	17.2597	9.0000e-005	2.7100e-003	18.0708
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
Worker	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
Total	**9.9000e-004**	**0.0415**	**7.8900e-003**	**1.6000e-004**	**0.0527**	**4.1000e-004**	**0.0531**	**6.0600e-003**	**3.9000e-004**	**6.4600e-003**		**17.2597**	**17.2597**	**9.0000e-005**	**2.7100e-003**	**18.0708**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Treatment Area 3

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
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2025
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Milepost 230 Liner Raise Project. SJVAPCD. Treatment Area 3.

Land Use - 24 sites centered around MP 230.75 and 30 sites centered around MP 231.30. 0.75 mile embankment repair and raise 0.8 mile liner.

Construction Phase - Construction activities would begin Spring 2024.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment based on information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

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Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment based on information from applicant.

Trips and VMT - Updated trips per information from applicant. 100 personal trucks and haul trucks based on maximum number of trips for Treatment Area 3. Added two water trucks to vendor trips.

On-road Fugitive Dust - Assume 99% paved.

Grading - revised

Construction Off-road Equipment Mitigation - Water twice daily and maintain vehicle speeds of 15 mph on unpaved roads. Use of Tier 4 Final equipment for equipment greater than 75 HP.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	30.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	2.00	4.00
tblConstructionPhase	NumDays	2.00	12.00
tblConstructionPhase	NumDays	2.00	39.00
tblConstructionPhase	NumDays	2.00	22.00

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tblConstructionPhase	NumDays	2.00	97.00
tblConstructionPhase	NumDays	2.00	217.00
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	HorsePower	221.00	750.00
tblOffRoadEquipment	HorsePower	221.00	750.00
tblOffRoadEquipment	HorsePower	9.00	25.00
tblOffRoadEquipment	HorsePower	85.00	25.00
tblOffRoadEquipment	HorsePower	89.00	120.00
tblOffRoadEquipment	HorsePower	89.00	120.00
tblOffRoadEquipment	HorsePower	84.00	750.00
tblOffRoadEquipment	HorsePower	84.00	750.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	65.00	50.00
tblOffRoadEquipment	HorsePower	65.00	50.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	PhaseName		39 Day Equipment
tblOffRoadEquipment	PhaseName		217 Day Equipment

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	PhaseName		39 Day Equipment
tblOffRoadEquipment	PhaseName		217 Day Equipment
tblOffRoadEquipment	PhaseName		39 Day Equipment
tblOffRoadEquipment	PhaseName		217 Day Equipment
tblOffRoadEquipment	PhaseName		39 Day Equipment
tblOffRoadEquipment	PhaseName		217 Day Equipment
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	281.00
tblTripsAndVMT	HaulingTripNumber	0.00	714.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	63.00	0.00
tblTripsAndVMT	WorkerTripNumber	88.00	200.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	63.00	0.00
tblTripsAndVMT	WorkerTripNumber	88.00	200.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.0 Emissions Summary

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					
2024	3.0596	23.0170	25.0232	0.1027	0.3298	0.8057	1.1355	0.0878	0.7740	0.8618	0.0000	9,980.6763	9,980.6763	1.1964	0.0118	10,014.1018
Maximum	**3.0596**	**23.0170**	**25.0232**	**0.1027**	**0.3298**	**0.8057**	**1.1355**	**0.0878**	**0.7740**	**0.8618**	**0.0000**	**9,980.6763**	**9,980.6763**	**1.1964**	**0.0118**	**10,014.1018**

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					
2024	1.6788	9.6993	46.9629	0.1027	0.3298	0.3755	0.7053	0.0878	0.3571	0.4449	0.0000	9,980.6647	9,980.6647	1.1964	0.0118	10,014.0903
Maximum	**1.6788**	**9.6993**	**46.9629**	**0.1027**	**0.3298**	**0.3755**	**0.7053**	**0.0878**	**0.3571**	**0.4449**	**0.0000**	**9,980.6647**	**9,980.6647**	**1.1964**	**0.0118**	**10,014.0903**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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	N20	CO2e
Percent Reduction	45.13	57.86	-87.68	0.00	0.00	53.40	37.89	0.00	53.86	48.37	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	4 Day Equipment	Grading	1/1/2024	1/4/2024	5	4	
2	12 Day Equipment	Grading	1/1/2024	1/16/2024	5	12	
3	39 Day Equipment	Grading	1/1/2024	2/22/2024	5	39	
4	22 Day Equipment	Grading	2/23/2024	3/25/2024	5	22	
5	97 Day Equipment	Grading	2/23/2024	7/8/2024	5	97	
6	217 Day Equipment	Grading	2/23/2024	12/23/2024	5	217	

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)

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
4 Day Equipment	Off-Highway Trucks	1	8.00	300	0.38
12 Day Equipment	Bore/Drill Rigs	15	8.00	750	0.50
12 Day Equipment	Skid Steer Loaders	10	8.00	50	0.37
39 Day Equipment	Cement and Mortar Mixers	10	8.00	25	0.56
39 Day Equipment	Forklifts	3	8.00	120	0.20
39 Day Equipment	Generator Sets	10	8.00	750	0.74
39 Day Equipment	Other Construction Equipment	10	8.00	172	0.42
22 Day Equipment	Off-Highway Trucks	1	8.00	300	0.38
97 Day Equipment	Bore/Drill Rigs	15	8.00	750	0.50
97 Day Equipment	Skid Steer Loaders	10	8.00	50	0.37
217 Day Equipment	Crushing/Proc. Equipment	10	8.00	25	0.78
217 Day Equipment	Forklifts	3	8.00	120	0.20
217 Day Equipment	Generator Sets	10	8.00	750	0.74
217 Day Equipment	Other Construction Equipment	10	8.00	172	0.42

Trips and VMT

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
4 Day Equipment	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
12 Day Equipment	25	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
39 Day Equipment	35	200.00	4.00	281.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
22 Day Equipment	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
97 Day Equipment	25	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
217 Day Equipment	35	200.00	4.00	714.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 4 Day Equipment - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.4000e-004	4.9700e-003	4.8500e-003	2.0000e-005		1.8000e-004	1.8000e-004		1.6000e-004	1.6000e-004	0.0000	1.7336	1.7336	5.6000e-004	0.0000	1.7476
Total	**7.4000e-004**	**4.9700e-003**	**4.8500e-003**	**2.0000e-005**	**0.0000**	**1.8000e-004**	**1.8000e-004**	**0.0000**	**1.6000e-004**	**1.6000e-004**	**0.0000**	**1.7336**	**1.7336**	**5.6000e-004**	**0.0000**	**1.7476**

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	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
Total	**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**

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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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4000e-004	1.0500e-003	8.8500e-003	2.0000e-005		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	1.7336	1.7336	5.6000e-004	0.0000	1.7476
Total	**2.4000e-004**	**1.0500e-003**	**8.8500e-003**	**2.0000e-005**	**0.0000**	**3.0000e-005**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**3.0000e-005**	**0.0000**	**1.7336**	**1.7336**	**5.6000e-004**	**0.0000**	**1.7476**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 12 Day Equipment - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0600	0.4651	0.6581	3.0600e-003		0.0170	0.0170		0.0157	0.0157	0.0000	268.6950	268.6950	0.0869	0.0000	270.8676
Total	**0.0600**	**0.4651**	**0.6581**	**3.0600e-003**	**0.0000**	**0.0170**	**0.0170**	**0.0000**	**0.0157**	**0.0157**	**0.0000**	**268.6950**	**268.6950**	**0.0869**	**0.0000**	**270.8676**

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	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
Total	**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**

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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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0426	0.2203	1.3814	3.0600e-003		6.5000e-003	6.5000e-003		6.3600e-003	6.3600e-003	0.0000	268.6947	268.6947	0.0869	0.0000	270.8673
Total	**0.0426**	**0.2203**	**1.3814**	**3.0600e-003**	**0.0000**	**6.5000e-003**	**6.5000e-003**	**0.0000**	**6.3600e-003**	**6.3600e-003**	**0.0000**	**268.6947**	**268.6947**	**0.0869**	**0.0000**	**270.8673**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 39 Day Equipment - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3957	3.0135	2.8618	0.0112		0.1056	0.1056		0.1027	0.1027	0.0000	1,125.3123	1,125.3123	0.0629	0.0000	1,126.8842
Total	**0.3957**	**3.0135**	**2.8618**	**0.0112**	**0.0000**	**0.1056**	**0.1056**	**0.0000**	**0.1027**	**0.1027**	**0.0000**	**1,125.3123**	**1,125.3123**	**0.0629**	**0.0000**	**1,126.8842**

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	3.0000e-004	0.0174	3.7000e-003	8.0000e-005	2.4100e-003	1.7000e-004	2.5700e-003	6.6000e-004	1.6000e-004	8.2000e-004	0.0000	7.7639	7.7639	3.0000e-005	1.2200e-003	8.1285
Vendor	8.0000e-005	3.2100e-003	1.0000e-003	1.0000e-005	4.7000e-004	2.0000e-005	4.9000e-004	1.4000e-004	2.0000e-005	1.5000e-004	0.0000	1.3530	1.3530	1.0000e-005	2.0000e-004	1.4135
Worker	0.0148	0.0102	0.1277	4.1000e-004	0.0485	2.3000e-004	0.0487	0.0129	2.1000e-004	0.0131	0.0000	37.1479	37.1479	8.5000e-004	9.4000e-004	37.4483
Total	**0.0152**	**0.0308**	**0.1324**	**5.0000e-004**	**0.0514**	**4.2000e-004**	**0.0518**	**0.0137**	**3.9000e-004**	**0.0141**	**0.0000**	**46.2648**	**46.2648**	**8.9000e-004**	**2.3600e-003**	**46.9902**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1865	1.2613	5.2708	0.0112		0.0482	0.0482		0.0456	0.0456	0.0000	1,125.3110	1,125.3110	0.0629	0.0000	1,126.8828
Total	**0.1865**	**1.2613**	**5.2708**	**0.0112**	**0.0000**	**0.0482**	**0.0482**	**0.0000**	**0.0456**	**0.0456**	**0.0000**	**1,125.3110**	**1,125.3110**	**0.0629**	**0.0000**	**1,126.8828**

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	3.0000e-004	0.0174	3.7000e-003	8.0000e-005	2.4100e-003	1.7000e-004	2.5700e-003	6.6000e-004	1.6000e-004	8.2000e-004	0.0000	7.7639	7.7639	3.0000e-005	1.2200e-003	8.1285
Vendor	8.0000e-005	3.2100e-003	1.0000e-003	1.0000e-005	4.7000e-004	2.0000e-005	4.9000e-004	1.4000e-004	2.0000e-005	1.5000e-004	0.0000	1.3530	1.3530	1.0000e-005	2.0000e-004	1.4135
Worker	0.0148	0.0102	0.1277	4.1000e-004	0.0485	2.3000e-004	0.0487	0.0129	2.1000e-004	0.0131	0.0000	37.1479	37.1479	8.5000e-004	9.4000e-004	37.4483
Total	**0.0152**	**0.0308**	**0.1324**	**5.0000e-004**	**0.0514**	**4.2000e-004**	**0.0518**	**0.0137**	**3.9000e-004**	**0.0141**	**0.0000**	**46.2648**	**46.2648**	**8.9000e-004**	**2.3600e-003**	**46.9902**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 22 Day Equipment - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.0800e-003	0.0273	0.0267	1.1000e-004		9.8000e-004	9.8000e-004		9.0000e-004	9.0000e-004	0.0000	9.5348	9.5348	3.0800e-003	0.0000	9.6119
Total	**4.0800e-003**	**0.0273**	**0.0267**	**1.1000e-004**	**0.0000**	**9.8000e-004**	**9.8000e-004**	**0.0000**	**9.0000e-004**	**9.0000e-004**	**0.0000**	**9.5348**	**9.5348**	**3.0800e-003**	**0.0000**	**9.6119**

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	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
Total	**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**

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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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3300e-003	5.7500e-003	0.0487	1.1000e-004		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	9.5348	9.5348	3.0800e-003	0.0000	9.6119
Total	**1.3300e-003**	**5.7500e-003**	**0.0487**	**1.1000e-004**	**0.0000**	**1.8000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**1.8000e-004**	**0.0000**	**9.5348**	**9.5348**	**3.0800e-003**	**0.0000**	**9.6119**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 97 Day Equipment - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4848	3.7599	5.3199	0.0248		0.1376	0.1376		0.1266	0.1266	0.0000	2,171.9516	2,171.9516	0.7025	0.0000	2,189.5129
Total	**0.4848**	**3.7599**	**5.3199**	**0.0248**	**0.0000**	**0.1376**	**0.1376**	**0.0000**	**0.1266**	**0.1266**	**0.0000**	**2,171.9516**	**2,171.9516**	**0.7025**	**0.0000**	**2,189.5129**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3440	1.7804	11.1664	0.0248		0.0525	0.0525		0.0514	0.0514	0.0000	2,171.9490	2,171.9490	0.7025	0.0000	2,189.5103
Total	**0.3440**	**1.7804**	**11.1664**	**0.0248**	**0.0000**	**0.0525**	**0.0525**	**0.0000**	**0.0514**	**0.0514**	**0.0000**	**2,171.9490**	**2,171.9490**	**0.7025**	**0.0000**	**2,189.5103**

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	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 217 Day Equipment - 2024

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0158	15.5967	15.2939	0.0605		0.5420	0.5420		0.5258	0.5258	0.0000	6,123.2339	6,123.2339	0.3348	0.0000	6,131.6029
Total	**2.0158**	**15.5967**	**15.2939**	**0.0605**	**0.0000**	**0.5420**	**0.5420**	**0.0000**	**0.5258**	**0.5258**	**0.0000**	**6,123.2339**	**6,123.2339**	**0.3348**	**0.0000**	**6,131.6029**

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	7.5000e-004	0.0442	9.3900e-003	2.1000e-004	6.1100e-003	4.3000e-004	6.5400e-003	1.6800e-003	4.1000e-004	2.0900e-003	0.0000	19.7274	19.7274	8.0000e-005	3.1000e-003	20.6539
Vendor	4.5000e-004	0.0179	5.5800e-003	8.0000e-005	2.6000e-003	1.1000e-004	2.7200e-003	7.5000e-004	1.1000e-004	8.6000e-004	0.0000	7.5282	7.5282	3.0000e-005	1.1300e-003	7.8647
Worker	0.0822	0.0566	0.7107	2.2500e-003	0.2698	1.2900e-003	0.2710	0.0717	1.1900e-003	0.0729	0.0000	206.6946	206.6946	4.7400e-003	5.2100e-003	208.3660
Total	**0.0834**	**0.1187**	**0.7256**	**2.5400e-003**	**0.2785**	**1.8300e-003**	**0.2803**	**0.0741**	**1.7100e-003**	**0.0758**	**0.0000**	**233.9502**	**233.9502**	**4.8500e-003**	**9.4400e-003**	**236.8846**

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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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0056	6.2811	28.2288	0.0605		0.2658	0.2658		0.2515	0.2515	0.0000	6,123.2266	6,123.2266	0.3348	0.0000	6,131.5956
Total	**1.0056**	**6.2811**	**28.2288**	**0.0605**	**0.0000**	**0.2658**	**0.2658**	**0.0000**	**0.2515**	**0.2515**	**0.0000**	**6,123.2266**	**6,123.2266**	**0.3348**	**0.0000**	**6,131.5956**

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	7.5000e-004	0.0442	9.3900e-003	2.1000e-004	6.1100e-003	4.3000e-004	6.5400e-003	1.6800e-003	4.1000e-004	2.0900e-003	0.0000	19.7274	19.7274	8.0000e-005	3.1000e-003	20.6539
Vendor	4.5000e-004	0.0179	5.5800e-003	8.0000e-005	2.6000e-003	1.1000e-004	2.7200e-003	7.5000e-004	1.1000e-004	8.6000e-004	0.0000	7.5282	7.5282	3.0000e-005	1.1300e-003	7.8647
Worker	0.0822	0.0566	0.7107	2.2500e-003	0.2698	1.2900e-003	0.2710	0.0717	1.1900e-003	0.0729	0.0000	206.6946	206.6946	4.7400e-003	5.2100e-003	208.3660
Total	**0.0834**	**0.1187**	**0.7256**	**2.5400e-003**	**0.2785**	**1.8300e-003**	**0.2803**	**0.0741**	**1.7100e-003**	**0.0758**	**0.0000**	**233.9502**	**233.9502**	**4.8500e-003**	**9.4400e-003**	**236.8846**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Treatment Area 3

San Joaquin Valley Unified APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2025
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Milepost 230 Liner Raise Project. SJVAPCD. Treatment Area 3.

Land Use - 24 sites centered around MP 230.75 and 30 sites centered around MP 231.30. 0.75 mile embankment repair and raise 0.8 mile liner.

Construction Phase - Construction activities would begin Spring 2024.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment based on information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment based on information from applicant.

Trips and VMT - Updated trips per information from applicant. 100 personal trucks and haul trucks based on maximum number of trips for Treatment Area 3. Added two water trucks to vendor trips.

On-road Fugitive Dust - Assume 99% paved.

Grading - revised

Construction Off-road Equipment Mitigation - Water twice daily and maintain vehicle speeds of 15 mph on unpaved roads. Use of Tier 4 Final equipment for equipment greater than 75 HP.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	30.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	2.00	4.00
tblConstructionPhase	NumDays	2.00	12.00
tblConstructionPhase	NumDays	2.00	39.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDays	2.00	22.00
tblConstructionPhase	NumDays	2.00	97.00
tblConstructionPhase	NumDays	2.00	217.00
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	HorsePower	221.00	750.00
tblOffRoadEquipment	HorsePower	221.00	750.00
tblOffRoadEquipment	HorsePower	9.00	25.00
tblOffRoadEquipment	HorsePower	85.00	25.00
tblOffRoadEquipment	HorsePower	89.00	120.00
tblOffRoadEquipment	HorsePower	89.00	120.00
tblOffRoadEquipment	HorsePower	84.00	750.00
tblOffRoadEquipment	HorsePower	84.00	750.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	65.00	50.00
tblOffRoadEquipment	HorsePower	65.00	50.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	10.00
tblOffRoadEquipment	PhaseName		39 Day Equipment

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tblOffRoadEquipment	PhaseName		217 Day Equipment
tblOffRoadEquipment	PhaseName		39 Day Equipment
tblOffRoadEquipment	PhaseName		217 Day Equipment
tblOffRoadEquipment	PhaseName		39 Day Equipment
tblOffRoadEquipment	PhaseName		217 Day Equipment
tblOffRoadEquipment	PhaseName		39 Day Equipment
tblOffRoadEquipment	PhaseName		217 Day Equipment
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	281.00
tblTripsAndVMT	HaulingTripNumber	0.00	714.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	63.00	0.00
tblTripsAndVMT	WorkerTripNumber	88.00	200.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	63.00	0.00
tblTripsAndVMT	WorkerTripNumber	88.00	200.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2024	31.5242	236.0374	266.8367	1.1223	2.7054	8.3637	11.0691	0.7192	7.9791	8.6983	0.0000	116,731.4604	116,731.4604	19.8785	0.1309	117,267.4270
Maximum	**31.5242**	**236.0374**	**266.8367**	**1.1223**	**2.7054**	**8.3637**	**11.0691**	**0.7192**	**7.9791**	**8.6983**	**0.0000**	**116,731.4604**	**116,731.4604**	**19.8785**	**0.1309**	**117,267.4270**

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	lb/day										lb/day					
2024	17.6458	103.4069	512.9209	1.1223	2.7054	3.5905	6.2959	0.7192	3.4335	4.1526	0.0000	116,731.4603	116,731.4603	19.8785	0.1309	117,267.4269
Maximum	**17.6458**	**103.4069**	**512.9209**	**1.1223**	**2.7054**	**3.5905**	**6.2959**	**0.7192**	**3.4335**	**4.1526**	**0.0000**	**116,731.4603**	**116,731.4603**	**19.8785**	**0.1309**	**117,267.4269**

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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	N20	CO2e
Percent Reduction	44.02	56.19	-92.22	0.00	0.00	57.07	43.12	0.00	56.97	52.26	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	4 Day Equipment	Grading	1/1/2024	1/4/2024	5	4	
2	12 Day Equipment	Grading	1/1/2024	1/16/2024	5	12	
3	39 Day Equipment	Grading	1/1/2024	2/22/2024	5	39	
4	22 Day Equipment	Grading	2/23/2024	3/25/2024	5	22	
5	97 Day Equipment	Grading	2/23/2024	7/8/2024	5	97	
6	217 Day Equipment	Grading	2/23/2024	12/23/2024	5	217	

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)

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OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
4 Day Equipment	Off-Highway Trucks	1	8.00	300	0.38
12 Day Equipment	Bore/Drill Rigs	15	8.00	750	0.50
12 Day Equipment	Skid Steer Loaders	10	8.00	50	0.37
39 Day Equipment	Cement and Mortar Mixers	10	8.00	25	0.56
39 Day Equipment	Forklifts	3	8.00	120	0.20
39 Day Equipment	Generator Sets	10	8.00	750	0.74
39 Day Equipment	Other Construction Equipment	10	8.00	172	0.42
22 Day Equipment	Off-Highway Trucks	1	8.00	300	0.38
97 Day Equipment	Bore/Drill Rigs	15	8.00	750	0.50
97 Day Equipment	Skid Steer Loaders	10	8.00	50	0.37
217 Day Equipment	Crushing/Proc. Equipment	10	8.00	25	0.78
217 Day Equipment	Forklifts	3	8.00	120	0.20
217 Day Equipment	Generator Sets	10	8.00	750	0.74
217 Day Equipment	Other Construction Equipment	10	8.00	172	0.42

Trips and VMT

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
4 Day Equipment	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
12 Day Equipment	25	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
39 Day Equipment	35	200.00	4.00	281.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
22 Day Equipment	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
97 Day Equipment	25	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
217 Day Equipment	35	200.00	4.00	714.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 4 Day Equipment - 2024

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3709	2.4835	2.4255	9.8700e-003		0.0894	0.0894		0.0823	0.0823		955.4854	955.4854	0.3090		963.2110
Total	**0.3709**	**2.4835**	**2.4255**	**9.8700e-003**	**0.0000**	**0.0894**	**0.0894**	**0.0000**	**0.0823**	**0.0823**		**955.4854**	**955.4854**	**0.3090**		**963.2110**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1206	0.5228	4.4234	9.8700e-003		0.0161	0.0161		0.0161	0.0161	0.0000	955.4854	955.4854	0.3090		963.2110
Total	**0.1206**	**0.5228**	**4.4234**	**9.8700e-003**	**0.0000**	**0.0161**	**0.0161**	**0.0000**	**0.0161**	**0.0161**	**0.0000**	**955.4854**	**955.4854**	**0.3090**		**963.2110**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 12 Day Equipment - 2024

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	9.9958	77.5234	109.6883	0.5103		2.8374	2.8374		2.6104	2.6104		49,364.2639	49,364.2639	15.9654		49,763.3990
Total	**9.9958**	**77.5234**	**109.6883**	**0.5103**	**0.0000**	**2.8374**	**2.8374**	**0.0000**	**2.6104**	**2.6104**		**49,364.2639**	**49,364.2639**	**15.9654**		**49,763.3990**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	7.0927	36.7100	230.2347	0.5103		1.0831	1.0831		1.0599	1.0599	0.0000	49,364.2639	49,364.2639	15.9654		49,763.3990
Total	**7.0927**	**36.7100**	**230.2347**	**0.5103**	**0.0000**	**1.0831**	**1.0831**	**0.0000**	**1.0599**	**1.0599**	**0.0000**	**49,364.2639**	**49,364.2639**	**15.9654**		**49,763.3990**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 39 Day Equipment - 2024

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	20.2900	154.5366	146.7575	0.5747		5.4153	5.4153		5.2662	5.2662		63,612.5397	63,612.5397	3.5541		63,701.3921
Total	**20.2900**	**154.5366**	**146.7575**	**0.5747**	**0.0000**	**5.4153**	**5.4153**	**0.0000**	**5.2662**	**5.2662**		**63,612.5397**	**63,612.5397**	**3.5541**		**63,701.3921**

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	lb/day										lb/day					
Hauling	0.0157	0.8513	0.1880	4.1400e-003	0.1263	8.6300e-003	0.1349	0.0346	8.2600e-003	0.0429		438.6374	438.6374	1.8600e-003	0.0690	459.2375
Vendor	4.2800e-003	0.1575	0.0507	7.2000e-004	0.0245	1.0400e-003	0.0256	7.0600e-003	1.0000e-003	8.0600e-003		76.4145	76.4145	3.3000e-004	0.0114	79.8280
Worker	0.8476	0.4851	7.7267	0.0226	2.5546	0.0119	2.5665	0.6775	0.0110	0.6884		2,284.1195	2,284.1195	0.0478	0.0505	2,300.3594
Total	**0.8675**	**1.4939**	**7.9653**	**0.0275**	**2.7054**	**0.0216**	**2.7270**	**0.7192**	**0.0202**	**0.7394**		**2,799.1714**	**2,799.1714**	**0.0500**	**0.1309**	**2,839.4249**

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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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	9.5649	64.6802	270.2975	0.5747		2.4698	2.4698		2.3372	2.3372	0.0000	63,612.5396	63,612.5396	3.5541		63,701.3921
Total	**9.5649**	**64.6802**	**270.2975**	**0.5747**	**0.0000**	**2.4698**	**2.4698**	**0.0000**	**2.3372**	**2.3372**	**0.0000**	**63,612.5396**	**63,612.5396**	**3.5541**		**63,701.3921**

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	lb/day										lb/day					
Hauling	0.0157	0.8513	0.1880	4.1400e-003	0.1263	8.6300e-003	0.1349	0.0346	8.2600e-003	0.0429		438.6374	438.6374	1.8600e-003	0.0690	459.2375
Vendor	4.2800e-003	0.1575	0.0507	7.2000e-004	0.0245	1.0400e-003	0.0256	7.0600e-003	1.0000e-003	8.0600e-003		76.4145	76.4145	3.3000e-004	0.0114	79.8280
Worker	0.8476	0.4851	7.7267	0.0226	2.5546	0.0119	2.5665	0.6775	0.0110	0.6884		2,284.1195	2,284.1195	0.0478	0.0505	2,300.3594
Total	**0.8675**	**1.4939**	**7.9653**	**0.0275**	**2.7054**	**0.0216**	**2.7270**	**0.7192**	**0.0202**	**0.7394**		**2,799.1714**	**2,799.1714**	**0.0500**	**0.1309**	**2,839.4249**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 22 Day Equipment - 2024

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3709	2.4835	2.4255	9.8700e-003		0.0894	0.0894		0.0823	0.0823		955.4854	955.4854	0.3090		963.2110
Total	**0.3709**	**2.4835**	**2.4255**	**9.8700e-003**	**0.0000**	**0.0894**	**0.0894**	**0.0000**	**0.0823**	**0.0823**		**955.4854**	**955.4854**	**0.3090**		**963.2110**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1206	0.5228	4.4234	9.8700e-003		0.0161	0.0161		0.0161	0.0161	0.0000	955.4854	955.4854	0.3090		963.2110
Total	**0.1206**	**0.5228**	**4.4234**	**9.8700e-003**	**0.0000**	**0.0161**	**0.0161**	**0.0000**	**0.0161**	**0.0161**	**0.0000**	**955.4854**	**955.4854**	**0.3090**		**963.2110**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 97 Day Equipment - 2024

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	9.9958	77.5234	109.6883	0.5103		2.8374	2.8374		2.6104	2.6104		49,364.2639	49,364.2639	15.9654		49,763.3990
Total	**9.9958**	**77.5234**	**109.6883**	**0.5103**	**0.0000**	**2.8374**	**2.8374**	**0.0000**	**2.6104**	**2.6104**		**49,364.2639**	**49,364.2639**	**15.9654**		**49,763.3990**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	7.0927	36.7100	230.2347	0.5103		1.0831	1.0831		1.0599	1.0599	0.0000	49,364.2639	49,364.2639	15.9654		49,763.3990
Total	**7.0927**	**36.7100**	**230.2347**	**0.5103**	**0.0000**	**1.0831**	**1.0831**	**0.0000**	**1.0599**	**1.0599**	**0.0000**	**49,364.2639**	**49,364.2639**	**15.9654**		**49,763.3990**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 217 Day Equipment - 2024

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	18.5789	143.7488	140.9574	0.5574		4.9955	4.9955		4.8464	4.8464		62,209.3087	62,209.3087	3.4010		62,294.3339
Total	**18.5789**	**143.7488**	**140.9574**	**0.5574**	**0.0000**	**4.9955**	**4.9955**	**0.0000**	**4.8464**	**4.8464**		**62,209.3087**	**62,209.3087**	**3.4010**		**62,294.3339**

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	lb/day										lb/day					
Hauling	7.1700e-003	0.3888	0.0858	1.8900e-003	0.0577	3.9400e-003	0.0616	0.0158	3.7700e-003	0.0196		200.3099	200.3099	8.5000e-004	0.0315	209.7172
Vendor	4.2800e-003	0.1575	0.0507	7.2000e-004	0.0245	1.0400e-003	0.0256	7.0600e-003	1.0000e-003	8.0600e-003		76.4145	76.4145	3.3000e-004	0.0114	79.8280
Worker	0.8476	0.4851	7.7267	0.0226	2.5546	0.0119	2.5665	0.6775	0.0110	0.6884		2,284.1195	2,284.1195	0.0478	0.0505	2,300.3594
Total	**0.8590**	**1.0313**	**7.8632**	**0.0252**	**2.6368**	**0.0169**	**2.6537**	**0.7003**	**0.0158**	**0.7161**		**2,560.8439**	**2,560.8439**	**0.0490**	**0.0934**	**2,589.9046**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	9.2686	57.8900	260.1738	0.5574		2.4500	2.4500		2.3175	2.3175	0.0000	62,209.3086	62,209.3086	3.4010		62,294.3338
Total	**9.2686**	**57.8900**	**260.1738**	**0.5574**	**0.0000**	**2.4500**	**2.4500**	**0.0000**	**2.3175**	**2.3175**	**0.0000**	**62,209.3086**	**62,209.3086**	**3.4010**		**62,294.3338**

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	lb/day										lb/day					
Hauling	7.1700e-003	0.3888	0.0858	1.8900e-003	0.0577	3.9400e-003	0.0616	0.0158	3.7700e-003	0.0196		200.3099	200.3099	8.5000e-004	0.0315	209.7172
Vendor	4.2800e-003	0.1575	0.0507	7.2000e-004	0.0245	1.0400e-003	0.0256	7.0600e-003	1.0000e-003	8.0600e-003		76.4145	76.4145	3.3000e-004	0.0114	79.8280
Worker	0.8476	0.4851	7.7267	0.0226	2.5546	0.0119	2.5665	0.6775	0.0110	0.6884		2,284.1195	2,284.1195	0.0478	0.0505	2,300.3594
Total	**0.8590**	**1.0313**	**7.8632**	**0.0252**	**2.6368**	**0.0169**	**2.6537**	**0.7003**	**0.0158**	**0.7161**		**2,560.8439**	**2,560.8439**	**0.0490**	**0.0934**	**2,589.9046**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Geotechnical Investigations and Rehab Work

San Joaquin Valley Unified APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.00	43,560.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2023
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Milepost 230 Liner Raise Project. SJVAPCD.

Land Use - 24 sites centered around MP 230.75 and 30 sites centered around MP 231.30.

Construction Phase - Geotechnical investigations would begin 2022, lasting 6 weeks.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Updated equipment per information from applicant.

Off-road Equipment - Based on information from applicant.

Trips and VMT - Updated trips per information from applicant. Haul trips based on CPT and trenching activities. 20 workers during repair and 5 workers for geotech.

On-road Fugitive Dust - Assume 99% paved.

Construction Off-road Equipment Mitigation - Water twice daily and maintain vehicle speeds of 15 mph on unpaved roads. Use of Tier 4 Final equipment.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	2.00	3.00
tblConstructionPhase	NumDays	2.00	12.00
tblConstructionPhase	NumDays	2.00	15.00
tblConstructionPhase	NumDays	2.00	18.00
tblConstructionPhase	NumDays	2.00	60.00
tblConstructionPhase	NumDays	2.00	75.00
tblLandUse	LandUseSquareFeet	0.00	43,560.00
tblLandUse	LotAcreage	0.00	1.00
tblOffRoadEquipment	HorsePower	85.00	25.00
tblOffRoadEquipment	HorsePower	402.00	250.00
tblOffRoadEquipment	HorsePower	402.00	500.00
tblOffRoadEquipment	HorsePower	130.00	230.00

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tblOffRoadEquipment	HorsePower	80.00	120.00
tblOffRoadEquipment	HorsePower	402.00	500.00
tblOffRoadEquipment	HorsePower	402.00	750.00
tblOffRoadEquipment	HorsePower	402.00	350.00
tblOffRoadEquipment	HorsePower	402.00	250.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	HaulingPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	VendorPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblOnRoadDust	WorkerPercentPave	100.00	99.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	14.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	38.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	5.00	0.00
tblTripsAndVMT	WorkerTripNumber	50.00	40.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00
tblTripsAndVMT	WorkerTripNumber	3.00	10.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2022	19.3091	155.8596	124.8421	0.4111	0.5109	6.0781	6.5890	0.1355	5.5918	5.7273	0.0000	39,818.9359	39,818.9359	12.7506	0.0134	40,141.6983
Maximum	**19.3091**	**155.8596**	**124.8421**	**0.4111**	**0.5109**	**6.0781**	**6.5890**	**0.1355**	**5.5918**	**5.7273**	**0.0000**	**39,818.9359**	**39,818.9359**	**12.7506**	**0.0134**	**40,141.6983**

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	lb/day										lb/day					
2022	18.9018	152.0655	126.6475	0.4111	0.5109	5.9268	6.4377	0.1355	5.4542	5.5897	0.0000	39,818.9359	39,818.9359	12.7506	0.0134	40,141.6983
Maximum	**18.9018**	**152.0655**	**126.6475**	**0.4111**	**0.5109**	**5.9268**	**6.4377**	**0.1355**	**5.4542**	**5.5897**	**0.0000**	**39,818.9359**	**39,818.9359**	**12.7506**	**0.0134**	**40,141.6983**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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	N20	CO2e
Percent Reduction	2.11	2.43	-1.45	0.00	0.00	2.49	2.30	0.00	2.46	2.40	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	3 Day Equipment	Grading	6/14/2022	6/16/2022	5	3	
2	2 Day Equipment	Grading	6/14/2022	6/15/2022	5	2	
3	12 Day Equipment	Grading	3/1/2022	3/16/2022	5	12	
4	15 Day Equipment	Grading	3/1/2022	3/21/2022	5	15	
5	18 Day Equipment	Grading	6/14/2022	7/7/2022	5	18	
6	60 Day Equipment	Grading	3/1/2022	5/23/2022	5	60	
7	75 Day Equipment	Grading	3/1/2022	6/13/2022	5	75	

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)

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
3 Day Equipment	Crushing/Proc. Equipment	1	8.00	25	0.78
3 Day Equipment	Off-Highway Trucks	9	8.00	250	0.38
3 Day Equipment	Off-Highway Trucks	2	8.00	500	0.38
3 Day Equipment	Pavers	1	8.00	230	0.42
3 Day Equipment	Rollers	2	8.00	120	0.38
2 Day Equipment	Off-Highway Trucks	1	8.00	500	0.38
12 Day Equipment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
15 Day Equipment	Bore/Drill Rigs	2	8.00	221	0.50
18 Day Equipment	Off-Highway Trucks	6	8.00	750	0.38
18 Day Equipment	Off-Highway Trucks	2	8.00	350	0.38
18 Day Equipment	Off-Highway Trucks	12	8.00	250	0.38
60 Day Equipment	Bore/Drill Rigs	1	8.00	221	0.50
75 Day Equipment	Other Construction Equipment	1	8.00	172	0.42

Trips and VMT

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
3 Day Equipment	15	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
2 Day Equipment	1	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
12 Day Equipment	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
15 Day Equipment	2	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
18 Day Equipment	20	40.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
60 Day Equipment	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
75 Day Equipment	1	10.00	0.00	14.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 3 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	5.2876	42.7967	34.9404	0.1222		1.7152	1.7152		1.5780	1.5780		11,830.2782	11,830.2782	3.8262		11,925.9320
Total	**5.2876**	**42.7967**	**34.9404**	**0.1222**	**0.0000**	**1.7152**	**1.7152**	**0.0000**	**1.5780**	**1.5780**		**11,830.2782**	**11,830.2782**	**3.8262**		**11,925.9320**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	5.1903	41.9352	35.5490	0.1222		1.6807	1.6807		1.5467	1.5467	0.0000	11,830.2782	11,830.2782	3.8262		11,925.9320
Total	**5.1903**	**41.9352**	**35.5490**	**0.1222**	**0.0000**	**1.6807**	**1.6807**	**0.0000**	**1.5467**	**1.5467**	**0.0000**	**11,830.2782**	**11,830.2782**	**3.8262**		**11,925.9320**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 2 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6572	4.9922	4.1775	0.0164		0.1815	0.1815		0.1670	0.1670		1,590.7777	1,590.7777	0.5145		1,603.6400
Total	**0.6572**	**4.9922**	**4.1775**	**0.0164**	**0.0000**	**0.1815**	**0.1815**	**0.0000**	**0.1670**	**0.1670**		**1,590.7777**	**1,590.7777**	**0.5145**		**1,603.6400**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.6436	4.8686	4.2734	0.0164		0.1769	0.1769		0.1628	0.1628	0.0000	1,590.7777	1,590.7777	0.5145		1,603.6400
Total	**0.6436**	**4.8686**	**4.2734**	**0.0164**	**0.0000**	**0.1769**	**0.1769**	**0.0000**	**0.1628**	**0.1628**	**0.0000**	**1,590.7777**	**1,590.7777**	**0.5145**		**1,603.6400**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 12 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1647	1.6756	2.2379	3.1100e-003		0.0901	0.0901		0.0829	0.0829		301.2390	301.2390	0.0974		303.6746
Total	**0.1647**	**1.6756**	**2.2379**	**3.1100e-003**	**0.0000**	**0.0901**	**0.0901**	**0.0000**	**0.0829**	**0.0829**		**301.2390**	**301.2390**	**0.0974**		**303.6746**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1647	1.6756	2.2379	3.1100e-003		0.0901	0.0901		0.0829	0.0829	0.0000	301.2390	301.2390	0.0974		303.6746
Total	**0.1647**	**1.6756**	**2.2379**	**3.1100e-003**	**0.0000**	**0.0901**	**0.0901**	**0.0000**	**0.0829**	**0.0829**	**0.0000**	**301.2390**	**301.2390**	**0.0974**		**303.6746**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 15 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4482	4.5328	4.0823	0.0189		0.1455	0.1455		0.1339	0.1339		1,827.1217	1,827.1217	0.5909		1,841.8949
Total	**0.4482**	**4.5328**	**4.0823**	**0.0189**	**0.0000**	**0.1455**	**0.1455**	**0.0000**	**0.1339**	**0.1339**		**1,827.1217**	**1,827.1217**	**0.5909**		**1,841.8949**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3775	3.3714	5.5649	0.0189		0.1078	0.1078		0.1000	0.1000	0.0000	1,827.1217	1,827.1217	0.5909		1,841.8949
Total	**0.3775**	**3.3714**	**5.5649**	**0.0189**	**0.0000**	**0.1078**	**0.1078**	**0.0000**	**0.1000**	**0.1000**	**0.0000**	**1,827.1217**	**1,827.1217**	**0.5909**		**1,841.8949**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 18 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	13.1757	107.9204	84.2040	0.2682		4.1787	4.1787		3.8444	3.8444		25,964.0364	25,964.0364	8.3973		26,173.9688
Total	**13.1757**	**107.9204**	**84.2040**	**0.2682**	**0.0000**	**4.1787**	**4.1787**	**0.0000**	**3.8444**	**3.8444**		**25,964.0364**	**25,964.0364**	**8.3973**		**26,173.9688**

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	lb/day										lb/day					
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
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
Worker	0.1886	0.1503	1.5201	4.2900e-003	0.5109	2.6800e-003	0.5136	0.1355	2.4700e-003	0.1380		433.8436	433.8436	0.0126	0.0134	438.1576
Total	**0.1886**	**0.1503**	**1.5201**	**4.2900e-003**	**0.5109**	**2.6800e-003**	**0.5136**	**0.1355**	**2.4700e-003**	**0.1380**		**433.8436**	**433.8436**	**0.0126**	**0.0134**	**438.1576**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	12.8793	105.1114	85.3051	0.2682		4.0665	4.0665		3.7422	3.7422	0.0000	25,964.0364	25,964.0364	8.3973		26,173.9688
Total	**12.8793**	**105.1114**	**85.3051**	**0.2682**	**0.0000**	**4.0665**	**4.0665**	**0.0000**	**3.7422**	**3.7422**	**0.0000**	**25,964.0364**	**25,964.0364**	**8.3973**		**26,173.9688**

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	lb/day										lb/day					
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
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
Worker	0.1886	0.1503	1.5201	4.2900e-003	0.5109	2.6800e-003	0.5136	0.1355	2.4700e-003	0.1380		433.8436	433.8436	0.0126	0.0134	438.1576
Total	**0.1886**	**0.1503**	**1.5201**	**4.2900e-003**	**0.5109**	**2.6800e-003**	**0.5136**	**0.1355**	**2.4700e-003**	**0.1380**		**433.8436**	**433.8436**	**0.0126**	**0.0134**	**438.1576**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 60 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.2241	2.2664	2.0411	9.4400e-003		0.0728	0.0728		0.0669	0.0669		913.5608	913.5608	0.2955		920.9474
Total	**0.2241**	**2.2664**	**2.0411**	**9.4400e-003**	**0.0000**	**0.0728**	**0.0728**	**0.0000**	**0.0669**	**0.0669**		**913.5608**	**913.5608**	**0.2955**		**920.9474**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.1887	1.6857	2.7825	9.4400e-003		0.0539	0.0539		0.0500	0.0500	0.0000	913.5608	913.5608	0.2955		920.9474
Total	**0.1887**	**1.6857**	**2.7825**	**9.4400e-003**	**0.0000**	**0.0539**	**0.0539**	**0.0000**	**0.0500**	**0.0500**	**0.0000**	**913.5608**	**913.5608**	**0.2955**		**920.9474**

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	lb/day										lb/day					
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
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
Worker	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
Total	**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**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.8 75 Day Equipment - 2022

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3760	3.8151	4.0203	6.1800e-003		0.1991	0.1991		0.1831	0.1831		598.3313	598.3313	0.1935		603.1691
Total	**0.3760**	**3.8151**	**4.0203**	**6.1800e-003**	**0.0000**	**0.1991**	**0.1991**	**0.0000**	**0.1831**	**0.1831**		**598.3313**	**598.3313**	**0.1935**		**603.1691**

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	lb/day										lb/day					
Hauling	6.9000e-004	0.0290	5.5200e-003	1.1000e-004	3.2700e-003	2.9000e-004	3.5600e-003	9.0000e-004	2.8000e-004	1.1700e-003		12.0818	12.0818	6.0000e-005	1.9000e-003	12.6496
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
Worker	0.0472	0.0376	0.3800	1.0700e-003	0.1277	6.7000e-004	0.1284	0.0339	6.2000e-004	0.0345		108.4609	108.4609	3.1600e-003	3.3500e-003	109.5394
Total	**0.0478**	**0.0666**	**0.3856**	**1.1800e-003**	**0.1310**	**9.6000e-004**	**0.1320**	**0.0348**	**9.0000e-004**	**0.0357**		**120.5427**	**120.5427**	**3.2200e-003**	**5.2500e-003**	**122.1889**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3760	3.8151	4.0203	6.1800e-003		0.1991	0.1991		0.1831	0.1831	0.0000	598.3313	598.3313	0.1935		603.1691
Total	**0.3760**	**3.8151**	**4.0203**	**6.1800e-003**	**0.0000**	**0.1991**	**0.1991**	**0.0000**	**0.1831**	**0.1831**	**0.0000**	**598.3313**	**598.3313**	**0.1935**		**603.1691**

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	lb/day										lb/day					
Hauling	6.9000e-004	0.0290	5.5200e-003	1.1000e-004	3.2700e-003	2.9000e-004	3.5600e-003	9.0000e-004	2.8000e-004	1.1700e-003		12.0818	12.0818	6.0000e-005	1.9000e-003	12.6496
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
Worker	0.0472	0.0376	0.3800	1.0700e-003	0.1277	6.7000e-004	0.1284	0.0339	6.2000e-004	0.0345		108.4609	108.4609	3.1600e-003	3.3500e-003	109.5394
Total	**0.0478**	**0.0666**	**0.3856**	**1.1800e-003**	**0.1310**	**9.6000e-004**	**0.1320**	**0.0348**	**9.0000e-004**	**0.0357**		**120.5427**	**120.5427**	**3.2200e-003**	**5.2500e-003**	**122.1889**

Construction

Hours of Operation for Construction Equipment

Geotechnical Investigations	Equipment Type	Number of Equipment	Hours/day	Phase Duration	Hours of Equipmment Use	Phase Totals	MTCO2
3 Day Equipment	Crushing/Proc Equipment	1	8	3	24		
	Off-Highway Trucks	11	8	3	264		
	Pavers	1	8	3	24		
	Rollers	2	8	3	48		
	Total	**11**				**360**	**16.10**
2 Day Equipment							
	Off-Highway Trucks	1	8	2	16		
	Total	**1**				**16**	**1.44**
12 Day Equipment							
	Tractors/Loaders/Backhoes	1	8	12	96		
	Total	**1**				**96**	**1.64**
15 Day Equipment							
	Bore/Drill Rig	1	8	15	120		
	Total	**1**				**120**	**12.43**
18 Day Equipment							
	Off-Highway Trucks	20	8	18	2,880		
	Total	**20**				**2,880**	**211.99**
60 Day Equipment							
	Bore/Drill Rig	1	8	60	480		
	Total	**1**				**480**	**24.86**
75 Day Equipment							
	Other Construction Equipment	1	8	75	600		
	Total	**1**				**600**	**20.35**
					Total	**4,552**	

Construction Equipment Diesel Demand

Phase	Pieces of Equipment	Equipment CO2 (MT)		Kg/CO2/Gallon	Gallons
3 Day Equipment	11	16.10		10.21	1,576.73
2 Day Equipment	1	1.44		10.21	141.34
12 Day Equipment	1	1.64		10.21	160.60
15 Day Equipment	1	12.43		10.21	1,217.58
18 Day Equipment	20	211.99		10.21	20,762.74
60 Day Equipment	1	24.86		10.21	2,435.17
75 Day Equipment	1	20.35		10.21	1,993.62
	36	288.8183	**Total**		**28,287.79**

Construction Worker Gasoline Demand

Phase	Trips	Vehicle CO2 (MT)		Kg/CO2/Gallon	Gallons
3 Day Equipment	0	0.00		8.78	0.00
2 Day Equipment	0	0.00		8.78	0.00
12 Day Equipment	0	0.00		8.78	0.00
15 Day Equipment	0	0.00		8.78	0.00
18 Day Equipment	720	3.66		8.78	417.18
60 Day Equipment	0	0.00		8.78	0.00
75 Day Equipment	750	20.35		8.78	2,318.33
	1,470	24.02	**Total**		**2,735.50**

Construction Vendor Truck Diesel Demand

Phase	Trips	Vehicle CO2 (MT)		Kg/CO2/Gallon	Gallons
3 Day Equipment	0	0.00		10.21	0.00
2 Day Equipment	0	0.00		10.21	0.00
12 Day Equipment	0	0.00		10.21	0.00
15 Day Equipment	0	0.00		10.21	0.00
18 Day Equipment	0	0.00		10.21	0.00
60 Day Equipment	0	0.00		10.21	0.00
75 Day Equipment	0	0.00		10.21	0.00
			Total		**0.00**

Construction Haul Truck Diesel Demand

Phase	Trips	Vehicle CO2 (MT)		Kg/CO2/Gallon	Gallons
3 Day Equipment	0	0.00		10.21	0.00
2 Day Equipment	0	0.00		10.21	0.00
12 Day Equipment	0	0.00		10.21	0.00
15 Day Equipment	0	0.00		10.21	0.00
18 Day Equipment	0	0.00		10.21	0.00
60 Day Equipment	0	0.00		10.21	0.00
75 Day Equipment	14	0.41		10.21	40.24
	Total	**0.41**			**40.24**

Total Diesel	28,328.03
Total Gasoline	2,735.50
	31,063.53

California's Consumption of Petroleum Over Construction Period

		Start	End	
78,600,000	gallons per day	3/1/2022	7/7/2022	128 days
10,060,800,000.00				

Construction

Hours of Operation for Construction Equipment

Treatment Area 3	Equipment Type	Number of Equipment	Hours/day	Phase Duration	Hours of Equipmment Use	Phase Totals	MTCO2
4 Day Equipment	Off-Highway Trucks	1	8	4	32		
Total		**1**				**32**	**1.73**
12 Day Equipment	Bore/Drill Rig	15	8	12	1,440		
	Skid Steer Loaders	10	8	12	960		
Total		**25**				**2,400**	**268.70**
39 Day Equipment	Cement and Mortar Mixers	10	8	39	3,120		
	Forklifts	3	8	39	936		
	Generators	10	8	39	3,120		
	Other Construction Equipment	10	8	39	3,120		
Total		**33**				**10,296**	**1,125.31**
22 Day Equipment							
	Off-Highway Trucks	1	8	22	176		
Total		**1**				**176**	**9.53**
97 Day Equipment	Bore/Drill Rig	15	8	97	11,640		
	Skid Steer Loaders	10	8	97	7,760		
Total		**25**				**19,400**	**2,171.95**
217 Day Equipment	Crushing and Processing Equipment	10	8	217	17,360		
	Forklifts	3	8	217	5,208		
	Generators	10	8	217	17,360		
	Other Construction Equipment	10	8	217	17,360		
Total		**33**				**57,288**	**6,123.23**
Total		**0**					
					Total	**89,592**	

Construction Equipment Diesel Demand

Phase	Pieces of Equipment	Equipment CO2 (MT)	Kg/CO2/Gallon	Gallons
4 Day Equipment	1	1.73	10.21	169.79
12 Day Equipment	25	268.70	10.21	26,316.85
39 Day Equipment	33	1,125.31	10.21	110,216.68
22 Day Equipment	1	9.53	10.21	933.87
97 Day Equipment	25	2,171.95	10.21	212,727.87
217 Day Equipment	33	6,123.23	10.21	599,729.08
	118	9700.4612	**Total**	**950,094.14**

Construction Worker Gasoline Demand

Phase	Trips	Vehicle CO2 (MT)	Kg/CO2/Gallon	Gallons
3 Day Equipment	0	0.00	8.78	0.00
12 Day Equipment	0	0.00	8.78	0.00
39 Day Equipment	7,800	37.15	8.78	4,230.97
22 Day Equipment	0	0.00	8.78	0.00
97 Day Equipment	0	0.00	8.78	0.00
217 Day Equipment	43,400	206.69	8.78	23,541.53
	51,200	243.84	**Total**	**27,772.49**

Construction Vendor Truck Diesel Demand

Phase	Trips	Vehicle CO2 (MT)	Kg/CO2/Gallon	Gallons
4 Day Equipment	0	0.00	10.21	0.00
12 Day Equipment	0	0.00	10.21	0.00
39 Day Equipment	156	1.35	10.21	132.52
22 Day Equipment	0	0.00	10.21	0.00
97 Day Equipment	0	0.00	10.21	0.00
217 Day Equipment	868	7.53	10.21	737.34
	1,024	8.88	**Total**	**869.85**

Construction Haul Truck Diesel Demand

Phase	Trips	Vehicle CO2 (MT)	Kg/CO2/Gallon	Gallons
4 Day Equipment	0	0.00	10.21	0.00
12 Day Equipment	0	0.00	10.21	0.00
39 Day Equipment	281	7.76	10.21	760.42
22 Day Equipment	0	0.00	10.21	0.00
97 Day Equipment	0	0.00	10.21	0.00
217 Day Equipment	714	19.73	10.21	1,932.16
	995	27.49	**Total**	**2,692.59**

Total Diesel	953,656.58
Total Gasoline	27,772.49
	981,429.08

California's Consumption of Petroleum Over Construction Period

		Start	End	
78,600,000	gallons per day	1/1/2024	12/23/2024	357 days
28,060,200,000.00				