Initial Study/Mitigated Negative Declaration

Fairmont Sedimentation Plant Project

Los Angeles Department of Water and Power
Environmental Affairs
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CEQA Initial Study and Mitigated Negative Declaration

Fairmont Sedimentation Plant Project

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Acronyms and Abbreviations

APE	area of potential effects
AQMP	Air Quality Management Plan
AVAQMD	Antelope Valley Air Quality Management District
BMP	best management practice
BSA	Biological Study Area
BTR	Biological Technical Report
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CFGC	California Fish and Game Code
CH_4	methane
CMP	Congestion Management Program
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
CRHR	California Register of Historical Resources
CTP	Cottonwood Treatment Plant
CWA	Clean Water Act
dBA	A-weighed decibel
CY	cubic yards
EPA	U.S. Environmental Protection Agency
General Plan	Los Angeles County General Plan
GHG	greenhouse gas
I-5	Interstate 5
kWh	kilowatt-hour
LAA	Los Angeles Aqueduct
LAA1	First Los Angeles Aqueduct
LAA2	Second Los Angeles Aqueduct
LAAFP	Los Angeles Aqueduct Filtration Plant

LADWP	Los Angeles Department of Water and Power
MDAB	Mojave Desert Air Basin
MND	Mitigated Negative Declaration
NAAQS	National Ambient Air Quality Standards
N_2O	nitrous oxide
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	ozone
PCE	Passenger Car Equivalency
$PM_{2.5}$	fine particulate matter 2.5 microns or less in diameter
PM_{10}	respirable particulate matter 10 microns or less in diameter
ppb	parts per billion
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RWQCB	Regional Water Quality Control Board
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SEA	Significant Ecological Area
SO_X	sulfur oxides
SR	State Route
SUSMP	Standard Urban Stormwater Mitigation Plan
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
TOC	total organic carbon
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compounds
WEMO	West Mojave Plan

SECTION 1
PROJECT DESCRIPTION

1.1 OVERVIEW OF THE PROJECT

The Los Angeles Department of Water and Power (LADWP) is proposing to implement the Fairmont Sedimentation Plant Project (proposed project or project) to maintain the quality and reliability of the City of Los Angeles (City) potable water supply. The project would improve raw water quality through a reduction in sediment in the water delivered by the First and Second Los Angeles Aqueducts (LAA1 and LAA2) to the Los Angeles Aqueduct Filtration Plant (LAAFP), where the water receives additional treatment and disinfection before entering the City's potable water distribution system. The proposed sedimentation plant would utilize plate settler technology to increase the efficiency and effectiveness of the sediment removal process and minimize the plant's required footprint.

Currently, aqueduct water is treated in a two-step process at two separate locations along the LAA system (see Figure 1-1). The initial step includes pretreatment at the Cottonwood Treatment Plant (CTP) in the Owens Valley, California, through the addition of coagulants and flocculants (chemical additives that bond with and encourage the settlement of suspended particles present in the water) into LAA1, which aids in sediment particle settling as flow velocities decrease when the aqueduct empties into North Haiwee Reservoir, approximately 16 miles south of CTP. Although the coagulants and flocculants are added only to LAA1, this process also provides pretreatment for water carried in LAA2 because LAA2 originates at the south end of North Haiwee Reservoir, via the South Haiwee Reservoir Bypass Channel.

Final treatment of LAA1 and LAA2 water then occurs at the LAAFP, which is located within the LADWP Van Norman Complex in the Sylmar area of Los Angeles. The treatment process at the LAAFP involves ozonation, biological filtration, ultraviolet disinfection, and chlorination followed by chloramination, which provides residual disinfection within the potable water distribution system.

While this current two-step process has been successful in treating LAA water to meet water quality goals and regulatory requirements, it is approaching its operational limits. The sediment that has settled out in North Haiwee Reservoir as a result of several decades of the coagulation/flocculation process at CTP has contributed to periodically limiting hydraulic conditions where built-up sediment deposits have created restrictive channels in the reservoir. The continued utilization of North Haiwee Reservoir as a settling basin is not a sustainable long-term solution and creates the potential for substantially restricted flows through the LAAs.

In addition, although the CTP coagulation/flocculation process removes a substantial quantity of sediment, the amount of sediment in the LAA water after leaving North and South Haiwee Reservoirs can nonetheless sometimes overburden the capabilities of the treatment system at the LAAFP. This buildup of sediment can significantly reduce the efficiency, effectiveness, and operational flexibility of the plant in treating and delivering potable water to the City. Furthermore, LADWP has recently completed the Neenach Pump Station in the Antelope Valley, connecting LAA1 to the State Water Project (SWP) East Branch and enabling the transfer of SWP water to LAA1. SWP East Branch water may experience

Figure 1-1

Los Angeles Aqueduct System

elevated levels of sediment on occasion that could also contribute to reduced treatment capacity of the LAAFP.

1.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA) applies to proposed projects initiated by, funded by, or requiring discretionary approvals from state or local government agencies. The proposed sedimentation plant constitutes a project as defined by CEQA (California Public Resources Code Section 21000 et seq.). The CEQA Guidelines Section 15367 states that a lead agency is “the public agency which has the principal responsibility for carrying out or approving a project.” Therefore, as a municipal utility, LADWP is the lead agency responsible for compliance with CEQA for the proposed project.

As lead agency for the proposed project, LADWP must complete an environmental review to determine if implementation of the project would result in significant adverse environmental impacts. To fulfill the purpose of CEQA, an Initial Study has been prepared to assist in making that determination. Based on the nature and scope of the proposed project and the evaluation contained in the Initial Study environmental checklist (contained in Section 3), LADWP has concluded that a Mitigated Negative Declaration (MND) is the proper level of environmental documentation for this project. The Initial Study shows that impacts caused by the proposed project are either less than significant or significant but mitigable with the incorporation of appropriate mitigation measures as defined herein. This conclusion is supported by CEQA Guidelines Section 15070, which states that an MND can be prepared when “(a) the initial study shows that there is not substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or (b) the initial study identifies potentially significant effects, but (1) revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur; and (2) there is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.”

1.3 PROJECT LOCATION AND SETTING

The proposed project site is located on LADWP-owned property adjacent to the LADWP Fairmont Reservoir #2. The Fairmont Reservoir property is located at West Avenue H and 170th Street West, approximately 6 miles west of the City of Lancaster, in the Antelope Valley in northwest Los Angeles County (see Figure 1-2). Regional access to the site is provided by State Route 138 (SR-138), an east-west thoroughfare approximately 4 miles north of the property that provides linkage between State Route 14 (SR-14) (about 15 miles east of the project site) and Interstate 5 (I-5) (about 20 miles west of the project site). The nearest paved road to the project site is Lancaster Road, which is approximately 1 mile to the northeast at its closest point. Direct access to the site is provided by unpaved roads.

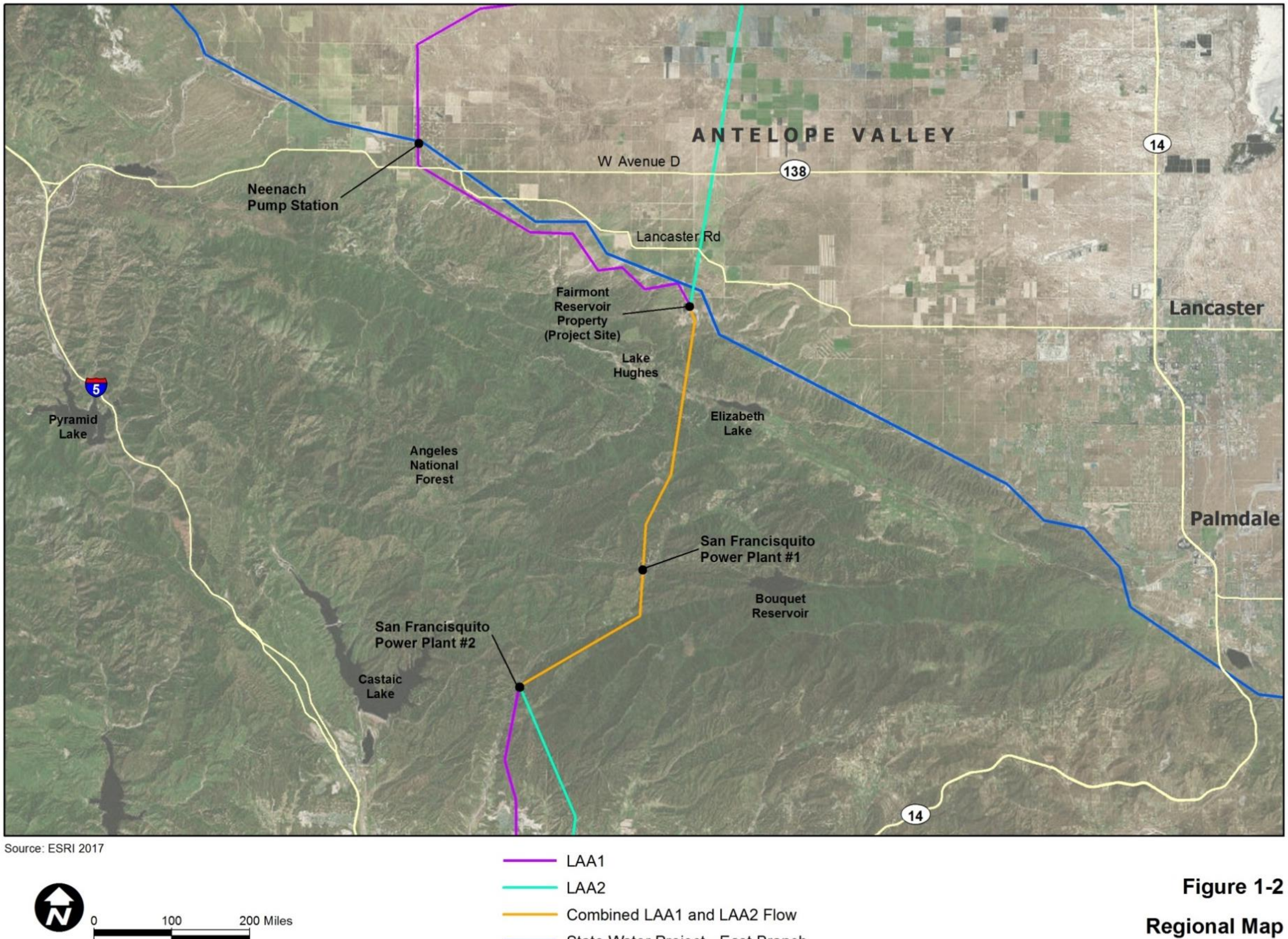


Figure 1-2

Regional Map

The original Fairmont Reservoir (now referred to as Fairmont Reservoir #1) was constructed in the early part of the twentieth century as part of the LAA1 system. It was used to regulate flows in LAA1 to San Francisquito Canyon Power Plants #1 and #2, downstream of the reservoir. LAA1, which is a buried pipeline at the Fairmont Reservoir property, emptied into Fairmont Reservoir #1, and water exited the reservoir through Elizabeth Tunnel, which carries water beneath the crest of the San Gabriel Mountains. In 1970, LAA2 was completed to provide additional water supply to Los Angeles. It is also a buried pipeline at the reservoir property and, like LAA1, it emptied into Fairmont Reservoir #1. The combined flows of both aqueducts were then carried through Elizabeth Tunnel as water exited the reservoir.

In 1982, Fairmont Reservoir #1 was replaced due to seismic concerns. The approximately 160-million-gallon Fairmont Reservoir #2 was constructed north of Fairmont Reservoir #1, and the original reservoir was drained and removed from service. LAA1 now empties into Fairmont Reservoir #2, which, similar to Fairmont Reservoir #1, is used to regulate flows to Power Plants #1 and #2. Water exits Fairmont Reservoir #2 into an outlet pipeline that connects to Elizabeth Tunnel. LAA2 bypasses Fairmont Reservoir #2 and connects directly to the outlet pipeline downstream of the reservoir. The outlet pipeline carries the combined flows of LAA1 and LAA2 to Elizabeth Tunnel.

The proposed project site consists of an approximately 20-acre vacant parcel just northeast of Fairmont Reservoir #2. The parcel is relatively flat, sparsely vegetated, and maintained by tilling. An ephemeral drainage course, which contains some vegetation, crosses the site generally from southwest to northeast. Along its northern and eastern edges, the site is bounded by a chain-link fence, which is part of the LADWP Fairmont Reservoir property perimeter security fence (see Figure 1-3).

Other than several agricultural properties that include residences (the closest of which is over 1,000 feet northeast of the project site), the area surrounding the site is primarily undeveloped. The nearest communities to the Fairmont Reservoir property are Lake Hughes (population of less than 1,000), located about 2.5 miles to the south, and Elizabeth Lake (population of less than 2,000), located about 4 miles to the southeast. As mentioned above, the City of Lancaster, with a population of about 160,000, is located approximately 6 miles to the east; however, the developed portions of the City are located approximately 10 miles from the project site.

Numerous large-scale solar energy developments are present in the Antelope Valley to the east and north of the project site. The 1,800-acre Antelope Valley California Poppy Reserve, which is administered by the California Department of Parks and Recreation, is located approximately 1.5 miles northeast of the project site.

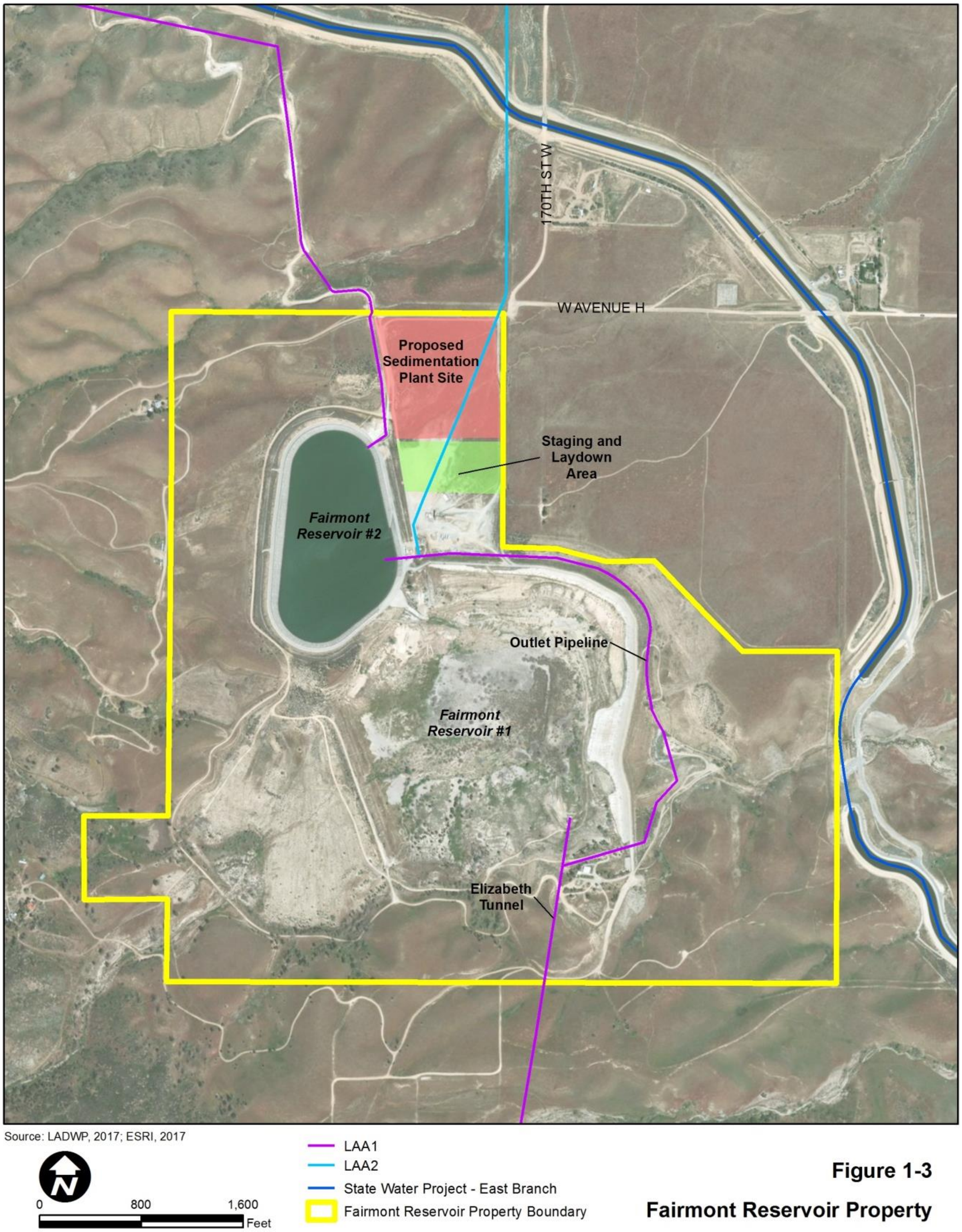


Figure 1-3

Fairmont Reservoir Property

1.4 PROJECT OBJECTIVES

Based on the requirement to maintain the quality and reliability of the City's potable water supply and based on the conditions related to the current LAA treatment systems described above, the objectives of the proposed project are to:

- *Increase and maintain the operational effectiveness, efficiency, and flexibility of the LAAFP by improving the quality of the source water that is delivered to the plant.*

  The LAAFP provides primary treatment for water delivered to the City of Los Angeles via the LAAs and the SWP, which represents a substantial share of the City's supply. The LAAFP utilizes ozone, followed by flocculation, and biologically active, rapid-rate, deep-bed filtration; UV-disinfection; chlorination; and chloramination. While these processes, working in sequence, are highly effective in treating the water, their efficiency is affected by the amount of sediment in the source water. A greater sediment load increases ozone demand and requires more frequent backwashing of the filters, both of which increase costs and energy use and reduce the rate at which the plant can treat water for delivery to the City. As mentioned above, periodic increases in sediment load may tax the capabilities of the treatment systems at the LAAFP, and such episodes are expected to increase in frequency with the transfers of water from the SWP East Branch at the recently completed Neenach Pump Station. Therefore, providing more effective treatment to remove sediment from LAA water upstream of the LAAFP (including SWP East Branch water that is transferred to LAA1) would help achieve the objective of increasing and maintaining the operational effectiveness, efficiency, and flexibility of the LAAFP.

- *Prevent additional sediment accumulation in North Haiwee Reservoir by eliminating the need to operate CTP on a regular basis.*

  At CTP, ferric chloride and polymer compounds are added to the aqueduct water to bond with suspended solids to form heavier particles as part of the coagulation/flocculation process. These solids are held in suspension in the water as it continues to flow in the aqueduct, but they settle out as flow velocities decrease when the aqueduct empties into North Haiwee Reservoir, downstream of CTP. This process began in 1996 as an interim management program to help meet drinking water standards by reducing sediment in the LAA water. While the interim program has been successful in relation to water quality standards, it has resulted in the accumulation of sediment in portions of North Haiwee Reservoir, creating uncertainty regarding the long-term viability of this approach. Therefore, while CTP may continue to occasionally be operated during certain conditions, providing a treatment system that would largely replace the need to add coagulants and flocculants upstream of North Haiwee Reservoir would help achieve the objective of preventing additional sediment accumulation in the reservoir.

1.5 SEDIMENTATION PLANT CHARACTERISTICS

1.5.1 Key Characteristics

To achieve the objectives discussed above, the proposed project would include several key characteristics, including the location of the sedimentation plant, the use of plate settler technology, and the capacity and flexibility of the treatment system.

Plant Location

A key consideration in locating the proposed sedimentation plant is that it must intercept flows from both LAA1 and LAA2 as well as from the SWP East Branch. From North Haiwee Reservoir, LAA1 and LAA2 follow separate, although roughly parallel, alignments until they reach the Fairmont Reservoir property. As discussed above, LAA1 discharges into Fairmont Reservoir #2, which in turn discharges into Elizabeth Tunnel via an outlet pipeline, and LAA2 connects directly to the outlet pipeline immediately downstream of the reservoir. In addition, the SWP East Branch interconnects with LAA1 at the Neenach Pump Station, which is located approximately 10 miles northwest and upstream of the Fairmont Reservoir property. Therefore, the Fairmont Reservoir property provides the first opportunity where all three sources of water (i.e., LAA1, LAA2, and SWP East Branch) converge. This occurs on LADWP-owned property with sufficient space and suitable terrain to accommodate the proposed sedimentation plant.

South of the Fairmont Reservoir property, the combined flows from both aqueducts (including the SWP East Branch transfer water) is carried in a series of tunnels through the San Gabriel Mountains until reaching Power Plant #2 (approximately 13 miles south of Fairmont Reservoir), where the two aqueducts again separate and follow different alignments via tunnels and pipelines until converging once more at the Van Norman Complex in Sylmar. The conditions (including terrain, access, hydraulics, and property ownership) along the section of the aqueduct between the Fairmont Reservoir property and Power Plant #2, where the three sources of water (LAA1, LAA2, and SWP East Branch) are combined, are not suitable for the construction of the proposed sedimentation plant.

Lastly, a new sedimentation plant at the CTP site, where the combined flows of the LAAs could be treated, would not address the sediment load anticipated with SWP East Branch water, which does not enter LAA1 until approximately 150 miles south of CTP. Therefore, the Fairmont Reservoir property provides the only viable location for the sedimentation plant where the combined sources of water could be treated upstream of the Van Norman Complex.

Plate Settler Technology

The plate settler technology proposed for the project significantly increases the sedimentation basins' effective surface area, which allows for more efficient solids settling for the same size footprint when compared to conventional water clarifier systems not utilizing plate settlers. Plate settlers increase the surface area of the basins by means of tightly spaced rows of parallel inclined metal plates. This technology has the ability to reduce the sedimentation basin footprint by up to 80 percent when compared to conventional clarifiers consisting of an open basin without plates. Since plate settlers passively increase a sedimentation basin's effective treatment area via stationary inclined plates, there are minimal moving parts, and energy consumption is greatly reduced when compared to other potentially effective treatment technologies.

The large settling area created by the inclined plates substantially improves the efficiency and effectiveness of the settling process, thereby allowing for an increased flow rate through the plant. With the addition of a coagulation/flocculation system upstream of the plate settlers to enhance the settling process, as proposed under the project, the sedimentation plant would achieve greater sediment removal than is currently achieved through the addition of coagulants and flocculants at CTP followed by the settling out of sediment in North Haiwee Reservoir. Even assuming significantly higher than normally anticipated sediment load in the influent water, the proposed sedimentation plant would result in improved source water quality at the LAAFP than under current conditions.

Plant Capacity and Flexibility

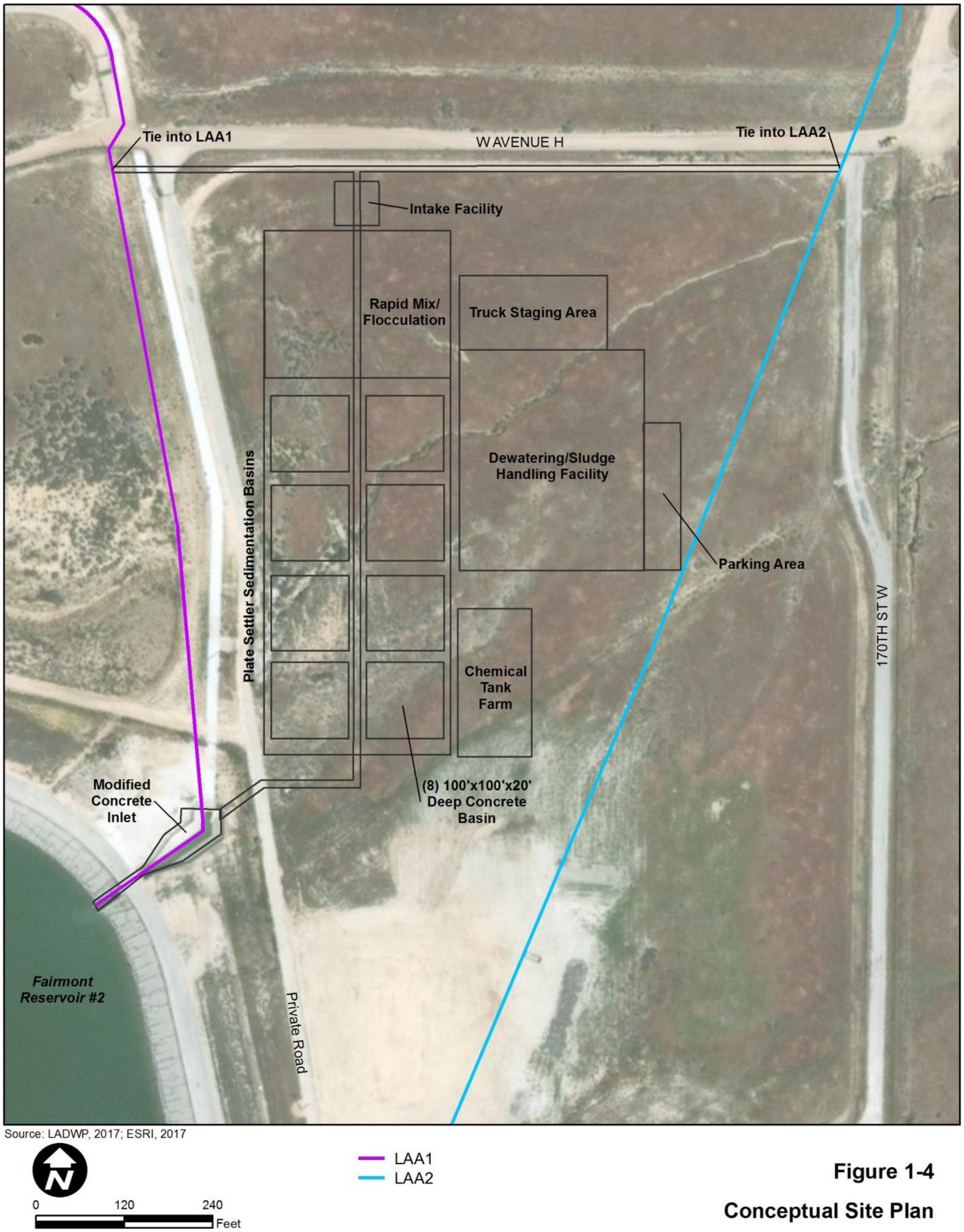
CTP is able to accommodate wide fluctuations in flow volumes in LAA1 because it involves the mixing of coagulants and flocculants directly into an open aqueduct channel and the settling of sediment downstream in a large open reservoir. The coagulants and flocculants added to the water at CTP are simply dosed according to the volume of the flow and the sediment conditions in the aqueduct as it passes the plant. However, unlike the open aqueduct condition present at CTP, the proposed sedimentation plant utilizing plate settler technology would be a contained system, and it must therefore be sized appropriately to accommodate flows from the LAAs in a manner that allows for the most effective and efficient removal of sediment from the water. Important considerations in the sizing of the plant are the total surface area provided by the plates (i.e., the number and size of the plates) and controlling the velocity of the water to facilitate an adequate sedimentation rate and reduce turbidity but still maximize the production rate of the plant.

Although the LAAs do not always flow at full capacity, the sedimentation plant would be sized to accommodate the combined LAA1 and LAA2 maximum flow capacity of 720 cubic feet per second (cfs) and the anticipated upper limit for sediment load, which would represent the maximum influent conditions for the plant. The transfer of SWP East Branch water to LAA1 upstream of the sedimentation plant would not affect the maximum flow condition because the 720-cfs capacity of the LAAs at Fairmont is limited by their physical properties, not by the supply of water.

In addition to sizing the plant to accommodate maximum influent conditions, by constructing a series of separate plate settler sedimentation basins that could be isolated as necessary, the proposed operations could be scaled according to the volume of influent at a given time. Sizing the proposed sedimentation plant to accommodate the combined capacity of the LAAs and maximum expected sediment load, as well as providing the flexibility to scale back operations according to LAA flow and sediment load, would eliminate the need to continue operations at CTP and would result in improved source water quality at the LAAFP under the anticipated influent conditions.

1.5.2 Facilities and Components of the Sedimentation Plant

In addition to the key characteristics described above, in order to achieve the project objectives, the proposed project would include the following primary facilities and components (see Figure 1-4).



Source: LADWP, 2017; ESRI, 2017

Figure 1-4

Conceptual Site Plan

LAA Realignment

As discussed above, LAA1 and LAA2 converge at the Fairmont Reservoir property. However, the actual convergence occurs downstream of Fairmont Reservoir #2, at the outlet pipeline of the reservoir, and downstream of the proposed sedimentation plant site. Currently, only LAA1 water passes through Fairmont Reservoir #2, while LAA2 is routed directly to the outlet pipeline. To allow both LAA1 and LAA2 to flow to the proposed sedimentation plant, they would be diverted into a new buried pipeline located upstream of the reservoir and connected to the plant intake facility. The existing buried aqueduct pipelines would remain in place with new isolation valves to allow for bypassing the sedimentation plant if necessary.

Intake Facility

An intake facility would meter total flow into the plant from the LAAs to determine the hydraulic conditions for plant operations. The intake facility would also include coarse screens to capture algae and larger debris.

Rapid Mix Coagulation/Flocculation

Following the intake facility but prior to the sedimentation basins, the water would pass through rapid mix coagulation/flocculation tanks. The application of coagulants/flocculants would improve the settling rate of sediment, resulting in more effective and efficient treatment and allowing for increased flow velocities through the sedimentation basins. Chemical storage tanks, with appropriate safety measures, including spill containment, would be required to store the coagulants/flocculants.

Plate Settler Sedimentation Basins

The sedimentation plant would include a series of basins sized to accommodate the maximum and operable minimum flow conditions at Fairmont. Each individual basin would contain plate settlers and could be operated independently of the other basins, as required. For a description of the plate settler technology, see Section 1.5.1, above.

Sludge Processing Facility

The plate settler treatment process would result in the accumulation of sediment on the bottom of the sedimentation basins. The accumulated sediment sludge would be removed from the basins by means of a mechanical system. The sludge would then be conveyed to a residual thickening facility consisting of settling tanks and equalization basins. The thickened sludge would then be conveyed to a mechanical dewatering facility where additional coagulants may be added and mechanical dewatering equipment would separate solid material from the water in the sludge. The resulting residual sludge could be temporarily stored in a hopper or loaded directly into trucks at an on-site staging facility to be transported to a suitable off-site landfill.

Administration and Support Facilities

To operate the sedimentation plant, support facilities including, but not limited to, offices and other administrative spaces, a control room, laboratory, and necessary shop and materials storage areas would be provided.

Sanitary Waste and Water Treatment

Given the location of the proposed project, a septic system would be required to handle sanitary waste. Since the effluent from the sedimentation plant would not be considered potable, a small on-site potable water treatment system and storage tank would be required to provide for personnel and operational needs.

1.5.3 Additional Project Elements

Access Road Paving

As mentioned above, direct access to the project site is currently provided via unpaved roads. To provide a stable and durable road surface for trucks and to minimize the creation of dust from vehicle travel on the unpaved road surfaces, approximately 3 miles of existing access roads would be paved prior to the outset of construction activities at the project site. This would entail paving Avenue H east of the project site to 160th Street and 160th Street north of Avenue H to its intersection with Lancaster Road, which is a paved roadway. In addition, 170th Street would be paved north of the project site to its intersection with Lancaster Road. This would provide two paved ingress/egress routes to the site (see Figure 1-5).

Fairmont Reservoir #2 Modifications

Reservoir Inlet Structure

As discussed above, LAA1 currently empties into Fairmont Reservoir #2, and LAA2 intercepts the outflow from Fairmont Reservoir #2 at the outlet pipeline directly downstream of the reservoir. However, under the proposed project, both LAA1 and LAA2 would flow into the sedimentation plant and, after treatment, the effluent from the plant, which would consist of the combined flows of both aqueducts, would be directed to Fairmont Reservoir #2. Modification of the open-channel concrete inlet structure for the reservoir would be required to accommodate this combined flow from the plant.

Reservoir Relining

Fairmont Reservoir #2 is fully lined with asphalt. However, this lining has not been replaced since the reservoir was first constructed in 1982, and it has deteriorated to the extent that maintenance of the reservoir is difficult. Since LAA1 would be out of service for a period of time during project construction (and therefore not flowing into Fairmont Reservoir #2), the opportunity to reline the reservoir would be available. This relining would include asphalt sidewalls and a concrete bottom for durability and maintenance.

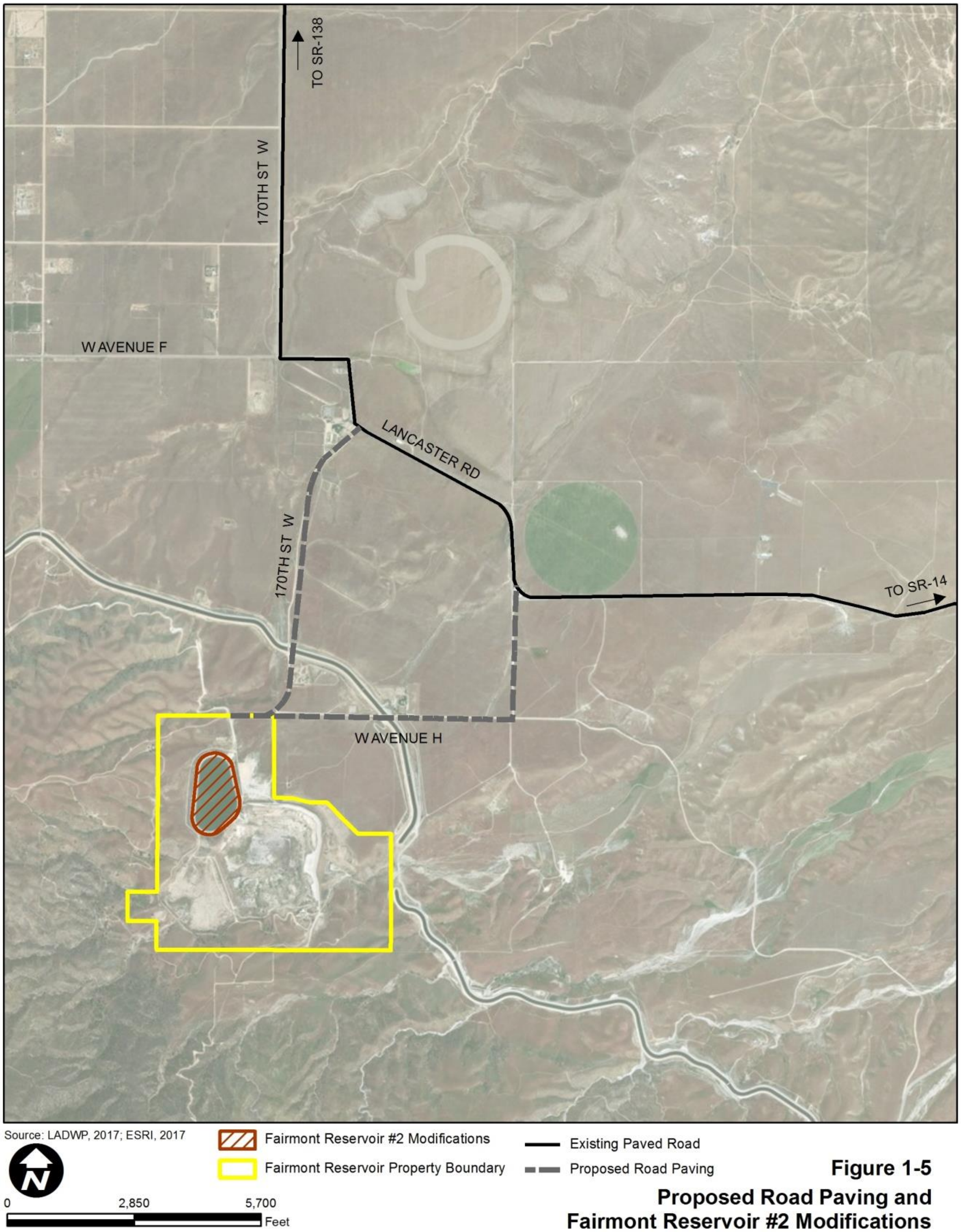


Figure 1-5
Proposed Road Paving and Fairmont Reservoir #2 Modifications

Electrical Power

Electrical power for the project would be drawn from the existing Southern California Edison (SCE) power feed to the Fairmont Reservoir property, which currently enters the property near the northwest corner of the sedimentation plant site. A diesel-powered backup power generator would also be installed to support minimal critical treatment processes as well as communications, human-machine interface, and alarm systems in the event of an outage on the SCE feed.

1.6 CONSTRUCTION SCHEDULE AND PROCEDURES

Construction of the proposed project is scheduled to begin in 2020. As shown in Figure 1-6, construction would consist of several tasks, including access road paving; LAA1 and LAA2 realignment; Fairmont Reservoir #2 modifications; excavation and grading for the sedimentation plant; construction of the structural elements of the plant (e.g., concrete foundations, basins, and tanks); and installation of the plant equipment and support facility construction. The general work that would occur in each of these phases is described below. While these phases are distinct and generally must precede or be preceded by others, some work associated with various phases could occur concurrently at different locations within the project site as construction of the plant proceeds. The exact sequencing of various tasks would be determined prior to the start of construction, but the total construction period, from mobilization to completion of the plant is anticipated to last approximately 3.5 years, including a plant commissioning period of several months.

Construction activities would normally occur Mondays through Fridays during the daytime hours, generally beginning no earlier than 7:00 a.m. and ending by late afternoon/early evening. Contractors and LADWP would require temporary trailers for construction management activities and temporary laydown areas and storage facilities for construction materials and equipment. All required administrative, staging, storage, and laydown areas related to project construction would be located within the existing Fairmont Reservoir property boundaries. Direct vehicular access to the site during construction would be provided along 170th Street West and West Avenue H, which, as discussed below, would be paved in the first phase of the project.

The phases described below, and indicated in Figure 1-6, help establish the general level and type of construction activities and functions associated with the project, such as equipment usage, delivery and haul truck trips, and worker commute trips. These represent important factors in relation to assessing the nature and extent of certain environmental impacts that may be created during construction of the project.

Construction of the plant and modification of the reservoir would require the operation of various pieces of heavy equipment on site, including excavators, front end loaders, bulldozers, motor graders, cranes, and concrete pump trucks. The type and level of use of this equipment would vary across the phases of work, with an estimated daily peak of about 32 pieces of equipment occurring during a few months of the project when the realignment of the LAAs and modifications of the reservoir would overlap.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Access Road Paving	■	■	■																																							
Site Mobilization				■	■																																					
LAA1 & LAA2 Realignment						■	■	■	■	■	■	■	■	■	■	■	■																									
Reservoir #2 Modifications											■	■	■	■	■	■	■																									
Plant Excavation & Grading																		■	■	■	■																					
Plant Structures																						■	■	■	■	■																
Plant Equip. & Support Facilities																											■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Demobilization																																										■
Average Daily Equipment	9	9	9	6	6	22	22	22	22	22	32	32	32	29	29	29	29	30	30	30	30	7	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6
Average Daily Truck Roundtrips	13	13	13	2	2	16	16	16	16	16	59	59	59	48	48	48	48	6	6	6	6	10	48	48	48	48	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	2
Average Daily Workers	15	15	15	10	10	25	25	25	25	25	45	45	45	75	75	75	75	25	25	25	25	25	25	25	25	25	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10

Figure 1-6
Project Schedule

The peak number of daily off-site truck round trips would be about 59, also occurring when the realignment of the LAAs and modifications of the reservoir would overlap. Secondary peaks of about 48 daily truck round trips would occur for several months in association with concrete deliveries for the reservoir relining and the plant structural elements. During the balance of the project, the average number of daily truck round trips would be substantially lower, at no greater than 16 and often less than 10 per day. These truck trips would generally be distributed throughout the workday, rather than concentrated during a particular portion of the day.

The number of daily on-site workers would range from a low of 15 to a high of 75, which would occur during the overlap of the LAA realignment and reservoir relining (i.e., asphalt and concrete work). It was assumed that each individual worker would generate a vehicle trip inbound to the project site in the morning and a vehicle trip outbound from the project site in the afternoon (i.e., no reduction in the number of worker trips associated with carpooling has been considered in the assessment of potential environmental effects).

The average number of equipment, off-site truck trips, and personnel across the various phases and months of the proposed project is indicated in Figure 1-6.

1.6.1 Access Road Paving

As discussed above, the roads that provide direct access to the Fairmont Reservoir property are currently unpaved. Because construction and operation of the plant would involve the delivery of heavy loads to the site (during construction) and the hauling of heavy loads from the site (during both construction and operation), access roads would be paved to provide a stable and durable surface and minimize dust that would be generated by travel on the unpaved roads (see Figure 1-5). The road paving would occur before work at the reservoir property would begin.

The paving would involve portions of 170th Street West, West Avenue H, and 160th Street West to link the project site to Lancaster Road in two different locations. The total length of road included in the paving would be approximately 15,000 feet, and the width of the paved surface would be 24 feet. The road would consist of 4 inches of structural base material and 2 inches of asphalt paving. Some grading of the existing unpaved road surface may be required prior to paving. The road paving would involve several pieces of equipment, including an excavator, dump truck, front end loader, asphalt paving machine, and compaction roller. It is estimated that approximately eight truckloads of base material and four truckloads of hot mix asphalt would be delivered each day. Approximately 15 construction personnel would be required throughout the paving phase, which is anticipated to take approximately 3 months to complete.

1.6.2 LAA1 and LAA2 Realignment

As discussed above, LAA1 and LAA2 physically converge at the Fairmont Reservoir property downstream of the Fairmont Reservoir #2 outlet. To feed into the proposed sedimentation plant, they would need to be realigned so that they converge upstream of Fairmont Reservoir #2. The 120-inch-diameter LAA1 crosses into the property at the northwest corner of the project site, and the 90-inch-diameter LAA2 crosses into the property at the northeast corner of the site. New supply lines of similar size would be installed below grade across the northern end of the site to connect each aqueduct to the sedimentation plant intake facility (see Figure 1-4). Isolation valves would be installed at the existing LAA connection points to allow for the temporary shutoff of flows to the plant from one or both LAAs. In addition, double block and bleed bypass valves would be installed on the existing LAA1 and LAA2 (both of which would remain in place) downstream of each new connection point. This would completely isolate the existing lines during normal operating conditions at the plant but also allow for flows to be temporarily diverted around the plant through the lines if necessary. The flow in each LAA would be discontinued non-concurrently while these valves were installed. After the installation of the valves, flows would continue through the existing LAA lines during the duration of plant construction.

The installation of the new line, which would be approximately 1,000 feet in length, would entail the excavation of a trench, with the excavated material stockpiled adjacent to the trench to be used as backfill once the line was installed. Because of the width and depth of the trench, shoring would be required. Energy dissipaters or other controls may also be installed to ensure proper inlet velocities at the plant intake facility from the combined flows of the two LAAs. Pipe sections and other material would be delivered to the site, and some demolition material and debris would be hauled from the site. This would involve an average of 16 daily truck round trips throughout the phase.

Numerous pieces of equipment would be needed to install the realigned LAA pipeline, including excavators, dump trucks, front end loaders, bulldozers, and a crawler crane. An average of about 22 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Approximately 25 construction personnel would be required throughout the pipeline installation, which is anticipated to take approximately 12 months to complete.

1.6.3 Fairmont Reservoir #2 Modifications

The current concrete inlet structure for Fairmont Reservoir #2 was constructed to accommodate the flows from only LAA1. As discussed above, LAA2 currently bypasses Fairmont Reservoir #2 and connects to the outlet pipeline immediately downstream of the reservoir. However, after completion of the sedimentation plant, the reservoir would accept the combined flows of LAA1 and LAA2 discharged from the plant. Therefore, the existing inlet structure would be enlarged to accommodate this combined flow. This would require the demolition and reconstruction of at least a portion of the existing inlet structure.

In addition, because Fairmont Reservoir #2 was constructed 35 years ago, the original asphalt lining has deteriorated. Since the enlargement of the inlet structure, as well as the realignment of LAA1, would mean that discharges to the reservoir would be paused for a period of time, an opportunity would be provided to replace the existing liner when the reservoir could be emptied. This replacement would involve the demolition of the liner and the repaving of the reservoir side walls with asphalt and the reservoir bottom with unreinforced concrete.

The demolition of the existing reservoir liner would involve the removal of approximately 18,000 cubic yards (CY) of asphalt, which would be hauled off site. This would result in approximately 43 haul truck round trips per day for about 3 months. The relining of the reservoir would require approximately 3,000 CY of asphalt and 22,000 CY of concrete, which would result in approximately 32 delivery truck round trips per day for about 4 months.

The demolition and relining of the reservoir would require numerous pieces of equipment, including dump trucks, front end loaders, concrete pump trucks, a bulldozer, an asphalt paver, and a compaction roller. A peak of 10 pieces of equipment (including pickup trucks and water trucks) would be in operation daily for about 3 months, during demolition. A peak of approximately 50 daily construction personnel would be required during the relining operation. The entire reservoir modification phase is anticipated to take about 7 months to complete.

The number of daily truck trips, construction equipment, and personnel described above relate to the reservoir modification work only. However, as discussed above, this work would occur concurrently with the LAA realignment phase because discharges to the reservoir would temporarily cease during the aqueduct realignment. Because these two phases of work would overlap, the actual daily peak of construction activity at the Fairmont Reservoir property during the 7-month reservoir modification would be higher. The combined work under these two phases would result in a peak of approximately 59 truck round trips and 32 pieces of operating equipment per day during the 3-month demolition task and 75 construction personnel per day during the 4-month repaving task.

1.6.4 Sedimentation Plant Excavation and Grading

The LAAs operate via gravity flow and, in order to maintain this gravity flow, the various plant components must be situated at the appropriate elevation so that water would continue to flow through the plant and discharge into Fairmont Reservoir #2 without pumping. This would require excavation and grading for the proposed sedimentation basins and the rapid mix coagulation/flocculation tanks, which would each need to be about 20 feet deep, and the sludge processing facility, which would need to be about 10 feet deep. Because of the depth of excavation, shoring may be required in locations where stable slopes cannot be built. Suitable excavated material would be used as necessary as fill to achieve the proper elevation across the entire plant. However, it is estimated that over 200,000 CY of excess material may be generated during the excavation and grading for the plant. This excess material would be placed into the empty Fairmont Reservoir #1, as indicated in Figure 1-7. To stabilize the material placed in Reservoir #1 to reduce erosion and windborne dust, it would be seeded with locally adapted native species and temporarily irrigated as appropriate to facilitate germination and growth. During the grading phase, runoff currently carried in the open drainage course that crosses the proposed project site would be intercepted and redirected. The final drainage plan would be designed and permitted in consultation with the appropriate regulatory agencies (i.e., the California Department of Wildlife [CDFW] and Regional Water Quality Control Board [RWQCB]).

The excavation and grading phase would require numerous pieces of equipment, including dump trucks, excavators, front end loaders, bulldozers, motor graders, and compaction rollers. An average of about 30 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Although most excavated material would remain on site, about six off-site haul truck round trips per day would be required to remove general debris during this phase. Approximately 25 construction personnel would be required throughout the excavation and grading phase, which is anticipated to take approximately 4 months to complete.

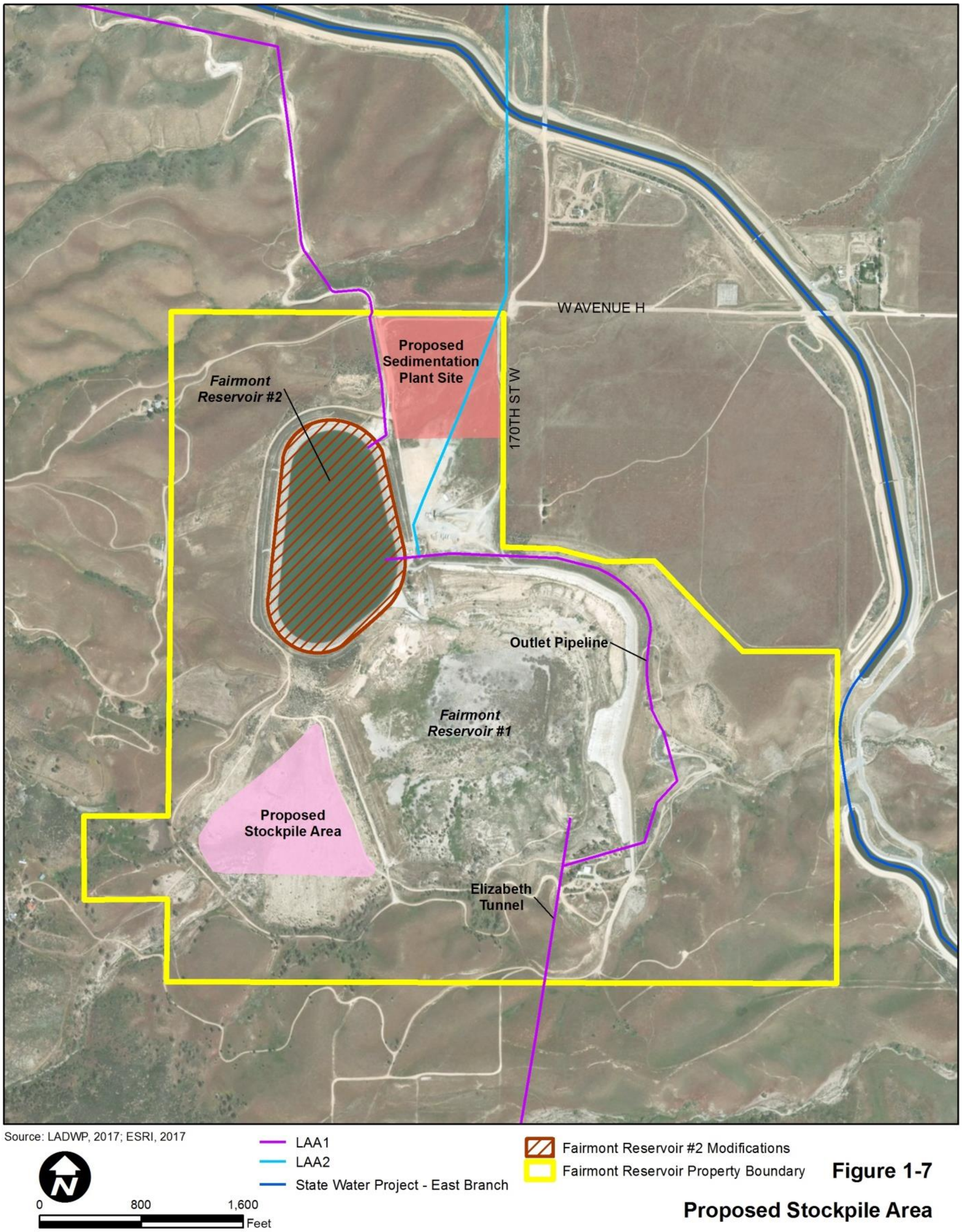


Figure 1-7

Proposed Stockpile Area

1.6.5 Sedimentation Plant Structures

The foundations for the sedimentation plant and ancillary facilities, as well as the walls for the plate settler sedimentation basins, the rapid mix coagulation/flocculation tanks, and the sludge processing facility, would require substantial quantities of concrete. The total volume of concrete for the structures is estimated at approximately 30,000 CY, which would require a total of about 3,000 concrete truck round trips over the 4 to 5 months of this phase of work. Along with the delivery of materials, such as reinforcing steel and form material, and the hauling of construction debris from the site, the peak number of daily off-site truck round trips would be about 48.

The primary pieces of on-site equipment required to complete the structures would be concrete pump trucks and a crawler crane. A peak of 9 pieces of equipment (including pickup trucks and water trucks) would be in operation daily for about 4 months. Approximately 25 construction personnel would be required throughout the structures phase, which is anticipated to take approximately 5 months to complete.

1.6.6 Plant Equipment and Support Facilities

The final phase of the sedimentation plant construction involves the installation of the plant equipment and the construction and finishing of the support facilities. The equipment includes flow meters, regulators, and screens at the intake facility; mechanical mixers and chemical feed apparatus at the rapid mix coagulation/flocculation tanks; plate settlers and mechanical sediment removal systems in the sedimentation basins; chemical feed apparatus, mechanical mixers, and centrifuge dewatering systems at the sludge processing facility; conveyance systems to transfer processed sludge to trucks at the truck staging area; and chemical storage tanks for coagulants and flocculants.

Support facility construction would involve structural and architectural elements and exterior and interior finishing, including plant control rooms, laboratories, administrative space, security systems, and personnel support facilities. In addition, the septic and potable water treatment systems would be constructed during this phase.

The delivery of materials and the hauling of construction debris would result in about 8 daily truck round trips throughout the plant equipment and support facilities phase. Equipment required would include a front end loader, crawler crane, backhoe, and forklifts. An average of about 12 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Approximately 20 construction personnel would be required throughout the phase, which is anticipated to take approximately 15 months to complete.

1.6.7 Environmental Commitments during Construction

The following best management practices (BMPs) would be employed during construction of the proposed project, to help minimize or eliminate potential impacts to the environment. BMPs are distinguished from mitigation measures because they are: 1) existing practices or measures required by law, regulation, or policy; 2) ongoing, regularly occurring practices; and 3) not unique to the proposed project.

1) The project would implement Rule 401 (Visible Emissions) measures required by the Antelope Valley Air Quality Management District (AVAQMD), which would include the following:

A. During construction activities, a person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is:

a. As dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines; or

b. Of such opacity as to obscure an observer's view to a degree equal to or greater than smoke described above.

2) The project would implement Rule 402 (Nuisance Emissions) measures required by the AVAQMD, which would include the following:

A. During construction activities, a person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

3) The project would implement Rule 403 (Fugitive Dust) dust control measures required by the AVAQMD, which would include the following:

A. During demolition, grading, and construction activities, water shall be applied to exposed surfaces to prevent generation of dust plumes, and limit visible dust emissions to 20 percent opacity.

B. The construction contractor shall utilize at least one of the following measures at each vehicle egress from the project site to a paved public road:

- Install a pad consisting of washed gravel maintained in clean condition to a depth of at least 6 inches and extending at least 30 feet wide and at least 50 feet long;
- Provide a paved surface extending at least 100 feet and at least 20 feet wide;
- Utilize a wheel shaker/wheel spreading device consisting of raised dividers at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle undercarriages; or
- Install a wheel washing system to remove bulk material from tires and vehicle undercarriages.

C. All trucks hauling soil, sand, and other loose materials shall be covered (e.g., with tarps or other enclosures that would reduce fugitive dust emissions).

D. Ground cover in disturbed areas shall be replaced in a timely fashion when work is completed in the area. This shall include stabilizing the excavated material placed in Reservoir #1 by seeding with locally adapted native species and temporarily irrigating as appropriate to facilitate germination and growth.

E. Non-toxic soil stabilizers or gravel shall be applied according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 or more days).

F. Traffic speeds on all unpaved roads shall be limited to 15 miles per hour or less.

4) The construction contractor shall develop and implement an erosion control plan and a Storm Water Pollution Prevention Plan (SWPPP) for construction activities. Erosion control and grading plans may include, but would not be limited to, the following:

- Minimizing the extent of disturbed areas and duration of exposure;
- Stabilizing and protecting disturbed areas;
- Keeping runoff velocities low; and
- Retaining sediment within the construction area.

Construction erosion control devices may include the following:

- Temporary desilting basins;
- Silt fences;
- Gravel bag barriers;
- Temporary soil stabilization with mattresses and mulching;
- Temporary drainage inlet protection; and
- Diversion dikes and interceptor swales.

5) The Project shall comply with the RWQCB's (RWQCB) National Pollutant Discharge Elimination System (NPDES) permit requirements.

6) To minimize the potential for accidental on-site fires during construction and operation of the project, mechanical equipment shall be maintained in good operating condition; flammable materials shall be carefully stored in appropriate containers; and flammable material spills shall be immediately and completely cleaned up if they occur.

7) Pursuant to CEQA Guidelines Section 15064.5(f) regarding provisions related to the accidental discovery of cultural resources, the following procedures shall be followed if previously unknown paleontological resources are encountered during project construction. Work shall halt in the immediate area of the find, LADWP shall be notified, and LADWP shall retain a qualified paleontologist to evaluate the significance of and determine an appropriate treatment for the find. Work in the area may not resume until evaluation and treatment of the resource is completed or the resource is recovered and removed from the project site. Construction activities may continue on other parts of the project site while evaluation and treatment of paleontological resources take place.

8) In accordance with the provisions of the California Health and Safety Code Section 7050.5, in the event that human remains are discovered during project construction, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains, and the Los Angeles County Coroner shall be notified. The coroner shall within two working days provide recommendations concerning the treatment and disposition of the human remains. If the remains and/or related resources, such as funerary objects, are determined to be of Native American origin, the coroner shall contact within 24 hours the Native American Heritage Commission. In accordance with California Public Resources Code Section 5097.98, the Native American Heritage Commission shall immediately notify the person it believes to be most likely descended from the deceased Native

American. The most likely descendant shall be given access to the site where the remains were discovered and may make recommendations for the treatment and disposition of the remains, any related resources, and the potential for other remains. Work at the discovery site may commence only after consultation with the most likely descendant and treatment of the remains and any associated resources have been concluded. Work may continue on other parts of the project site while consultation and treatment are conducted.

1.7 PROJECT OPERATIONS

As discussed above, the proposed sedimentation plant would be sized to operate at a peak inflow of 720 cfs, which is the maximum combined flow of LAA1 and LAA2 based on the physical characteristics of the aqueducts. The plant would also be designed to treat LAA influent water with the upper limit of sediment load derived from the last 10 years of available data. The addition of SWP East Branch water to LAA1 would not increase these levels because the maximum anticipated concentration of sediment in the SWP East Branch is lower than that of the LAAs. The sedimentation plant as proposed would achieve a higher treatment standard than is currently achieved at CTP, even under the highly conservative design assumptions for influent quantity and quality.

1.7.1 Treatment Process

Water from LAA1 and LAA2, as well as water recycled from the sludge processing facility (see below), would enter the intake facility, where it would be metered to determine the hydraulic conditions and chemical dosing requirements for plant operations. The water would also pass through a coarse screen at the intake to remove algae and larger debris. From the intake facility, water would flow into the coagulation/flocculation tanks, where chemicals would be injected and mixed into the water by means of mechanical rapid mixers. This process would induce suspended particles to clump together into molecularly destabilized charged particles so they would more readily settle out in the sedimentation basins.

The water would then enter the sedimentation basins through inlet structures that could be independently opened or closed for each of the sedimentation basins. The number of basins that would be operated at a given time would be based on the quantity and quality of the influent raw water. The influent water would flow upward between the inclined settler plates, and, based on the design velocity of the flow, the sediment would move downward on the surface of the plates and settle on the bottom of the basins, while the clarified water would continue to flow upward to collection channels. The effluent from the sedimentation basins would be discharged to a pipe and conveyed to the Fairmont Reservoir #2 inlet structure. The sediment that has accumulated on the bottom of the basins would be collected by means of a mechanical system and conveyed to the sludge processing facility.

The sludge collected from the basins would include a mixture of sediment and water that must be further dewatered before the sludge could be transported off site for disposal. The sludge would first flow to settling tanks, where coagulants would be injected and mixed with the sludge. The destabilized particles would settle to the bottom of the tank as thickened sludge, while the clear water lying above the solids layer would be recycled to the sedimentation plant intake facility. The thickened sludge would then enter a flow equalization basin(s) that would provide storage capacity to temporarily retain, as necessary, the sludge, which could then be released into the dewatering facility system at a controlled rate to help maintain a more uniform volume of influent. From the equalization basins, the thickened sludge would then be conveyed to a mechanical dewatering facility, where additional coagulants may be added to the solids and water would be separated from solids by mechanical means. The water would be recycled to the plant intake facility, and the residual sludge would be temporarily stored in a sludge hopper, from which it would be loaded onto trucks for transport off site (see Figure 1-8).

1.7.2 Plant Operations and Maintenance

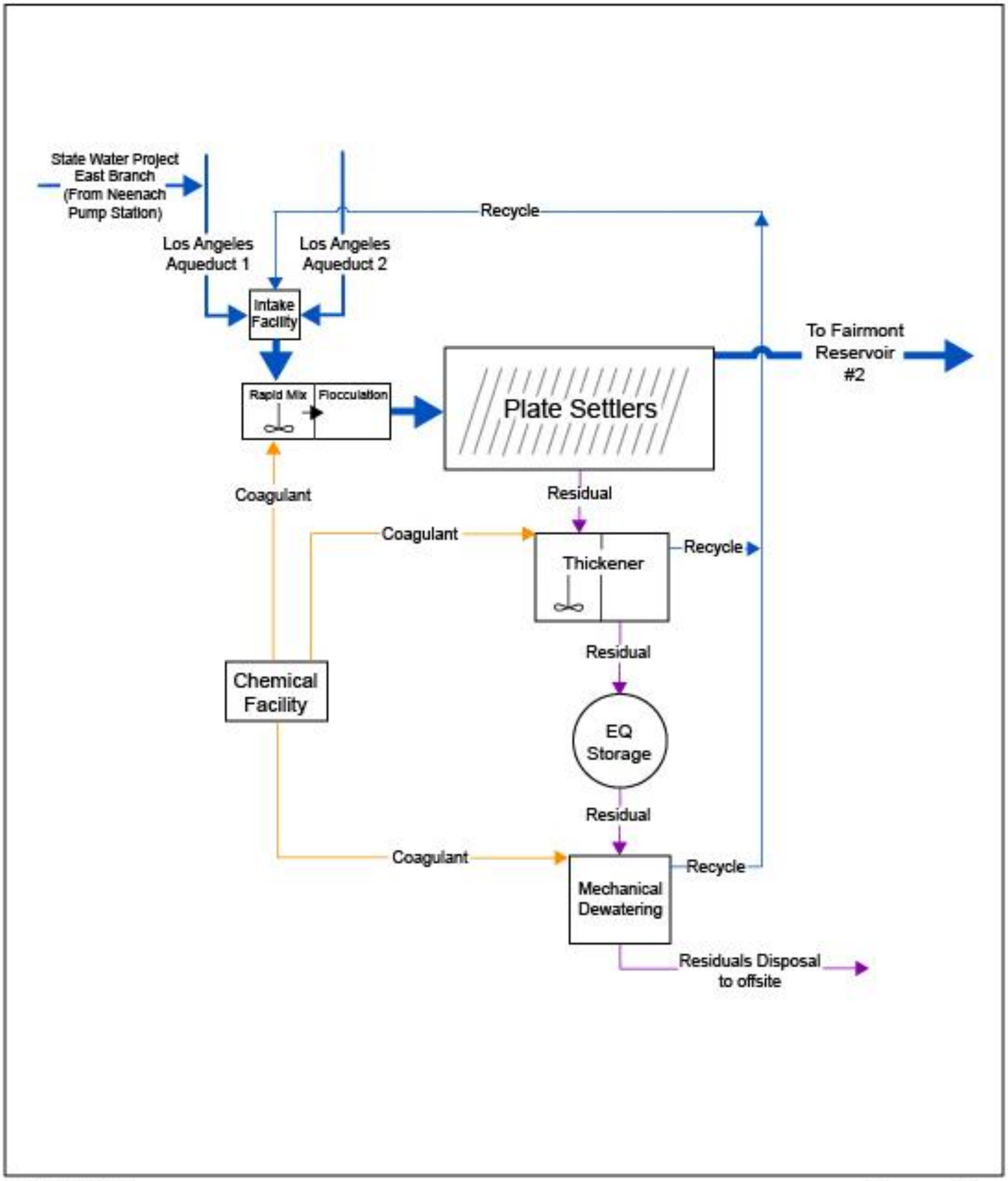
The sedimentation plant would generally be in operations 24 hours per day, 7 days per week, whenever the LAAs are flowing. The plant would require up to 10 personnel, who would be distributed between two to three shifts during a day.

After commissioning of the sedimentation plant, CTP would be taken out of operation. However, the existing equipment would remain in place and, if circumstances required, it could be used to add coagulants and flocculants to LAA1 at CTP, as is currently done.

Although both LAA1 and LAA2 would flow through Fairmont Reservoir #2 after completion of the sedimentation plant, the reservoir would continue to operate with approximately the same freeboard elevation as it currently does, providing storage and regulating flows to Power Plants #1 and #2.

Based on a flow of 320 cfs and turbidity of 14 Nephelometric Turbidity Units averaged across the last 10 years of available LAA water quality data, approximately 144 wet tons of residual sludge would be processed on average each day. However, at peak flow and sediment concentration levels for the LAAs, approximately 346 wet tons of residual sludge would be processed in 1 day. Because arsenic, a naturally occurring trace element in LAA water, would be present in the sludge, it would be treated as California hazardous waste and disposed of at an approved hazardous waste landfill. Based on the average sludge production rate, it would require about 10 truck trips a day, Monday through Friday (typical landfill operating days), to transport about 200 tons of sludge. The sludge hopper at the plant would be sized to accommodate a minimum of 1 week of processed sludge to help maintain uniformity in the number of daily haul trucks trips.

Under emergency conditions when the Fairmont Sedimentation Plant must be shut down, the LAA1 and LAA2 isolation valves would be closed to shut off flow to the plant, and the double block and bleed bypass valves on the original aqueduct lines would be opened to allow water to flow through. As currently happens, LAA1 water would flow through Fairmont Reservoir #2, and LAA2 water would flow into the reservoir outlet pipeline downstream of the reservoir. If during the emergency shutdown it is determined, based on the concentrations of sediment in the LAA water or on the length of the shutdown, that the LAAFP cannot adequately treat the water, coagulants and flocculants would be added to LAA1 at CTP as described above, inducing sediment to settle out in North Haiwee Reservoir.



Source: LADWP, 2017

Figure 1-8

Fairmont Sedimentation Plant Process Flow Diagram

NOT TO SCALE

Scheduled maintenance of the plant would occur during lower-flow periods of the LAAs, generally between October 1 and March 31. During maintenance in normal precipitation years, the LAA1 and LAA2 isolation valves would be closed to shut off flow to the plant, and the double block and bleed bypass valves on LAA1 and/or LAA2 would be opened to allow flows through to Elizabeth Tunnel and the LAAFP, which would have the capability to temporarily treat the relatively low volumes of water without pretreatment at the Fairmont Sedimentation Plant. During high precipitation years, the plant shutdown during maintenance would be similar, but greater control of flows from the various sources (i.e., LAA1, LAA2, and SWP East Branch) may be necessary, depending on the sediment load in each source.

1.8 REQUIRED PERMITS AND APPROVALS

Numerous approvals and/or permits would be required to implement the proposed project. The environmental documentation for the project would be used to facilitate compliance with federal and state laws and the granting of permits by various state and local agencies having jurisdiction over one or more aspects of the project. These approvals and permits may include, but may not be limited, to the following:

California Department of Fish and Wildlife

- Lake or Streambed Alteration Agreement due to drainage modifications.

California Department of Water Resources, Division of Safety of Dams

- Application for Approval of Plans and Specifications for the Repair or Alteration of a Dam and Reservoir, due to modifications to the inlet and outlet for Fairmont Reservoir #2.

City of Los Angeles Department of Water and Power

- Adoption by the City of Los Angeles Board of Water and Power Commissioners of the Initial Study/MND with a finding that it complies with CEQA and other applicable codes and guidelines.
- Approval by the City of Los Angeles Board of Water and Power Commissioners of the proposed project.

County of Los Angeles, Department of Public Works, Bureau of Sanitation

- Low Impact Development Ordinance to manage stormwater on site.

County of Los Angeles, Department of Public Works, Roadways

- Road permit for paving and use of roadways during construction activities.

Lahontan Regional Water Quality Control Board

- Waste Discharge Requirement.
- NPDES Permit for construction dewatering and hydrostatic test water discharge.
- Standard Urban Stormwater Mitigation Plan (SUSMP) post-construction.

State of California, Division of Occupational Safety and Health

- Excavations, Trenches, Construction and Demolition and the Underground Use of Diesel Engines in Work in Mines and Tunnels Permit.

State Water Resources Control Board

- General Construction Storm Water Permit and SWPPP.

State Water Resources Control Board, Division of Drinking Water

- Water Quality operating permit.

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SECTION 2
INITIAL STUDY CHECKLIST

The following discussion of potential environmental effects was completed in accordance with Section 15063(d)(3) of the CEQA Guidelines (2016) to determine if the proposed project may have a significant effect on the environment.

CEQA INITIAL STUDY FORM

Project Title:
Fairmont Sedimentation Plant

Lead Agency Name and Address:
Los Angeles Department of Water and Power
Environmental Planning and Assessment
111 North Hope Street, Room 1044
Los Angeles, CA 90012

Contact Person and Phone Number:
Jane Hauptman
Environmental Affairs
Los Angeles Department of Water and Power
(213) 367-0968

Project Sponsor's Name and Address:
Los Angeles Department of Water and Power
Water Engineering and Technical Services
111 North Hope Street
Los Angeles, CA 90012

Project Location:
The project area is located in the Antelope Valley area of Los Angeles County, CA.

General Plan Designation:

The proposed project site is located on LADWP-owned property adjacent to the LADWP Fairmont Reservoir #2. Under the General Plan, the project site is designated RL20 for rural land uses, which provides for development of single-family residences on a lot no less than 20 acres, equestrian and animal uses, and agricultural and related activities.[1] The project site is also located within the Antelope Valley Area Plan boundary, under which it is designated as a Rural Preserve Area, which is an area that is largely undeveloped and generally not served by existing infrastructure or public facilities.[2]

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[1] Los Angeles County Department of Regional Planning, Los Angeles County General Plan Land Use Element, 2015, available at http://planning.lacounty.gov/assets/upl/project/gp_final-general-plan-ch6.pdf, accessed October 17, 2017.

[2] Los Angeles County Department of Regional Planning, Antelope Valley Area Plan, June 2015, available at http://planning.lacounty.gov/tnc/documents/, accessed October 17, 2017.

Zoning:

The area containing the existing Fairmont Reservoir #2 is zoned OS for open space uses, while the remainder of the project site is zoned A-2 for heavy agriculture uses.[3] Under the Los Angeles County Zoning Code, the agricultural zones, including the A-2 zone, are established to permit a comprehensive range of agricultural uses in areas particularly suited for agricultural activities.[4] In addition to agricultural uses, facilities related to the storage and distribution of water, including reservoirs and treatment plants, are permitted conditional uses in the A-2 zone.[5]

Description of Project:

LADWP is proposing to implement the proposed project to improve raw water quality through a reduction in sediment in the water delivered by LAA1 and LAA2 to the LAAFP, where the water receives additional treatment and disinfection before entering the City's potable water distribution system. This would be achieved through the construction and operation of a sedimentation plant at the Fairmont Reservoir property. The primary components of the sedimentation plant would include an intake facility, rapid mix coagulation/flocculation tanks, plate settler sedimentation basins, and a sludge processing facility. The proposed plate settler technology would increase the efficiency and effectiveness of the sediment removal process and minimize the plant's required footprint. In addition to the sedimentation plant, the proposed project would also include modifications to Fairmont Reservoir #2 to enlarge the inlet structure and reline the reservoir sides and bottom. A detailed description of the proposed project is included above in Section 1 of this document.

Surrounding Land Uses and Setting:

The proposed project site is located on LADWP-owned property adjacent to the LADWP Fairmont Reservoir #2. The Fairmont Reservoir property is located at West Avenue H and 170th Street West, approximately 6 miles west of the City of Lancaster, in the Antelope Valley in northwest Los Angeles County. Regional access to the site is provided by SR-138, an east-west thoroughfare that is located approximately 4 miles north of the property. The nearest paved road to the project site is Lancaster Road, which is approximately 1 mile to the northeast at its closest point. Direct access to the site is provided by unpaved roads.

The proposed project site consists of an approximately 20-acre vacant parcel located just northeast of Fairmont Reservoir #2. The parcel is relatively flat, sparsely vegetated, and maintained by tilling. An ephemeral drainage course, which contains some vegetation, crosses the site generally from southwest to northeast. Along its northern and eastern edges, the site is bounded by a chain link fence, which is part of the LADWP Fairmont Reservoir property perimeter security fence.

Other than several agricultural properties that include residences (the closest of which is over 1,000 feet northeast of the project site), the area surrounding the site is essentially

[3] Los Angeles County Department of Regional Planning, Planning and Zoning Information Map Tool, available at http://rpgis.isd.lacounty.gov/GIS-NET3_Public/Viewer.html, accessed October 12, 2017.
[4] Los Angeles County Planning and Zoning Code, Section 22.16.010(B)(1).
[5] Los Angeles County Planning and Zoning Code, Table 22.16.030-B.

undeveloped. The nearest communities to the Fairmont Reservoir property are Lake Hughes (population of less than 1,000), located about 2.5 miles to the south, and Elizabeth Lake (population of less than 2,000), located about 4 miles to the southeast. As mentioned above, the City of Lancaster, with a population of about 160,000, is located approximately 6 miles to the east; however, the developed portions of the City are located approximately 10 miles from the project site.

Numerous large-scale solar energy developments are present in the Antelope Valley to the east and north of the project site. The 1,800-acre Antelope Valley California Poppy Reserve, which is administered by the California Department of Parks and Recreation, is located approximately 1.5 miles northeast of the project site.

Reviewing Agencies:

- California Department of Fish and Wildlife
- California Department of Water Resources, Division of Safety of Dams
- County of Los Angeles, Department of Public Works
- County of Los Angeles, Department of Regional Planning
- State Water Resources Control Board
- State of California, Lahontan Regional Water Quality Control Board

California Native American Tribe Consultation:

One California Native American tribe has requested formal consultation pursuant to Public Resources Code section 21080.3.1 and consultation has been conducted with LADWP. Consultation included a discussion of the level of environmental review, potential adverse impacts to tribal cultural resources, and the invitation of a Native American monitor to be present during ground-breaking activities. Confidentiality has been maintained pursuant to Public Resources Code 21092.3(c). See Section XVII below for additional discussion.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the Environmental Impacts discussion in Section 3.

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality
☐ Land Use Planning	☐ Mineral Resources	☐ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☐ Transportation/Traffic	☐ Tribal Cultural Resources	☐ Utilities/Service Systems
☐ Mandatory Findings of Significance		

DETERMINATION

On the basis of this initial evaluation:

☐ 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 pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Nadia J Parker — 3-28-18

Signature — Date

Nadia Parker
Environmental Supervisor of Environmental Planning and Assessment
Los Angeles Department of Water and Power

		Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
I.	**AESTHETICS**. Would the project:				
a.	Have a substantial adverse effect on a scenic vista?				**X**
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				**X**
c.	Substantially degrade the existing visual character or quality of the site and its surroundings?			**X**	
d.	Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?			**X**	
II.	**AGRICULTURE AND FORESTRY RESOURCES**. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California 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?				**X**
b.	Conflict with existing zoning for agricultural use, or a Williamson act contract?			**X**	
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))?				**X**
d.	Result in the loss of forest land or conversion of forest land to non-forest use?				**X**
e.	Involve other changes in the existing environment that, 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?				**X**

		Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
III.	**AIR QUALITY**. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a.	Conflict with or obstruct implementation of the applicable air quality plan?			X	
b.	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X	
c.	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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	
d.	Expose sensitive receptors to substantial pollutant concentrations?			X	
e.	Create objectionable odors affecting a substantial number of people?			X	
IV.	**BIOLOGICAL RESOURCES**. Would the project:				
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
c.	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X	
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
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?				X

		Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
V.	**CULTURAL RESOURCES**. Would the project:				
a.	Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5?			**X**	
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?		**X**		
c.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			**X**	
d.	Disturb any human remains, including those interred outside of formal cemeteries?			**X**	
VI.	**GEOLOGY AND SOILS**. Would the project:				
a.	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
	i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			**X**	
	ii) Strong seismic ground shaking?			**X**	
	iii) Seismic-related ground failure, including liquefaction?			**X**	
	iv) Landslides?				**X**
b.	Result in substantial soil erosion, loss of topsoil, or changes in topography or unstable soil conditions from excavation, grading, or fill?			**X**	
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?			**X**	
d.	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			**X**	
e.	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?			**X**	
VII.	**GREENHOUSE GAS EMISSIONS**: Would the project:				
a.	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impacts on the environment?			**X**	
b.	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			**X**	

		Potentially Significant Impact	Less Than Significant Impact After 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?			**X**	
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?			**X**	
c.	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			**X**	
d.	Be located on a site that 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?				**X**
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 for people residing or working in the project area?				**X**
f.	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				**X**
g.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				**X**
h.	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			**X**	
IX.	**HYDROLOGY AND WATER QUALITY**. Would the project:				
a.	Violate any water quality standards or waste discharge requirements?			**X**	
b.	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			**X**	
c.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?			**X**	

		Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
d.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?			X	
e.	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?				X
f.	Otherwise substantially degrade water quality?			X	
g.	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h.	Place within a 100-year flood hazard area structures that would impede or redirect flood flows?				X
i.	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			X	
j.	Inundation by seiche, tsunami, or mudflow?				X
X.	**LAND USE AND PLANNING**. Would the project:				
a.	Physically divide an established community?				X
b.	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			X	
c.	Conflict with any applicable habitat conservation plan or natural community conservation plan?				X
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?				X
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?				X
XII.	**NOISE**. Would the project result in:				
a.	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b.	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			X	
c.	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X	

		Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
d.	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
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 expose people residing or working in the project area to excessive noise levels?				X
f.	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X
XIII.	**POPULATION AND HOUSING**. Would the project:				
a.	Induce substantial 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)?			X	
b.	Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c.	Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X
XIV.	**PUBLIC SERVICES**.				
a.	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
	i) Fire protection?				X
	ii) Police protection?				X
	iii) Schools?				X
	iv) Parks?				X
	v) Other public facilities?				X
XV.	**RECREATION**.				
a.	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b.	Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				X

	Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC. Would the project:				
a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			X	
b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?			X	
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e. Result in inadequate emergency access?				X
f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				X
XVII. TRIBAL CULTURAL RESOURCES				
a. Cause a substantial adverse change in the significance of a tribal cultural resources, 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)			X	
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		X		

		Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII.	**UTILITIES AND SERVICE SYSTEMS.** Would the project:				
a.	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			**X**	
b.	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			**X**	
c.	Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			**X**	
d.	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			**X**	
e.	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?			**X**	
f.	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			**X**	
g.	Comply with federal, state, and local statutes and regulations related to solid waste?				**X**
XIX.	**MANDATORY FINDINGS OF SIGNIFICANCE**.				
a.	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		**X**		
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.			**X**	
c.	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?			**X**	

SECTION 3
ENVIRONMENTAL IMPACT ASSESSMENT

INTRODUCTION

The following discussion addresses impacts to various environmental resources per the Initial Study checklist questions contained in Appendix G of the CEQA Guidelines.

I. AESTHETICS

Would the project:

a) Have a substantial adverse effect on a scenic vista?

No Impact. Scenic vistas are panoramic public views to various features, including, for example, the ocean or other water body, mountains, striking or unusual natural terrain, or unique urban or historic features.[6] Public access to these vistas may be from park lands, privately or publicly owned sites, and public rights-of-way. The project site is located entirely within the interior of the existing Fairmont Reservoir property, which is dedicated to water storage and distribution. The proposed project would construct a sedimentation plant and associated facilities and reline the existing Fairmont Reservoir #2. Based on the scale and profile of these facilities, their location within the secured Fairmont Reservoir property, and the property's relationship to public viewpoints and scenic vistas, the proposed project would not obscure views to any scenic vistas. The proposed project would not have an adverse effect on a scenic vista, and no impact would occur.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. The proposed project is not located along or near a designated California Scenic Highway or locally designated scenic highway.[7,8] The nearest Eligible State Scenic Highways (not officially designated) are portions of I-5 and State Route 126 (SR-126), located approximately 20 miles southwest of the project site, beyond the crest of the San Gabriel Mountains.

The Antelope Valley California Poppy Reserve, located approximately 1.5 miles northeast of the project site, is a California designated scenic resource.[9] However, the proposed project is located entirely within the interior of the existing Fairmont

6 County of Los Angeles, Department of Regional Planning, *General Plan 2035, Chapter 9: Conservation and Natural Resources Element*, available at http://planning.lacounty.gov/generalplan/generalplan, accessed November 20, 2017.

7 California Department of Transportation (Caltrans), California Scenic Highway Mapping System, available at http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/, accessed November 20, 2017.

8 County of Los Angeles, Department of Regional Planning, *General Plan Update Draft Environmental Impact Report, June 2014*, available at http://planning.lacounty.gov/assets/upl/project/gp_2035_deir.pdf, accessed December 28, 2017.

9 County of Los Angeles, Department of Regional Planning, *Antelope Valley Area Plan.* Adopted June 2015.

Reservoir property, and no work is proposed that would cause damage to the Antelope Valley California Poppy Reserve. Additionally, no scenic resources such as groves of trees or rock outcroppings would be impacted by implementation of the proposed project. Therefore, the proposed project would not result in substantial damage to scenic resources, and no impact would occur.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Less than Significant Impact. The proposed project would be located within the existing Fairmont Reservoir property. As discussed above, the property is used for water storage and distribution. The proposed project would construct a sedimentation plant and associated facilities and reline Fairmont Reservoir #2. Given the general character and function of the Fairmont Reservoir property, the proposed facilities would not substantially degrade the existing visual character or quality of the site. Furthermore, while the project facilities may be partially visible from surrounding roads or residential properties, these views would be relatively distant and generally obscured by intervening terrain. Therefore, the proposed project would not substantially degrade the existing visual character or quality of the surroundings. The impact would be less than significant.

d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Less than Significant Impact. The project site is located within the interior of the existing Fairmont Reservoir property, which includes limited existing lighting. The proposed project would provide additional exterior lighting, which would be restricted to that which is necessary to safely and securely operate the sedimentation plant at night. This exterior lighting would be operated only when required. It is anticipated that the proposed new facilities would be constructed of concrete and other non-reflective materials. Therefore, the proposed project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area, and the impact would be less than significant.

II. AGRICULTURE AND FORESTRY RESOURCES

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?

No Impact. The proposed sedimentation plant and the Fairmont Reservoir #2 modifications would be located entirely within LADWP property, and the access road paving would occur within the existing roadways. All portions of the project site are designated as Grazing Land on the Los Angeles County Important Farmland 2016 map prepared by the California Department of Conservation, Division of Land Resource Protection pursuant to the Farmland Mapping and

Monitoring Program.[10] No portion of the project site is identified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.[11] Additionally, the project site is not used for agricultural uses. Therefore, the proposed project would not convert farmland to a non-agricultural use, and no impact would occur.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Less than Significant Impact. The area containing the existing Fairmont Reservoir #2 is zoned OS (Open Space), while the remainder of the project site is zoned A-2 (Heavy Agriculture).[12] Under the Los Angeles County Zoning Code, the A-2 zone permits the development of "water reservoirs, dams, treatment plants, gauging stations, pumping stations, wells, and tanks, and any other use normal and accessory to the storage and distribution of water" with issuance of a Conditional Use Permit.[13] However, in accordance with California Government Code 53090, LADWP is exempt from county zoning ordinances. (See California Government Code Section 53090 et seq.; Lawler v. City of Redding, 7 Cal. App. 4th 778 [1992]). Therefore, the proposed project would not require a Conditional Use Permit. The Fairmont Reservoir property is not subject to a Williamson Act contract.[14] The impact would be less than significant.

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))?

No Impact. No portion of the project site is zoned for forest land or timberland as defined in Public Resources Code Section 12220(g) and Government Code Section 4526, respectively.[15] Therefore, the proposed project would not conflict with existing zoning for, or cause a rezoning of, forest or timberland, and no impact would occur.

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10 State of California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, Los Angeles County Important Farmland 2016 map, available at ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/los16.pdf, accessed October 12, 2017.

11 State of California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, Los Angeles County Important Farmland 2016 map, available at ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/los16.pdf, accessed October 12, 2017.

12 Los Angeles County Department of Regional Planning, Planning and Zoning Information Map Tool, available at http://rpgis.isd.lacounty.gov/GIS-NET3_Public/Viewer.html, accessed October 12, 2017.

13 Los Angeles County Planning and Zoning Code, Table 22.16.030-B.

14 State of California Department of Conservation, Division of Land Resource Protection, Los Angeles County. Williamson Act FY 2015/2016 map, available at ftp://ftp.consrv.ca.gov/pub/dlrp/wa/LA_15_16_WA.pdf, accessed October 12, 2017.

15 Los Angeles County Department of Regional Planning, Planning and Zoning Information Map Tool, available at http://rpgis.isd.lacounty.gov/GIS-NET3_Public/Viewer.html, accessed October 12, 2017.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. No portion of the project site is includes forest land, and the project site is not located within or adjacent to forest lands.[16] Therefore, the proposed project would not result in the loss of forest land or conversion of forest land to non-forest use, and no impact would occur.

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?

No Impact. The project site and adjacent properties are located in an area designated as "Grazing Land" on the Los Angeles County Important Farmland 2016 map prepared by the California Department of Conservation, Division of Land Resource Protection pursuant to the Farmland Mapping and Monitoring Program.[17] No portion of the project site or surrounding area is identified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.[18] Additionally, no forest lands exist on or adjacent to the project site. All development activities would occur either within the existing Fairmont Reservoir property or within existing roadways. Therefore, the proposed project would not change the existing environment such that Farmland would be converted to a non-agricultural use or forest land converted to non-forest use, and no impact would occur.

III. AIR QUALITY

The following analysis is based on the *LADWP Fairmont Sedimentation Plant Project Air Quality Impact Study*, prepared by Terry A. Hayes Associates, Inc. This report is included as Appendix A of this Initial Study/MND.

Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan (e.g., the SCAQMD Plan or Congestion Management Plan)?

Less Than Significant Impact. While the Antelope Valley Air Quality Management District (AVAQMD) has jurisdictional authority over the Antelope Valley area of the Mojave Desert Air Basin (MDAB), documentation of progress in improving regional air quality and planning of future program and policy implementation is provided in the 2016 Air Quality Management Plan (AQMP) prepared by the South Coast Air Quality Management District (SCAQMD). The AVAQMD advises that a project would not conflict with or obstruct implementation of the AQMP if the project is consistent with the existing land use plan. The AVAQMD also advises that zoning

16 Los Angeles County Department of Regional Planning, Planning and Zoning Information Map Tool, available at http://rpgis.isd.lacounty.gov/GIS-NET3_Public/Viewer.html, accessed October 12, 2017.

17 State of California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, Los Angeles County Important Farmland 2016 map, available at ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/los16.pdf, accessed October 12, 2017.

18 State of California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, Los Angeles County Important Farmland 2016 map, available at ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/los16.pdf, accessed October 12, 2017.

changes, specific plans, general plan amendments, and similar land use changes that do not increase dwelling unit density, do not increase vehicle trips, and do not increase vehicle miles traveled are also deemed to not to conflict with or obstruct implementation of the AQMP. The proposed project would be located on property currently owned by LADWP and would not require a land use or zoning change. Therefore, in accordance with AVAQMD guidance, impacts would be less than significant.

Furthermore, according to the SCAQMD, there are two key indicators of consistency with the AQMP: (1) whether the proposed project would result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the plan; and (2) whether the proposed project would cause the project area to exceed the forecasted growth incorporated into the plan.

The first consistency criterion relates to violations of the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS) that would obstruct timely attainment of the air quality standards. The AVAQMD focuses on reducing emissions of ozone (O_3) precursors (volatile organic compounds [VOC], nitrogen oxides [NO_X]), and particulate matter (PM_{10}) given the existing regional nonattainment designations. As shown under the impact discussion below in Section III(b), maximum daily emissions of O_3 precursors and particulate matter from construction activities would not exceed regional or localized significance threshold values. Construction emissions would also be temporary in nature and would not have a long-term impact on the region's ability to meet California and federal air quality standards.

In addition, construction activities associated with the proposed project would comply with state and local strategies designed to control air pollution, such as AVAQMD Rules 402 (Nuisance Emissions) and 403 (Fugitive Dust), as discussed in Section 1.6.7 of this MND. By adhering to the AVAQMD rules and regulations pertaining to fugitive dust control and equipment maintenance, as well as resulting in maximum daily emissions below the AVAQMD mass daily thresholds, project construction activities would be consistent with the goals and objectives of the AQMP.

The second consistency criterion requires that the proposed project not exceed the assumptions incorporated into the AQMP, which is based on the Southern California Association of Governments (SCAG) 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). A large-scale individual project could potentially exceed assumptions in the AQMP if it required a zoning change that resulted in disproportionate growth relative to the land use types analyzed in the plan. However, the AQMP focuses on long-term, operational sources of air pollutants that contribute to the regional emission inventory. Short-term, temporary emissions associated with construction activities would not conflict with the air quality plan so long as no AVAQMD thresholds of significance were exceeded. As shown below in Table 3-2 and Table 3-3 in Section III(b), construction activities would not generate daily air pollutant emissions of sufficient magnitude to exceed any applicable threshold of significance; thus, impacts related to conflict with the AQMP would be less than significant for proposed project construction activities.

Operational activity at the sedimentation plant would involve the hauling of sludge effluent in trucks to an off-site disposal facility. The plant itself would be powered by the electrical grid, so no electricity would be required through on-site power generation. As discussed below, haul truck activity would be minimal (approximately 10 truck round trips per day during weekdays), and emissions would not exceed applicable AVAQMD significance threshold values. Operation of the proposed project would not have the potential to result in any new or exacerbated air quality violations. Additionally, since the project would provide no additional water supply to the City, it would not result in any new residential or commercial development that would affect the region's population, employment, or vehicle trips projections that were incorporated into the SCAG 2016–2040 RTP/SCS. Operation of the proposed project would not conflict with or obstruct implementation of the 2016 AQMP, and the impact would be less than significant.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less Than Significant Impact. Construction and operation of the proposed project would have a potentially significant air quality impact if maximum daily emissions of any regulated pollutant exceeded the applicable AVAQMD air quality significance thresholds presented in Table 3-1 below.

Table 3-1
AVAQMD Significant Emissions Thresholds

	Units	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Daily Threshold	lbs/day	137	137	548	137	82	65
Annual Threshold	tons/year	25	25	100	25	15	12

Notes: VOC – volatile organic compounds, NO_X – nitrogen oxides, SO_X – sulfur oxides, PM_{10} – respirable particulate matter 10 microns or less in diameter, $PM_{2.5}$ – fine particulate matter 2.5 microns or less in diameter
Source: AVAQMD, California Environmental Quality Act (CEQA) and Federal Conformity Guidelines, August 2016.

Construction of the proposed project is anticipated to begin in 2020 and last for approximately 3.5 years. Construction would involve a total of eight individual activities, each requiring a specific equipment inventory, number of workers, and number of daily truck trips. Sources of air pollutants following completion of construction activities would include haul trucks used to transport sludge from the sedimentation plant to an off-site disposal facility. Daily and annual emissions of regulated pollutants were quantified for construction activities and future operation of the proposed project using emission factors from the California Air Resources Board (CARB) OFFROAD2011 model.

As shown in Table 3-2, maximum daily emissions during construction of the proposed project would be no greater than 7.5 pounds VOC, 89.3 pounds NO_X, 45.9 pounds carbon monoxide (CO), 0.2 pounds sulfur oxides (SO_X), 30.5 pounds PM_{10}, and 17.5 pounds fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$). Maximum daily emissions during construction would not exceed any applicable AVAQMD daily threshold value, and impacts would be less than significant.

Table 3-2
Estimated Daily Construction Emissions

	Daily Emissions (Pounds Per Day)					
	VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Maximum Daily Emissions	**7.5**	**89.3**	**45.9**	**0.2**	**30.5**	**17.5**
Regional Significance Threshold	137	137	548	137	82	65
Exceed Regional Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Terry A. Hayes Associates Inc., 2017

As shown in Table 3-3, maximum annual emissions during construction of the proposed project would be no greater than 0.7 ton VOC, 8.8 tons NO_X, 4.6 tons CO, less than 0.1 ton SO_X, 2.8 tons PM_{10}, and 1.6 tons $PM_{2.5}$. Maximum annual emissions during construction would not exceed any applicable AVAQMD regional threshold value, and impacts would be less than significant.

Table 3-3
Estimated Annual Construction Emissions

	Annual Emissions (Tons Per Year)					
	VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Maximum Annual Emissions	**0.7**	**8.8**	**4.6**	**<0.1**	**2.8**	**1.6**
Annual Significance Threshold	25	25	100	25	15	12
Exceed Regional Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Terry A. Hayes Associates Inc., 2017

Operational activities at the sedimentation plant would not constitute a substantial stationary source of air pollutant emissions as the flow of water into and out of the plant is accomplished by gravity, and power supply for other functions would be provided by connecting to existing SCE power lines. Operational emissions would primarily be attributed to haul truck trips. Implementation of the proposed project would generate approximately 10 truckloads of sludge per weekday that would be hauled to an off-site disposal facility. There are currently three California-approved landfills that may accept the sludge from the sedimentation plant (two in California and one in Nevada). For the purposes of the air quality analysis, it was conservatively assumed that sludge would be hauled to the approved disposal facility located a distance of 230 miles away, near Beatty, Nevada. Based on this assumption, daily air pollutant emissions generated by operational haul truck trips would be far below applicable AVAQMD daily and annual threshold values, as shown in Table 3-4 below, and impacts would be less than significant.

Table 3-4
Estimated Annual Operation Emissions

	Annual Emissions (Tons)					
	VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Maximum Daily Emissions	**0.8**	**11.8**	**7.3**	**0.2**	**1.1**	**0.5**
Daily Significance Threshold	137	137	548	137	82	65
Exceed Daily AVAQMD Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Maximum Annual Emissions	0.1	1.5	0.9	<0.1	0.1	<0.1
Annual Significance Threshold	25	25	100	25	15	12
Exceed Annual AVAQMD Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Terry A. Hayes Associates Inc., 2017

c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less Than Significant Impact. The Antelope Valley region is designated as nonattainment of the CAAQS and NAAQS for O_3 and PM_{10}. Therefore, there is an ongoing regionally cumulative impact associated with these air pollutants. The AVAQMD guidance for applying thresholds of significance for criteria air pollutants is relevant to the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality. Per CEQA Guidelines (California Code Regulations, Title 14 Section 15064(h)(3)), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project would comply with the requirements in a previously approved plan or mitigation program including, but not limited to, an air quality attainment or maintenance plan that provides specific requirements that would avoid or substantially lessen the regionally cumulative air quality issue.

Implementation of the proposed project would not generate daily or annual emissions of regulated air pollutants of sufficient quantity to exceed any applicable AVAQMD significance threshold value. Additionally, construction of the proposed project would comply with the applicable provisions set forth in the AVAQMD Rule Book, including, but not limited to, those described under Rule 401 (Visible Emissions) and Rule 403 (Fugitive Dust), as outlined in Section 1.6.7 of this MND. Employment of these BMPs and compliance with inspection and maintenance requirements would ensure that equipment and trucks were operating within acceptable conditions. Emissions of air pollutants would not be significant on an individual project scale, and implementation of the proposed project would not conflict with the 2016 AQMP. Therefore, the proposed project would not result in a cumulatively considerable net increase in emissions of O_3 precursors or PM_{10}, and impacts would be less than significant.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. According to the AVAQMD, residences, schools, daycare centers, playgrounds, and medical facilities are considered sensitive receptor land uses. The AVAQMD recommends that industrial projects within 1,000 feet of existing or planned sensitive receptor land use must be evaluated. The nearest sensitive receptor land uses (residences) are located over 1,000 feet from the project site. Equipment activity, truck loading and unloading, and material stockpiling would occur on the project site and would not be conducted in proximity to sensitive receptors. Results of emissions modeling shown in Table 3-2 demonstrate that maximum daily emissions would not exceed any applicable AVAQMD threshold value. The threshold values were derived to prevent the occurrence of air pollutant concentrations exceeding ambient air quality standards, which were designed to protect public health and the environment. Therefore, construction of the proposed project would not have the potential to generate concentrations of air pollutants at sensitive receptor locations that may be of concern. Construction activities would be temporary in nature, and emissions would cease at the completion of construction.

Valley fever is an illness caused by the fungus Coccidioides, which is found in semiarid areas throughout the southwestern United States as well as Mexico and Central and South America. Coccidioides thrives in dry, sandy, alkaline soils. In California, it is especially prevalent in the San Joaquin Valley but also occurs in the Antelope Valley. The vast majority of cases of Valley Fever are contracted from the inhalation of the spores of Coccidioides, which become airborne when contaminated soil is disturbed from agricultural, construction, or other activity. When present, the Coccidioides fungus exists only in the upper layer of the soil, no deeper than about 1 foot. As mentioned above, Coccidioides thrives in sandy, alkaline soils. The soils at the project site are generally classified as sandy loams with a slightly to moderately acidic pH. Therefore, it is unlikely that Coccidioides would be present in the soils at the site.

Nonetheless, measures would be undertaken to achieve dust suppression and minimize unnecessary disturbance of ground cover. Access roads to the project site would be paved during the first phase of construction to prevent the entrainment of dust as vehicles enter and exit the site during ensuing activities. Additionally, water would be applied to storage piles and graded areas to reduce windblown dust. Construction activities would be required to comply with AVAQMD Rule 403 (Fugitive Dust) and implement BMPs such as limiting equipment and vehicle speeds to 15 miles per hour on unpaved areas, as outlined in Section 1.6.7 of this MND. Based on the low likelihood of the presence of Coccidioides in the soil at the project site and implementation of the measures discussed above that would control dust generation from the upper layer of the soil during project construction, the impact from project construction activities related to exposure to the Coccidioides fungus would be less than significant. Project operation is not anticipated to involve soil-disturbing activities; therefore, no long-term impact would occur related to Valley Fever.

The predominant wind direction in the project area is from the west and west-southwest, blowing toward the east and east-northeast. The nearest downwind sensitive receptors are residential parcels located approximately 1,020 feet to the northeast of the project site along 170th Street West and approximately 2,950 feet to the east of the project site along West Avenue H. Air pollutant concentrations resulting from construction activity emissions would disperse and dissipate before reaching these downwind distances, and there is no potential for any air quality standard to be exceeded at these locations. Additionally, the proposed project would comply with the applicable provisions set forth in the AVAQMD Rule Book, including, but not limited to, those described under Rule 401 (Visible Emissions) and Rule 403 (Fugitive Dust), as outlined in Section 1.6.7 of this MND. Therefore, construction impacts related to exposing sensitive receptors to substantial pollutant concentrations would be less than significant.

Operation of the proposed project would not introduce a new substantial stationary source of air pollutant emissions to the project area. Operational air pollutant emissions would be primarily attributed to haul truck traffic disposing of sludge from the sedimentation plant. Haul truck traffic would average about 10 trucks per day during weekdays. Such minimal truck traffic would not have the potential to expose any sensitive receptor land uses to substantial pollutant concentrations. While the proposed project is industrial in nature, operation of the proposed project does not involve any significant source of long-term emissions. Therefore, operational impacts related to exposing sensitive receptors to substantial pollutant concentrations would be less than significant.

e) Create objectionable odors affecting a substantial number of people?

Less Than Significant Impact. The nearest sensitive receptors are individual single-family residences over 1,000 feet from the project site. Sources that may potentially emit odors during construction activities include equipment exhaust and asphalt paving. Odors from these sources would be localized and generally confined to the immediate area surrounding the project site. Construction of the proposed project would adhere to all requirements set forth in the AVAQMD Rules and Regulations, including employing standard construction techniques (e.g., inspection and maintenance of diesel-fueled heavy-duty equipment) and implementing the BMPs, as outlined in Section 1.6.7 of this MND to prevent the occurrence of nuisance odors. Odors would be typical of most construction sites and temporary in nature. Odorous emissions during paving would be limited to the near vicinity of the proposed project and cease upon completion of the road and reservoir sidewall paving.

Operation of the proposed project would not introduce any new long-term stationary source of odors to the project area. The primary source of operational emissions would be haul truck traffic disposing of sludge from the plant. Haul trucks would be inspected and maintained in accordance with CARB and AVAQMD Rules and Regulations. Compliance with applicable regulations would ensure that haul trucks would be operating within acceptable conditions. Therefore, construction and operational impacts of the proposed project related to creating objectionable odors would be less than significant.

IV. BIOLOGICAL RESOURCES

The following analysis is based on the *Biological Technical Report and Preliminary Jurisdictional Determination* (BTR), prepared by AECOM. The BTR is included as Appendix B of this Initial Study/MND.

The BTR focused on the vegetation communities and land cover types, plant species, and wildlife species found within the project site plus a 500-foot survey buffer around the project, designated as the Biological Study Area (BSA) (Figure 3-1). The project area evaluated in the BTR includes the proposed sedimentation plant site, staging and laydown area, stockpile area, and Fairmont Reservoir #2.

The proposed project is situated along the northern edge of the San Gabriel Mountains and the western edge of the Mojave Desert and is located on the Lake Hughes, California, U.S. Geological Survey 7.5-minute quadrangle map. Elevations in the BSA generally range between 3,010 and 3,070 feet above mean sea level. Other than several agricultural properties that include residences, the closest of which is over 1,000 feet northeast of the proposed sedimentation plant, the area surrounding the proposed project is essentially undeveloped.

During project operations and routine maintenance activities, activities would be conducted within previously disturbed and developed surfaces and would not encroach into adjacent habitats potentially suitable for special-status wildlife, sensitive natural vegetation communities, or jurisdictional waters. As a result, impacts to biological resources would be limited and are expected to be minimal, short term, and in most cases would not directly affect biological resources. Therefore, impacts to biological resources are not anticipated during operation and maintenance of the project. Thus, the analysis of biological resources presented in this section focuses on the short-term effects during the construction phase of the proposed project.

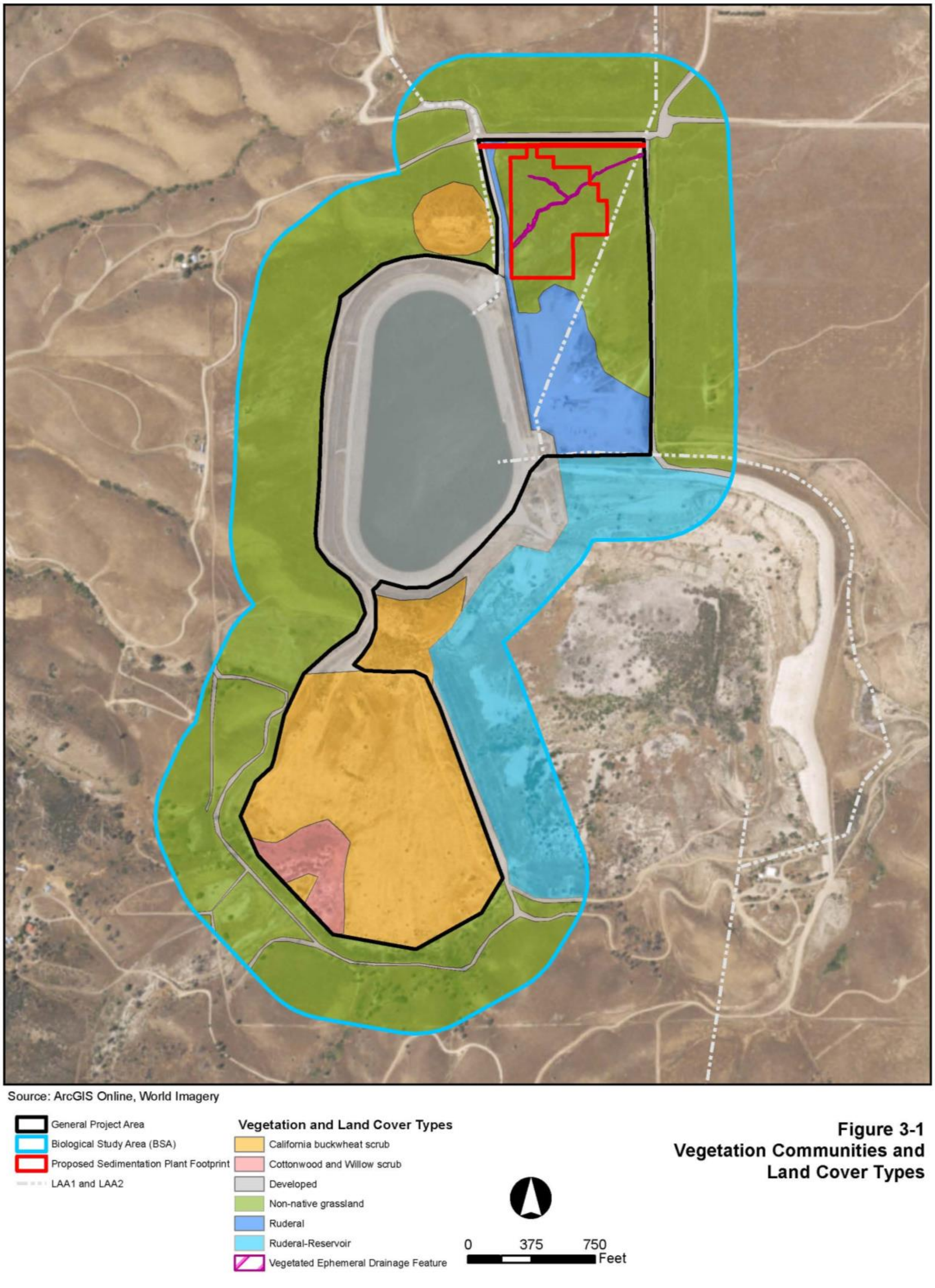

Figure 3-1
Vegetation Communities and Land Cover Types

Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less Than Significant Impact with Mitigation. Direct and indirect impacts to plant and wildlife species are discussed below.

Special-Status Plant Species

Special-status plant species include those listed as Endangered, Threatened, Rare or those species proposed for listing (Candidates) by the U.S. Fish and Wildlife Service (USFWS), CDFW, and the California Native Plant Society.[19,20,21] No special-status plant species were observed during field surveys and the project site generally does not contain habitat potentially suitable for special-status plants. Vegetation communities and land cover types in the BSA have been altered by human activities at the reservoir complex over time, including construction and subsequent operation of the Fairmont reservoirs and other water supply infrastructure in the vicinity (i.e. LAA1, LAA2, and SWP), and routine vegetation maintenance (i.e., mowing/tilling on-site grasslands). As a result, developed, ruderal, and non-native grassland habitats dominate the project area. Some native California buckwheat scrub habitat occurs in the proposed stockpile area of Fairmont Reservoir #1, as shown in Figure 3-1. Direct impacts to non-native grassland habitat and California buckwheat scrub habitats resulting from construction of the proposed project are not considered significant, since no sensitive vegetation community would be affected, and the impacted habitats represent an incrementally small area compared to nearly identical habitats that occur outside the BSA within the surrounding Antelope Valley. As no special-status plant species were observed on site during the field surveys and potentially suitable habitat is generally absent, direct impacts to special-status plant species would be less than significant.

Indirect impacts to special-status plant species occurring outside the project area typically result from construction-related habitat loss and modification of sensitive natural communities related to dust, noise, and stormwater runoff, and through the potential spread of noxious and invasive plant species into these communities. However, erosion control measures as part of the proposed project's SWPPP to control surface runoff, erosion, sedimentation, and tracking of material by trucks outside of the proposed project's footprint would be implemented during construction and, as a result, indirect impacts to special-status plant species would be less than significant.

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19 Species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (Title 50 Code of Federal Regulations [CFR] 17.12 [listed plants], Title 50 CFR 17.11 [listed animals], and includes notices in the Federal Register for proposed species).

20 Species listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (Title 14 California Code of Regulations 670.5).

21 Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.).

Special-Status Wildlife Species

Special-status wildlife species include those listed by the USFWS under the federal Endangered Species Act and by CDFW under the California Endangered Species Act. USFWS and CDFW officially list species as either Threatened or Endangered, or as Candidates for listing. On-site non-native grassland and coastal sage scrub habitat is potentially suitable for a number of regional special-status species, including two species observed during the field survey: loggerhead shrike (*Lanius ludovicianus*), a CDFW Species of Special Concern, and California horned lark (*Eremophila alpestris actia*), a CDFW Watch List species. As evaluated in the BTR, on-site habitats are potentially suitable to support 16 additional regional special-status wildlife species, which were determined to have potential to occur in the project area.

Special-Status Raptors

Two raptors, red-tailed hawk (*Buteo jamaicensis*) and turkey vulture (*Cathartes aura*), were detected flying over the BSA during field surveys. Additionally, seven special-status raptor species known to occur in the region have some potential (Low or Moderate) to occur within the project area, most likely as transient foragers, since potentially suitable nesting habitat for raptors is limited in the project area. Raptors typically build nests in mature, large coniferous or deciduous trees, using twigs or branches as nesting material, or nest in cavities in trees or on cliffs. Raptors generally have a greater potential to forage over the mix of disturbed, desert scrub, and grassland habitats that occur in and adjacent to the BSA, rather than nest in it. Although nesting habitat preferred by raptors is limited, common and special-status raptors could nest in and adjacent to the BSA, in particular in trees in and along Fairmont Reservoir #1, and in scattered trees on hillsides to the south and west of the project area. Because the trees potentially suitable for nesting raptors would not be removed by the project, there is a potential for raptors to nest within the BSA, and the impact would be considered potentially significant. However, with implementation of Mitigation Measures BIO-A and BIO-B, impacts to special-status raptor species would be reduced to less than significant.

Construction noise may indirectly affect raptor species if they are present in the vicinity, causing them to change their behavior and move out of the area. If raptors are detected nesting in the vicinity of the project prior or during construction, noise-reduction measures may need to be implemented to reduce construction noise levels to acceptable levels, or work discontinued until the young have fledged. By adhering to avoidance and minimization measures outlined in Mitigation Measures BIO-A and BIO-B, indirect impacts to special-status raptor species would be less than significant.

Special-Status Passerine and Non-Passerine Birds

Two special-status passerines, loggerhead shrike and California horned lark, were detected in the BSA. These species typically use most habitat types and are known to nest on the ground; in shrubs and trees; on buildings; under bridges; and within cavities, crevices, and manmade structures. Three additional special-status passerines from the region have some potential (Low or Moderate) to forage in the project area, with trees and grassland habitat in the BSA also providing potentially suitable habitat for nesting. While some saplings within the proposed stockpile area of Reservoir #1 may be impacted, no mature trees preferred by nesting birds would be removed by the project. In addition, some non-native grassland habitat, which is common in and around the BSA, would be removed, and the impact would be considered potentially significant. By adhering to Mitigation Measures BIO-A and BIO-B, direct impacts to special-status passerines and non-passerines, or their associated habitats, during project construction would be reduced to less than significant.

Construction noise may indirectly affect special-status passerine and non-passerine species if they are present in the vicinity, causing them to change their behavior and move out of the area. If passerines or non-passerines are detected nesting in the vicinity of the project prior or during construction, noise-reduction measures may need to be implemented to reduce construction noise levels to acceptable levels, or work discontinued until the young have fledged. By adhering to avoidance and minimization measures outlined in Mitigation Measures BIO-A and BIO-B, indirect impacts to special-status passerines and non-passerines would be reduced to less than significant.

Nesting Birds

All birds, except European starlings, English house sparrows, rock doves (pigeons), and non-migratory game birds such as quail, pheasant, and grouse, are protected under the Migratory Bird Treaty Act (MBTA), which prohibits the kill or transport of native migratory birds, or any part, nest, or egg of any such bird unless allowed by another regulation adopted in accordance with the MBTA.[22] Non-migratory game birds are also protected under California Fish and Game Code (CFGC).[23] Although suitable trees for nesting are limited in the BSA, existing vegetation and man-made structures in the project area could provide suitable nesting habitat for some bird species. As a result, direct impacts to nesting birds could occur and would be considered potentially significant. By adhering to Mitigation Measures BIO-A and BIO-B, direct impacts on nesting birds or their associated habitat would be reduced to less than significant.

Temporary indirect impacts to nesting birds within the vicinity of the project could occur as a result of noise and increased human presence during construction. Disturbances related to construction could result in changes in bird behavior, including nest abandonment or decreased feeding frequency, leading to increased nestling mortality. By adhering to Mitigation Measures BIO-A and BIO-B, indirect impacts to nesting birds would be less than significant.

Special-Status Mammals, Reptiles, Amphibians, Fish, and Invertebrates

The eight special-status mammal; six reptile; and one each of amphibian, fish, and invertebrate species known to occur in the region and evaluated in the BTR are not expected, or have only low potential, to occur in the BSA, generally due to the absence of habitats required by these species. As a result, direct impacts to special-status species of these groups are not anticipated, and impacts would be less than significant.

[22] U.S.C. Title 16, Chapter 7, Subchapter II, Sections 703–712.
[23] CFGC Section 3503.

Indirect impacts to regional special-status wildlife species in these groups that could potentially occur on site would arise as a result of noise and increased human activity during construction. Disturbances related to construction could result in changes in behavior and avoidance of the construction area. By adhering to Mitigation Measures BIO-A and BIO-B, any indirect impacts to special-status species of the groups presented above would be reduced to less than significant.

Mitigation Measures BIO-A and BIO-B are required, as follows:

BIO-A: The following measures shall be implemented to avoid and minimize impacts to special-status species and sensitive habitats:

1. Work areas shall be clearly delineated with fencing or other boundary markers prior to the start of construction.

2. The project limits shall be clearly marked on project maps provided to the construction contractor(s) by LADWP, and areas outside of the project limits shall be designated as “no construction” zones. A construction manager shall be present during all construction activities to ensure that work is limited to designated project limits.

3. During construction, construction workers shall strictly limit their activities, vehicles, equipment, and construction materials to the designated construction limits.

4. During construction, all equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other such activities shall occur in designated areas outside of jurisdictional wetlands or waters and within the project limits. Fueling of equipment shall take place within existing paved areas greater than 100 feet from water features. Contractor equipment shall be checked daily for leaks prior to operation and repaired as necessary.

5. During construction, the construction work zone shall be kept as clean of debris as possible to avoid attracting predators of sensitive wildlife. All food-related trash items shall be enclosed in sealed containers and removed daily from the construction work zone.

6. Pets of project personnel shall not be allowed on the project site during construction.

7. Prior to the start of construction, a SWPPP shall be prepared to reduce the potential for accidental releases of fuel, pesticides, and other materials. This plan shall outline refueling locations, emergency response procedures, and reporting requirements. During construction, equipment for immediate cleanup shall be kept on site. This plan shall also include erosion control measures to control surface runoff, erosion, and sedimentation outside of the project footprints.

BIO-B: The clearance of any vegetation during construction shall occur outside of the nesting bird season (generally February 15 through September 15). If vegetation removal and other project construction outside this time period are not feasible, the following additional measures shall be employed to avoid and minimize impacts to special-status bird species and nesting birds protected under the MBTA:

1. A pre-construction nesting bird survey shall be conducted by a qualified biologist within 3 days prior to the start of construction activities to determine whether active nests are present within or directly adjacent to the construction zone. All nests found shall be recorded.

2. If construction activities would occur within 300 feet of an active nest of any passerine bird or within 500 feet of an active nest of any raptor, a qualified biologist shall monitor the nest on a weekly basis and the construction activity shall be postponed until the biologist determines that the nest is no longer active.

3. If the recommended nest avoidance zone is not feasible, the qualified biologist shall determine whether an exception is possible and obtain concurrence from the appropriate resource agency before construction work can resume within the avoidance buffer zone. All work shall cease within the avoidance buffer zone until either agency concurrence is obtained or the biologist determines that the adults and young are no longer reliant on the nest site.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less Than Significant Impact with Mitigation. Sensitive natural communities are those designated as rare in the region by the California Natural Diversity Database, support special-status plant or wildlife species, or receive regulatory protection.

The project site is dominated by developed, ruderal, and non-native grassland habitats, and no sensitive natural vegetation communities are present within the BSA. Much of the vegetation in the BSA has been disturbed by past anthropogenic activities in the reservoir property, and is of marginal quality to provide suitable habitat for riparian or other sensitive natural community. As a result, direct impacts to such communities would be less than significant.

However, as shown in Figure 3-1, an ephemeral drainage feature within the BSA flows northeast across the proposed sedimentation plant site. This drainage would be removed to accommodate the sedimentation plant, and the water source from west of LAA1 would be intercepted and redirected. The drainage is vegetated with a similar species composition as adjacent upland areas. The drainage remains in a defined channel for approximately 500 feet beyond the boundary of the Fairmont reservoir property, before becoming an indefinable channel, dissipating as surface flows within West Avenue H. Evidence of surface flows on the opposite side of West Avenue H were observed during the field surveys; however, no surface connection between the on-site vegetated ephemeral drainage feature and the SWP, or any other water feature in the vicinity, was detected during the field surveys.

Nonetheless, within the project site, the vegetated ephemeral drainage feature exhibits a defined bed, bank, and channel, and is therefore potentially subject to CDFW's permitting authority under Section 1600 et seq. of the CFGC. Vegetation within the drainage is dominated by upland vegetation and no riparian habitat that would potentially also fall under CDFW jurisdiction is present along the drainage. As a result, the extent of CDFW jurisdiction is restricted to the area between the drainage feature's banks, where a total of 0.28 acres, representing approximately 1,235 linear feet, occurs as potential jurisdictional waters of the State. On average, the bank-to-bank width of the channel is approximately 4 feet. No other waters under CDFW jurisdiction were identified within the BSA. Therefore, the project would require a Lake or Streambed Alteration Agreement (LSAA) from CDFW. Through coordination with CDFW on preparation of an LSAA, direct impacts to waters of the State would be less than significant level.

Indirect impacts to sensitive natural vegetation communities during construction could include noise, the accumulation of fugitive dust, increase of surface runoff, increase of erosion, and increase of sediment deposition within habitat beyond the project footprint. By adhering to the provisions of the SWPPP prepared for the project and to Mitigation Measures BIO-A and BIO-B, the potential for indirect impacts to natural communities would be less than significant.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact. As discussed above, the on-site ephemeral drainage feature remains in a defined channel for approximately 500 feet beyond the boundary of the Fairmont reservoir property, before becoming an indefinable channel and dissipating as surface flows within West Avenue H. Evidence of surface flows on the opposite side of West Avenue H were observed during the field surveys; however, no surface connection between the on-site drainage feature and the SWP, or any other water feature in the vicinity, was detected during the field surveys.

The BSA occurs in the Amargosa Creek watershed and is within the Myrick Canyon subwatershed. The U.S. Army Corps of Engineers (USACE) completed a Non-Jurisdictional Determination for the Amargosa Creek watershed in June 2004 (File No. 2004-01295-AOA), which determined that Amargosa Creek is a non-navigable isolated water body that does not exhibit a substantial nexus to interstate commerce, and therefore is not subject to USACE jurisdiction and is not considered a regulated water of the U.S. As a result, no permit from USACE pursuant to Section 404 of the CWA is required for impacts to the vegetated ephemeral drainage feature. No adverse impacts to federally protected waters of the U.S. as defined by Section 404 of the CWA would occur during project implementation. No impact would occur.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery/breeding sites?

Less Than Significant Impact with Mitigation. Vegetation communities occurring in and within the vicinity of the BSA provide a corridor for regional wildlife movement between mountain ranges and the valley floor, and localized movement within the valley and adjacent foothills south and west of the BSA. The project site is located within the Antelope Valley, which likely provides regional corridors for wildlife movement between the San Gabriel Mountains (to the south) and Tehachapi Mountains (to the north) across the valley floor, as well as for the local movement of individuals and populations occurring in the valley. The Los Angeles County Significant Ecological Areas Technical Advisory Committee has identified areas in and around existing and proposed Significant Ecological Areas (SEAs) in Los Angeles County that are conducive to or a hindrance to wildlife movement between SEAs. The BSA partially occurs within the San Andreas SEA, and there are three movement corridors located in or within proximity of the BSA. These three provide linkages between large natural areas, generally following natural topography, such as a streambed or ridgeline. The two corridors occurring outside the BSA are located 0.50 to 1.0 mile north-northwest of the BSA at bridge crossings that provide movement over the SWP. These linkages are located at an anthropogenic feature (the SWP) that may prevent, impede, or slow movement within or outside the San Andreas SEA. The corridor coinciding with the BSA occurs between the area around Fairmont Reservoir #1 and larger contiguous natural areas to the south, in the foothills of the San Gabriel Mountains. Movement from the BSA into the foothills then theoretically provides further movement to the south and west into the San Gabriel Mountains, where additional large undisturbed natural areas exist in the Angeles National Forest.

Vegetation would be removed during project construction in the proposed sedimentation plant location; however, the loss of non-native grassland habitat that would be permanently impacted by construction of the proposed sedimentation plant occurs in an area that has experienced development and disturbances associated with the Fairmont reservoir property, and the loss represents an incrementally small area of this habitat type compared to the greater valley floor. Additionally, the movement corridor identified by the County of Los Angeles that occurs within the BSA does not coincide with the location for the proposed sedimentation plant.[24] As a result, direct impacts to wildlife movement would be less than significant.

Indirect effects during construction due to human presence, noise, and dust could occur to the wildlife movement corridor identified in the BSA between the area of Fairmont Reservoir #1 and larger natural areas in the foothills to the south and west. In the event that vegetation communities adjacent to the project construction are indirectly impacted, they would be temporary in nature and restricted to the construction time period. Construction in the BSA occurs at least 0.50 mile from bridges that provide corridors over the SWP, linking vegetation communities on

[24] County of Los Angeles, SEA Ordinance. SEA Connectivity & Constrictions Map, Draft. April 2014.

opposite sides of the SWP. The functions and values of vegetation communities in the BSA as wildlife movement corridors would generally be unchanged from current conditions upon the completion of construction. By adhering to Mitigation Measure BIO-A, long-term indirect impacts to wildlife movement corridors would be less than significant.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (e.g., oak trees or California walnut woodlands)?

No Impact. No oak trees protected under the Los Angeles County Oak Tree ordinance,[25] or other trees or habitats protected under local policy or ordinance were documented in the BSA. No impact would occur.

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?

No Impact. The BSA does not coincide with USFWS-designated critical habitat; however, it does coincide within an area covered under the multi-jurisdictional West Mojave Plan,[26] and a portion of the BSA occurs within a County of Los Angeles SEA. The portion of the project site containing Fairmont Reservoir #2 is also within the boundaries of the San Andreas SEA. The proposed project work within the San Andreas SEA would consist of relining the existing reservoir. There would be no change in the use or size of the reservoir. Therefore, the proposed project would not conflict with the objectives of the SEA, and no impact would occur.

The project site occurs along the western fringe of the West Mojave Plan (WEMO) area. The WEMO is a large-scale, multiagency plan that develops conservation and management strategies for sensitive species throughout the western Mojave Desert. The proposed project occurs exclusively on privately owned (LADWP) land and is not anticipated to impact any federal or state-listed species, or species identified for management under the WEMO. Therefore, the proposed project would not conflict with the WEMO, and no impact would occur.

V. CULTURAL RESOURCES

The following analysis is based on the *Cultural Resources Impact Study for the Fairmont Sedimentation Plant Project*, prepared by AECOM. This report is included as Appendix C of this Initial Study/MND.

25 Los Angeles County Ordinance Section 22.56.2050 Oak Tree Permit Regulations.
26 Final Environmental Impact Report and Statement for the West Mojave Plan. A Habitat and Conservation Plan and California Desert Conservation Area Plan Amendment. January 2005.

Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in California Code of Regulations Section 15064.5?

Less Than Significant Impact. To determine project impacts to cultural and historical resources, a Phase I intensive pedestrian survey was conducted to determine the location of unknown cultural resources and evaluate the present condition of the single known historic resource at the project site, LAA1. The majority of the area of potential effects (APE) that might be impacted by the project has never been subjected to such a systematic pedestrian survey. The survey conducted within the APE found an extension of one previously recorded historic resource: LAA1 (P-19-002105H). The resource consists of the entirety of LAA1, beginning in the Owens Valley and ending in the San Fernando Valley. It was found to be eligible for inclusion in the California Register of Historical Resources (CRHR) under several criteria, including its importance as a water carrying resource that contributed to the success of Los Angeles in its infancy (Criterion 1) and its association with famous engineer William Mulholland, who was responsible for major water projects in the region (Criterion 2). The aqueduct has also been recommended eligible as the work of a master engineer (Criterion 3). For these reasons, the aqueduct might also be considered eligible for inclusion in the National Register of Historic Places (NRHP) under similar criteria.

A 1,100-foot-long portion of LAA1 is visible within the APE. This portion of LAA1 enters from the northwest and connects with Fairmont Reservoir #2. It would be modified where it enters the Fairmont Reservoir property to provide a connection to the sedimentation plant intake facility. However, the segment within the APE does not contribute to the resource's significance because the segment has been modified heavily since the period of significance. The visible portions of the aqueduct all date to 2010. As such, the segment of the aqueduct within the APE has been modified to the extent that it no longer conveys the historic significance of the aqueduct constructed in the first quarter of the twentieth century under the leadership of William Mulholland. This segment of the aqueduct has lost its integrity due to substantial modification, and is not eligible for inclusion in the NRHP or the CRHR. As such, the proposed project would result in less than significant impacts to historical resources.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to California Code of Regulations Section 15064.5?

Less Than Significant Impact with Mitigation. Based on the records search of the project area, eight previously recorded cultural resources were identified within 0.5 mile of the project area, with one historical resource recorded within the project area (LAA1, as stated above). No archaeological resources were recorded within the project site or encountered during the pedestrian survey.

Based on the results of the archival research and survey, there is low potential that archaeological resources would be encountered during ground-disturbing activities for the proposed project. Nonetheless, archaeological deposits can be buried with no surface indications of their existence, particularly in areas of alluvial deposits. Therefore, it is possible that archaeological resources could be buried beneath the ground surface, especially in areas where previous development has included only minimal ground disturbance. In addition, because archaeological resources, including prehistoric resources, may be present below the surface, Native American tribal representatives, through consultation, have requested that a Native American archaeological monitor be present during ground-disturbing activities.

Because the potential to encounter archaeological resources exists during construction of the proposed project, the impact would be considered potentially significant. However, with implementation of Mitigation Measures CR-A and CR-B, impacts to archaeological resources would be less than significant.

Mitigation Measures CR-A and CR-B are required, as follows:

CR-A: Before the start of ground-disturbing activities at the project site, a training program for construction personnel shall be developed and implemented to familiarize construction personnel with the relevant legal context for potential cultural resources at the project site and with the types of cultural sites, features, and artifacts that could be uncovered during construction activities. In addition, this training is to prevent unauthorized collection of archaeological materials or vandalism to known archaeological sites. These training sessions will be conducted before beginning construction and will be repeated as needed as construction crews and supervisors change.

CR-B: Pursuant to California Public Resources Code Section 21083.2(i) regarding provisions related to the accidental discovery of archaeological resources, the following procedures shall be followed if such resources are accidentally encountered during ground-disturbing activities. Work shall immediately be halted in the vicinity (within a 60-foot buffer of the find), LADWP shall be notified, and LADWP shall contact a qualified archaeologist meeting U.S. Secretary of Interior standards to evaluate the significance of and determine appropriate treatment for the resource in accordance with the provisions of CEQA Guidelines Section 15064.5 and the National Historic Preservation Act. Work in the area may not resume until evaluation and treatment of the resource is completed or the resource is recovered and removed from the site. Construction activities may continue on other parts of the construction site while evaluation and treatment at the site take place. A trained Native American monitor shall be invited to be present during all ground-disturbing activities and as the archaeologist conducts the assessment of any discovered resources believed to be of Native American origin. In consultation with LADWP and the archaeologist, the Native American monitor may make recommendations for the treatment and disposition of any such resources.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant Impact. Based on the results of the archival research and site survey, there are no known paleontological resources at the project site. The project site is located in the Mojave Desert in the Mojave physiographic province, which is mostly Quaternary sediments as well as mixed tertiary quaternary, Mesozoic granite, and older sedimentary deposits, which have a low paleontological sensitivity and are unlikely to yield significant fossil remains. Nonetheless, paleontological deposits can be buried with no surface indications of their existence, particularly in areas of older Quaternary alluvium deposits. However, with implementation of BMP 7 as presented in Section 1.6.7 of this MND, impacts to paleontological resources would be less than significant.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Less Than Significant Impact. There are no known cemeteries located within the project vicinity. As discussed above, based on the results of the archival research and survey, there is low potential that prehistoric and/or historic archaeological resources would be encountered during ground-disturbing activities at the project site. Although no resources were identified, it is possible that significant archaeological resources, including human remains, may be encountered during project construction activities involving ground disturbance. However, with implementation of BMP 8 as presented in Section 1.6.7 of this MND, impacts to human remains would be less than significant.

VI. GEOLOGY AND SOILS

Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Less Than Significant Impact. The proposed project would not expose people or structures to new adverse effects associated with rupture of a known earthquake fault. The project site is not within an Alquist-Priolo Earthquake Zone or on any other known fault trace.[27] However, the project site is within the seismically active southern California region, including within 2.5 miles of the San Andreas Fault. The proposed project would be designed and constructed in accordance with all applicable federal, state, and local codes related to seismic criteria. Therefore, the proposed project would not expose people or structures to potential adverse effects from the rupture of a known earthquake fault, and impacts would be less than significant.

ii) Strong seismic ground shaking?

Less Than Significant Impact. As with most locations in southern California, the project site is susceptible to ground shaking during an earthquake. As discussed in Section VI(a)(i), the project site is located within 2.5 miles of the San Andreas Fault. The proposed project would be designed and constructed in accordance with all applicable federal, state, and local codes related to

[27] California Department of Conservation, Alquist-Priolo Fault Zone and Seismic Hazard Zone Maps, search Lake Hughes, available online at http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps, accessed October 5, 2017.

seismic criteria. Therefore, the proposed project would not expose people or structures to potential adverse effects related to strong seismic ground shaking, and impacts would be less than significant.

iii) Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. The southern portion of the Fairmont Reservoir property is located within a zone identified as potentially susceptible to liquefaction.[28] However, the project site itself is not located within a liquefaction zone. With adherence to all applicable state and local building standards and codes, impacts related to seismic-related ground failure, including liquefaction, would be less than significant.

iv) Landslides?

No Impact. The project site and surrounding area is relatively flat and, according to the California Department of Conservation Landslide Index, does not contain slopes that would be subject to landslides.[29] No impact would occur.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact. Construction activities would expose soils for a limited time, allowing for possible erosion. However, during construction, transport of sediments from the project site by stormwater runoff and winds would be prevented through the implementation of appropriate BMPs, as discussed in Section 1.6.7 of this MND. This would include implementation of Rule 403 dust control measures and the development and implementation of an erosion control plan and a SWPPP for construction activities, in compliance with the latest RWQCB's NPDES permit requirements for stormwater discharges. The SWPPP would list the measures to be implemented in order to prevent erosion from project construction-related activities. With adherence to applicable regulations and implementation of appropriate BMPs, construction impacts associated with soil erosion or the loss of topsoil would be less than significant.

Long-term operation of the proposed project would not result in substantial erosion or loss of topsoil. The proposed project would be constructed in accordance with applicable state and local requirements and BMPs as outlined in Section 1.6.7 of this MND. The project design would include appropriate drought-tolerant landscaping and other soil cover to help stabilize exposed areas, including the excavated material placed in Fairmont Reservoir #1. As a result, no substantial increase in erosion or siltation would occur. With implementation of operational BMPs, specifically compliance with NPDES permit requirements, long-term impacts associated with soil erosion or loss of topsoil would be less than significant.

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28 California Department of Conservation, Alquist-Priolo Fault Zone and Seismic Hazard Zone Maps, search Lake Hughes, available online at http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps, accessed October 5, 2017.

29 California Department of Conservation, Landslide Map Index, available online at http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=landslides, accessed October 5, 2017.

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?

Less Than Significant Impact. As discussed in Section VI(a)(iv) above, the project site is characterized by flat topography and does not contain slopes that would be subject to landslides. In addition, according to the California Department of Conservation Landslide Index maps of the site, the project site is not designated as a potential earthquake-induced landslide area.[30] Therefore, no impact from on- or off-site landslides would occur.

Lateral spreading involves primarily horizontal movement of earth materials due to liquefaction. As discussed in Section VI(a)(iii) above, the portions of the Fairmont Reservoir property (specifically, Fairmont Reservoir #1, which has been drained and removed from service) are subject to liquefaction. However, the proposed project site itself is not located in a liquefaction zone. Subsidence is the lowering of surface elevation due to changes occurring underground, such as the extraction of large amounts of groundwater, oil, or gas. The proposed project does not include such extraction from the project site. Therefore, subsidence would not occur.

Collapsible soils consist of loose dry materials that collapse and compact under the addition of water or excessive loading. As discussed above, the proposed project would be designed and constructed in accordance with the County of Los Angeles Building Code and other applicable federal, state, and local codes. Soils would be excavated and properly compacted per County requirements prior to use as backfill. All structures would include appropriate foundations to distribute loads based on detailed geotechnical analyses. With adherence to all applicable state and local requirements, impacts related to lateral spreading, subsidence, liquefaction, or collapse resulting from unstable soils would be less than significant.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Less Than Significant Impact. Expansive soils are clay-based soils that tend to expand (increase in volume) as they absorb water and shrink (lessen in volume) as water is drawn away. The project site primarily consists of RcC and RcD (Ramona coarse sandy loam), TsF (Terrace escarpments), and GsC (Greenfield sandy loam) soils, which are generally sandy soils.[31] These soil types are not predominantly composed of clay, and the potential to create risks to life or property related to expansive soils is considered to be low. Additionally, as discussed above, the proposed project would be designed and constructed in accordance with all applicable federal, state, and local codes. With adherence to all applicable regulations, impacts from expansive soils would be less than significant.

30 California Department of Conservation, Landslide Map Index, available online at http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=landslides, accessed October 5, 2017.

31 United States Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey Soil Map – Antelope Valley Area, California, available online at https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx, accessed October 16, 2017.

e) Have soils incapable of adequately supporting use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

Less Than Significant Impact. The proposed project would require the use of a septic system for personnel needs because the project site is in a remote and generally undeveloped area. The septic system would comply with standard construction methods to ensure that soils are capable of adequately supporting its use. Therefore, the proposed project would result in a less than significant impact related to soils supporting the use of septic systems.

VII. GREENHOUSE GAS EMISSIONS

The following analysis is based on the *LADWP Fairmont Sedimentation Plant Project Greenhouse Gas Emissions Impact Study*, prepared by Terry A. Hayes Associates, Inc. This report is included as Appendix D of this Initial Study/MND.

Greenhouse gas (GHG) emissions refer to a group of emissions that are generally believed to affect global climate conditions. The greenhouse effect compares Earth and the atmosphere surrounding it to a greenhouse with glass panes. The glass panes in a greenhouse let heat from sunlight in and reduce the amount of heat that escapes. GHGs, such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), keep the average surface temperature of Earth close to 60 degrees Fahrenheit. Of all the GHGs, CO_2 is the most abundant gas that contributes to the greenhouse effect. CO_2 in the Earth's atmosphere is mostly naturally occurring, but man-made CO_2, primarily generated through the combustion of fossil fuels, is generally accepted to be a major cause of global climate change. Other GHGs are less abundant but have higher global warming potential than CO_2. To account for this higher potential, other GHGs are frequently expressed in the equivalent mass of CO_2, denoted as CO_2e.

The AVAQMD *CEQA and Federal Conformity Guidelines* include daily and annual quantitative thresholds of significance for GHG emissions generated by individual projects within Antelope Valley. It is very unlikely that any individual development project would generate GHG emissions of a sufficient magnitude to directly impact regional climate change unless it were an industrial use of large scale or a land use that would generate a disproportionately high number of vehicle trips. Therefore, the AVAQMD quantitative thresholds were established to ensure that individual projects would not make a significant incremental contribution to a larger cumulative effect related to regional GHG emissions and would not thereby interfere with plans and policies aimed at reducing GHG emissions.

According to the AVAQMD guidelines, the proposed project could potentially result in a significant environmental impact related to GHG emissions if construction or operation of the project resulted in daily GHG emissions equal to or exceeding 548,000 pounds CO_2e or annual GHG emissions equal to or exceeding 100,000 tons CO_2e. If daily or annual emissions exceed the respective thresholds of significance, further demonstration of consistency with state and regional GHG emissions reduction plans would be warranted to determine the severity of impacts.

Would the project:

a) **Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

Less Than Significant Impact. A GHG emissions analysis for the proposed project construction was conducted for heavy duty equipment and vehicle trips, as shown in Table 3-5. Daily emissions modeling conservatively assumed that all construction equipment would operate for the entire 8-hour workday, which is highly unlikely. As shown in Table 3-5, maximum daily and annual GHG emissions resulting from construction of the proposed project would remain substantially below the respective applicable AVAQMD significance threshold values, representing about 3.5 percent of the AVAQMD allowable daily limit and less than 2.0 percent of the annual limit for an individual project. Furthermore, all heavy duty construction equipment and diesel haul trucks would be operated in accordance with existing CARB and AVAQMD Rules and Regulations. Construction of the proposed project would not generate GHG emissions of sufficient magnitude to have a significant impact on the environment. The impact would be less than significant.

Table 3-5
Estimated Greenhouse Gas Emissions – Proposed Project Construction

Source Category	Maximum Daily Emissions (pounds CO_2e per day)	Maximum Annual Emissions (tons CO_2e per year)
Construction Equipment	7,860	817
Vehicle Trips	11,116	916
Total	**18,976**	**1,733**
AVAQMD Threshold Value	548,000	100,000
Exceeds AVAQMD Threshold Value?	**No**	**No**

Source: Terry A. Hayes Associates Inc., 2017

Since the proposed project would provide no additional water supply to the City, it would not induce growth that could represent an indirect source of GHG emissions created as a result of the project. Direct sources of GHG emissions that would be associated with operation of the proposed project include approximately 20 daily one-way haul truck trips disposing of sludge from the sedimentation plant and the provision of electricity by SCE. There are currently three California-approved landfills that may accept the sludge from the sedimentation plant (two in California and one in Nevada). For the purposes of the GHG analysis, it was conservatively assumed that sludge would be hauled to the farthest approved hazardous waste disposal facility near Beatty, Nevada, located approximately 230 miles from the project site. The GHG emission intensity factor for provision of electricity by SCE is 0.705 pounds of CO_2e per kilowatt-hour (kWh) based on a survey of power generation sources compiled by the California Air Pollution Control Officers Association. LADWP determined that the proposed project would require approximately 9,377,471 kWh annually, or approximately 25,692 kWh daily. Table 3-6 presents the results of the operational GHG emissions analysis.

Table 3-6
Estimated Greenhouse Gas Emissions – Proposed Project Operation

Source Category	Daily Emissions (pounds CO_2e per day)	Annual Emissions (tons CO_2e per year)
Electricity	18,113	3,306
Vehicle Trips	15,065	1,883
Total	**33,178**	**5,189**
AVAQMD Threshold Value	548,000	100,000
Exceeds AVAQMD Threshold Value?	**No**	**No**

Source: Terry A. Hayes Associates Inc., 2017

As shown in Table 3-6, maximum daily and annual GHG emissions that would be generated by operation of the proposed project would be substantially below the applicable AVAQMD significance thresholds, representing about 6 percent of the allowable daily limit and about 5 percent of the annual limit for an individual project. Based on the results of the operational GHG emissions analysis, the proposed project would not generate GHG emissions that would have a significant impact on the environment, and the impact would be less than significant.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less Than Significant Impact. GHG emissions are cumulative in nature and it is highly unlikely construction of any individual project would generate GHG emissions of sufficient quantity to conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Standard construction procedures would be undertaken in accordance with AVAQMD and CARB regulations applicable to heavy-duty construction equipment and diesel haul trucks. For construction, adhering to CARB requirements pertinent to construction equipment maintenance and inspections and emissions standards, as well as diesel fleet requirements including idling time restrictions and maintenance, would ensure that construction of the proposed project would not conflict with GHG emissions reductions efforts. For operations, adhering to requirements pertinent to haul truck and facility maintenance and inspections and emissions standards, as well as diesel fleet requirements, would ensure that operation of the proposed project would not conflict with GHG emissions reductions efforts. Furthermore, as shown in Tables 3-5 and 3-6, maximum daily and annual GHG emissions would remain substantially below the allowable limits set forth by the AVAQMD for individual projects. The proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, and impacts would be less than significant.

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?

Less Than Significant Impact. Implementation of the proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Construction activities would include the use of machinery and other equipment that may require fueling or maintenance/servicing with petroleum-based products (e.g., grease, oil). In addition, during construction of the proposed project, paints, solvents, and other potentially hazardous materials may be used. These types of materials are not acutely hazardous, and all storage, handling, and disposal of these materials are regulated by the California Department of Toxic Substances Control, the EPA, and the Los Angeles County Fire Department. All construction activities involving the transportation, usage, and disposal of such hazardous materials would be subject to federal, state, and local health and safety requirements. This would include the prevention of spills or leaks related to construction equipment and vehicles as well as other construction-related fluids. With adherence to applicable regulations, the impact related to the routine use and handling of hazardous materials during construction would be less than significant.

Operation of the proposed project would involve the use of chemical coagulants (ferric chloride) and flocculants (cationic polymers) to improve the settling rate of sediment in the settling basins. These chemicals would be consumed during project operation and would be delivered to the site on a regular basis and transferred to tanks designed for safe containment. These chemicals are stable and non-flammable, but they can cause skin, eye, and respiratory tract irritation, and can be toxic if swallowed. All transport, storage, and handling of these chemicals would be subject to the applicable federal, state, and local health and safety regulations.

Operation of the proposed project would also require transport of sludge to an off-site disposal facility. Because arsenic, a naturally occurring trace element in LAA water, would be present in the sludge, it would be treated as California hazardous waste and disposed of at an approved hazardous waste landfill. However, the sludge is not considered acutely hazardous. All storage, handling, and disposal of the sludge would be subject to the applicable federal, state, and local health and safety regulations.

With adherence to these regulations, impacts related to the routine transport and disposal of hazardous materials during project operation would be less than significant.

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?

Less Than Significant Impact. During construction of the proposed project, small quantities of hazardous materials (e.g., petroleum-based products, solvents, sealers, etc.) would be transported, used, stored, and disposed of according to local, state, and federal regulations. These substances are not considered acutely hazardous. Consequently, the potential for a significant hazard to the public or the environment related to the accidental release involving these materials is relatively low.

As previously discussed, operation of the proposed project would involve the routine transport, storage, and use of chemical as coagulants and flocculants. These chemicals are stable and non-flammable, but they can cause skin, eye, and respiratory tract irritation, and can be toxic if swallowed. All transport, storage, and handling of these chemicals would be subject to the applicable federal, state, and local health and safety regulations. In addition, the project would require the transport and disposal of sludge, a byproduct of the water treatment process. Because of the arsenic present in the sludge, it would be treated as hazardous waste and disposed of at an approved hazardous waste landfill. However, the sludge is not considered acutely hazardous. All storage, handling, and disposal of the sludge would be subject to the applicable federal, state, and local health and safety regulations. With adherence to these regulations, the potential for a significant hazard to the public or the environment related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials would be less than significant.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?

Less Than Significant Impact. The project site is located in a remote and generally undeveloped area. The nearest school is located approximately 2.5 miles south of the project site. As such, there would be no potential to emit or handle hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school during construction of the proposed project.

During operation of the proposed project, sludge produced as a byproduct of the water treatment process would be hauled to an approved off-site hazardous waste facility. The haul route for the trucks would have the potential to be located within one-quarter mile of existing schools. However, the sludge is not considered acutely hazardous, and all storage, handling, and disposal of hazardous materials would be subject to the applicable federal, state, and local health and safety regulations. Therefore, operational impacts related to emitting hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing school would be less than significant.

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?

No Impact. No hazardous materials sites are located within the Fairmont Reservoir property. The California Department of Toxic Substances Control's EnviroStor and State Water Resources Control Board's GeoTracker databases indicate that the nearest hazardous material site is located approximately 4.2 miles east of the project site.[32,33] The project site is not listed on the Cortese List or the EPA's National Priorities List.[34,35] These lists are compiled pursuant to Section 65962.5 of the Government Code. As such, implementation of the proposed project would not create a significant hazard to the public or the environment related to an existing hazardous materials site. No impact would occur.

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 for people residing or working in the project area?

No Impact. The project site is not located within 2 miles of a public airport or within an airport land use plan.[36] The nearest public use airport is the General William J. Fox Airfield, located approximately 12 miles northeast of the project site. As such, the proposed project would not result in a safety hazard for people residing or working in the project area related to a nearby airport. No impact would occur.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The project site is not located within the vicinity of a private airstrip. The nearest private airstrip is located approximately 8 miles north of the project site. As such, the proposed project would not result in a safety hazard for people residing or working in the project area related to a nearby private airstrip. No impact would occur.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. The proposed project would be located within the interior of the Fairmont Reservoir property, which is owned and operated by LADWP. Access to

32 California Department of Toxic Substances Control, EnviroStor Database, Search by Map Location, available online at https://www.envirostor.dtsc.ca.gov/public/, accessed October 24, 2017.

33 California State Water Resources Control Board, GeoTracker Database, Search by Map Location, available online at https://geotracker.waterboards.ca.gov/, accessed October 24, 2017.

34 California Environmental Protection Agency, Cortese List Data Resources, accessed October 24, 2017, available online at https://calepa.ca.gov/SiteCleanup/CorteseList/, accessed October 24, 2017.

35 United States Environmental Protection Agency, Superfund National Priorities List (NPL) Where You Live Map, available online at https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=33cebcdfdd1b4c3a8b51d416956c41f1, accessed October 24, 2017.

36 Airnav.com, Airports Search by Location, available online at http://www.airnav.com/airport/KWJF, accessed October 23, 2017.

the project site is provided along 170th Street West and West Avenue H, which are two-lane roads that would be paved during project construction. This would provide two separate paved ingress/egress routes to the site. All construction and operation activities would take place within the project site. Except during road paving, which would briefly close one of the two available site access routes at a time, no road closures are anticipated during project construction. Therefore, no impact related to impairing the implementation of or physically interfering with an adopted emergency response plan or emergency evacuation plan would occur.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Less Than Significant Impact. The sedimentation plant site is located within a designated high fire hazard severity zone and a portion of Fairmont Reservoir #2 is designated a very high fire hazard severity zone in the State Responsibility Area.[37] The project site is located in a remote and generally undeveloped and unpopulated area. During construction and operation, implementation of applicable BMPs as outlined in Section 1.6.7 of this MND, such as the availability of fire suppression equipment on site and safe handling of flammable products, would ensure that exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires would be less than significant.

IX. HYDROLOGY AND WATER QUALITY

Would the project:

a) Violate any water quality standards or waste discharge requirements?

Less Than Significant Impact. Construction activities, such as grading, would result in the disturbance of soil and temporarily increase the potential for soil erosion. Additionally, construction activities and equipment would require the on-site use and storage of fuels, lubricants, and other petroleum products.

Prior to the start of construction, the construction contractor would be required to obtain a General Construction Activity Stormwater Permit, issued by the State Water Resources Control Board. One of the conditions of the General Permit is the development and the implementation of a SWPPP, which would identify structural and nonstructural BMPs to be implemented during the construction phase. The construction contractor would also be required to develop and implement an erosion control plan for the proposed project. These plans would include but not be limited to erosion and sediment control, general housekeeping practices such as sweeping up of site debris, proper waste disposal procedures, use of tarps or other controls on soil stockpiles, containment of building materials, and inspection for and repair of leaks and spills from construction vehicles. With implementation of the SWPPP, stormwater discharges during construction are not anticipated to

[37] CAL FIRE, Los Angeles County Fire Hazard Severity Zones in SRA, Adopted by CAL FIRE on November 7, 2007, available online at http://frap.fire.ca.gov/webdata/maps/los_angeles/fhszs_map.19.pdf, accessed October 23, 2017.

violate any water quality standards or waste discharge requirements set by the RWQCB, and the impact would be less than significant.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Less Than Significant Impact. The proposed sedimentation plant would require excavation of up to 20 feet in depth. Recent test borings at numerous locations within the proposed project site have indicated that no groundwater was encountered to a boring depth of up to 54 feet. Therefore, construction activities would not interfere substantially with groundwater recharge or deplete groundwater supplies, and the impact would be less than significant.

During operation, the project would not involve any extraction of groundwater. Water required for personnel and operational needs would be supplied from the sedimentation plant effluent, which would require a small on-site potable water treatment system and storage tank. The project would be designed to capture and infiltrate stormwater for groundwater recharge in compliance with the Los Angeles County Standard Urban Storm Water Mitigation Plan (SUSMP) and Low Impact Development ordinance. Therefore, operation of the project would not interfere substantially with groundwater recharge or deplete groundwater supplies, and the impact would be less than significant.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?

Less Than Significant Impact. There are no streams or rivers located within the vicinity of the project site that would be potentially affected by construction or operation. However, as discussed above, runoff currently carried in the ephemeral open drainage course that crosses the proposed project site would be intercepted and redirected. This would be achieved in a manner that would not concentrate the runoff such that a new source of erosion is created. Construction activities, including clearing, excavation, stockpiling, and grading, would have the potential to increase soil erosion at the project site. Compliance with the SWPPP and the erosion control plan developed for the proposed project would stabilize soils and prevent substantial erosion or siltation on- or off-site caused by storm and non-storm sources of water. Therefore, impacts related to erosion resulting from altered drainage patterns at the project site would be less than significant.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?

Less Than Significant Impact. There are no streams or rivers located within the vicinity of the project site that would be potentially affected by construction or operation. Clearing of the project site during construction as well as increases in impervious surfaces related to the sedimentation plant facilities have the potential to increase surface runoff. In addition, runoff currently carried in the ephemeral open drainage course that crosses the proposed project site would be intercepted and redirected. However, the project would be designed to capture and infiltrate runoff in compliance with the Los Angeles County SUSMP and Low Impact Development ordinance to reduce surface runoff. Therefore, the project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site. Impacts would be less than significant.

e) 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?

No Impact. There are no existing stormwater drainage systems that collect surface runoff at or surrounding the project site. As discussed above, the proposed project facilities would generate some increase in runoff due to an increase in impervious surface area. In addition, runoff currently carried in the ephemeral open drainage course that crosses the proposed project site would be intercepted and redirected. However, the project would be designed to capture and infiltrate runoff in compliance with the Los Angeles County SUSMP and Low Impact Development ordinance. Therefore, no impact would occur to existing or planned stormwater drainage systems.

f) Otherwise substantially degrade water quality?

Less Than Significant Impact. Other than the construction sources of pollutants described previously (e.g., fuels from construction equipment, etc.), the proposed project would not include other potential sources of contaminants that could degrade water quality. Compliance with the SWPPP developed for the proposed project's NPDES permit and implementation of BMPs to control erosion and runoff from the project site during construction would ensure less than significant impacts related to water quality.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact. The project does not involve the construction of housing, and the project site is not located within or near a 100-year flood hazard area.[38] The Fairmont Reservoir property is located within an area designated as Zone X on the Federal Emergency Management Agency flood insurance rate map for the area. The Zone X designation indicates areas determined to be outside the 100-year floodplain. Additionally, there are no 100-year flood hazard areas within the areas surrounding the project area. No impact would occur.

[38] Federal Emergency Management Agency, Flood Insurance Rate Maps, Search by Street Address. Available at http://tinyurl.com/j4xwp5e, accessed September 21, 2017.

h) Place within a 100-year flood area structures to impede or redirect flood flows?

No Impact. As discussed above in Section IX(g), the project is not located within or near a 100-year flood area. No impact would occur.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Less Than Significant Impact. The proposed project is located within the boundaries of the existing Fairmont Reservoir property, which is not located within or near a 100-year flood hazard area. The sedimentation plant site is located adjacent to Fairmont Reservoir #2, and while a catastrophic failure the reservoir dam is regarded as unlikely, the inundation area for the reservoir is the empty basin of Fairmont Reservoir #1, south of the sedimentation plant site. Therefore, the proposed project would not result in exposure of people or structures to significant risk of loss, injury or death related to flooding or dam failure. The impact would be less than significant.

j) Inundation by seiche, tsunami, or mudflow?

No Impact. Seiches are oscillating standing waves generated by two waves traveling in opposite directions in an enclosed body of water. They can be caused by wind or earthquake-related ground shaking. The enclosed condition and closely spaced plate settlers in the sedimentation basins would prevent the propagation of waves that cause the standing oscillating wave of a seiche. While a seiche could potentially form in Reservoir #2 under certain conditions, because of the size of the reservoir, it would not be expected to reach heights that would overtop the reservoir and inundate the sedimentation plant.

Tsunamis are large waves caused by the sudden displacement of water that results from an underwater earthquake, landslide, or volcanic eruption. Tsunamis generally affect low-lying areas along the coastline. The project site is not located within a designated Tsunami Hazard Area and is not subject to tsunamis.

No portion of the project site is located within a hillside area and the site would not be subject to a landslide. There is no potential for inundation from mudflow to occur. Therefore, construction of the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow. No impact would occur.

X. LAND USE AND PLANNING

Would the project:

a) Physically divide an established community?

No Impact. The proposed project would be located in a largely undeveloped area of the Antelope Valley in northwest Los Angeles County. All project faculties would be located within the existing LADWP-owned Fairmont Reservoir property. No separation of existing uses surrounding the property or disruption of access between uses would occur. As such, the proposed project would not physically divide an established community, and no impact would occur.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Less Than Significant Impact. The project site is located on LADWP-owned land in northern unincorporated Los Angeles County. The majority of the project site is located within LADWP-owned land that contains Fairmont Reservoir #2 and other water distribution facilities. The project also includes the paving of two existing unpaved roadways that provide access to the Fairmont Reservoir property. The paving of the two roadways would not conflict with the zoning or land use designations of the adjacent properties. Accordingly, the following analysis focuses on the potential impacts of the proposed project occurring within the reservoir property (i.e., the proposed sedimentation plant and modifications to Fairmont Reservoir #2).

Consistency with Los Angeles County General Plan

In accordance with California Government Code 53090, LADWP is exempt from county general plans. (See California Government Code Section 53090 et seq.; Lawler v. City of Redding, 7 Cal. App. 4th 778 [1992]). Nonetheless, the following summary indicates consistency with the Los Angeles County General Plan.

Under the General Plan, the project site is designated RL20 for rural land uses. The purpose of the RL20 designation is to provide for development of single-family residences on a lot no less than 20 acres, equestrian and animal uses, and agricultural and related activities.[39] The project site is also located within the Antelope Valley Area Plan boundary, under which it is designated as a Rural Preserve Area, which applies to areas that are largely undeveloped and generally not served by existing infrastructure or public facilities.[40] Notwithstanding the rural land use designation, the project site is owned by LADWP, and the proposed sedimentation plant and Fairmont Reservoir #2 modifications would be consistent with existing uses at the project site. Additionally, the proposed structures associated with the sedimentation plant would be relatively low in profile and would be contained within the interior of the LADWP property. Thus, the proposed project would not affect the character of the adjacent rural properties.

Under the General Plan, the portion of the project site containing Fairmont Reservoir #2 is also located within the boundaries of the San Andreas SEA. While SEAs are not preserves, they are areas where the County of Los Angeles deems it important to facilitate a balance between development and resource conservation.

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39 Los Angeles County Department of Regional Planning, Los Angeles County General Plan Land Use Element, 2015, available at http://planning.lacounty.gov/assets/upl/project/gp_final-general-plan-ch6.pdf, accessed October 17, 2017.

40 Los Angeles County Department of Regional Planning, Antelope Valley Area Plan, June 2015, available at http://planning.lacounty.gov/tnc/documents/, accessed October 17, 2017.

The proposed project work within the San Andreas SEA would consist of relining the existing reservoir. There would be no change in the use, size, or general appearance of the reservoir. Therefore, the proposed project would not conflict with the objectives of the SEA.

An analysis of the proposed project's consistency with applicable General Plan policies is provided in Table 3-7.

Table 3-7
Project Consistency with Applicable General Plan Policies

Policy	Consistency Discussion
Land Use Element	
LU 3.1: Encourage the protection and conservation of areas with natural resources, and SEAs.	The proposed Fairmont Reservoir #2 modifications would occur within the boundaries of the San Andreas SEA. As construction activities would occur within the limits of the existing reservoir, the proposed project would not affect any previously undeveloped lands within the SEA. As such, the proposed project would be consistent with this policy.
LU 6.1: Protect rural communities from the encroachment of incompatible development that conflicts with existing land use patterns and service standards.	The project site is located within an area characterized by rural lands and low density development. The proposed sedimentation plant and the Fairmont Reservoir #2 modifications would be located entirely within LADWP property. The proposed project would be compatible with existing uses at the LADWP property. Additionally, no portion of the project would encroach upon adjacent properties or land uses. The proposed project would be consistent with this policy.
LU 6.2: Encourage land uses and developments that are compatible with the natural environment and landscape.	The proposed project includes the development of a sedimentation plant and modifications to the existing Fairmont Reservoir #2 within the interior of the LADWP property. The proposed structures associated with the sedimentation plant would be relatively low in profile. As discussed in the response to Question I(c) (Aesthetics), the proposed project would not substantially alter the visual appearance of the project site, and views of the project site are distant and limited from nearby land uses. Thus, the proposed project would be compatible with the natural environment and landscape of the surrounding area. The proposed project would be consistent with this policy.

Table 3-7
Project Consistency with Applicable General Plan Policies

Policy	Consistency Discussion
LU 6.3: Encourage low density and low intensity development in rural areas that is compatible with rural community character, preserves open space, and conserves agricultural land.	As discussed above, the proposed structures associated with the sedimentation plant would be relatively low in profile and would not substantially alter the visual appearance of the project site. Views of the project site are distant and limited from nearby land uses. Thus, the proposed project would be compatible with the surrounding rural community character. Additionally, the proposed project would not encroach upon adjacent open space or agricultural land uses. The proposed project would be consistent with this policy.
Antelope Valley Area Plan	
LU 1.2: Limit the amount of potential development in rural preserve areas, through appropriate land use designations with very low residential densities.	The project site is located within an area designated under the Antelope Valley Area Plan as a rural preserve area. The project site is designated RL20 under the General Plan Land Use Element, which provides for low density residential development on lots no less than 20 acres. No residential uses would be developed as part of the proposed project. The proposed project would be consistent with existing uses at the project site. The proposed project would be consistent with this policy.
LU 2.1: Limit the amount of potential development in Significant Ecological Areas, including Joshua Tree Woodlands, wildlife corridors, and other sensitive habitat areas, through appropriate land use designations with very low residential densities.	The proposed Fairmont Reservoir #2 modifications would occur within the boundaries of the San Andreas SEA. As previously discussed, because construction activities would occur within the limits of the existing reservoir, the proposed project would not affect any previously undeveloped lands within the SEA. The proposed project would be consistent with this policy.

Note: This table lists only those policies applicable to the proposed project (i.e., policies relating to residential or other land uses are not analyzed).

The proposed project would not conflict with the existing General Plan land use designations at the project site, and would be compatible with the existing land uses at the LADWP property. Additionally, the proposed project would be consistent with the applicable General Plan policies. Therefore, impacts related to consistency with the Los Angeles County General Plan would be less than significant.

Consistency with Los Angeles County Planning and Zoning Code

The area containing the existing Fairmont Reservoir #2 is zoned OS for open space uses, while the remainder of the project site is zoned A-2 for heavy agriculture uses.[41] The modifications within Reservoir #2 would not change the use, size, or general appearance of the reservoir, and would be consistent with the OS zoning designation. Under the Los Angeles County Zoning Code, agricultural zones, including the A-2 zone, are established to permit a comprehensive range of agricultural uses in areas particularly suited for agricultural activities.[42] In addition to agricultural uses, the A-2 zone permits the development of "water reservoirs, dams, treatment plants, gauging stations, pumping stations, wells, and tanks, and any other use normal and accessory to the storage and distribution of water" with issuance of a Conditional Use Permit.[43] However, in accordance with California Government Code 53090, LADWP is exempt from county zoning ordinances. (See California Government Code Section 53090 et seq.; Lawler v. City of Redding, 7 Cal. App. 4th 778 [1992]). Therefore, the proposed project would not require a Conditional Use Permit.. The impact would be less than significant.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. The portion of the project site containing Fairmont Reservoir #2 is also located within the boundaries of the San Andreas SEA. While SEAs are not preserves, they are areas where the County of Los Angeles deems it important to facilitate a balance between development and resource conservation. The proposed project work within the San Andreas SEA would consist of relining the existing reservoir. There would be no change in the use, size, or general appearance of the reservoir. Therefore, the proposed project would not conflict with the objectives of the SEA, and no impact would occur.

The project site occurs along the western fringe of the WEMO area. The WEMO is a large-scale, multiagency plan that develops conservation and management strategies for sensitive species throughout the western Mojave Desert. The proposed project occurs exclusively on privately owned (LADWP) land, and is not anticipated to impact a federal or state-listed species or species identified for management under the WEMO. Therefore, the proposed project would not conflict with the WEMO, and no impact would occur.

41 Los Angeles County Department of Regional Planning, Planning and Zoning Information Map Tool, available at http://rpgis.isd.lacounty.gov/GIS-NET3_Public/Viewer.html, accessed October 12, 2017.
42 Los Angeles County Planning and Zoning Code, Section 22.16.010(B)(1).
43 Los Angeles County Planning and Zoning Code, Table 22.16.030-B.

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?

No Impact. According to the State of California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, there are no oil, gas, or geothermal resources located on or in the vicinity of the project site.[44] The project site is not mapped as or known to contain an important mineral resource.[45] Therefore, the proposed project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of California. No impact would occur.

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?

No Impact. The project site is not delineated as a locally important mineral resource recovery site in the Antelope Valley Area Plan or other land use plans. Therefore, implementation of the proposed project would not result in the loss of availability of a locally important mineral resource recovery site, and no impact would occur.

XII. NOISE

The following analysis is based on the *LADWP Fairmont Sedimentation Plant Project Noise and Vibration Impact Study*, prepared by Terry A. Hayes Associates, Inc. This report is included as Appendix E of this Initial Study/MND.

Noise is generally defined as unwanted sound. The degree to which noise can impact the human environment ranges from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise, the amount of background noise present before the intruding noise, the nature of work or human activity that is exposed to the noise source.

Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 decibels measured on the A-weighted scale (dBA). A change of at least 5 dBA would be noticeable and may evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would likely cause a community response. Noise in this analysis is

[44] State of California Department of Conservation, Division of Oil, Gas & Geothermal Resources, Well Finder. Website https://maps.conservation.ca.gov/doggr/wellfinder/#close, accessed October 5, 2017.

[45] Los Angeles County, Department of Regional Planning, *Town and County Antelope Valley Area Plan, Map 4.4: Mineral Resources Zones*. Website http://planning.lacounty.gov/assets/upl/project/tnc_map4-4-20150601.pdf, accessed April 18, 2017.

usually expressed in terms of Equivalent Noise Level (L_{eq}), which is the average sound level for any specific time period, on an energy basis. For example, the L_{eq} for 1 hour is the energy average noise level during the hour. The average noise level is based on the acoustic energy content of the sound. L_{eq} can be thought of as the level of a continuous noise, which has the same energy content as the fluctuating noise level. L_{eq} is expressed in units of dBA.

Noise levels decrease as the distance from the noise source to the receiver increases. Noise levels generated by a stationary noise source, or "point source," will decrease by approximately 6 dBA over hard surfaces (e.g., pavement) and 7.5 dBA over soft surfaces (e.g., grass) for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level would be 82 dBA at a distance of 100 feet over soft surfaces from the noise source, 75 dBA at a distance of 200 feet, and so on. Noise levels generated by a mobile source will decrease by approximately 3 dBA over hard surfaces and 4.5 dBA over soft surfaces for each doubling of the distance.

Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of applicable standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant Impact. To characterize the existing noise environment around the project site, ambient noise was monitored using a SoundPro DL Sound Level Meter on Wednesday, May 18, 2017, between 11:00 a.m. and 1:30 p.m. Measurements were taken for 15-minute periods at four locations, as shown in Table 3-8 and Figure 3-2. The existing ambient sound levels range between 47.7 and 64.3 dBA L_{eq}. Traffic was the primary source of noise at each location.

Table 3-8
Existing Ambient Noise Levels

Figure 3-1 Key	Noise Monitoring Location	Sound Level (dBA, L_{eq})
1	Residence along SR-138 (8215 W. Ave. D)	64.3
2	Healy Farms Residence (16700 Lancaster Rd.)	55.1
3	Residence along 170th St. West (approximately 700 feet north of Ave. H)	47.7
4	Residence along Ave. H (approximately 400 feet east of the California Aqueduct)	51.3

Source: Terry A. Hayes Associates Inc., 2017

The proposed project is located in a rural environment and there are no sensitive receptors located within 1,000 feet of the project site. However, the proposed project includes paving the portions of 160th Street West, 170th Street West, and Avenue H in the vicinity of the project site. There are sensitive receptors (residences) located along these roads. Furthermore, there are sensitive receptors located along potential haul routes with the majority grouped along SR-138. Sensitive receptor locations are shown in Figure 3-2 and include the following:

- Residence (Healy Farms) located adjacent the intersection of Lancaster Road and 170th Street West;
- Residence located adjacent to 170th Street West, north of Avenue H;
- Residence located adjacent to Avenue H, east of the State Water Project;
- Church (15861 Lancaster Road) located adjacent to the intersection of Lancaster Road and 160th Street West;
- Residences and other sensitive uses located along SR-138 between State Route 14 (SR-14) and 170th Street West and to the west in and around Neenach; and
- Residence along Pecel Road, west of the project site.

Construction Noise

Noise impacts from construction of the proposed project would fluctuate depending on the construction phase, equipment type and duration of use, and distance between the noise source and receptor. Construction activities typically require the use of numerous pieces of noise-generating equipment. Typical noise levels from various types of equipment that may be used during construction are listed in Table 3-9. Noise levels from individual pieces of equipment typically are between 70.3 and 81.0 dBA L_{eq} at 50 feet.

Table 3-9
Construction Equipment Noise Level Ranges

Construction Equipment	Noise Level at 50 feet (dBA, L_{eq})
Backhoe	73.6
Compactor (ground)	76.2
Concrete Mixer Truck	74.8
Concrete Pump Truck	74.4
Crane	72.6
Dozer	77.7
Dump Truck	72.5
Excavator	76.7
Flat Bed Truck	70.3
Front End Loader	75.1
Generator	77.6
Grader	81.0
Paver	74.2

Source: Federal Highway Administration, *Roadway Construction Noise Model*, Version 1.1, 2008

Table 3-9 presents anticipated noise levels when construction equipment is operating under full power conditions even though equipment used on construction sites often operates at less than full power. To more accurately characterize construction-period noise levels, the noise levels shown in Table 3-10 take into account the likelihood that multiple pieces of construction equipment would be operating simultaneously and the typical overall noise levels expected for each phase of construction based on the equipment used. When considered as an entire process with multiple pieces of equipment, excavation and finishing activity would generate the loudest noise level of approximately 89 dBA L_{eq} at 50 feet.

Table 3-10
Typical Outdoor Construction Noise Levels

Construction Method	Noise Level at 50 feet (dBA, L_{eq})
Ground Clearing	84
Site Preparation	89
Foundations	78
Structural	85
Finishing	89

Source: USEPA, Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, PB 206717, 1971.

The impact analysis is based on the construction time and noise limits in the County of Los Angeles Code. Construction activity for the proposed project would comply with the allowable hours of construction in the County Code, including between the hours of 7:00 a.m. to 7:00 p.m. Monday through Saturday, and no construction activity on Sundays. Section 12.08.440 of the County Code establishes construction noise restrictions at affected uses, as shown in Table 3-11.

Table 3-11
Construction Noise Restrictions

Time Period	Single-Family Residential	Multi-Family Residential	Semi-Residential/ Commercial
Mobile Equipment [a]			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	60 dBA	64 dBA	70 dBA
Stationary Equipment [b]			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA

[a] Maximum *noise* levels for nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment.
[b] Maximum *noise* level for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment.
Source: County Code, *Section 12.08.440 (b)*, 2017.

For construction of the proposed sedimentation plant, the maximum noise level at the surrounding sensitive receptors, as shown in Table 3-12, would be 56.8 dBA L_{eq}, which would be below the 60 dBA threshold established for single-family residences in the County Code. Furthermore, many of the residences do not have a line-of-sight to the project site and would likely experience noise levels lower than those calculated for the analysis. As a conservative measure, noise levels were calculated assuming the line-of-sight.

Table 3-12
Typical Construction Noise Levels at Receptors – Sedimentation Plant

Sensitive Receptor	Distance (feet)[a]	Maximum Noise Level (dBA)	Existing Ambient (dBA, L_{eq})	New Ambient at Receptor (dBA, L_{eq})
Residence along 170th St. West (approximately 700 feet north of Ave. H)	1,020	56.3	47.7	56.8
Residence along Pecel Rd.	1,830	49.9	47.7[b]	52.0
Residence along Ave. H (approximately 400 feet east of the California Aqueduct)	2,950	44.7	51.3	52.2

[a] Distance is the setback of the residence from the roadway.
[b] Used measured noise level at residence along 170th Street, as existing noise conditions are similar for these two receptors.
Source: Terry A. Hayes Associates Inc., 2017

The proposed project would also include paving the existing dirt roads of 160th Street West, 170th Street West, and Avenue H. Paving would take approximately 3 months. Equipment associated with road paving typically includes a grader, paver, and dozer and would have a noise level most similar to the site preparation phase as shown in Table 3-10, 89 dBA at 50 feet. Paving activity would move relatively quickly along each segment and would represent a mobile source; thus, the 75 dBA threshold identified in the County Code is the appropriate threshold to assess noise impacts from paving activity. As shown in Table 3-13, the maximum noise level at a sensitive receptor would be 74.0 dBA L_{eq}, which would be below the 75 dBA threshold established for single-family residences. Although paving activity would temporarily increase noise levels, construction would be short term in any given location.

Table 3-13
Typical Construction Noise Levels at Receptors – Road Paving

Sensitive Receptor	Distance (feet)[a]	Maximum Noise Level (dBA)	Existing Ambient (dBA, L_{eq})	New Ambient at Receptor (dBA, L_{eq})
Residence along 170th St. West (approximately 700 feet north of Ave. H)	200	73.9	47.7	74.0
Residence along Ave. H (approximately 400 feet east of the California Aqueduct)	250	71.5	51.3	71.6
Healy Farms Residence (16700 Lancaster Rd.)	330	68.5	55.1	68.7

[a] Distance is the setback of the residence from the roadway.
Source: Terry A. Hayes Associates Inc., 2017.

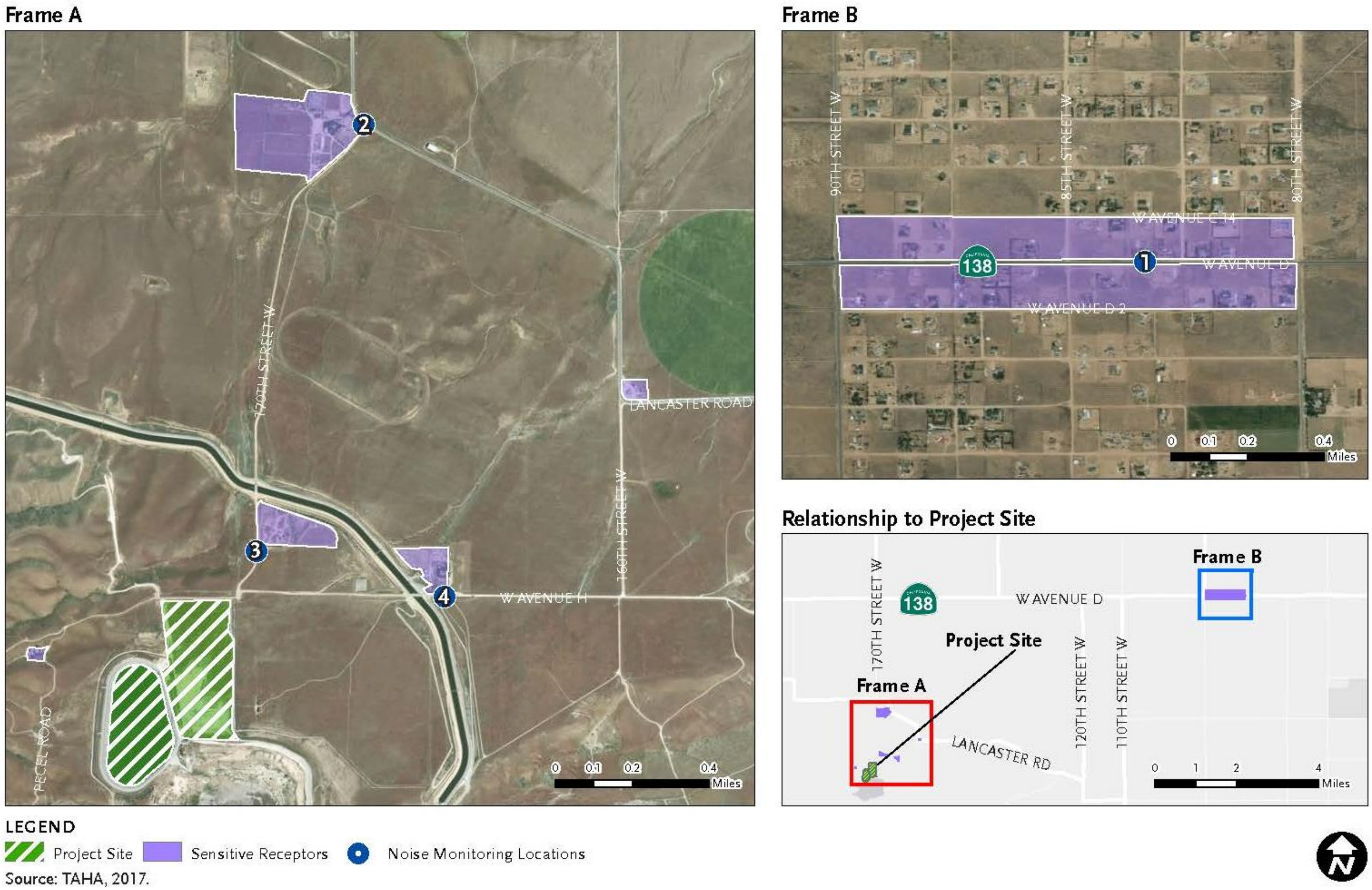

Figure 3-2
Noise Monitoring Locations and Sensitive Receptors

In addition to on-site construction activities, noise would be generated off-site by construction-related trucks and construction worker vehicles. Construction trucks generate higher noise levels than construction worker-related traffic. For example, one heavy-duty truck, traveling 35 miles per hour, generates the equivalent noise of 31 passenger vehicles. The anticipated haul route for incoming haul trucks to the project site is from SR-138, south down 170th Street, left onto Lancaster Road, and right onto 170th Street, then into the project site. Outgoing haul trucks would likely use the same route or travel down Avenue H, turn left onto 160th Street and continue onto Lancaster Road back to SR-138. It is also possible trucks could come from I-5 and travel east along SR-138 to the project site. The maximum number of haul truck trips would occur during the LAA realignment and Fairmont Reservoir #2 modifications. It is anticipated that construction activity could result in a maximum of approximately 59 haul truck trips per day (118 one-way trips) or 15 haul truck trips per hour over an 8-hour workday. The majority of employee trips would occur during the start and end of each workday. There would be approximately 19 construction employee trips for each starting and ending hour. Hourly construction truck volumes and construction employee vehicle trips were added to the existing traffic volumes on SR-138 between 170th Street and SR-14, and Lancaster Road near Healy Farms to determine if project noise levels would exceed 75 dBA at sensitive receptors. Due to the low traffic volumes along 170th Street between Lancaster Road and Avenue H and along Avenue H between 170th Street and Lancaster Road, existing noise levels were used as the baseline rather than a modeled existing noise level using traffic volumes.

A significant impact would result if mobile source noise levels cause the ambient noise level measured at the affected single-family residences to exceed 75 dBA from 7:00 a.m. to 8:00 p.m. As shown in Table 3-14, ambient noise levels would still be relatively low with the inclusion of construction traffic, and would remain under 75 dBA. Nighttime construction is not anticipated. Therefore, the proposed project would result in less than significant impacts related to generating noise levels in excess of standards established in the local general plan or noise ordinance.

Table 3-14
Haul Truck Noise Levels

Roadway Segment	Sensitive Receptor	Existing Noise Level (2017) (dBA, L_{eq})	Noise Level at Affected Structure (dBA, L_{eq})
SR-138 between 170th St. and I-5	Residence and other sensitive uses along SR-138	66.7	67.1
SR-138 between 170th St. and SR-14	Residences along SR-138	59.7	61.6
Lancaster Rd. near Healy Farms	Healy Farms Residence	42.9	47.1
170th St. between Lancaster Rd. and Ave. H	Residence along 170th St.	47.7	62.1
Ave H. between 170th St. and Lancaster Rd.	Residence along Ave. H	51.3	62.4

Source: Terry A. Hayes Associates Inc., 2017

Operational Noise

The proposed sedimentation plant would be sized to operate at a peak inflow of 720 cfs. A mixer and valve motors would operate along the northern side of the project site for the rapid mix flocculation process. Noise associated with these uses would be similar to a low humming or churning sound. The nearest sensitive receptor would be well over 1,000 feet away along 170th Street and noise from mechanical equipment and the mixer would not be audible at this distance. Therefore, the proposed project would result in a less than significant impact related to on-site plant operational noise.

A doubling of traffic volumes is needed for a person with normal hearing to perceive an increase in mobile noise levels. The existing daily traffic volumes along SR-138 and Lancaster Road are approximately 14,400 and 792 trips per hour, respectively. Traffic volumes along 160th Street, 170th Street, and Avenue H are likely less than 100 daily trips as the roadways are currently unpaved and only used for local access for a few residences and the Fairmont Reservoir property. During project operation, these roadways would be paved. However, trips along these roadways would likely remain similar to existing conditions, other than the minor increase from project operations. Ambient noise levels within the project area range from 47.7 dBA L_{eq} to 55.1 dBA L_{eq}. The proposed project would add approximately 10 daily employee trips and 10 material export trips a day (20 one-way trips). Employees would be distributed between two to three shifts per day. Employee trips would only occur during shift changes and would only result in a maximum of five trips per hour during shift changes (assuming two shifts per day). Material export trips would occur during the operating hours of the potential landfill disposal sites, which generally open on weekdays only and no earlier than 7 a.m. and close at 5 p.m. As such, the proposed project would generate an average of approximately two pass-by trips per hour, assuming 10 round trips per day. Trips associated with the proposed project may instantaneously increase noise levels but would be very short and infrequent. Operational activities associated with truck trips would not increase noise levels at the property line of sensitive receptors that would exceed the exterior noise standards for a cumulative period of 30 minutes in any hour. Therefore, the proposed project would result in a less than significant impact related to operational mobile noise.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact. Construction activity can generate varying degrees of vibration, depending on the procedure and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings within the vicinity of a construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, and to slight damage at the highest levels. In most cases, the primary concern regarding construction vibration relates to damage.

The Federal Transit Administration provides vibration levels for various types of construction equipment with an average source level reported in terms of velocity. Table 3-15 provides estimates of vibration levels for a wide range of soil conditions. The reference levels were used to estimate vibration levels at the sensitive receptors most likely to be impacted by equipment at each location of construction activity.

Table 3-15
Vibration Velocities[a] for Construction Equipment

Equipment	Peak Particle Velocity at 25 feet (Inches/Second)
Large Bulldozer	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer	0.003

[a] RMS velocity in decibels (VdB) related to 1 micro-inch/second.
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006

The Federal Transit Administration (FTA) has published guidance for assessing building damage impacts from vibration. Table 3-16 shows the FTA building damage criteria for vibration.

Table 3-16
Construction Vibration Damage Criteria

Building Category	Peak Particle Velocity (in/second)
I. Reinforced-concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

Source: FTA, *Transit Noise and Vibration Impact Assessment*, May 2006

Construction at the proposed sedimentation plant would include a number of vibration-generating activities. The nearest residence is along 170th Street West (approximately 700 feet north of Avenue H), located over 1,000 feet to the northeast of the project site. Construction activity would utilize equipment that is best characterized in Table 3-15, above, by large bulldozers. A large bulldozer produces a vibration level of 0.089 inches per second at 25 feet. At 25 feet, the vibration level would be well below the 0.3 inches per second significance threshold given in Table 3-16. Because the nearest receptor is located over 1,000 feet away, no vibration impacts would occur at this receptor or any other receptor near the sedimentation plant. Therefore, the proposed project would result in a less than significant impact related to construction vibration at the sedimentation plant.

The proposed project would include paving the existing dirt roads of 160th Street West, 170th Street West, and Avenue H. The nearest residence is setback approximately 200 feet from 170th Street West where paving activity would occur. Equipment associated with road paving typically includes a grader, paver, and dozer, which are best characterized in Table 3-15, above, by large bulldozers. At 25 feet, the vibration level would be below the 0.3 inches per second significance threshold. Because the nearest residence is setback approximately 200 feet from the roadway, no vibration impacts would occur at this receptor or any other receptor near road paving activity. Therefore, the proposed project would result in a less than significant impact related to construction vibration associated with road paving activity.

In addition to on-site construction activities, construction trucks on the roadway network have the potential to expose vibration-sensitive land uses located near the proposed project access route. In relation to annoyance (rather than damage) from vibration, Section 12.08.560 of the County Code prohibits the operation of any device that creates vibration above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet (46 meters) from the source if on a public space or public right-of way. The perception threshold shall be a motion velocity of 0.01 inches per second over a range of 1 to 100 Hertz.

As shown in Table 3-15, above, loaded trucks generate vibration levels of 0.076 inches per second at a distance of 25 feet. Rubber-tired vehicles, including trucks, do not generate significant roadway vibrations that can cause building damage. At 150 feet from the right-of-way, loaded trucks would generate a vibration level of 0.005 inches per second, well below the 0.01 inches per second vibration perception threshold. Therefore, the proposed project would result in a less than significant impact related to construction truck vibration.

The primary sources of operational-related vibration would include on-road vehicles related to routine inspection, maintenance activities, and sludge haul trucks leaving and arriving at the site. As discussed above, rubber-tired vehicles, including trucks, do not generate significant roadway vibrations that can cause building damage. It is possible that trucks would generate perceptible vibration at sensitive receptors adjacent to the roadway. As shown in Table 3-15, above, loaded trucks generate vibration levels of 0.076 inches per second at a distance of 25 feet. At 150 feet from the right-of-way, loaded trucks would generate a vibration level of 0.005 inches per second, well below the 0.01 inches per second vibration perception threshold. The proposed project would not introduce any significant stationary sources of vibration, including mechanical equipment that would be perceptible at sensitive receptors, which would be over 1,000 feet from the sedimentation plant. Therefore, the proposed project would result in a less than significant impact related to operational vibration.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact. As discussed in Sections XII(a), permanent operational noise levels were considered for both stationary and mobile sources, and none would exceed the significance thresholds. Therefore, the proposed project would result in a less than significant impact related to operational noise.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less Than Significant Impact. Construction activity for the proposed project would temporarily increase ambient noise levels during construction of the sedimentation plant, roadway paving activity, and off-site truck activity. As discussed in Section XII(a), construction activity would comply with the allowable hours of construction in the County Code, including 7:00 a.m. to 7:00 p.m. Monday through Saturday, and no construction activity on Sundays. The maximum noise level at a sensitive receptor for construction of the sedimentation plant would be 56.8 dBA L_{eq}, which would be below the 60 dBA threshold for stationary noise sources established for single-family residences. Paving activity would move fairly quickly along each roadway and would not remain directly in front of any residence for a long period of time. The maximum noise level at a sensitive receptor for off-site truck activity would be 62.4 dBA L_{eq}, which would be below the 75 dBA threshold for mobile noise sources established for single-family residences. Therefore, the proposed project would result in a less than significant impact related to a substantial temporary or periodic increase in ambient noise levels.

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 expose people residing or working in the project area to excessive noise levels?

No Impact. The project site is not located within an airport land use plan nor is it located within 2 miles of a public airport or public use airport. The nearest public use airport to the proposed project is the General William J. Fox Airfield, located approximately 11 miles to the northwest. Therefore, no impact related to airport noise would occur.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The project site is not located within the vicinity of a private airstrip. The nearest private airstrip is located approximately 8 miles north of the project site. Therefore, no impact related to private airstrip noise would occur.

XIII. POPULATION AND HOUSING

Would the project:

a) Induce substantial 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)?

Less than Significant Impact. Construction of the proposed project is scheduled to begin in 2020 and is anticipated to last approximately 3.5 years, including a several-month plant commissioning period. The number of daily on-site workers would range from a low of 15 to a high of 75. Given the temporary nature of construction industry jobs, the relatively large regional construction industry, and the relatively nominal total number of construction workers needed during any construction phase, it is likely that the labor force from within the region would be sufficient to complete project construction without a substantial influx of new workers and their families, and any such relocation within the region would be minimal. Accordingly, construction employment generated by the proposed project would not impact population in the region. Therefore, construction of the proposed project would not directly induce substantial population growth, and the impact would be less than significant.

The proposed project does not include construction of any residential or business uses, and, therefore, would not result in a direct population increase from such uses. Operations of the sedimentation plant facilities would require up to 10 personnel. Given the small total number of operations workers needed, there would not be a substantial influx of new workers. Accordingly, employment generated by the operation of the proposed project would not result in a direct population increase. Since the proposed project would provide no additional water supply to the City, it would not indirectly induce population growth. Therefore, operations of the proposed project would not induce substantial population growth, and the impact would be less than significant.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. The proposed project involves construction of water treatment facilities at the LADWP-owned Fairmont Reservoir property. No structures, including residential units, would be demolished or displaced to accommodate project components. Accordingly, the proposed project would not displace any existing housing and no replacement housing would be required. No impact would occur.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. As stated above, the project site does not contain any housing or residential uses. As such, no housing or people would be displaced as a result of the proposed project. No impact would occur.

XIV. PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

i) Fire protection?

No Impact. The project site and surrounding area are served by the Los Angeles County Fire Department. The closest station is Fire Station 78, located approximately 2.5 miles south of the project site at 17021 Elizabeth Lake Road, Lake Hughes. The proposed project does not include new housing or non-residential development that would substantially increase the residential or employee populations in the area; thus, the demand for emergency services would not substantially increase. The proposed project would provide treatment facilities at the Fairmont Reservoir property to remove sediment from LAA water. All facilities would be constructed in compliance with the Los Angeles County Fire Code and the State of California Fire Code, including the provision of suppression systems such as fire sprinklers. The operation of the plant, including the use of chemical coagulants and flocculants (which are stale and non-flammable), would not substantially increase fire hazard at the site such that the provision of new or physically altered fire protection facilities would be required. No impact would occur.

ii) Police protection?

No Impact. The project site and surrounding area are served by the Los Angeles County Sheriff's Department. The closest station is located at 501 West Lancaster Boulevard, Lancaster, approximately 18 miles by road east of the project site.

As previously stated, the proposed project does not include new housing or non-residential development that would substantially increase the residential or employee populations in the area; thus, the demand for emergency services would not substantially increase. The proposed project would provide water treatment facilities at the Fairmont Reservoir to remove sediment from LAA water. The site security system would include perimeter fencing and lighting, electrically operated locking gates, and intrusion alarms on all access points and exterior doors, hatches, and cabinets. As such, the proposed project would not increase the need for additional police protection services such that the provision of new or physically altered police protection facilities would be required. No impact would occur.

iii) Schools?

No Impact. The demand for new or expanded school facilities is generally associated with an increase in housing or population. As previously stated in Section XIII, Population and Housing, the proposed project does not include a component that would generate an increase in housing or population. Construction workers are anticipated to be drawn from the existing workforce throughout the region. As such, construction of the proposed project would not generate new permanent residents that would increase the demand for schools. While 10 new employees would be required to operate and maintain the proposed sedimentation plant, this nominal amount would not substantially increase demand for schools even assuming all the employees relocated to the area and had school-age children. Therefore, neither construction nor operation of the proposed project would result in substantial adverse physical impacts associated with the provision of new or physically altered school facilities. No impact would occur.

iv) Parks?

No Impact. The demand for parks and recreational services is generally associated with an increase in housing or population. As previously stated in Section XIII, Population and Housing, the proposed project does not include a component that would generate an increase in housing or population. Construction workers are anticipated to be drawn from the existing workforce throughout the region. As such, construction of the proposed project would not generate new permanent residents that would increase the demand for parks and recreational facilities. While 10 new employees would be required to operate and maintain the proposed sedimentation plant, this nominal amount would not substantially increase demand for parks and recreational facilities, even assuming all the employees relocated to the area. Therefore, neither construction nor operation of the proposed project would result in substantial adverse physical impacts associated with the provision of new or physically altered parks. No impact would occur.

v) Other public facilities?

No Impact. Demand for other public facilities, such as libraries, is generally associated with increased housing or population. As previously discussed, the proposed project does not include a component that would generate an increase in housing or population. Construction workers are anticipated to be drawn from the existing workforce throughout the region. As such, construction of the proposed project would not generate new permanent residents that would increase the demand for public facilities. While 10 new employees would be required to operate and maintain the proposed sedimentation plant, this nominal amount would not substantially increase demand for public services. Therefore, neither construction nor operation of the proposed project would result in substantial adverse physical impacts associated with the provision of new or expanded public facilities. No impact would occur.

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?

No Impact. The demand for parks and recreational facilities is generally associated with an increase in housing or population. Construction workers are anticipated to be largely drawn from the existing workforce in the region. As such, construction of the proposed project would not generate new permanent residents that would substantially increase the use of existing parks and recreational facilities. The operation of the proposed sedimentation plant would require up to 10 personnel. This nominal increase in permanent employees would not result in a substantial increase in the use of existing parks and recreational facilities, even assuming all the employees relocated to the area. Therefore, substantial physical deterioration of existing parks would not occur or be accelerated with implementation of the proposed project. No impact would occur.

b) Include recreational facilities or require construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. The proposed project does not include development of any residential uses or other uses that would increase the demand for recreational facilities. Further, Since the proposed project would provide no additional water supply to the City, it would not induce growth that could require the construction or expansion of recreational facilities. Therefore, no impact would occur.

XVI. TRANSPORTATION/TRAFFIC

The following analysis is based on the *Traffic Study for LADWP Fairmont Sedimentation Plant*, prepared by KOA Corporation. This report is included as Appendix F of this Initial Study/MND.

Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Less Than Significant Impact. The proposed project site is located in the Antelope Valley in northwest Los Angeles County at West Avenue H and 170th Street East, approximately 6 miles west of the City of Lancaster. Regional access to the project site is provided by SR-138, an east-west thoroughfare that is located approximately 4 miles north of the project site and provides linkage between SR-14 (approximately 15 miles east of the project site) and I-5 (approximately 20 miles west of the project site). The nearest paved road to the project site is Lancaster Road, which is approximately 1 mile to the northeast at its closest point. Direct vehicular access to the project site is provided along 170th Street West and West Avenue H, which would be paved in the first phase of the proposed project. Currently, these are two-lane unpaved roadways.

Construction

The proposed project construction activities would generate additional vehicle trips in the immediate area, based on truck hauling/delivery trips and construction employee trips. Roadway segment counts for affected roadways were compiled from California Department of Transportation Annual Average Daily Traffic data. The following are the study roadway segments included in this traffic impact analysis:

1. **SR-138.** Intersects with a paved portion of 170th Street, approximately 4 miles north of the project site. 170th Street has a stop sign at its approach to this roadway. SR-138 is a two-lane paved highway and provides east-west regional access.
2. **Lancaster Road.** Intersects with 170th Street, to the north of the project site. Lancaster Road is a two-lane paved roadway, and 170th Street has a stop sign at its approach to Lancaster Road.

Construction of the proposed project is planned to begin in 2020 and last for approximately 3.5 years. Construction activities would normally occur Mondays through Fridays during the daytime hours, generally beginning no earlier than 7:00 a.m. and ending by late afternoon/early evening.

The peak number of daily off-site truck round trips would be about 59, which would occur during the overlap of the LAA realignment and the reservoir relining. The number of daily on-site workers would range from a low of 15 to a high of 75 during this period. The peak activity year would be 2021 and therefore is defined as the future analysis year as it represents the period of highest combined construction truck and worker traffic.

Secondary peaks of about 48 daily truck round trips would occur for several months in association with concrete deliveries for the reservoir relining and the sedimentation plant's structural elements. During the balance of the project, the average number of daily truck round trips would be substantially lower, at no greater than 16 and often less than 10 per day. These truck trips would generally be distributed throughout the workday, rather than concentrated during a particular portion of the day.

Project Trip Generation

Project trip generation calculations include construction truck trips and construction employee vehicle trips. The trip generation totals were determined based on the period that would generate the highest number of combined trips for the proposed project. Truck volumes were multiplied by a Passenger Car Equivalency (PCE) factor of 2.5 to estimate the real effect of total project traffic, consistent with traffic studies in the area.

Although some carpooling would likely occur during project construction, project trip generation calculations conservatively assumed that each employee would commute in a single personal vehicle. To provide a conservative analysis, the total number of trips analyzed represents the highest trips generated by both construction employees and trucks, even though current estimates indicate that these peaks would not overlap during project construction.

The maximum number of daily employee trips would be 150 based on one inbound and one outbound trip for the estimate peak number of 75 workers. The maximum number of daily truck trips would be 295 based on 59 inbound and 59 outbound trips (118 one-way trips) multiplied by the PCE factor of 2.5. Therefore, a peak of 445 daily PCE trips would occur during project construction.

This total daily number of trips is compared in the analysis to the daily carrying capacity of the affected roads while also accounting for existing traffic volumes on those roads. Peak-hour trips related to construction (i.e., during the morning and evening period when workers would be arriving and departing the site) were not considered because there is no discernable peak traffic period in the vicinity of the project site.

Project Trip Distribution

Construction employees and truck vehicle trip patterns were based on the local roadway network that would provide primary access to the project site. Although I-5 has an interchange with SR-138 to the west, the population center of Lancaster/Palmdale, as well as SR-14, is located to the east. Therefore, employee and truck trip distribution was estimated to be 75 percent from and to the east, and 25 percent from and to the west.

Project traffic from and to the west was analyzed on SR-138, which would provide access from and to I-5. Project traffic from and to the east was analyzed on Lancaster Road, which would provide access from and to the Lancaster/Palmdale area and SR-14.

Project Study Roadway Volumes

Table 3-17 provides a comparison of the analyzed existing with/without project scenario volumes for the study roadway segments. This analysis excludes consideration of the growth in non-project-related background traffic from the present to 2021, when the peak of project construction traffic would occur. However, it has been included based on precedents set by the *Sunnyvale and Smart Rail* CEQA court cases, which indicated that project impact analyses should include a scenario without future estimated traffic growth.

Table 3-17
Project Study Roadway Segment Existing Volumes Analysis

Roadway Segment	Existing Daily Volumes	Daily Construction Trips	Existing with Construction	Roadway Capacity
SR-138, west of 170th Street W	2,885	111	2,996	20,000
Lancaster Road, east of 170th Street W	1,016	334	1,350	15,000

Table 3-18 provides a comparison of the analyzed future with/without project scenario volumes for the study roadway segments. Future year 2021 volumes were defined by multiplying the existing volumes by an ambient growth rate for the area defined by modeled subregion analysis within the Metro Congestion Management Program (CMP).

Table 3-18
Project Study Roadway Segment Future Volumes Analysis

Roadway Segment	Existing Daily Volumes	Future 2021 without Construction	Daily Construction Trips	Future 2021 with Construction	Roadway Capacity
SR-138, west of 170th Street W	2,885	3,002	111	3,113	20,000
Lancaster Road, east of 170th Street W	1,016	1,057	334	1,391	15,000

Both study roadways are two-lane paved facilities, and capacities are based on the Highway Capacity Manual are generally 7,500 to 10,000 vehicles per lane per day. The roadway segments analyzed here would be operating in the range of 1,350 to 3,113 vehicles per day based on Tables 3-17 and 3-18, with project construction trips.

On both roadway study segments, adequate capacity would remain during the construction period. During the other non-peak months of the overall construction schedule, traffic volumes would decline from these peak levels. Therefore, the proposed project would not create any significant impacts at the analyzed locations during the construction period. The proposed project would result in a less than significant impact related to construction traffic.

Operation

The proposed sedimentation plant would generally be in operation 24 hours per day, 7 days per week, whenever the LAAs are flowing. Operational activity at the sedimentation plant would include the hauling of sludge in trucks to an off-site disposal facility. Haul truck activity would be minimal at approximately 10 truck round trips per day, Monday through Friday, which are typical landfill operating days. The trips would occur during the operating hours of the potential landfill disposal sites, which open no earlier than 7 a.m. and close at 5 p.m.

The proposed project would require up to 10 personnel distributed between two to three shifts during a day, resulting in approximately 10 daily employee trips. Employee trips would only occur during shift changes and would only result in a maximum of 10 trips per hour during shift changes.

The small permanent workforce and minor number of supporting truck trips would not generate a significant number of trips that would create impacts on the local transportation network or otherwise substantially affect levels of service in the project area. Therefore, the proposed project would result in a less than significant impact related to operational traffic.

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Less Than Significant Impact. Project-related traffic impacts would occur during construction and operation activities. The County of Los Angeles CMP level of significance thresholds are not intended to be applied to construction activities. Additionally, the small permanent workforce and minor number of supporting truck trips during the project operation would not generate a significant number of trips that would create impacts on the local transportation network or otherwise substantially affect levels of service in the project area. Therefore, the proposed project would not conflict with an applicable congestion management project, and the impact would be less than significant.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. The project site lies entirely within the boundaries of the Fairmont Reservoir property, which is owned by LADWP and occupied by facilities devoted to water storage and distribution. Construction and operation of the proposed project would not generate air traffic. Additionally, the proposed project would not include any high-rise structures that could be a hazard to aircraft navigation. The proposed project would not result in a change in air traffic patterns that would result in substantial safety risks. Therefore, no impacts to air traffic patterns would occur.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact. The project site lies entirely within the boundaries of the Fairmont Reservoir property, which is owned by LADWP and occupied by facilities devoted to water storage and distribution. Although the first phase of the proposed project includes paving the existing two-lane unpaved roadways along 170th Street West, West Avenue H, and 160th Street West, it would not alter any nearby roadways and would not include dangerous design features or incompatible uses. Paving of these roadways, which would be done prior to the outset of construction activities at the project site, would provide stable and durable road surfaces. Therefore, no impact related to an increase in hazards due to a design feature or incompatible uses would occur.

e) Result in inadequate emergency access?

No Impact. Direct access to the project site during construction and operation would be the two-lane roadways along 170th Street West and West Avenue H, which would provide two ingress/egress routes. Other than the paving of the site access roads prior to the commencement of on-site construction, all construction and operation activities would take place within the project site. Except during road paving, which would briefly close one of the two available site access routes at a time, no road closures are anticipated during project construction. Therefore, no impact to roadways would occur that would result in inadequate emergency access.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

No Impact. The project site lies entirely within the boundaries of the Fairmont Reservoir property, which is owned by LADWP and occupied by facilities devoted to water storage and distribution. Other than access road paving, all construction and construction staging would take place within the project site. Other than several agricultural properties with residences (the closest of which is over 1,000 feet northeast of the project site), the area surrounding the project site is essentially undeveloped. Therefore, the construction and operation of the proposed project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. No impacts would occur.

XVII. TRIBAL CULTURAL RESOURCES

The following analysis is based on Native American consultation by LADWP in accordance with Assembly Bill 52 (AB 52), which requires that a lead agency must consult with interested California Native American tribes who request formal consultation regarding impacts to tribal cultural resources. Additional information on these consultation efforts are provided in the *Cultural Resources Impact Study*, Appendix C of this Initial Study/MND.

Would the project:

a) Cause a substantial adverse change in the significance of a tribal cultural resources, 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 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)?

Less Than Significant Impact. Based on the records search of the California Historical Resources Information System at the South Central Coastal Information Center, eight previously recorded cultural resources were identified within 0.5 miles of the project site, including one historical resource recorded within the project site (LAA1, as discussed in Section V(a), Cultural Resources). No archaeological resources were recorded within the project site or encountered during the pedestrian survey of the site conducted for the project. No known resources of Native American origin were identified at the project site based on the Sacred Lands File search conducted by the Native American Heritage Commission, archival research, or consultation with Native American tribal representatives. Other than LAA1, no cultural resources at the site are listed or eligible for listing in the California Register of Historic Resources. Therefore, the impact to tribal cultural resources that are listed or eligible for listing in the California Register of Historic Resources would be less then significant.

b) Cause a substantial adverse change in the significance of a tribal cultural resources, 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 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?

Less Than Significant Impact with Mitigation. No archaeological resources were recorded within the project site or encountered during the pedestrian survey of the site conducted for the project. No resources of Native American origin were identified for the project site based on the Sacred Lands File search conducted by the Native American Heritage Commission, archival research, or consultation with Native American tribal representatives. California Native American tribes contacted for AB 52 consultation expressed concern that unknown cultural resources may exist within the project area, although they did not relay knowledge of any tribal cultural resources known to exist within the APE, as of the date of this publication. The Fernandeño Tataviam Band of Mission Indians underwent formal consultation and expressed concern that unknown resources may exist within the project area, and provided information on tribal cultural resources identified in the greater area but not specifically within the project APE. The Fernandeño Tataviam Band of Mission Indians requested that a qualified Native American representative be present during all ground-disturbing activities. The San Manuel Band of Mission Indians indicated that they do not have specific concerns with the project implementation plans and did not identify any known tribal cultural resources in the project APE, but recommended mitigation measures be implemented to protect unanticipated discoveries, including the opportunity for tribal representatives to be present during the evaluation of such discoveries, as discussed below.

Because tribal cultural resources may be buried with no surface indications of their existence, particularly in areas of alluvial deposits, the Fernandeño Tataviam Band of Mission Indians have requested that a Native American representative be invited to be present during ground-disturbing activities at the project site. Should any tribal cultural resources be identified during construction activities at the project site, the Native American representative(s) would be consulted regarding appropriate treatment and disposition of the resources. In consultation with the Native American representative(s) with the Fernandeño Tataviam Band of Mission Indians and San Manuel Band of Mission Indians, LADWP would determine whether the resource is significant pursuant to criteria set forth in Section 5024.1 of the Public Resources Code. To minimize impacts to potentially significant tribal cultural resources at the project site, Mitigation Measure TCR-A would be implemented. Ongoing Native American consultation and implementation of Mitigation Measure TCR-A would ensure that impacts to tribal cultural resources would be less than significant.

Mitigation Measure TCR-A is required, as follows:

TCR-A: Before ground-disturbing construction, LADWP will include a monitoring plan in their work plan or in the contract conditions of the construction contractor, identifying the following steps to be taken in the event of the inadvertent discovery of previously unknown tribal cultural resources: A trained Native American monitor from the appropriate tribe shall be invited to be present to observe ground-disturbing activities at the project site. In the event of the discovery of a tribal cultural resource, work shall cease in the immediate vicinity (within a 60-foot buffer of the find), LADWP shall be notified, and LADWP shall contact a qualified professional archaeologist who meets the Secretary of the Interior's standards to evaluate the significance of and determine appropriate treatment for the resource. This shall include a determination of eligibility for listing in the California Register of Historic Resources pursuant to criteria set forth in Section 5024.1 of the California Public Resources Code. Work in the area of the discovery may not resume until evaluation and treatment of the resource is completed and/or the resource is recovered and removed from the site. Construction activities may continue on other parts of the construction site while evaluation and treatment of resource takes place. The Native American monitor shall be consulted regarding the evaluation and treatment of the resource, and the archaeologist shall make recommendations for further evaluation and treatment as necessary in consultation with the Native American monitor.

XVIII.UTILITIES AND SERVICE SYSTEMS

Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Less Than Significant Impact. The proposed project would generate wastewater during construction and operation of the sedimentation plant. Sanitary waste related to the temporary increase in on-site workforce during project construction would be handled through the use of portable chemical toilets, the waste from which would be removed by a private contractor and disposed at an approved off-site location that would comply with the wastewater treatment requirements of the Lahontan RWQCB. As discussed in the project description, a septic system would be constructed as part of the proposed project to handle sanitary waste during operation of the proposed project. LADWP would coordinate with the Lahontan RWQCB regarding the siting, design, operation, and maintenance of the septic system. Compliance with the conditions of the Lahontan RWQCB would result in a less than significant impact to wastewater treatment requirements.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less Than Significant Impact. Construction of the proposed project is scheduled to begin in 2020 and is anticipated to last approximately 3.5 years, including a several-month plant commissioning period. The number of daily on-site workers would range from a low of 15 to a high of 75, which would occur during the overlap of the LAA realignment and reservoir relining (asphalt and concrete work). During construction, water would be required for activities such as dust control. However, these activities are limited and temporary and would not consume large amounts of water requiring construction of new water treatment facilities. Sanitary waste related to the temporary increase in on-site workforce during project construction would be handled through the use of portable chemical toilets, the waste from which would be removed by a private contractor and disposed at an approved off-site location that would comply with the wastewater treatment requirements of the Lahontan RWQCB. Due to the temporary nature of the construction activities and the relatively low number of construction workers, the amount of construction-related wastewater that would be generated is not expected to have a significant impact related to the capacity of existing wastewater treatment facilities.

Operation of the proposed sedimentation plant would require up to 10 personnel, and is anticipated to result in a nominal increase in demand for water supply and the generation of wastewater. During project operation, water for personnel and operational needs would be supplied from the sedimentation plant effluent, which would require a small on-site potable water treatment system and storage tank. This would not impact the local or regional water supply or treatment system.

A septic system would be constructed as part of the proposed project to handle sanitary waste on site during operation of the proposed project. The relatively small quantity of waste that would need to be pumped from the septic system and disposed of would not result in the construction of new wastewater treatment facilities or the expansion of existing facilities. The impact would be less than significant.

c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less Than Significant Impact. The proposed project would involve a site-level stormwater drainage system, including the redirection of an open drainage channel that currently crosses the project site. No expansion of existing stormwater facilities is anticipated. The project would be designed to capture and infiltrate stormwater in compliance with the Los Angeles County SUSMP requirements and Low Impact Development ordinance. The relatively small scale of the stormwater drainage system within the context of the sedimentation plant facilities would not separately cause environmental impacts that have not previously addressed in this MND. The impact would be less than significant.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Less than Significant Impact. The proposed project would require use of water during construction for dust control, excavation, and other construction-related activities. A small on-site potable water treatment system and storage tank would provide water for personnel and operational needs during operation of the proposed project. Water would be provided by LADWP, and no new or expanded entitlements would be required. Impacts would be less than significant.

e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Less than Significant Impact. Operation of the proposed sedimentation plant would require up to 10 personnel. As discussed above, a septic system would be constructed to handle sanitary waste during operation of the proposed project. The relatively small quantity of waste that would need to be pumped from the septic system and disposed of would not result in a determination by the wastewater treatment provider that it does not have adequate capacity to accommodate the project's wastewater treatment demand. The impact would be less than significant.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Less than Significant Impact. During project construction, solid waste would be generated from clearing and grubbing the sedimentation plant site, the demolition of existing structures, and in the form of general construction debris. Two landfills in the area of the proposed project are permitted to receive construction/demolition waste. The Lancaster Landfill and Recycling Center is located approximately 25 miles by road east of the proposed project site. As of 2012, it has a remaining capacity of 14.5 million CY and a daily permitted throughput of about 5,100 tons. The Antelope Valley Recycling and Disposal Facility is located approximately 28 miles by road southeast of the project site. As of 2016, it has a remaining capacity of 18.5 million CY and a daily permitted throughput of about 3,600 tons.

In accordance with state and local codes and ordinances, the construction contractor would be required to employ source reduction techniques and recycling measures, which would substantially reduce the amount of construction-generated solid waste that would require disposal in landfills. The majority of the solid waste that would be generated during construction would be from the demolition of the Fairmont Reservoir #2 liner, which would result in about 18,000 CY, or about 21,600 tons, of asphalt debris. The reservoir demolition work is estimated to take approximately 3 months to complete, which would result in an average of approximately 360 tons of asphalt debris per day.

Demolished asphalt can be reclaimed for use as pavement or road base, and as discussed above, recycling measures would be required during construction to divert waste from landfills. However, even if all the asphalt debris was disposed of at the local landfills discussed above, it would represent less than 0.05 percent of the total remaining landfill capacity in CY and less than 5 percent of the daily capacity in tons during the 3-month reservoir demolition period. In addition, 3,900 tons of daily capacity (2,100 tons at the Lancaster Landfill and Recycling Center and 1,800 tons at the Antelope Valley Recycling and Disposal Facility) is allocated for inert debris that can be recycled for beneficial uses, such as fully cured asphalt that is recycled to produce road base for internal landfill use. The 360 tons of asphalt debris generated by the project each day would represent less than 10 percent of the daily capacity for inert debris during the 3-month reservoir demolition.

The amount of waste generated during the balance of project construction would be substantially less than that generated by the reservoir liner demolition; therefore, it could be readily accommodated within the permitted capacity of the local landfills. The impact to landfills during project construction would be less than significant.

As discussed above in Section 1 of the MND (Project Description), during project operation, an average of approximately 144 tons per day (approximately 1,000 tons per week) of sludge would be produced at the sedimentation plant. This would amount to approximately 57,000 CY of sludge annually. Because arsenic, a naturally occurring trace element in LAA water, would be present in the sludge, it would be treated as California hazardous waste and disposed of at an approved hazardous waste landfill. Based on the average sludge production rate at the plant, it would require about 10 truck trips a day, Monday through Friday (typical landfill operating days), to transport about 200 tons of sludge. The sludge hopper at the plant would be sized to accommodate a minimum of 1 week of processed sludge to help maintain uniformity in the number of daily haul trucks trips to the hazardous waste landfills.

There are currently two landfills in California approved to accept the sludge from the sedimentation plant. The Clean Harbors Buttonwillow landfill is located approximately 105 miles by road northwest of the proposed project site. It has a currently permitted remaining capacity of about 5 million CY and a daily permitted throughput of about 10,200 tons. Without further expansion, the expected life of operation of the facility is 20 years.

The Kettleman Hills Facility is located approximately 140 miles by road northwest of the project site. It currently has a permitted remaining capacity of about 4.5 million CY. It also has received CEQA certification for a 14.2-million CY expansion, which is yet to be permitted. Kettleman Hills has a currently permitted throughput of 8,000 tons per day. Without expansion, the facility has an expected life of operation of 15 years; with the proposed expansion, the life of operation would be 24 years.

In addition to these two California facilities, US Ecology operates a California-approved hazardous waste landfill near Beatty, Nevada, located approximately 230 miles by road northeast of the project site. It has a currently permitted remaining capacity of about 8.7 million CY and a daily throughput of about 17,000 tons. Without further expansion, the expected life of operation of the facility is 30 years.

All these facilities would be capable of accepting the sludge from the sedimentation plant without further dewatering or treatment required. While LADWP would likely contract to have the sludge hauled to only one landfill at a given time, these contracts would be relatively short term (usually 3 years). Therefore, the combined capacity of these facilities is generally available for the sedimentation plant over the long term.

The 200 tons per day of sludge disposal would represent a small fraction of the daily throughput at any of the approved facilities discussed above, at about 2.0 percent at Clean Harbors Buttonwillow, 2.5 percent at Kettleman Hills, and 1.0 percent at Beatty.

Assuming the currently planned future expansion at the Kettleman Hills Facility is not implemented, the annual sludge disposal from the proposed project would represent about 1.25 percent of the total remaining capacity at the facility; if the expansion is implemented, the annual sludge disposal would represent about 0.3 percent of the total remaining capacity. The annual sludge disposal would represent about 1.2 percent of the total remaining capacity at Buttonwillow and 0.7 percent of the total remaining capacity at Beatty.

Over the expected operating life of the approved landfills (30 years, based on Beatty), the sludge disposal from the proposed project would represent less than 10 percent of the combined capacity of the landfills, assuming the currently planned future expansion at the Kettleman Hills Facility is not implemented. If the expansion is implemented, the sludge disposal would represent about 5.5 percent of the combined capacity during the expected operating life of the landfills.

Other than the sludge, the proposed project is not anticipated to produce substantial solid waste during operation. Based on the permitted capacity of the approved hazardous waste landfills available to the project, the impact to landfills during project operation would be less than significant.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

No Impact. As required by regulation and law, during construction and operation of the proposed project, LADWP would comply with all federal, state, and local solid waste diversion, reduction, and recycling mandates, including compliance with the County-wide Integrated Waste Management Plan. The storage, handling, and disposal of the sludge would be subject to the applicable federal, state, and local health and safety regulations. No impact would occur.

XIX. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant Impact with Mitigation. No direct impacts to special-status plant species are anticipated, as none were observed during the field survey, and the project footprint generally lacks suitable habitat for such species. Two special-status wildlife species, California horned lark and loggerhead shrike, were observed during the field survey. In addition, birds protected under the MBTA and CFGC have the potential to occur and nest within or in the proximity of the project footprint. Potential direct impacts to these species or their nests could occur during vegetation removal activities. Potential indirect impacts during construction are associated with noise, dust, vibration, and increased human activity, which could cause individuals to change their behavior and move out of the area.

However, as discussed in Section IV of this MND, by adhering to the avoidance and minimization measures provided in Mitigation Measures BIO-A and BIO-B, impacts on plant or wildlife species would be considered less than significant.

Within the project site, the vegetated ephemeral drainage feature exhibits a defined bed, bank, and channel, and is therefore potentially subject to CDFW's permitting authority under Section 1600 et seq. of the CFGC. Through coordination with CDFW on preparation of an LSAA, direct impacts to waters of the State would be less than significant.

Archival research and a cultural resources pedestrian survey identified one cultural resource within the APE, a portion of one previously recorded site, LAA1 (P-19-002105H). The resource consists of the entirety of LAA1, beginning in the Owens Valley and ending in the San Fernando Valley. A 1,100-foot-long portion of LAA1 is visible within the APE. This portion of LAA1 enters from the northwest and connects with Fairmont Reservoir #2. It would be modified where it enters the Fairmont Reservoir property to provide a connection to the sedimentation plant intake facility. However, as discussed in Section V of this MND, the segment within the APE does not contribute to the resource's significance because the segment has been modified heavily since the period of significance. As such, the segment of the aqueduct within the APE has been modified to the extent that it no longer conveys the historic significance of the aqueduct. As such, the proposed project would result in less than significant impacts to historical resources.

No archaeological resources were encountered during the pedestrian survey, and no known paleontological resources have been identified in the project area. Based on the results of the archival research and survey, there is low potential that archaeological or paleontological resources would be encountered during ground-disturbing activities for the proposed project. Nonetheless, archaeological deposits can be buried with no surface indications of their existence, particularly in areas of alluvial deposits. Therefore, it is possible that archaeological resources, including human remains, could be buried beneath the ground surface, especially in areas where development has included only minimal ground disturbance. In addition, paleontological deposits can be buried with no surface indications of their existence, particularly in areas of older Quaternary alluvium deposits. With implementation of BMP 7 and 8, as presented in Section 1.6.7 of this MND, and Mitigation Measures CR-A and CR-B, impacts to archaeological, paleontological, historic, and prehistoric resources would be to less than significant.

Tribal cultural resources can only be designated with Native American consultation, but no probable tribal cultural resources were identified during the archival research or field survey. However, LADWP continues to consult with tribal representatives, and because tribal cultural resources may be buried with no surface indications of their existence, particularly in areas of alluvial deposits, Native American tribal representatives, through the consultation process, have requested that a Native American archaeological monitor be invited to be present during ground-disturbing activities at the project site. Should any tribal cultural resources be identified during project construction, LADWP would engage a qualified professional archaeologist and consult with Native American tribal representatives to evaluate and determine appropriate treatment for the resource. To minimize impacts to potential tribal cultural resources in the project site, Mitigation Measure TCR-A would be implemented. Implementation of Mitigation Measure TCR-A would ensure that impacts to tribal cultural resources would be less than significant.

b) Does the project have environmental effects that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Less Than Significant Impact. A cumulatively significant environmental impact could result from the combined effects of two or more projects that are closely related geographically (i.e., within the same vicinity or region) and in time (i.e., recently completed projects, projects currently under construction, and/or projects anticipated in the near-term future). The analysis of cumulative impacts under CEQA allows decision-makers to consider the potential consequences of a project(s) in a broader environmental context rather than in isolation. This is necessary because a cumulative significant impact could result even when the individual impacts of the related projects are less than significant. The combined effects of several related projects with individually less then significant impacts may also be determined to be less than significant on a cumulative basis. In addition, even if the combined effects of several related projects are determined to be cumulatively significant, a project's incremental contribution to those cumulative effects may be determined to be less than cumulatively considerable and, therefore, less than significant.

Based on location and implementation timeframe, the only related project whose effects would combine with those from the Fairmont Sedimentation Plant Project to create cumulative impacts is the Elizabeth Tunnel Seismic Enhancement Project. This project would entail the installation of bracing and/or pipeline sections within selected portions of the Elizabeth Tunnel south of the Fairmont Reservoir Property to maintain the flow of aqueduct water through the tunnel in the event of a seismic event along the San Andreas Fault Zone, across which the tunnel passes. Because the Elizabeth Tunnel must generally remain open to supply aqueduct water to the City of Los Angeles, the seismic enhancement work could only occur during brief periods of any given year when demand is relatively low and can be reliably met through other sources, allowing for the temporary suspension of use of the tunnel. This would normally occur during portions of the winter rainy season, when the use of water for landscape irrigation is substantially reduced. Therefore, it is anticipated that the Elizabeth Tunnel work would occur in relatively small time increments over a period of about 5 to 6 years, depending on the actual availability of access to the tunnel.

The construction of the seismic enhancements would first involve the grading of a flat pad in the southeast corner of the basin of Fairmont Reservoir #1, adjacent to the access point to the tunnel. An existing concrete structure that served as the reservoir's outlet tower would also require demolition to clear access to the tunnel. The graded pad would serve as a laydown and staging area for the tunnel work. Pipeline sections, tunnel bracing components, and other construction materials would be delivered by truck to the pad. From the staging area, the pipeline and bracing components would be transported into the tunnel, which has an inside diameter of approximately 10 feet. Some equipment, such as a lattice boom crane, front-end loaders, and pipe carrier vehicles would be required. The number of personnel necessary during the tunnel work would likely be 20 or less.

After the completion of the tunnel enhancement construction, there would be no impacts from operation, which would entail the flow of water through the tunnel similar to existing conditions. Therefore, the only overlap of potential effects from the Elizabeth Tunnel Seismic Enhancement Project with those from the Fairmont Sedimentation Plant Project would be during the period of construction for both projects. The preparation of the Elizabeth Tunnel staging area would occur in 2019, prior to the beginning of construction work on the Fairmont Sedimentation Plant Project, which is scheduled to begin in 2020. Thus, no combined effect would occur from the two projects during this work.

The actual work within the tunnel would begin in 2020 and would thus overlap with the sedimentation plant construction. Since, as discussed above, access to the tunnel would only be available during a brief period of each year (approximately 6 weeks) and construction would require several years to complete, delivery of material to the Elizabeth Tunnel could occur in a staged manner, thus minimizing the number of truck trips during any given period or day. Therefore, since the impacts to traffic from the Fairmont Sedimentation Plant Project would be substantially below established thresholds of significance (as discussed in Section XVI of this MND), the combined effects on traffic from the two projects would remain less than significant. When the work in Elizabeth Tunnel is actually occurring, the relatively few number of personnel commuting to the site on a daily basis would not change this conclusion regarding impacts to traffic.

The operation of equipment during the tunnel work would contribute air pollutant emissions that would combine with the emissions associated with the Fairmont Sedimentation Plant Project. However, given the relatively few pieces of equipment involved and given that the emissions associated with the construction of the Fairmont Sedimentation Plant Project would be substantially below the established thresholds of significance (as discussed in Section III of this MND), the combined effects on air quality from the two projects would remain less than significant. Likewise, given that the GHG emissions from the Fairmont Sedimentation Plant Project would be substantially below the established thresholds of significance (as discussed in Section VII of this MND), the additional GHG emissions from the Elizabeth Tunnel construction work would not result in a cumulatively significant impact.

Since the Elizabeth Tunnel staging area is nearly 1 mile from the nearest residential property in the vicinity and is situated within the basin of Fairmont Reservoir #1, there would be no significant impact from the combined effects related to noise generation from the two projects. No other effects from the projects, including those to biological and cultural resources, could combine to create a cumulatively significant impact.

Therefore, because the combined effects of the projects would remain less than significant, the proposed project would not have impacts that are individually limited but cumulatively considerable. The impact would less than significant.

c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant Impact. As discussed throughout Section 3 of this MND, the proposed project would not result in potentially significant impacts to the environment that would result in substantial adverse effects on human beings, either directly or indirectly. Impacts would be less than significant.

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SECTION 4
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LADWP FAIRMONT SEDIMENTATION PLANT PROJECT

AIR QUALITY IMPACT STUDY

Prepared for

AECOM

Prepared by

TERRY A. HAYES ASSOCIATES INC.

APRIL 2018

taha 2017-031

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1.0 SUMMARY OF FINDINGS

Terry A. Hayes Associates Inc. (TAHA) completed an air quality impact assessment for the Los Angeles Department of Water and Power (LADWP) Fairmont Sedimentation Plant Project (proposed project) located in unincorporated Los Angeles County approximately 6 miles west of Lancaster, California. The analyses assessed potential environmental impacts related to air pollutant emissions resulting from construction and operation of the proposed project. Emissions of air pollutants that will be generated by construction and operation of the proposed project were evaluated for potential significance in accordance with applicable Antelope Valley Air Quality Management District (AVAQMD) methodologies for development projects within the Mojave Desert Air Basin (MDAB). Conclusions that address significance determinations under the California Environmental Quality Act (CEQA) Environmental Checklist criteria are shown in **Table 1-1**.

TABLE 1-1: SUMMARY OF IMPACT STATEMENTS

Impact Statement	Proposed Project Level of Significance	Applicable Mitigation Measures	Level of Significance After Mitigation
Would the proposed project conflict with or obstruct implementation of the applicable air quality plan?	Less-than-Significant Impact	None	Less-than-Significant Impact
Would the proposed project violate any air quality standard or contribute substantially to an existing or projected air quality violation?	Less-than-Significant Impact	None	Less-than-Significant Impact
Would the proposed project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	Less-than-Significant Impact	None	Less-than-Significant Impact
Would the proposed project expose sensitive receptors to substantial pollutant concentrations?	Less-than-Significant Impact	None	Less-than-Significant Impact
Would the proposed project create objectionable odors affecting a substantial number of people?	Less-than-Significant Impact	None	Less-than-Significant Impact

SOURCE: TAHA, 2017.

2.0 INTRODUCTION

2.1 PURPOSE OF REPORT

The purpose of this report is to evaluate the potential significance of environmental impacts related to air quality associated with construction and operation of the proposed project.

2.2 PROJECT DESCRIPTION

Background

To maintain the quality and reliability of the City of Los Angeles' potable water supply, LADWP is proposing to implement the proposed project to improve raw water quality through a reduction in sediment in the water delivered by the First and Second Los Angeles Aqueducts (LAA1 and LAA2) to the Los Angeles Aqueduct Filtration Plant (LAAFP), where the water receives additional treatment and disinfection before entering the City's potable water distribution system. The proposed sedimentation plant would utilize plate settler technology to increase the efficiency and effectiveness of the sediment removal process and minimize the new plant's required footprint.

Project Location

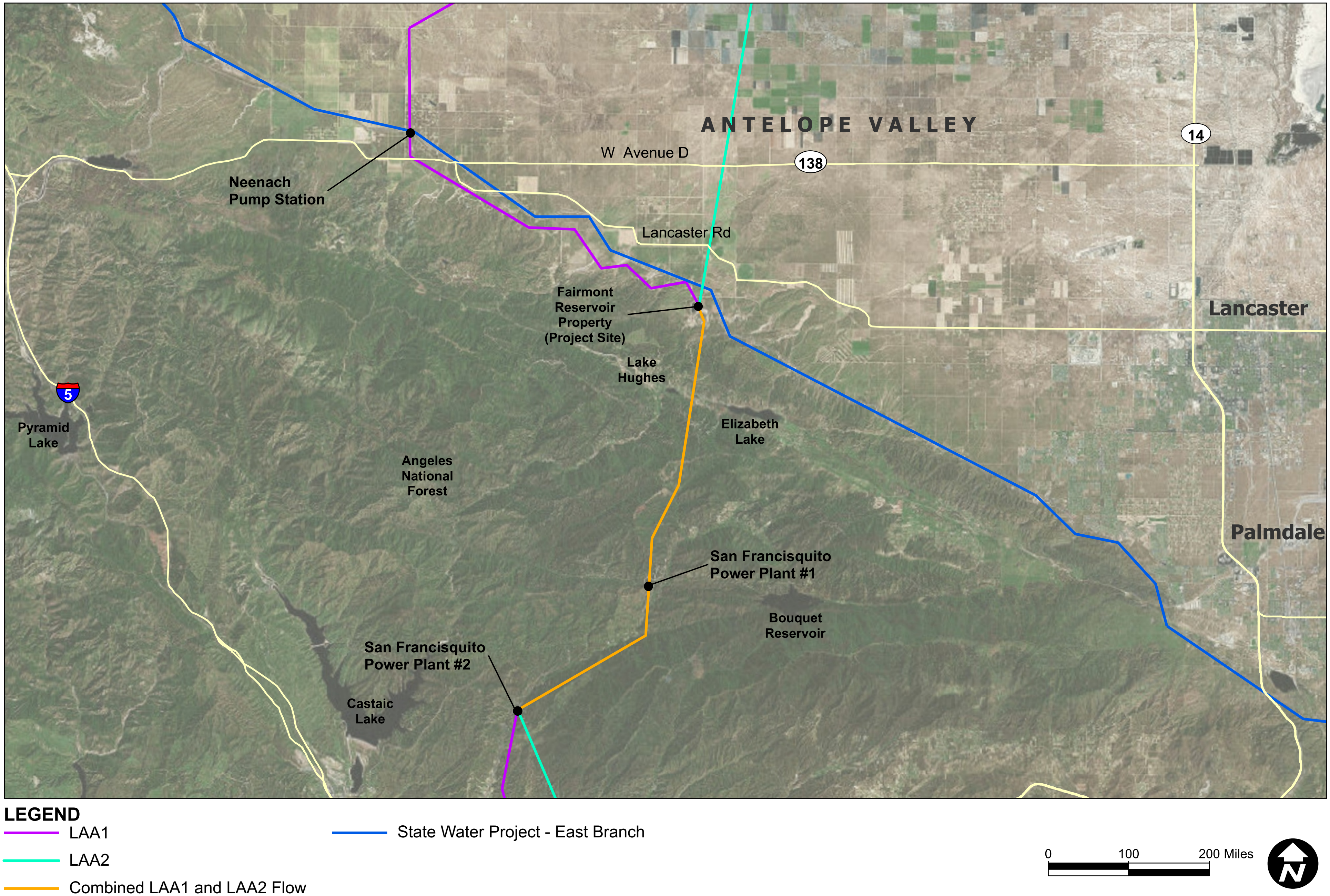
The project site is located on LADWP-owned property adjacent to LADWP Fairmont Reservoir #2. The Fairmont Reservoir property is located at West Avenue H and 170th Street West, approximately 6 miles west of the City of Lancaster, in the Antelope Valley in northwest Los Angeles County (see **Figure 2-1**). Regional access to the site is provided by State Highway 138, an east-west thoroughfare that is located approximately 4 miles north of the property and provides linkage between State Highway 14 (about 15 miles east of the project site) and Interstate Route 5 (about 20 miles west of the project site). The nearest paved road to the project site is Lancaster Road, which is approximately 1 mile to the northeast at its closest point. Immediate access to the project site is provided by unpaved roads. The proposed project site consists of an approximately 20-acre vacant parcel located just northeast of Fairmont Reservoir #2. The parcel is relatively flat, sparsely vegetated, and maintained by tilling. An ephemeral drainage course, which contains some vegetation, crosses the site generally from southwest to northeast. Along its northern and eastern edges, the site is bounded by a chain-link fence, which is part of the LADWP Fairmont Reservoir property perimeter security fence (see **Figure 2-2**).

Proposed Project

In addition to the key characteristics described above, in order to achieve the project objectives, the sedimentation plant would include the following primary facilities and components (see **Figure 2-3**).

LAA Realignment

LAA1 and LAA2 converge at the Fairmont Reservoir property. However, the actual convergence occurs downstream of the Fairmont Reservoir #2, at the outlet pipeline of the reservoir, and downstream of the proposed sedimentation plant site. Currently, only LAA1 water passes through the Fairmont Reservoir #2, while LAA2 is routed directly to the outlet pipeline. In order to allow both LAA1 and LAA2 to flow to the proposed sedimentation plant, they would be diverted into a new buried pipeline located upstream of the reservoir and connected to the plant intake facility. The existing buried aqueduct pipelines would remain in place with new isolation valves to allow for bypassing the sedimentation plant if necessary.



SOURCE: AECOM, 2018.

Fairmont Sedimentation Plant Project
Air Quality Impact Study

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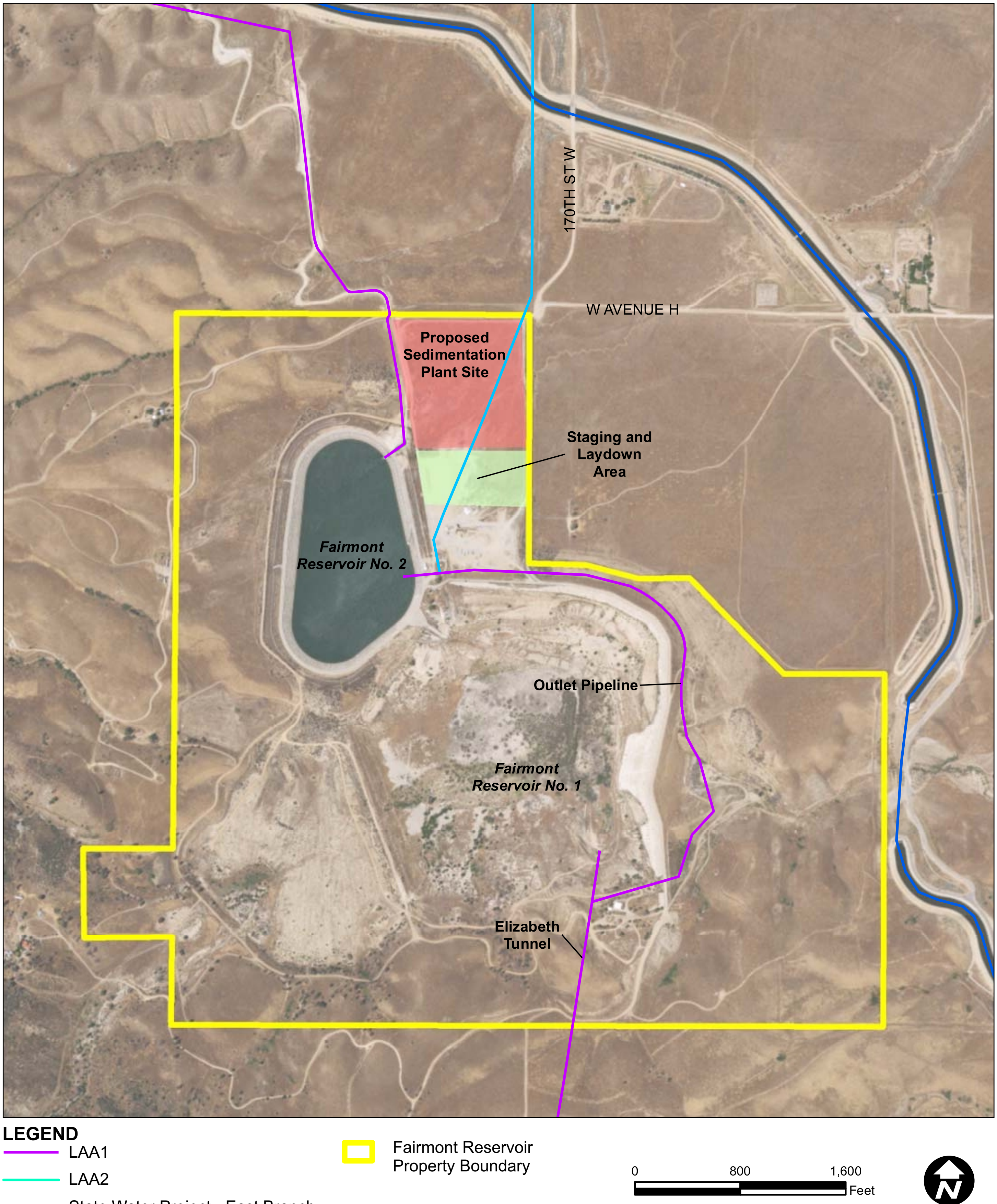
LADWP

FIGURE 2-1

REGIONAL LOCATION MAP



SOURCE: LADWP, 2017; AECOM, 2017.

Fairmont Sedimentation Plant Project
Air Quality Impact Study

LADWP

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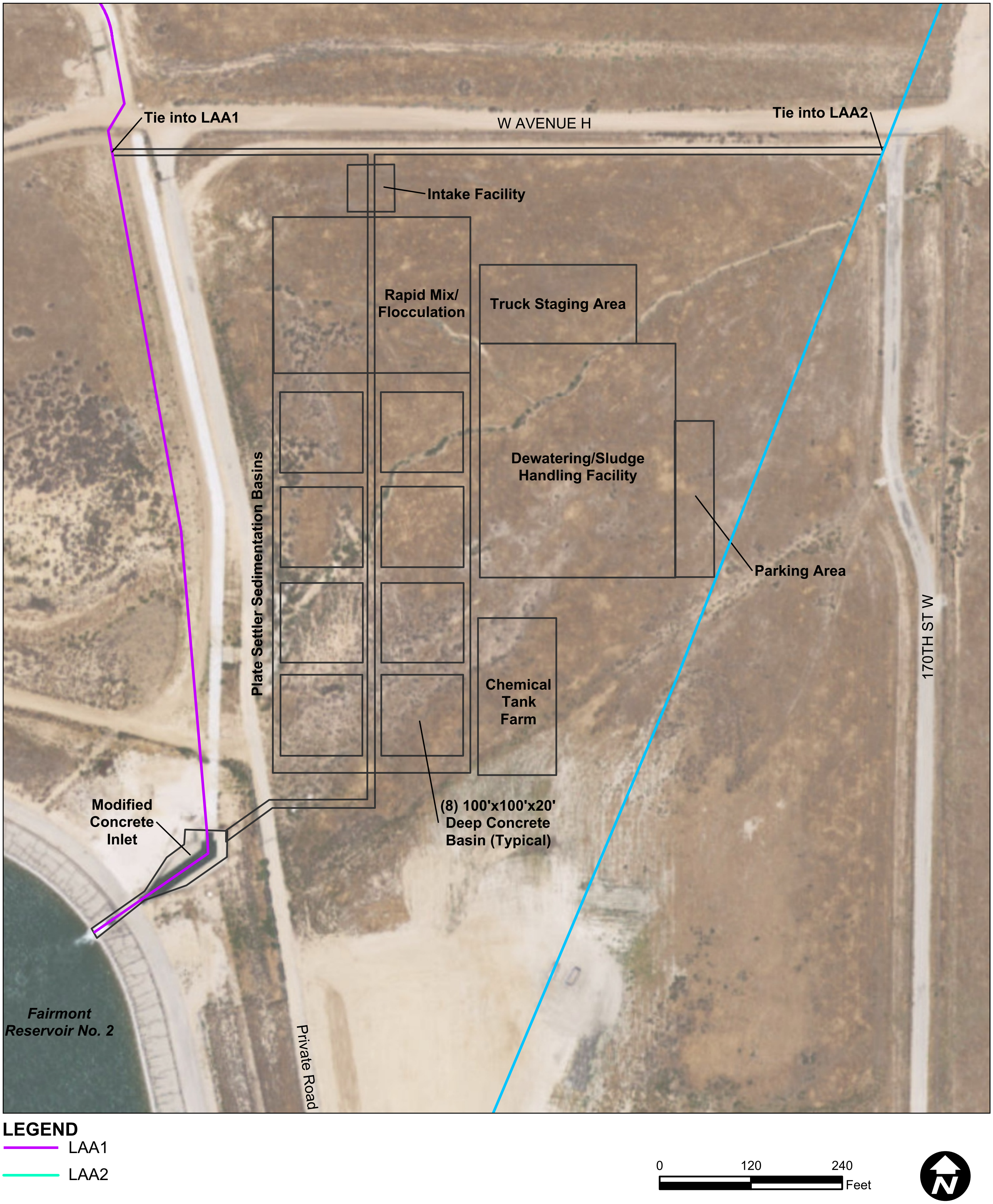
FIGURE 2-2

FAIRMONT RESERVOIR PROPERTY



SOURCE: LADWP, 2017; AECOM, 2017.

Fairmont Sedimentation Plant Project
Air Quality Impact Study

LADWP

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FIGURE 2-3

CONCEPTUAL SITE PLAN

Intake Facility

An intake facility would meter total flow into the plant from the LAAs to determine the hydraulic conditions for plant operations. The intake facility would also include coarse screens to capture algae and larger debris.

Rapid Mix Coagulation/Flocculation

Following the intake facility but prior to the sedimentation basins, the water would pass through rapid mix coagulation/flocculation tanks. The application of coagulants/flocculants would improve the settling rate of sediment, resulting in more effective and efficient treatment and allowing for increased flow velocities through the sedimentation basins. Chemical storage tanks, with appropriate safety measures, including spill containment, would be required to store the coagulants/flocculants.

Plate Settler Sedimentation Basins

The sedimentation plant would include a series of basins sized to accommodate the maximum and operable minimum flow conditions at Fairmont. Each individual basin would contain plate settlers and could be operated independently of the other basins, as required.

Sludge Processing Facility

The plate settler treatment process would result in the accumulation of sediment on the bottom of the sedimentation basins. The accumulated sediment would be removed from the basins by means of a mechanical system to a collection pit. The sediment would then be conveyed to a sludge thickening facility consisting of rapid mix coagulation settling tanks and equalization basins. The thickened sludge would then be conveyed to a mechanical dewatering facility where additional coagulants may be added and mechanical dewatering equipment would separate solid material from the water in the sludge. The resulting residual sludge would be temporarily stored in a hopper or loaded directly into trucks at an on-site staging facility to be transported to a suitable off-site landfill.

Administration and Support Facilities

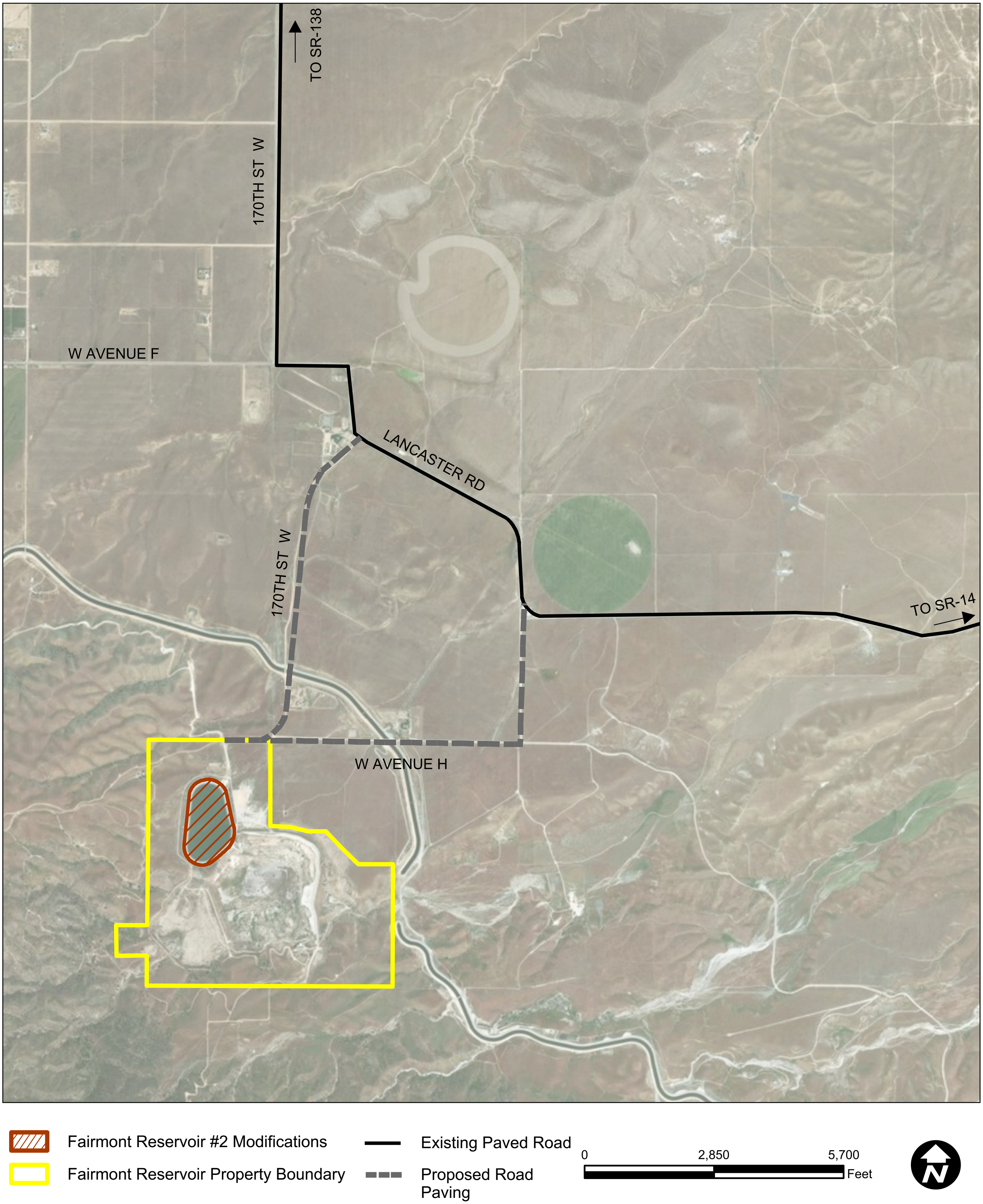
To operate the sedimentation plant, support facilities including, but not limited to, offices and other administrative spaces, a control room, laboratory, and necessary shop and materials storage areas would be provided.

Sanitary Waste and Water Treatment

Given the location of the proposed project, a septic system would be required to handle sanitary waste. Since the effluent from the sedimentation plant would not be considered potable, a small on-site potable water treatment system and storage tank would be required to provide for personnel and operational needs.

Access Road Paving

Immediate access to the project site is currently provided via unpaved roads. To provide a stable and durable road surface for trucks and to minimize the creation of dust from vehicle travel on the unpaved road surfaces, approximately 3 miles of existing access roads would be paved prior to the outset of construction activities at the project site. This would entail paving Avenue H east of the project site to 160th Street and 160th Street north of Avenue H to its intersection with Lancaster Road, which is a paved roadway. In addition, 170th Street would be paved north of the project site to its intersection with Lancaster Road. This would provide two paved ingress/egress routes to the site (see **Figure 2-4**).



SOURCE: LADWP, 2017; AECOM, 2018.

TAHA 2017-031

Fairmont Sedimentation Plant Project
Air Quality Impact Study

LADWP

FIGURE 2-4

PROPOSED ROAD PAVING

Fairmont Reservoir #2 Modifications

Reservoir Inlet Structure. LAA1 currently empties into Fairmont Reservoir #2, and LAA2 intercepts the outflow from the Fairmont Reservoir #2 at the outlet pipeline directly downstream of the reservoir. However, under the proposed project, both LAA1 and LAA2 would flow into the sedimentation plant, and after treatment, the effluent from the plant, which would consist of the combined flows of both aqueducts, would be directed to Fairmont Reservoir #2. Modification of the open-channel concrete inlet structure for the reservoir would be required to accommodate the combined flow from the plant.

Reservoir Relining. Fairmont Reservoir #2 is fully lined with asphalt. However, this lining has not been replaced since the reservoir was first constructed in 1982, and it has deteriorated to the extent that maintenance of the reservoir is difficult. Since LAA1 would be out of service for a period of time during project construction (and therefore not flow into Fairmont Reservoir #2), the opportunity to reline the reservoir would be available. This relining would include asphalt sidewalls and a concrete bottom for durability and maintenance.

Electrical Power

Electrical power for the project would be drawn from the existing Southern California Edison power feed to the Fairmont Reservoir property, which currently enters the property near the northwest corner of the sedimentation plant site. A diesel-powered backup power generator would also be installed to support minimal critical treatment processes as well as communications, human-machine interface, and alarm systems in the event of an outage on the Southern California Edison feed.

Project Construction

Construction of the proposed project is scheduled to begin in early 2020. As shown in **Figure 2-5**, construction would consist of several tasks, including access road paving; LAA1 and LAA2 realignment; Fairmont Reservoir #2 modifications; excavation and grading for the sedimentation plant; construction of the structural elements of the plant (e.g., concrete foundations, basins, and tanks); and installation of the plant equipment and support facility construction. The general work that would occur in each of these phases is described below. While these phases are distinct and generally must precede or be preceded by others, some work associated with various phases could occur concurrently at different locations within the project site as construction of the plant proceeds. The exact sequencing of various tasks would be determined prior to the start of construction, but the total construction period, from mobilization to completion of the plant is anticipated to last approximately 3.5 years, including a plant commissioning period of several months.

Construction activities would normally occur Mondays through Fridays during the daytime hours, generally beginning no earlier than 7:00 a.m. and ending by late afternoon/early evening. Contractors and LADWP would require temporary trailers for construction management activities and temporary laydown areas and storage facilities for construction materials and equipment. All required administrative, staging, storage, and laydown areas related to project construction would be located within the existing Fairmont Reservoir property boundaries. Direct vehicular access to the site during construction would be provided along 170th Street West and West Avenue H, which, as discussed below, would be paved in the first phase of the project.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Access Road Paving	■	■	■																																							
Site Mobilization				■	■																																					
LAA1 & LAA2 Realignment						■	■	■	■	■	■	■	■	■	■	■	■																									
Reservoir #2 Modifications											■	■	■	■	■	■	■																									
Plant Excavation & Grading																		■	■	■	■																					
Plant Structures																						■	■	■	■	■																
Plant Equip. & Support Facilities																											■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Demobilization																																										■
Average Daily Equipment	9	9	9	6	6	22	22	22	22	22	32	32	32	29	29	29	29	30	30	30	30	7	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6
Average Daily Truck Roundtrips	13	13	13	2	2	16	16	16	16	16	59	59	59	48	48	48	48	6	6	6	6	10	48	48	48	48	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	2
Average Daily Workers	15	15	15	10	10	25	25	25	25	25	45	45	45	75	75	75	75	25	25	25	25	25	25	25	25	25	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10

SOURCE: AECOM, 2017.

FIGURE 2-5

PROJECT SCHEDULE

Construction of the plant and modification of the reservoir would require the operation of various pieces of heavy equipment on site, including excavators, front end loaders, bulldozers, motor graders, cranes, and concrete pump trucks. The type and level of use of this equipment would vary across the phases of work, with an estimated daily peak of about 32 pieces of equipment occurring during a few months of the project when the realignment of the LAAs and modifications of the reservoir would overlap.

The peak number of daily off-site truck round trips would be about 59, also occurring when the realignment of the LAAs and modifications of the reservoir would overlap. Secondary peaks of about 48 daily truck round trips would occur for several months in association with concrete deliveries for the reservoir relining and the plant structural elements. During the balance of the project, the average number of daily truck round trips would be substantially lower, at no greater than 16 and often less than 10 per day. These truck trips would generally be distributed throughout the workday, rather than concentrated during a particular portion of the day.

The number of daily on-site workers would range from a low of 15 to a high of 75, which would occur during the overlap of the LAA realignment and reservoir relining (i.e., asphalt and concrete work). It was assumed that each individual worker would generate a vehicle trip inbound to the project site in the morning and a vehicle trip outbound from the project site in the afternoon (i.e., no reduction in the number of worker trips associated with carpooling has been considered in the assessment of potential environmental effects).

Access Road Paving

As discussed above, the roads that provide direct access to the Fairmont Reservoir property are currently unpaved. Because construction and operation of the plant would involve the delivery of heavy loads to the site (during construction) and the hauling of heavy loads from the site (during both construction and operation), access roads would be paved to provide a stable and durable surface and minimize dust that would be generated by travel on the unpaved roads (see Figure 2-4). The road paving would occur before work at the reservoir property would begin.

The paving would involve portions of 170th Street West, West Avenue H, and 160th Street West to link the project site to Lancaster Road in two different locations. The total length of road included in the paving would be approximately 15,000 feet, and the width of the paved surface would be 24 feet. The road would consist of 4 inches of structural base material and 2 inches of asphalt paving. Some grading of the existing unpaved road surface may be required prior to paving. The road paving would involve several pieces of equipment, including an excavator, dump truck, front end loader, asphalt paving machine, and compaction roller. It is estimated that approximately eight truckloads of base material and four truckloads of hot mix asphalt would be delivered each day. Approximately 15 construction personnel would be required throughout the paving phase, which is anticipated to take approximately 3 months to complete.

LAA1 and LAA2 Realignment

As discussed above, LAA1 and LAA2 physically converge at the Fairmont Reservoir property downstream of the Fairmont Reservoir #2 outlet. To feed into the proposed sedimentation plant, they would need to be realigned, so that they converge upstream of Fairmont Reservoir #2. The 120-inch diameter LAA1 crosses into the property at the northwest corner of the project site, and the 90-inch diameter LAA2 crosses into the property at the northeast corner of the site. New supply lines of similar size would be installed below grade across the northern end of the site to connect each aqueduct to the sedimentation plant intake facility (see **Figure 2-3**). Isolation valves would be installed at the existing LAA connection points to allow for the temporary shutoff of flows to the plant from one or both LAAs. In addition, double block and bleed bypass valves would be installed on the existing LAA1 and LAA2 (both of which would remain in place) downstream of each new connection point. This would completely isolate the existing lines during normal operating conditions at the plant but also allow for flows to be temporarily diverted around the plant through the lines if necessary. The flow in each LAA would be discontinued non-concurrently while these valves were installed. After the installation of the valves, flows would continue through the existing LAA lines during the duration of plant construction.

The installation of the new line, which would be approximately 1,000 feet in length, would entail the excavation of a trench, with the excavated material stockpiled adjacent to the trench to be used as backfill once the line was installed. Because of the width and depth of the trench, shoring would be required. Energy dissipaters or other controls may also be installed to ensure proper inlet velocities at the plant intake facility from the combined flows of the two LAAs. Pipe sections and other material would be delivered to the site, and some demolition material and debris would be hauled from the site. This would involve an average of 16 daily truck roundtrips throughout the phase.

Numerous pieces of equipment would be needed to install the realigned LAA pipeline, including excavators, dump trucks, front end loaders, bulldozers, and a crawler crane. An average of about 22 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Approximately 25 construction personnel would be required throughout the pipeline installation, which is anticipated to take approximately 12 months to complete.

Fairmont Reservoir #2 Modifications

The current concrete inlet structure for Fairmont Reservoir #2 was constructed to accommodate the flows from only LAA1. As discussed above, LAA2 currently bypasses Fairmont Reservoir #2 and connects to the outlet pipeline immediately downstream of the reservoir. However, after completion of the sedimentation plant, the reservoir would accept the combined flows of LAA1 and LAA2 discharged from the plant. Therefore, the existing inlet structure would be enlarged to accommodate this combined flow. This would require the demolition and reconstruction of at least a portion of the existing inlet structure.

In addition, because Fairmont Reservoir #2 was constructed 35 years ago, the original asphalt lining has deteriorated. Since the enlargement of the inlet structure, as well as the realignment of LAA1, would mean that discharges to the reservoir would be paused for a period of time, an opportunity would be provided to replace the existing liner when the reservoir could be emptied. This replacement would involve the demolition of the liner and the repaving of the reservoir side walls with asphalt and the reservoir bottom with unreinforced concrete.

The demolition of the existing reservoir liner would involve the removal of approximately 18,000 cubic yards (CY) of asphalt, which would be hauled off site. This would result in approximately 43 haul truck roundtrips per day for about three months. The relining of the reservoir bottom would require approximately 3,000 CY of asphalt and 22,000 CY of concrete, which would result in approximately 32 delivery truck roundtrips per day for about 4 months.

The demolition and relining of the reservoir would require numerous pieces of equipment, including dump trucks, front end loaders, concrete pump trucks, a bulldozer, an asphalt paver, and a compaction roller. A peak of 10 pieces of equipment (including pickup trucks and water trucks) would be in operation daily for about 3 months, during demolition. A peak of approximately 50 daily construction personnel would be required during the relining operation. The entire reservoir modification phase is anticipated to take about 7 months to complete.

The number of daily truck trips, construction equipment, and personnel described above relate to the reservoir modification work only. However, as discussed above, this work would occur concurrently with the LAA realignment phase because discharges to the reservoir would temporarily cease during the aqueduct realignment. Because these two phases of work would overlap, the actual daily peak of construction activity at the Fairmont Reservoir property during the 7-month reservoir modification would be higher. The combined work under these two phases would result in a peak of approximately 59 truck roundtrips and 32 pieces of operating equipment per day during the 3-month demolition task and 75 construction personnel per day during the 4-month repaving task.

Sedimentation Plant Excavation and Grading

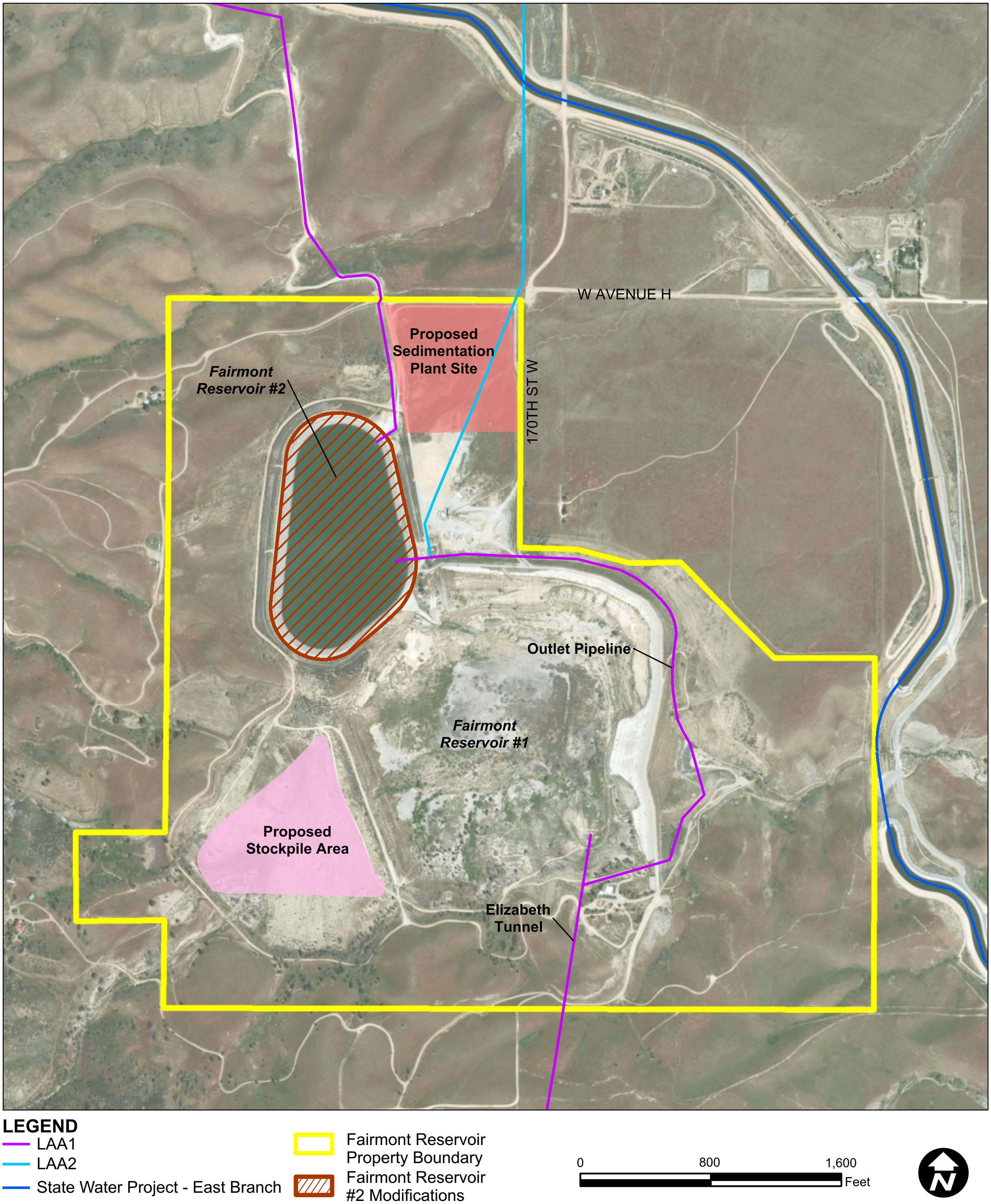
The LAAs operate via gravity flow, and in order to maintain this gravity flow, the various plant components must be situated at the appropriate elevation so that water would continue to flow through the plant and discharge into Fairmont Reservoir #2 without pumping. This would require excavation and grading for the proposed sedimentation basins and the rapid mix coagulation/flocculation tanks, which would each need to be about 20 feet deep, and the sludge processing facility, which would need to be about 10 feet deep. Because of the depth of excavation, shoring may be required in locations stable slopes cannot be built. Suitable excavated material would be used as necessary as fill to achieve the proper elevation across the entire plant. However, it is estimated that over 200,000 CY of excess material may be generated during the excavation and grading for the plant. This excess material would be placed into the empty Fairmont Reservoir #1, as indicated in **Figure 2-6**. To stabilize the material placed in Reservoir #1 to reduce erosion and windborne dust, it would be seeded with locally adapted native species and temporarily irrigated as appropriate to facilitate germination and growth. During the grading phase, runoff currently carried in the open drainage channel that crosses the proposed project site would be intercepted and redirected. The final drainage plan would be designed and permitted in consultation with the appropriate regulatory agencies (i.e. CDFW, RWQCB).

The excavation and grading phase would require numerous pieces of equipment, including dump trucks, excavators, front end loaders, bulldozers, and motor graders, and compaction rollers. An average of about 30 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Although most excavated material would remain on site, about six off-site haul truck round trips per day would be required to remove general debris during this phase. Approximately 25 construction personnel would be required throughout the excavation and grading phase, which is anticipated to take approximately 4 months to complete.

Sedimentation Plant Structures

The foundations for the sedimentation plant and ancillary facilities, as well as the walls for the plate settler sedimentation basins, the rapid mix coagulation/flocculation tanks, and the sludge processing facility would require substantial quantities of concrete. The total volume of concrete for the structures is estimated at approximately 30,000 CY, which would require a total of 3,000 concrete truck roundtrips over the 4 to 5 months of this phase of work. Along with the delivery of materials, such as reinforcing steel and form material, and the hauling of construction debris from the site, the peak number of daily off-site truck roundtrips would be about 48.

The primary pieces of on-site equipment required to complete the structures would be concrete pump trucks and a crawler crane. A peak of 9 pieces of equipment (including pickup trucks and water trucks) would be in operation daily for about 4 months. Approximately 25 construction personnel would be required throughout the structures phase, which is anticipated to take approximately 5 months to complete.



SOURCE: LADWP, 2017; AECOM, 2018.

taha environmental planners
TAHA 2017-031

Fairmont Sedimentation Plant Project
Air Quality Impact Study

LADWP

FIGURE 2-6

PROPOSED STOCKPILE AREAS

Plant Equipment and Support Facilities

The final phase of the sedimentation plant construction involves the installation of the plant equipment and the construction and finishing of the support facilities. The equipment includes: flow meters, regulators, and screens at the intake facility; mechanical mixers and chemical feed apparatus at the rapid mix coagulation/flocculation tanks; plate settlers and mechanical sediment removal systems in the sedimentation basins; chemical feed apparatus, mechanical mixers, and centrifuge dewatering systems at the sludge processing facility; conveyance systems to transfer processed sludge to trucks at the truck staging area; and chemical storage tanks for coagulants and flocculants. Support facility construction would involve structural and architectural elements and exterior and interior finishing, including plant control rooms, laboratories, administrative space, security systems, and personnel support facilities. In addition, septic and potable water treatment systems would be constructed during this phase.

The delivery of materials and the hauling of construction debris would result in about 8 truck roundtrips through the plant equipment and support facilities phase. Equipment required would include a front end loader, crawler crane, backhoe, and forklifts. An average of about 12 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Approximately 20 construction personnel would be required throughout the phase, which is anticipated to take approximately 15 months to complete.

Project Operation

The proposed sedimentation plant would be sized to operate at a peak inflow of 720 cfs, which is the maximum combined flow of LAA1 and LAA2 based on the physical characteristics of the aqueducts. The plant would be designed to treat LAA influent water with sediment load derived from the last 10 years of available data. The addition of SWP East Branch water to LAA1 would not increase these concentration levels because the maximum anticipated concentration of sediment in the SWP East Branch is lower than that of the LAAs. The sedimentation plant as proposed would achieve a higher treatment standard than is currently achieved at CTP, even under the highly conservative design assumptions for influent quantity and quality.

Treatment Process

Water from LAA1 and LAA2, as well as water recycled from the sludge processing facility (see below), would enter the intake facility, where it would be metered to determine the hydraulic conditions and chemical dosing requirements for plant operations. The water would also pass through a coarse screen at the intake to remove algae and larger debris. From the intake facility, water would flow into the coagulation/flocculation tanks, where chemicals would be injected and mixed into the water by means of mechanical rapid mixers. This process would induce suspended particles to clump together into molecularly destabilized charged particles so they will more readily settle out in the sedimentation basins.

The water would then enter the sedimentation basins through inlet structures that could be independently opened or closed for each of the sedimentation basins. The number of basins that would be operated at a given time would be based on the quantity and quality of the influent raw water. The influent water would flow upward between the inclined settler plates, and based on the design velocity of the flow, the sediment would move downward on the surface of the plates and settle on the bottom of the basins, while the clarified water would continue to flow upward to collection channels. The effluent from the sedimentation basins would be discharged to a pipe and conveyed to the Fairmont Reservoir #2 inlet structure. The sediment that has accumulated on the bottom of the basins would be collected by means of a mechanical system and conveyed to the sludge processing facility.

The sludge collected from the basins would include a substantial mixture of sediment and water that must be further dewatered before the sludge could be transported off site for disposal. The sludge would first flow to settling tanks, where coagulants would be injected and mixed with the sludge. The destabilized particles would settle to the bottom of the tank as thickened sludge, while the clear water lying above the solids layer would be recycled to the sedimentation plant intake facility. The thickened sludge would then enter a flow equalization basin(s) that would provide storage capacity to temporarily retain, as necessary, the sludge, which could then be released into the dewatering facility system at a controlled rate to help maintain a more uniform volume of influent. From the equalization basins, the thickened sludge would then be conveyed to a mechanical dewatering facility, where additional coagulants may be added to the solids and water would be separated from solids by mechanical means. The water would be recycled to the plant intake facility, and the residual sludge would be temporarily stored in a sludge hopper, from which it would be loaded onto trucks for transport offsite.

Plant Operation and Maintenance

The sedimentation plant would generally be in operations 24 hours per day, 7 days per week, whenever the LAAs are flowing. The plant would require up to 10 personnel, who would be distributed between two to three shifts during a day. After commissioning of the sedimentation plant, CTP would be taken out of operation. However, the existing equipment would remain in place, and if circumstances required, it could be used to add coagulants and flocculants to LAA1 at CTP, as is currently done. Although both LAA1 and LAA2 would flow through Fairmont Reservoir #2 after completion of the sedimentation pant, the reservoir would continue to operate with approximately the same freeboard elevation as it currently does, providing storage and regulating flows to Power Plants #1 and #2.

Based on a flow of 320 cfs and turbidity of 14 Nephelometric Turbidity Units (NTU) averaged across the last 10 years of available LAA water quality data, approximately 144 wet tons of residual sludge would be processed on average each day. However, at peak flow and sediment concentration levels for the LAAs, approximately 346 wet tons of residual sludge would be processed in 1 day. Because arsenic, a naturally occurring trace element in LAA water, would be present in the sludge, it would be treated as California hazardous waste and disposed of at an approved hazardous waste landfill. Based on the average sludge production rate, it would require about 10 truck trips a day, Monday through Friday (typical landfill operating days), to transport about 200 tons of sludge. The sludge hopper at the plant would be sized to accommodate a minimum of 1 week of processed sludge to help maintain uniformity in the number of daily haul trucks trips.

Under emergency conditions when the Fairmont Sedimentation Plant must be shut down, the LAA1 and LAA2 isolation valves would be closed to shut off flow to the plant, and the double block and bleed bypass valves on the original aqueduct lines would be opened to allow water to flow through. As currently happens, LAA1 water would flow through Fairmont Reservoir #2, and LAA2 water would flow into the reservoir outlet pipeline downstream of the reservoir. If during the emergency shutdown it is determined, based on the concentrations of sediment in the LAA water or on the length of the shutdown, that the LAAFP cannot adequately treat the water, coagulants and flocculants would be added to LAA1 at CTP as described above, inducing sediment to settle out in North Haiwee Reservoir.

Scheduled maintenance of the plant would occur during lower-flow periods of the LAAs, generally between October 1 and March 31. During maintenance in normal precipitation years, the LAA1 and LAA2 isolation valves would be closed to shut off flow to the plant, and the double block and bleed bypass valves on LAA1 and/or LAA2 would be opened to allow flows through to Elizabeth Tunnel and the LAAFP, which would have the capability to temporarily treat the relatively low volumes of water without pretreatment at the Fairmont Sedimentation Plant. During high precipitation years, the plant shutdown during maintenance would be similar, but greater control of flows from the various sources (i.e., LAA1, LAA2, and SWP East Branch) may be necessary, depending on the sediment load in each source.

3.0 AIR QUALITY

This section examines the degree to which the proposed project may result in changes to air quality on regional and local scales. This section also describes the characteristics and effects of air pollutants, the applicable regulatory framework, and the existing air quality conditions in the proposed project area. This section assesses the potential significance of air pollutant emissions associated with construction and operation of the proposed project. Construction activities would generate emissions of criteria air pollutants and ozone (O_3) precursors through the use of heavy duty construction equipment, haul truck trips to dispose of displaced material, and worker vehicle trips. Operation of the proposed project would require daily haul truck trips to dispose of sludge, which would represent mobile sources of air pollutant emissions. Emissions are quantified in terms of pounds (lb/day) of pollutant emitted into the atmosphere on a daily basis during construction activities. The concentration of a pollutant in ambient air is defined by the amount of air pollutant per volumetric unit of air, expressed in terms of parts-per-million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

3.1 AIR POLLUTANT CHARACTERISTICS AND EFFECTS

Air quality is characterized by ambient air concentrations of seven specific pollutants identified by the United States Environmental Protection Agency (USEPA) to be of concern with respect to health and welfare of the general public. These specific pollutants, known as "criteria air pollutants," are pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal ambient concentration criteria are known as the National Ambient Air Quality Standards (NAAQS), and the California ambient concentration criteria are referred to as the California Ambient Air Quality Standards (CAAQS). Federal criteria air pollutants include ground-level ozone (O_3), nitrogen oxides (NO_X), carbon monoxide (CO), sulfur oxides (SO_X), respirable particulate matter ten microns or less in diameter (PM_{10}), fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), and lead (Pb). The following descriptions of each criteria air pollutant and their health effects are based on information provided by the South Coast Air Quality Management District (SCAQMD).[1]

3.1.1 Federal Criteria Air Pollutants

Ozone (O_3). O_3, a colorless gas with a sharp odor, is a highly reactive form of oxygen. High O_3 concentrations exist naturally in the stratosphere. However, it is also formed in the atmosphere when volatile organic compounds (VOC) and nitrogen oxides (NO_X) react in the presence of ultraviolet sunlight (also known as smog). The primary sources of VOC and NO_X, the components of O_3, are automobile exhaust and industrial sources. Some mixing of stratospheric O_3 downward through the troposphere to the earth's surface does occur; however, the extent of O_3 transport is limited.

While O_3 is beneficial in the stratosphere because it filters out skin-cancer-causing ultraviolet radiation, it is a highly reactive oxidant. It is this reactivity which accounts for its damaging effects on materials, plants, and human health at the earth's surface. The propensity of O_3 for reacting with organic materials causes it to be damaging to living cells and cause health effects. O_3 enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection. Individuals exercising outdoors, children and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for O_3 effects.

[1]SCAQMD, *Final Program Environmental Impact Report for the 2016 AQMP*, January 2017.

Short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient O_3 levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in communities with high O_3.

Nitrogen Dioxide (NO_2). NO_2 is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from nitrogen (N_2) and oxygen (O_2) under conditions of high temperature and pressure which are generally present during combustion of fuels (e.g., motor vehicles); NO reacts rapidly with the oxygen in air to form NO_2. NO_2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO_2, are referred to collectively as NO_X. In the presence of sunlight, atmospheric NO_2 reacts and splits to form an NO molecule and an oxygen atom. The oxygen atom can react further to form O_3, via a complex series of chemical reactions involving hydrocarbons.

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposures to NO_2 at levels found in homes with gas stoves, which are higher than ambient levels found in Southern California (fewer or no stoves). In healthy subjects, increase in resistance to air flow and airway contraction is observed after short-term exposure to NO_2. Larger decreases in lung functions are observed in individuals with asthma and/or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. More recent studies have found associations between NO_2 exposures and cardiopulmonary mortality, decreased lung function, respiratory symptoms and emergency room asthma visits.

Carbon Monoxide (CO). CO is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, CO occurs in the atmosphere at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline.

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of worsening oxygen supply to the heart. Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport by competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO.

Individuals most at risk include patients with diseases involving heart and blood vessels, fetuses (unborn babies), and patients with chronic hypoxemia (oxygen deficiency) as seen in high altitudes. Reductions in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO, resulting in COHb levels similar to those observed in smokers. Studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels. These include pre-term births and heart abnormalities.

Sulfur Dioxide (SO_2). SO_2 is a colorless gas with a sharp odor. It reacts in air to form sulfuric acid, which contributes to acid precipitation, and sulfates, which are components of particulate matter. Main sources of SO_2 include coal and oil used in power plants and industries. Exposure of a few minutes to low levels of SO_2 can result in airway constriction in some asthmatics. All asthmatics are sensitive to the effects of SO_2. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, is observed after acute higher exposure to SO_2. In contrast, healthy individuals do not exhibit similar acute responses, even after exposure to higher concentrations of SO_2.

Particulate Matter (PM_{10} and $PM_{2.5}$). Particles small enough to be inhaled into the deepest parts of the lung are of great concern to public health. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood burning stoves and fireplaces; dust from construction, landfills and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Emissions of $PM_{2.5}$ result from fuel combustion (e.g., motor vehicles, power generation and industrial facilities), residential fireplaces and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_X, and VOC.

Respirable particles (PM_{10}) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM. A consistent correlation between elevated ambient fine particulate matter ($PM_{2.5}$) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by $PM_{2.5}$ and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in $PM_{2.5}$ concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to PM. In addition to children, the elderly, and people with pre-existing respiratory and/or cardiovascular disease appear to be more susceptible to the effects of PM_{10} and $PM_{2.5}$.

Lead (Pb). Pb in the atmosphere is present as a mixture of a number of lead compounds. Leaded gasoline and lead smelters have been the main sources of lead emitted into the air. Due to the phasing out of leaded gasoline, there was a dramatic reduction in atmospheric Pb over the past three decades. Exposure to low levels of Pb can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. Fetuses, infants, and children are more sensitive than others to the adverse effects of Pb exposure. In adults, increased Pb levels are associated with increased blood pressure. Pb poisoning can cause anemia, lethargy, seizures, and death. There is no evidence to suggest that there are direct effects of Pb on the respiratory system.

3.1.2 State Criteria Air Pollutants

The State of California has established CAAQS for the following pollutants in addition to those that are regulated under the NAAQS.

Visibility-Reducing Particles. Deterioration of visibility is one of the most obvious manifestations of air pollution and plays a major role in the public's perception of air quality. Visibility reduction from air pollution is often due to the presence of sulfur and NO_X, as well as PM.

Sulfates ($X\text{-}SO_4^{2-}$). Sulfates are chemical compounds which contain the sulfate ion (SO_4^{2-}) and are part of the mixture of solid materials that comprise PM_{10}. Most of SO_X in the atmosphere are produced by oxidation of SO_4^{2-}. Oxidation of sulfur dioxide yields sulfur trioxide, which reacts with water to form sulfuric acid, which contributes to acid deposition. The reaction of sulfuric acid with basic substances such as ammonia yields SO_4^{2-}, a component of PM_{10} and $PM_{2.5}$. Both mortality and morbidity effects have been observed with an increase in ambient SO_4^{2-} concentrations. However, studies to separate the effects of SO_4^{2-} from the effects of other pollutants have generally not been successful. Clinical studies of asthmatics exposed to sulfuric acid suggest that adolescent asthmatics are possibly a subgroup susceptible to acid aerosol exposure.

Hydrogen Sulfide (H_2S). H_2S is a colorless, flammable, poisonous compound having a characteristic rotten-egg odor. It is used as a reagent and as an intermediate in the preparation of other reduced sulfur compounds. It is also a by-product of the desulfurization processes in the oil and gas industries and rayon production, sewage treatment, and leather tanning. Geothermal power plants, petroleum production and refining, and sewer gas are specific sources of H_2S in California. High H_2S exposure has been documented as a cause of sudden death in the workplace.

Vinyl Chloride. Vinyl chloride is a colorless, flammable gas at ambient temperature and pressure. It is also highly toxic and is classified as a known carcinogen by the American Conference of Governmental Industrial Hygienists and the International Agency for Research on Cancer. At room temperature, vinyl chloride is a gas with a sickly-sweet odor that is easily condensed. However, it is stored at cooler temperatures as a liquid. Due to the hazardous nature of vinyl chloride to human health, there are no end products that use vinyl chloride in its monomer form. Vinyl chloride is a chemical intermediate, not a final product.

Vinyl chloride is an important industrial chemical chiefly used to produce polyvinyl chloride (PVC). The process involves vinyl chloride liquid fed to polymerization reactors where it is converted from a monomer to a polymer PVC. The final product of the polymerization process is PVC in either a flake or pellet form. From its flake or pellet form, PVC is sold to companies that heat and mold the PVC into end products such as PVC pipe and bottles. Vinyl chloride emissions are historically associated primarily with landfills.

3.1.3 Air Toxics

Air toxics are generally defined as those contaminants that are known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard. Air toxics are also defined as an air pollutant that may increase a person's risk of developing cancer and/or other serious health effects; however, the emission of a toxic chemical does not automatically create a health hazard. Other factors, such as the amount of the chemical; its toxicity, and how it is released into the air, the weather, and the terrain, all influence whether the emission could be hazardous to human health.

Air toxics are emitted by a variety of industrial processes that include petroleum refining, electric utility and chrome plating operations, commercial operations, such as gasoline stations and dry cleaners, and motor vehicle exhaust and may exist as PM_{10} and $PM_{2.5}$ or as vapors (gases). Air toxics include metals, other particles, gases absorbed by particles, and certain vapors from fuels and other sources.

The emission of toxic substances into the air can be damaging to human health and to the environment. Human exposure to these pollutants at sufficient concentrations and durations can result in cancer, poisoning, and rapid onset of sickness, such as nausea or difficulty in breathing. Other less measurable effects include immunological, neurological, reproductive, developmental, and respiratory problems. Pollutants deposited onto soil or into lakes and streams affect ecological systems and eventually human health through consumption of contaminated food or water. The carcinogenic potential of air toxics is a particular public health concern because many scientists currently believe that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of contracting cancer.

According to the 2006 California Almanac of Emissions and Air Quality, the majority of the estimated health risks from air toxics can be attributed to relatively few compounds, the most important being PM from the exhaust of diesel-fueled engines (diesel PM). Diesel PM differs from other air toxics in that it is a complex mixture of hundreds of substances rather than a single substance.

Diesel PM is composed of two phases, gas and particle, and both phases contribute to the health risk. The gas phase is composed of many of the urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde and polycyclic aromatic hydrocarbons. The particle phase is also composed of many different types of particles by size or composition. Fine and ultra-fine diesel PM are of the greatest health concern, and may be composed of elemental carbon with adsorbed compounds such as organic compounds, SO_X, nitrates, metals and other trace elements. Diesel PM is emitted from a broad range of diesel engines; the on-road diesel engines of trucks, buses and cars and the off-road diesel engines that include locomotives, marine vessels and heavy-duty equipment. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

The most common exposure to diesel PM is breathing the air that contains diesel PM. The fine and ultra-fine particles are respirable (similar to $PM_{2.5}$), which means that they can avoid many of the human respiratory system defense mechanisms and enter deeply into the lung. Exposure to diesel PM comes from both on-road and off-road engine exhaust that is either directly emitted from the engines or lingering in the atmosphere.

Diesel PM causes health effects from both short-term or acute exposures, and long-term chronic exposures. The type and severity of health effects depends upon several factors including the amount of chemical exposure and the duration of exposure. Individuals also react differently to different levels of exposure. There is limited information on exposure to just diesel PM but there is enough evidence to indicate that inhalation exposure to diesel exhaust causes acute and chronic health effects.

Acute exposure to diesel exhaust may cause irritation to the eyes, nose, throat and lungs, and some neurological effects, such as lightheadedness. Acute exposure may also elicit a cough or nausea, as well as exacerbate asthma. Chronic exposure to diesel PM in experimental animal inhalation studies has shown a range of dose-dependent lung inflammation and cellular changes in the lung and immunological effects. Based upon human and laboratory studies, there is considerable evidence that diesel PM is a likely carcinogen. Human epidemiological studies have demonstrated an association between diesel PM exposure and increased lung cancer rates in occupational settings.

3.2 REGULATORY FRAMEWORK

This portion of the air quality section provides brief discussions of the relevant regulations, policies, and programs that have been adopted by federal, state, and local agencies to protect air quality and public health.

Federal

The Clean Air Act (CAA) governs air quality at the national level and the USEPA is responsible for enforcing the regulations provided in the CAA. Under the CAA, the USEPA is authorized to establish NAAQS that set protective limits on concentrations of air pollutants in ambient air. Enforcement of the NAAQS is required under the 1977 CAA and subsequent amendments. The USEPA also regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The USEPA has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California.

As required by the CAA, NAAQS have been established for the seven criteria air pollutants: O_3, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and Pb. These pollutants are common byproducts of human activities and have been documented through scientific research to cause adverse health effects. The CAA grants the USEPA authority to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS concentrations have been met on a regional scale relying upon air monitoring data from the most recent three-year period. The NAAQS are summarized in **Table 3-1**.

As part of its enforcement responsibilities, the USEPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the SIP.

State

Air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). The CCAA is administered by the California Air Resources Board (CARB) at the state level and by the air quality management districts at the regional and local levels. The CCAA requires all areas of the state to achieve and maintain the CAAQS by the earliest feasible date, which is determined in the most recent SIP based on existing emissions and reasonably foreseeable control measures that will be implemented in the future. The CAAQS are also summarized in **Table 3-1**, which also presents the attainment status designations for the Antelope Valley portion of the MDAB.

The CARB, a department of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, the CARB conducts research, designates the CAAQS, compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the SIP. The CARB also establishes emissions standards for motor vehicles sold in California, consumer products (i.e., hair spray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

The CARB's statewide comprehensive air toxics program was established in the early 1980s. The Toxic Air Contaminant Identification and Control Act created California's program to reduce exposure to air toxics. Under the Toxic Air Contaminant Identification and Control Act, the CARB is required to prioritize the identification and control of air toxics emissions. In selecting substances for review, the CARB must consider criteria relating to the risk of harm to public health, such as amount or potential amount of emissions, manner of and exposure to usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community. The Toxic Air Contaminant Identification and Control Act also require CARB to use available information gathered from the Air Toxics Hot Spots Information and Assessment Act to include in the prioritization of compounds.

TABLE 3-1: CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS DESIGNATIONS FOR ANTELOPE VALLEY

Pollutant	Averaging Period	California		Federal	
		Standards (CAAQS)	Attainment Status	Standards (NAAQS)	Attainment Status
Ozone (O_3)	1-Hour Average	0.09 ppm (180 μg/m^3)	Nonattainment	--	--
	8-Hour Average	0.070 ppm (137 μg/m^3)	Nonattainment	0.070 ppm (137 μg/m^3)	Pending – Nonattainment
Carbon Monoxide (CO)	1-Hour Average	20 ppm (23 mg/m^3)	Attainment	35.0 ppm (40 mg/m^3)	Attainment
	8-Hour Average	9.0 ppm (10 mg/m^3)	Attainment	9.0 ppm (10 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	1-Hour Average	0.18 ppm (338 μg/m^3)	Attainment	0.10 ppm (188 μg/m^3)	Attainment
	Annual Arithmetic Mean	0.03 ppm (57 μg/m^3)	Attainment	0.053 ppm (100 μg/m^3)	Attainment
Sulfur Dioxide (SO_2)	1-Hour Average	0.25 ppm (655 μg/m^3)	Attainment	0.075 ppm (196 μg/m^3)	Attainment
	24-Hour Average	0.04 ppm (105 μg/m^3)	Attainment	0.14 ppm (365 μg/m^3)	Attainment
	Annual Arithmetic Mean	--	--	0.030 ppm (80 μg/m^3)	Attainment
Respirable Particulate Matter (PM_{10})	24-Hour Average	50 μg/m^3	Nonattainment	150 μg/m^3	Attainment (Maintenance)
	Annual Arithmetic Mean	20 μg/m^3	Nonattainment	--	--
Fine Particulate Matter ($PM_{2.5}$)	24-Hour Average	--	--	35 μg/m^3	Unclassified/ Attainment
	Annual Arithmetic Mean	12 μg/m^3	Unclassified	12.0 μg/m^3	Unclassified/ Attainment
Lead (Pb)	30-day Average	1.5 μg/m^3	Attainment	--	--
	Calendar Quarter	--	--	1.5 μg/m^3	Unclassified/ Attainment
	Rolling 3-Month Average	--	--	0.15 μg/m^3	Unclassified/ Attainment
Sulfates	24-Hour Average	25 μg/m^3	Attainment	**No Federal Standards**	
Hydrogen Sulfide	1-Hour Average	0.03 ppm (42 μg/m^3)	Attainment		
Vinyl Chloride	24-Hour Average	0.01 ppm (26 μg/m^3)	Attainment		

ppm = Parts per million; μg/m^3 = micrograms per cubic meter.
SOURCE: AVAQMD, *AVAQMD CEQA and Federal Conformity Guidelines*, August 2016.

Regional

In 1997, the California State Legislature established the District Program which separated the Antelope Valley and northern Los Angeles County from the South Coast Air Quality Management District (SCAQMD) and created the AVAQMD. The AVAQMD is the local agency with the primary responsibility for the control of non-vehicular sources of air pollution throughout the Antelope Valley region. The AVAQMD lies within the northern part of Los Angeles County and is bounded by the City of Acton to the south, the Kern/Los Angeles County line to the north, the San Bernardino/Los Angeles County line to the east, and the Quail Lake area to the west. The AVAQMD is located within the MDAB. The geographic extent of the Antelope Valley and the MDAB are shown in **Figure 3-1** along with the location of the proposed project.

The AVAQMD manages a comprehensive program of planning, regulation, enforcement, technical innovation, and education efforts to achieve and maintain healthful air quality throughout its jurisdiction. Endeavors undertaken by the AVAQMD to accomplish its goals include adoption of rules that limit pollution, issuance of permits to ensure compliance, and inspection of pollution sources. Additionally, the AVAQMD is tasked with preparing Clean Air Plans to identify existing air quality conditions, assess air pollution sources and transport within the region, and determine how to control pollution sources most effectively. The AVAQMD also functions in a regulatory oversight role in assessing the air quality impacts associated with new businesses and land development projects. The AVAQMD published its CEQA and Federal Conformity Guidelines in 2016 to assist the preparation of air quality impact assessments for projects within its jurisdiction.

In addition to the CEQA and Federal Conformity Guidelines, the AVAQMD maintains a Rule Book that governs various projects and activities that may result in releases of air pollutants to the atmosphere. Construction of the proposed project will adhere to the following rules provided in the AVAQMD Rule Book.

Rule 401 Visible Emissions

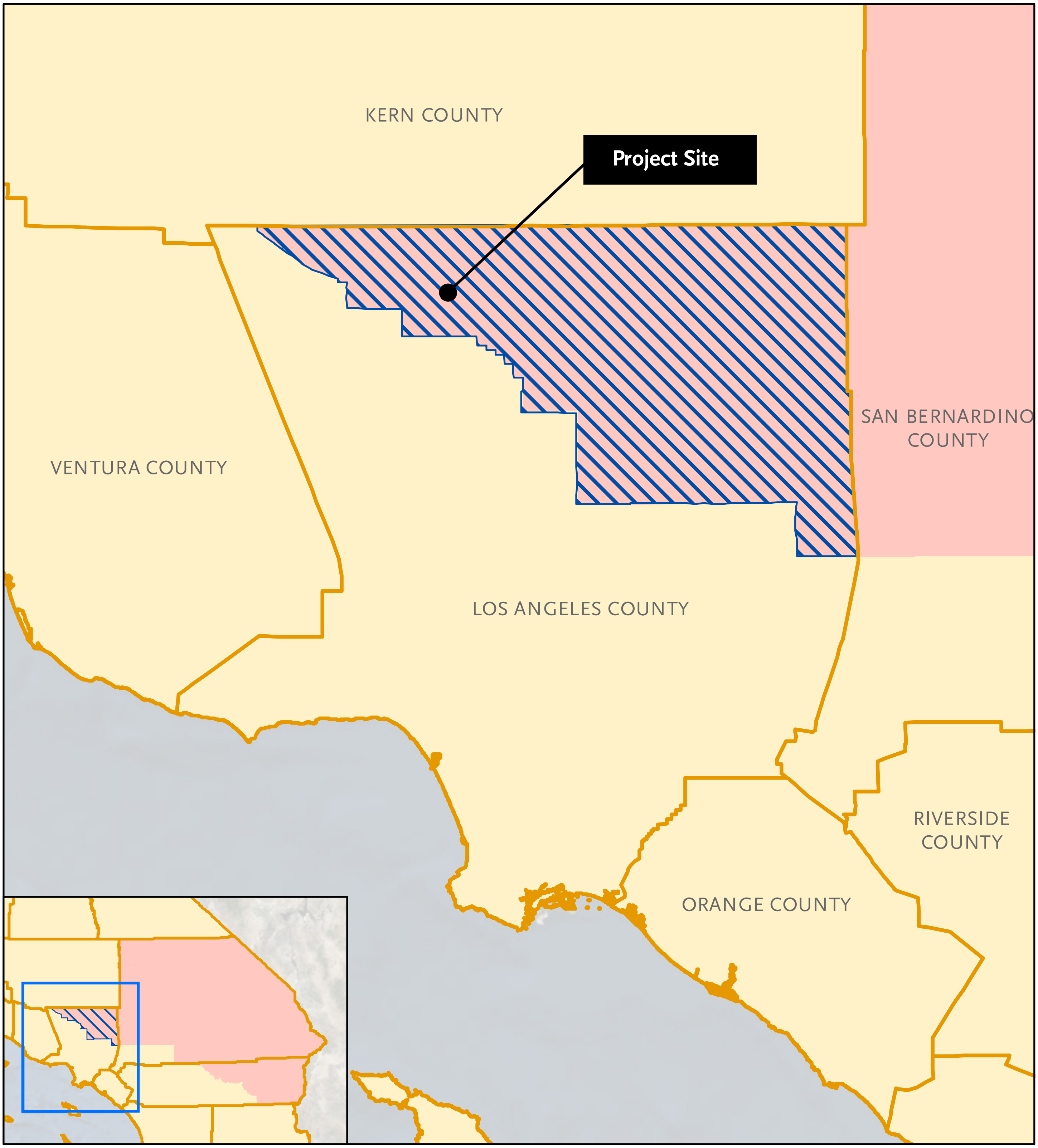
A person shall not discharge into the atmosphere from any single source of emission any air contaminant for a period or periods aggregating more than three minutes in any one hour which is greater than or equal to 20 percent opacity, designated as No.1 on the Ringelmann Chart.

Rule 402 Nuisance

A person shall not discharge from any source such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

Rule 403 Fugitive Dust

This rule was implemented to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. Fugitive dust emissions can be reduced by various methods including, but not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel-washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site, and maintaining effective cover over exposed areas.



LEGEND

County Boundaries | Mojave Desert Air Basin | Antelope Valley Air Quality Management District Jurisdiction

Source: SCAG, 2014; TAHA, 2017

taha environmental planners

TAHA 2017-031

Fairmont Sedimentation Plant Project
Air Quality Impact Study

LADWP

FIGURE 3-1

ANTELOPE VALLEY AND MOJAVE DESERT AIR BASIN

Rule 1113 Architectural Coatings

This rule sets limits on VOC content of architectural coatings for various applications. For the purposes of this proposed project, the rule applies to the striping of roadways and any additional painting that will be involved.

Air Quality Management Plan (AQMP)

While the AVAQMD has jurisdictional authority over the Antelope Valley area specifically, documentation of progress in improving regional air quality and planning of future program and policy implementation is provided in the Air Quality Management Plan (AQMP) prepared by the SCAQMD. The AQMP is updated every four years to evaluate the effectiveness of the adopted programs and policies and to forecast attainment dates for nonattainment pollutants to support the California SIP based on measured regional air quality and anticipated implementation of new technologies and emissions reductions. The most recent publication is the 2016 AQMP, which is intended to serve as a regional blueprint for achieving the federal air quality standards and healthful air.

The 2016 AQMP represents a thorough analysis of existing and potential regulatory control options, and includes available, proven, and cost-effective strategies to pursue multiple goals in promoting reductions in GHG emissions and toxic risk, as well as efficiencies in energy use, transportation, and goods movement. The 2016 AQMP focuses on demonstrating NAAQS attainment dates for the 2008 8-hour O_3 standard, the 2012 annual $PM_{2.5}$ standard, and the 2006 24-hour $PM_{2.5}$ standard. The 2016 AQMP acknowledged that the most significant air quality challenge in the southern California region is the reduction of NO_X emissions sufficient to meet the upcoming ozone standard deadlines. The 2016 AQMP includes both stationary and mobile source strategies to ensure that rapidly approach attainment deadlines are met, that public health is protected to the maximum extent feasible, and that the region is not faced with burdensome sanctions if the NAAQS are not met by the established date.

The 2016 AQMP includes an element that is related to transportation and sustainable communities planning. Pursuant to California Health and Safety Code Section 40450, the Southern California Association of Governments (SCAG)—the Metropolitan Planning Organization (MPO) for Southern California—has the responsibility of preparing and approving the portions of the 2016 AQMP relating to regional demographic projections and integrated regional land use, housing, employment, and transportation programs, measures, and strategies. The analysis incorporated into the 2016 AQMP is based on the forecasts contained within the SCAG 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (2016–2040 RTP/SCS). Land use strategies outlined in the 2016–2040 RTP/SCS that will contribute to regional air quality improvements include: focusing new growth around transit/high quality transit areas (HQTAs), planning for growth around livable corridors, providing more options for short trips/neighborhood mobility areas, and supporting local sustainability planning.

3.3 EXISTING ENVIRONMENTAL SETTING

3.3.1 Mojave Desert Air Basin Topography and Climate

The AVAQMD jurisdiction spans the western portion of the MDAB and encompasses the incorporated cities of Lancaster and Palmdale, Air Force Plant 42, and the southern portion of Edwards Air Force Base. The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains which dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north; air masses pushed onshore in southern California by differential heating are channeled through the MDAB.

The MDAB is separated from the southern California coastal and central California valley regions by mountains (highest elevation approximately 10,000 feet) whose passes are the main channels for these air masses. The Antelope Valley is bordered in the northwest by the Tehachapi Mountains, separated from the Sierra Nevada Mountains in the north by Tehachapi Pass (3,800-foot elevation). The Antelope Valley is bordered in the south by the San Gabriel Mountains, bisected by Soledad Canyon (3,300 feet).

During the summer, the MDAB is generally influenced by a Pacific Subtropical High cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time they reach the desert. Most desert moisture arrives from infrequent warm, moist and unstable air masses from the south. The MDAB averages between three and seven inches of precipitation per year (from 16 to 30 days with a least 0.01 inches of precipitation), and is classified as a dry-hot desert climate, with portions classified as dry-very hot desert, indicating that at least three months have maximum average temperatures over 100.4 degrees Fahrenheit (°F).[2]

The nearest meteorological station that collects wind, temperature, and precipitation data is at the William J. Fox Airfield located approximately 11 miles east to the northwest. Data describing wind speed and direction for the period between 2009 and 2014 were obtained from the CARB meteorological data portal; temperature and precipitation data for the period between 1997 and 2008 were obtained through the Western Regional Climate Center (WRCC) data portal.[3,4] The average wind speed in the project area is approximately 11 miles per hour with a fairly large proportion of calm winds (approximately 19 percent), and the wind direction predominantly blows from the west and the west-southwest. A wind rose chart displaying the wind speed and direction distribution measured at the William J. Fox Airfield is shown in **Figure 3-2**.

Temperature and precipitation data were available for the period between 1997 and 2008 through the WRCC data portal. The annual average temperature in the project area is 62°F, with an average summer temperature of 80°F and an average winter temperature of 45°F. Annual average rainfall in the project area is approximately 6.6 inches, with a majority of the precipitation occurring during the winter season. Average seasonal precipitation is approximately 4.3 inches during the winter, 1.2 inches during the spring, 0.1 inches during the summer, and 1.0 inches during the fall. The temperature and precipitation patterns are typical of arid desert regions.

3.3.3 Local Air Quality Conditions

Air quality within the Antelope Valley region is characterized by concentrations of air pollutants measured at the Lancaster monitoring station located at 43301 Division Street in the City of Lancaster, which is approximately 17 miles east of the proposed project. The Lancaster monitoring station actively measures and records concentrations of criteria air pollutants O_3, NO_2, PM_{10}, and $PM_{2.5}$. Due to continued demonstration of decreasing trends in ambient concentrations of CO and SO_2 and regional attainment of the air quality standards, monitoring activities for CO and SO_2 within the project area have been suspended indefinitely in recent years throughout the AVAQMD jurisdiction.

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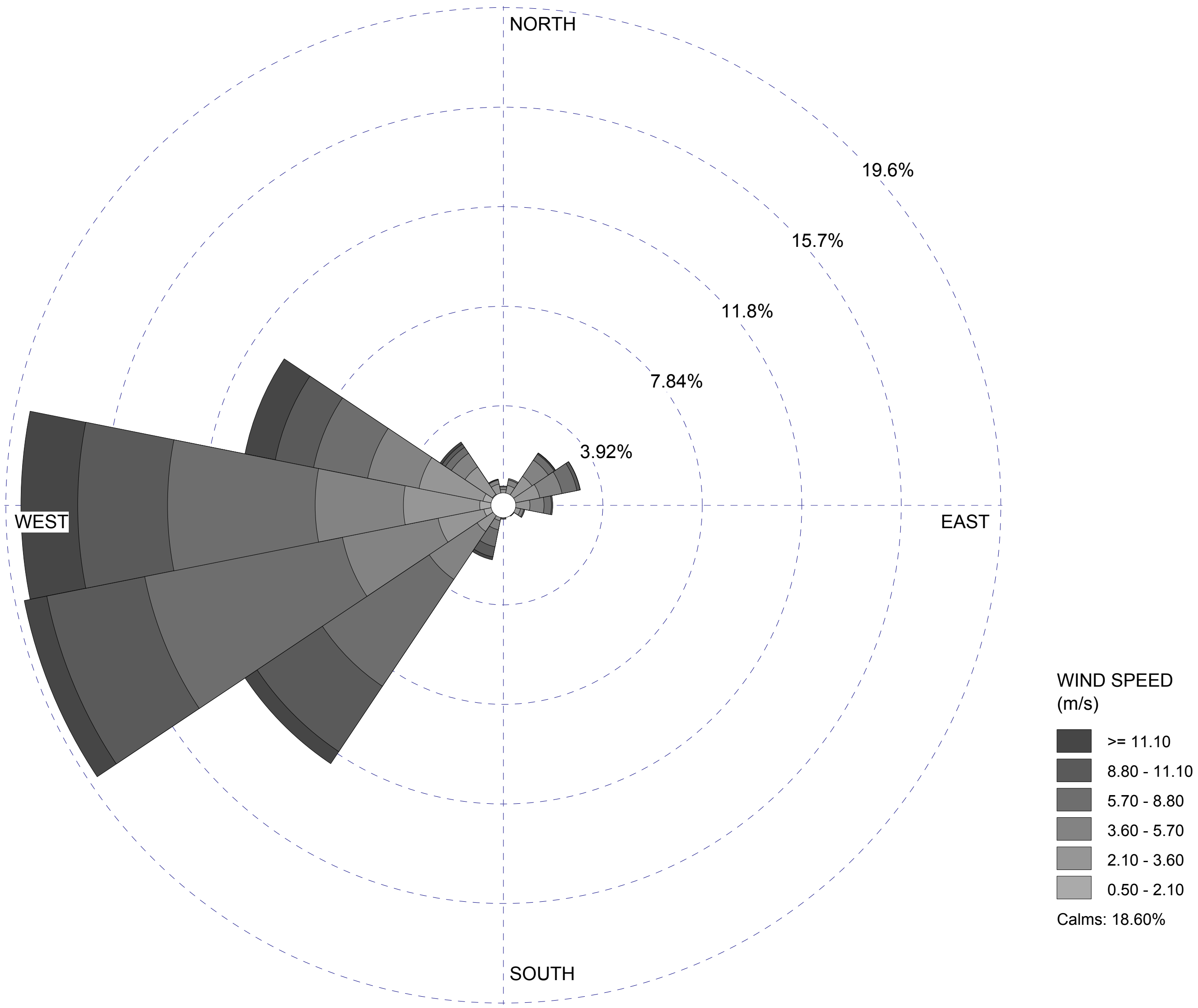
[2]AVAQMD, *CEQA and Federal Conformity Guidelines*, 2016.
[3]CARB, *Meteorological Files*, Accessed September 19, 2017. Available at <https://www.arb.ca.gov/toxics/harp/metfiles2.htm>.
[4]WRCC, *Local Climate Data Summaries – Lancaster*, Accessed September 19, 2017. Available at <https://wrcc.dri.edu/Climate/west_lcd_show.php?iyear=2008&sstate=CA&stag=lancaster&sloc=Lancaster>.



Source: CARB, 2014; TAHA, 2017

FIGURE 3-2

WIND ROSE CHART

Concentrations of O_3, NO_2, PM_{10}, and $PM_{2.5}$ measured during the period between 2014 and 2016 were obtained from the CARB air monitoring data portal for the Lancaster monitoring station to represent existing air quality conditions in the project area.[5]

Table 3-2 presents a summary of the maximum concentrations and frequencies of exceeded State and federal air quality standards during each year. As shown in **Table 3-2**, maximum concentrations of O_3, PM_{10}, and $PM_{2.5}$ exceeded applicable standards at numerous times during the three year period. The air monitoring data statistics are consistent with the attainment designations for Antelope Valley presented in **Table 3-1**.

TABLE 3-2: AMBIENT AIR QUALITY DATA – LANCASTER MONITORING STATION

Pollutant	Ambient Air Quality Standards and Comparative Metrics	Annual Maximum Concentrations and Frequencies of Exceeded Standards		
		2014	2015	2016
Ozone (O_3)	Maximum 1-hr Concentration (ppm)	0.101	0.132	0.108
	Days > 0.09 ppm (State 1-hr Standard)	3	26	3
	Maximum 8-hr Concentration (ppm)	0.087	0.103	0.090
	Days > 0.07 ppm (State & Federal 8-hr Standard)	35	80	60
Nitrogen Dioxide (NO_2)	Maximum 1-hr Concentration (ppm)	0.052	0.042	0.049
	Days > 0.18 ppm (State 1-hr Standard)	0	0	0
	Maximum 1-hr Concentration (ppm)	0.052	0.042	0.049
	Days > 0.10 ppm (Federal 1-hr Standard)	0	0	0
	Annual Arithmetic Mean Conc. (ppm)	0.008	N/A	0.008
	Exceed State Standard (0.053 ppm)?	No	No	No
	Exceed State Standard (0.030 ppm)?	No	No	No
Respirable Particulate Matter (PM_{10})	Maximum 24-hr concentration (μg/m^3)	132	124	145
	Days > 50 μg/m^3 (State 24-hr Standard)	N/A	N/A	N/A
	Maximum 24-hr concentration (μg/m^3)	132	124	145
	Days > 150 μg/m^3 (Federal 24-hr Standard)	N/A	N/A	N/A
	Annual Arithmetic Mean Concentration (μg/m^3)	24.3	19.4	25.7
	Exceed State Standard (20 μg/m^3)?	Yes	No	Yes
Fine Particulate Matter ($PM_{2.5}$)	Maximum 24-hr concentration (μg/m^3)	42.0	10.4	64.8
	Days > 50 μg/m^3 (State 24-hr Standard)	1	0	2
	Maximum 24-hr concentration (μg/m^3)	42.0	10.4	43.0
	Days > 150 μg/m^3 (Federal 24-hr Standard)	0	0	0
	Annual Arithmetic Mean Concentration (μg/m^3)	7.2	N/A	7.7
	Exceed State Standard (20 μg/m^3)?	No	N/A	No

SOURCE: CARB, Air Quality Data Statistics, *Top 4 Summary*, accessed September 21, 2017. N/A = Insufficient Data.

[5] CARB, *Air Quality Data Statistics – Top 4 Summary: Lancaster*, Accessed September 19, 2017. Available at <https://www.arb.ca.gov/adam/topfour/topfour1.php>.

3.3.4 Sensitive Receptors

According to the AVAQMD, residences, schools, daycare centers, playgrounds, and medical facilities are considered sensitive receptor land uses. The AVAQMD recommends that the following project types proposed for sites within the specific distance to an existing or planned sensitive receptor land use must be evaluated: any industrial project within 1,000 feet; a distribution center (40 or more trucks per day) within 1,000 feet; a major transportation center (50,000 or more vehicles per day) within 1,000 feet, a dry cleaner using perchloroethylene within 500 feet, or a gasoline dispensing facility within 300 feet. The proposed project is industrial in nature; however, there are no sensitive receptor land uses within 1,000 feet of the project site and long-term operation of the proposed project would not introduce a new substantial stationary source of air pollutant emissions to the project area.

3.4 METHODOLOGY AND SIGNIFICANCE THRESHOLDS

3.4.1 Methodology

Implementation of the proposed project involves the installation and operation of a sedimentation plant adjacent to the LADWP Fairmont Reservoir. Construction and operation of the proposed project would generate emissions of air pollutants. Sources of air pollutant emissions associated with construction activities include off-road equipment exhaust, fugitive dust particulate matter (PM_{10} and $PM_{2.5}$) from earthmoving activities, and vehicle trips to and from the project site for construction workers and material delivery and hauling. Sources of air pollutants that will exist following completion of construction activities include haul trucks used to transport sludge from the sedimentation plant to an off-site disposal facility. Daily and annual emissions of regulated pollutants were quantified for construction activities and future operation of the proposed project.

As discussed in Section 2.0, construction of the proposed project is anticipated to begin in early 2020 and last for approximately 42 months. Construction will involve a total of eight individual activities, each requiring a specific equipment inventory, number of workers, and number of daily haul truck trips for transporting materials. **Table 3-3** presents a summary of the schedule of activities. As shown in **Table 3-3**, some activities overlap (LAAs Realignment and Reservoir Demolition) and other activities span multiple years. In order to most effectively characterize emissions that would be generated by construction of the proposed project, the schedule was divided into 11 scenarios that represent unique combinations of equipment inventories, workers, and haul trips that are specific to a given year. The scenario numbers can be found in the first column of **Table 3-3**. Detailed equipment, worker, and haul trip inventories can be found in the technical Appendix.

Air pollutant emissions from construction equipment exhaust were quantified using emission factors from the CARB OFFROAD2011 model contained in the technical appendix for the California Emissions Estimator Model (CalEEMod) documentation.[6] The OFFROAD2011 emission factors are expressed in terms of grams of pollutant emitted per horsepower per hour (g/bhp-hr). The CalEEMod technical appendix contains emission rates for VOC, NO_X, CO, SO_2, PM_{10}, $PM_{2.5}$, methane (CH_4), and carbon dioxide (CO_2) from various types of construction equipment based on horsepower ranges. The emission factors were derived from statewide surveys and stack testing of exhaust emissions from construction equipment.

[6]South Coast Air Quality Management District, *CalEEMod Appendix D Default Data Tables*, September 2017.

TABLE 3-3: PROJECT CONSTRUCTION SCHEDULE SUMMARY						
Phase	**Year**	**Activity Description**	**Duration (Days)**	**Pieces of Equipment**	**Number of Workers**	**Daily Haul Truck Trips**
1	2020	Access Road Paving	60	9	15	26
2	2020	Site Mobilization	40	6	10	4
3	2020	LAAs Realignment	100	22	25	32
4	2021	LAAs Realignment + Reservoir Demo	60	32	45	118
5	2021	LAAs Realignment + Reservoir Demo	80	29	75	96
6	2021	Plant Excavation & Grading	80	30	25	12
7	2021	Plant Structural	20	7	25	20
8	2022	Plant Structural	80	9	25	96
9	2022	Plant Construction & Finishing	160	12	20	16
10	2023	Plant Construction & Finishing	140	12	20	16
11	2023	Demobilization	20	6	10	4
SOURCE: TAHA, 2017.						

Daily emissions of air pollutants expressed in pounds per day (lb/day) from construction equipment exhaust were estimated using the following equation, where HP is the average horsepower of the type of equipment and LF is the load factor (ratio of actual output to the maximum output of a piece of equipment), default values were obtained from CARB OFFROAD2011:

$$E\left(\frac{lb}{day}\right) = EF\left(\frac{g}{bhp-hr}\right) \times HP \times Usage\left(\frac{hr}{day}\right) \times LF \times \left(\frac{1\ lb}{453.592\ g}\right)$$

The CalEEMod technical appendix included average horsepower and load factors for each type of equipment identified by the project team.[7] Detailed construction equipment inventory information, OFFROAD2011 emission rates, and emission calculations can be found in the Appendix.

Fugitive dust emissions (PM_{10} and $PM_{2.5}$) would be generated by grading and bulldozing activities and loading of excavated material into haul trucks for off-site disposal. The CalEEMod technical documentation includes equations for estimating fugitive dust emissions from grading activities and truck loading. Daily emissions of PM_{10} and $PM_{2.5}$ were calculated using the following equations, where 7.1 miles per hour (mph) is the USEPA AP-42 default speed for grading equipment, 12 feet (ft) is the default grader blade width, and 0.5 acres is the default acres covered per day for a single grader:

$$E_{PM10}\left(\frac{lb}{day}\right) = [0.051 \times (7.1\ mph)^{2.0}]\left(\frac{lb_{PM15}}{mile}\right) \times 0.6\left(\frac{PM_{10}}{PM_{15}}\right) \times \left(\frac{0.5\ acre/day}{12\ ft\ blade}\right) \times \left(\frac{43{,}560\ sq\ ft/acre}{5{,}280\ ft/mile}\right)$$

$$E_{PM2.5}\left(\frac{lb}{day}\right) = [0.04 \times (7.1\ mph)^{2.5}]\left(\frac{lb_{TSP}}{mile}\right) \times 0.031\left(\frac{PM_{2.5}}{PM_{TSP}}\right) \times \left(\frac{0.5\ acre/day}{12\ ft\ blade}\right) \times \left(\frac{43{,}560\ sq\ ft/acre}{5{,}280\ ft/mile}\right)$$

Detailed fugitive dust emissions calculations for project site grading can be found in the Appendix.

Similar to grading equipment passes, the bulldozing emission factors for PM_{10} and $PM_{2.5}$ are scaled from those of PM_{15} and TSP (total suspended particulates). Based on Section 11.9 of USEPA AP-42, fugitive dust emissions for bulldozing activities are calculated by the following formulas, where C_{TSP} is a unitless coefficient equal to 5.7, C_{PM15} is a unitless coefficient equal to 1.0, *s* is the default

[7]California Air Pollution Control Officers Association, *California Emissions Estimator Model (CalEEMod v2016.3.1) User's Guide*, September 2016.

silt content for overburden (6.9 percent), and *M* is the default moisture content for overburden (7.5 percent):

$$E_{PM10}\left(\frac{lb}{day}\right) = \left(\frac{C_{TSP} \times s^{1.5}}{M^{1.4}}\right) \times 0.75 \left(\frac{PM_{10}}{PM_{15}}\right) \times 8\left(\frac{hours}{day}\right)$$

$$E_{PM2.5}\left(\frac{lb}{day}\right) = \left(\frac{C_{PM15} \times s^{1.2}}{M^{1.3}}\right) \times 0.105 \left(\frac{PM_{2.5}}{TSP}\right) \times 8\left(\frac{hours}{day}\right)$$

Detailed fugitive dust emissions calculations for bulldozing activities can be found in the Appendix.

Truck loading emissions were calculated using the following USEPA AP-42 equation, where *S* is the mean wind speed in miles per hour in the project area obtained from the William J. Fox Airport meteorological station (11.2 mph), *M* is the moisture content of the displaced ground cover (0.12), and 0.35 and 0.053 are the particle size fractions for PM_{10} and $PM_{2.5}$, respectively:

$$E_{PM10}\left(\frac{lb}{day}\right) = \left[0.35 \times 0.0032 \times \frac{\left(\frac{S}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}\right]\left(\frac{lb}{ton}\right) \times TP_{loaded}\left(\frac{tons}{day}\right)$$

$$E_{PM2.5}\left(\frac{lb}{day}\right) = \left[0.053 \times 0.0032 \times \frac{\left(\frac{S}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}\right]\left(\frac{lb}{ton}\right) \times TP_{loaded}\left(\frac{tons}{day}\right)$$

The daily material throughput loaded during each phase of construction activities was obtained from the project team. Detailed fugitive dust emissions calculations for truck loading can be found in the Appendix.

Paving of the access roads would involve laying of asphalt, which would off-gas emissions of VOC to the atmosphere. Emissions of VOC associated with asphalt paving were calculated using the following formula in accordance with the CalEEMod guidance document, where the default *EF* is 2.62 pounds per acre (lb/acre):

$$E_{VOC}\left(\frac{lb}{day}\right) = EF\left(\frac{lb}{acre}\right) \times A_{Paved}\left(\frac{acres}{day}\right)$$

In addition to equipment exhaust, fugitive dust, and paving emissions calculations, vehicle trips to and from the project site would constitute mobile sources of air pollutant emissions. Daily vehicle trips for construction workers, material delivery, and hauling of displaced material to a disposal site were provided by the project team for each phase of construction. Emissions were quantified using vehicle trip data provided by the project team, regionally-specific trip length data extracted from CalEEMod, and emission rates obtained from the CARB EMFAC2014 mobile source emissions model. The EMFAC2014 model database contains emission rates for various processes associated with on-road vehicle operations.

Emission rates for running exhaust (VOC, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$) and brake and tire wear (PM_{10} and $PM_{2.5}$) were obtained from the EMFAC2014 model to estimate daily emissions from vehicle travel associated with construction of the proposed project. The EMFAC2014 emission rates are expressed in terms of grams of pollutant emitted per vehicle mile traveled

(VMT) for both processes. The following equation was used to calculate daily emissions of air pollutants associated with exhaust and brake and tire wear:

$$E\left(\frac{lb}{day}\right) = EF\left(\frac{g}{mile}\right) \times \left(\frac{miles}{trip}\right) \times \left(\frac{trips}{day}\right) \times \left(\frac{1\ lb}{453.592\ g}\right)$$

For each phase of construction activity, daily air pollutant emissions were quantified by the sum of emissions from equipment exhaust, fugitive dust, asphalt paving, and vehicle trips. Detailed emissions calculations can be found in the Appendix.

Operational emissions were quantified for haul truck trips. Emissions from operational hauling activity were calculated using the EMFAC2014 methodology described above assuming that 10 trips per day would be required to transport sludge effluent from the plant to an offsite disposal facility. The sedimentation plant will be powered by the electrical grid, and therefore will not require auxiliary power provided by diesel generators. Haul truck trips to dispose of sludge effluent will be the primary source of operational air pollutant emissions. It was conservatively assumed that all haul truck trips would dispose of sludge at the hazardous waste disposal facility approximately 230 miles away in Beatty, Nevada.

3.4.2 Significance Thresholds

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would have a significant impact on the environment related to air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The AVAQMD published a *CEQA and Federal Conformity Guidelines* handbook that outlines procedures for air quality assessments for CEQA projects within its jurisdiction.[8] AVAQMD methodologies recommend that air pollutant emissions be analyzed for both daily and annual time scales. To assist in the assessment of air pollutant emissions under impact criteria b) and c) above, the AVAQMD established maximum daily and annual threshold values for air pollutant emissions from CEQA projects within AVAQMD jurisdiction. The AVAQMD significant emissions thresholds are shown in **Table 3-4**. The threshold values apply to both construction and operation.

TABLE 3-4: AVAQMD SIGNIFICANT EMISSIONS THRESHOLDS

Pollutant	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Daily Threshold (lbs/day)	137	137	548	137	82	65
Annual Threshold (tons/year)	25	25	100	25	15	12
SOURCE: AVAQMD, 2016.						

[8] Antelope Valley Air Quality Management District, *CEQA and Federal Conformity Guidelines*, August 2016.

3.5 ENVIRONMENTAL IMPACTS

3.5.1 Would the proposed project conflict with or obstruct implementation of the applicable air quality plan? (*Less-than-Significant Impact*)

Impact Analysis

Construction

The AVAQMD advises that a project would not exceed this threshold—and hence not be significant under this criterion—if it is consistent with the existing land use plan. The AVAQMD also includes that zoning changes, specific plans, general plan amendments, and similar land use changes which do not increase dwelling unit density, do not increase vehicle trips, and do not increase vehicle miles traveled are also deemed to not exceed this threshold. The proposed project would be located on property currently owned by the LADWP and would not require a zoning change. Therefore, in accordance with AVAQMD guidance, impacts would be less than significant and no mitigation would be required.

Furthermore, according to the SCAQMD, there are two key indicators of consistency with the applicable air quality plan: 1) whether the proposed project would result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the air quality plan; and 2) whether the proposed project would cause the project area to exceed the forecasted growth incorporated into the applicable air quality plan.

The first consistency criterion relates to violations of the CAAQS and NAAQS that would obstruct timely attainment of the air quality standards. The AVAQMD focuses on reducing emissions of O_3 precursors (VOC, NO_X) and particulate matter (PM_{10}) given the existing regional nonattainment designations. Construction emissions associated with development of the proposed project would be temporary in nature and would not have a long-term impact on the region's ability to meet California and federal air quality standards. As shown under the impact discussion for Criterion 3.5.2 (below), maximum daily emissions of O_3 precursors and particulate matter from construction activities would not exceed regional or localized significance threshold values.

In addition, construction activities associated with the proposed project would comply with State and local strategies designed to control air pollution, such as AVAQMD Rules 402 and 403. By adhering to the AVAQMD rules and regulations pertaining to fugitive dust control and equipment maintenance, as well as limiting maximum daily emissions below the AVAQMD mass daily thresholds, project construction activities would be consistent with the goals and objectives of the applicable air quality plan to improve air quality in the MDAB.

The second consistency criterion requires that the proposed project not exceed the assumptions incorporated into the applicable air quality plan. The most applicable air quality plan for the proposed project is the SCAQMD 2016 AQMP, which is based on the SCAG 2016–2040 RTP/SCS. A large-scale individual project could potentially exceed assumptions in the air quality plan if it resulted in a zoning change that resulted in disproportionate growth relative to the land use types analyzed in the air quality plan. However, the air quality plan focuses on long-term, operational sources of air pollutants that contribute to the regional emission inventory. Short-term, temporary emissions associated with construction activities would not conflict with the air quality plan so long as no AVAQMD thresholds of significance are exceeded. As shown in **Table 3-5** and **Table 3-6** under Criterion 3.5.2, construction activities would not generate daily air pollutant emissions of sufficient magnitude to exceed any applicable threshold of significance, and impacts under Criterion 3.5.1 would be less than significant for the proposed project design.

Operation

Operational activity at the sedimentation plant would involve the hauling of sludge effluent in large trucks to an off-site disposal facility. The plant itself would be powered by the electrical grid, so no ancillary electricity would be required through diesel generators. As discussed under **Criterion 3.5.2**, haul truck activity would be minimal (approximately 10 truck round trips per day) and emissions would not exceed applicable AVAQMD significance threshold values. Operation of the proposed project would not have the potential to result in any new or exacerbated air quality violations. Additionally, implementation of the proposed project would not result in any new residential or commercial development that would affect the region's population, employment, or vehicle trips projections that were incorporated into the SCAG 2016–2040 RTP/SCS. Operation of the proposed project would not conflict with or obstruct implementation of the 2016 AQMP.

Mitigation Measures

No significant impacts have been identified for the proposed project. Therefore, no mitigation measures are required.

3.5.2 Would the proposed project violate any air quality standard or contribute substantially to an existing or projected air quality violation? (*Less-than-Significant Impact*)

Impact Analysis

Construction

Construction of the proposed project would have a potentially significant air quality impact under this criterion if maximum daily emissions of any regulated pollutant exceeded the applicable AVAQMD air quality significance thresholds presented in **Table 3-4**. Daily emissions of regulated pollutants were quantified following the methodology described in Section 3.4.1 for each phase of construction activity presented in **Table 3-3**. Refer to **Table 3-5** for a comparison of the maximum daily emissions during each phase of construction to the applicable AVAQMD air quality significance thresholds. Refer to **Table 3-6** below for a comparison of the annual air pollutant emissions associated with construction activities to the applicable AVAQMD thresholds.

Table 3-5 presents maximum daily emissions of air pollutants that would be generated by each phase of construction activities associated with the proposed project, and **Table 3-6** presents annual emissions based on the anticipated construction schedule outlined in **Table 3-3**. As discussed under Section 3.4, sources included in the emissions modeling were equipment exhaust, fugitive dust, asphalt paving (Phase 1 only), and vehicular travel. The daily emissions estimates conservatively assumed that each piece of construction equipment would be used for eight hours per day. The annual emissions estimates were calculated by multiplying the daily emissions by the duration of each phase, and then summing across those falling in the same year.

As shown in **Table 3-5**, maximum daily emissions during construction of the proposed project would be no greater than 7.5 pounds VOC, 89.3 pounds NO_X, 45.9 pounds CO, 0.2 pounds SO_X, 30.5 pounds PM_{10}, and 17.5 pounds $PM_{2.5}$. Maximum daily emissions during construction would not exceed any applicable AVAQMD daily threshold value.

TABLE 3-5: ESTIMATED DAILY EMISSIONS – PROPOSED PROJECT CONSTRUCTION						
	Daily Emissions (Pounds Per Day)					
Phase (Year)	**VOC**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
1. Access Road Paving (2020)	2.5	17.5	13.5	<0.1	0.9	0.7
2. Site Mobilization (2020)	0.7	8.7	6.2	<0.1	0.4	0.3
3. LAAs Realignment (2020)	5.4	61.8	28.6	0.1	22.4	13.1
4. LAAs Realignment + Reservoir Demo (2021)	7.5	89.3	42.9	0.2	30.5	17.5
5. LAAs Realignment + Reservoir Demo (2021)	6.4	75.3	45.9	0.2	23.5	13.6
6. Plant Excavation & Grading (2021)	6.6	76.6	35.9	0.1	23.3	13.6
7. Plant Structural (2021)	0.6	8.8	4.8	<0.1	0.5	0.3
8. Plant Structural (2022)	1.6	22.6	15.1	0.1	1.6	0.8
9. Plant Construction & Finishing (2022)	1.2	15.3	12.5	<0.1	0.7	0.5
10. Plant Construction & Finishing (2023)	1.1	13.4	12.2	<0.1	0.7	0.5
11. Demobilization (2023)	0.5	5.2	6.2	<0.1	0.3	0.2
ANALYSIS						
Maximum Daily Emissions	**7.5**	**89.3**	**45.9**	**0.2**	**30.5**	**17.5**
Regional Significance Threshold	137	137	548	137	85	65
Exceed Regional Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Emissions modeling files can be found in the technical Appendix.
SOURCE: TAHA, 2017.

As shown in **Table 3-6**, maximum annual emissions during construction of the proposed project would be no greater than 0.7 tons VOC, 8.8 tons NO_X, 4.6 tons CO, less than 0.1 tons SO_X, 2.8 tons PM_{10}, and 1.6 tons $PM_{2.5}$. Maximum annual emissions would not exceed any applicable AVAQMD annual threshold value. As demonstrated by the emissions modeling results presented in **Table 3-5** and **Table 3-6**, construction of the proposed project would not exceed any applicable daily or annual threshold values. Impacts associated with this air quality criterion would be less than significant and no mitigation is required.

TABLE 3-6: ESTIMATED ANNUAL EMISSIONS – PROPOSED PROJECT CONSTRUCTION						
	Annual Emissions (Tons)					
Year	**VOC**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
2020	0.4	3.8	2.0	<0.1	1.2	0.7
2021	0.7	8.8	4.6	<0.1	2.8	1.6
2022	0.2	2.1	1.6	<0.1	0.1	0.1
2023	0.1	1.0	0.9	<0.1	0.1	0.0
ANALYSIS						
Maximum Annual Emissions	**0.7**	**8.8**	**4.6**	<0.1	**2.8**	**1.6**
Annual Significance Threshold	25	25	100	25	15	12
Exceed Regional Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Emissions modeling files can be found in the technical Appendix.
SOURCE: TAHA, 2017.

Operation

Operational activities at the sedimentation plant would not constitute a substantial stationary source of air pollutant emissions as the flow of water into and out of the plant is driven by gravity and power supply will be provided by connecting to existing Southern California Edison utilities. Operational emissions would primarily be attributed to haul truck trips. Implementation of the proposed project would generate approximately 10 daily truckloads of sludge effluent that would be hauled to an offsite disposal facility. Conservatively assuming that all haul truck trips would travel to the hazardous waste disposal facility located a maximum distance of 230 miles away near Beatty, Nevada, daily air pollutant emissions generated by operational haul truck trips would be no greater than 0.8 pounds VOC, 11.8 pounds NO_X, 7.3 pounds CO, 0.2 pounds SO_X, 1.1 pounds PM_{10}, and 0.5 pounds $PM_{2.5}$. Operational emissions would be far below applicable AVAQMD daily threshold values presented in **Table 3-5**, and operational impacts would be less than significant.

Mitigation Measures

No significant impacts have been identified for the proposed project. Therefore, no mitigation measures are required.

3.5.3 Would the proposed 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)? (*Less-than-Significant Impact*)

Impact Analysis

The Antelope Valley region is designated as nonattainment of the CAAQS and NAAQS for O_3 and PM_{10}, as presented in **Table 3-1**. Therefore, there is an ongoing regionally cumulative impact associated with these air pollutants. The AVAQMD guidance for applying thresholds of significance for criteria air pollutants is relevant to the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality. Per CEQA Guidelines (California Code Regulations, Title 14 Section 15064(h)(3)) a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan on mitigation program including, but not limited to, an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the regionally cumulative air quality issue.

As discussed under Criterion 3.5.1 and Criterion 3.5.2, implementation of the proposed project would not generate daily or annual emissions of regulated air pollutants of sufficient quantity to exceed any applicable AVAQMD significance threshold value. Additionally, construction of the proposed project would comply with the applicable provisions set forth in the AVAQMD Rule Book, including, but not limited to, those described under Rule 401 and Rule 403. Employment of best management practices and compliance with inspection and maintenance requirements would ensure that equipment and trucks were operating within acceptable conditions. Emissions of air pollutants would not be significant on an individual project scale, and implementation of the proposed project would not conflict with an applicable air quality plan. Therefore, the proposed project would not result in a cumulatively considerable net increase in emissions of O_3 precursors or PM_{10}, and this impact would be less than significant. No mitigation is required.

Mitigation Measures

No significant impacts have been identified for the proposed project. Therefore, no mitigation measures are required.

3.5.4 Would the proposed project expose sensitive receptors to substantial pollutant concentrations? (*Less-than-Significant Impact*)

Impact Analysis

Construction

As discussed in Section 3.3.4, the nearest sensitive receptor land uses are located over 1,000 feet from the project site. A vast majority of equipment activity, truck loading and unloading and material stockpiling would occur on the project site and would not be conducted in close proximity to sensitive receptors. Results of emissions modeling shown in **Table 3-5** demonstrate that maximum daily emissions would not exceed any applicable AVAQMD threshold value. The threshold values were derived to prevent the occurrence of air pollutant concentrations exceeding ambient air quality standards, which were designed to protect public health and the environment. Therefore, construction of the proposed project would not have the potential to generate concentrations of air pollutants at sensitive receptor locations that may be of concern. Construction activities would be temporary in nature, and emissions would cease at the completion of construction.

Valley fever is an illness caused by the fungus Coccidioides, which is found in semiarid areas throughout the southwestern United States as well as Mexico and Central and South America. Coccidioides thrives in dry, sandy, alkaline soils. In California, it is especially prevalent in the San Joaquin Valley but also occurs in the Antelope Valley. The vast majority of cases of Valley Fever are contracted from the inhalation of the spores of Coccidioides, which become airborne when contaminated soil is disturbed from agricultural, construction, or other activity.[9]

The majority of individuals who are infected with Coccidioides develop no symptoms or experience only mild flu-like symptoms that resolve without complications. However, some individuals, including certain ethnic groups, the elderly, and those with weakened immune systems, can develop more serious symptoms that may require medications and longer recovery times. In the most severe cases, known as disseminated disease, the fungus can spread throughout the body and result in symptoms such as skin and bone lesions, chronic pneumonia, and meningitis, and, rarely, may lead to death due to these complications.[10]

When present, the Coccidioides fungus exists only in the upper layer of the soil, no deeper than about 1 foot. It is also more prevalent during times of the year when soils are driest, usually in the summer and fall. As mentioned above, Coccidioides thrives in sandy, alkaline soils. The soils at the project site are generally classified as sandy loams with a slightly to moderately acidic pH. Therefore, it is unlikely that Coccidioides would be present in the soils at the site.[11]

Nonetheless, extensive measures will be undertaken to achieve dust suppression and minimize unnecessary disturbance of ground cover. As discussed in detail in Section 2.2 Project Description, access roads to the project site will be paved during the first phase of construction to prevent the entrainment of dust as vehicles enter and exit during ensuing activities. Additionally, water will be applied to storage piles and graded areas to reduce windblown dust. Construction activities will be required to comply with AVAQMD Rule 403 and implement best management practices such as limiting equipment and vehicle speeds to 15 miles per hour on unpaved areas.

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[9] The Center for Food Security and Public Health, *Coccidioidomycosis,* Iowa State University, College of Veterinary Medicine. 2010. http://www.cfsph.iastate.edu/Factsheets/pdfs/coccidioidomycosis.pdf

[10] Valley Fever Center for Excellence*, Valley Fever in People,* The University of Arizona Health Sciences, College of Medicine, 2017. http://vfce.arizona.edu/valley-fever-people.

[11] Natural Resources Conservation Service. *Web Soil Survey*. United States Department of Agriculture. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

Based on the low likelihood of the presence of Coccidioides in the soil at the project site and on the measures discussed above that would control dust generation from the upper layer of the soil during project construction, the impact from project construction activities related to exposure to the Coccidioides fungus would be less than significant. Project operation is not anticipated to involve soil disturbing activities; therefore, there would be no long-term impact related to Valley Fever.

As shown in **Figure 3-2**, the predominant wind direction in the project area is from the west and west-southwest, blowing toward the east. The nearest downwind sensitive receptors are residential parcels located approximately 1,020 feet to the northeast of the project site along 170th Street West and located approximately 2,950 feet to the east of the project site along West Avenue H. Air pollutant concentrations resulting from construction activity emissions would disperse and dissipate long before reaching these downwind distances and there is no potential for any air quality standard to be exceeded at these locations. Air quality impacts associated with construction of the proposed project would be less than significant and no mitigation is required.

Operation

Operation of the proposed project would not introduce a new substantial stationary source of air pollutant emissions to the project area. Operational air pollutant emissions would be primarily attributed to haul truck traffic disposing of sludge effluent from the sedimentation plant. Haul truck traffic would be limited to no more than 10 trucks per day, or 1.25 trucks per hour. Such minimal truck traffic would not have the potential to expose any sensitive receptor land uses to substantial pollutant concentrations. While the proposed project is industrial in nature, operation of the proposed project does not involve any significant source of long-term emissions. Air quality impacts associated with operation under this criterion would be less than significant and no mitigation would is required.

Mitigation Measures

No significant impacts have been identified for the proposed project. Therefore, no mitigation measures are required.

3.5.5 Would the Proposed project or its alternatives create objectionable odors affecting a substantial number of people? (*Less-than-Significant Impact*)

Impact Analysis

Construction

Sources that may potentially emit odors during construction activities include equipment exhaust and asphalt paving. Odors from these sources would be localized and generally confined to the immediate area surrounding the project site. Construction of the proposed project would employ standard construction techniques (e.g., inspections and maintenance of diesel-fueled heavy-duty equipment in compliance with AVAQMD regulations) and best management practices to prevent the occurrence of a nuisance odor in accordance with AVAQMD Rule 402, and the odors would be typical of most construction sites and temporary in nature. Odorous emissions during paving would be limited to the near vicinity of the proposed project and cease upon completion of Phase 1. There are no schools or public parks in close proximity to the project site that would be especially sensitive to odors emanating from these sources. Additionally, the construction of the proposed project would adhere to all requirements set forth in the AVAQMD Rules and Regulations. Therefore, implementation of the proposed project would result in a less than significant impact related to construction odors.

Operation

Implementation of the proposed sedimentation plant would not introduce any new long-term stationary source of odors to the project area. There are no sensitive receptor land uses within 1,000 feet of the project site, and the primary source of operational emissions would be haul truck traffic disposing of sludge effluent from the plant. It shall be the responsibility of the truck fleet operator to ensure that haul trucks are inspected and maintained in accordance with CARB and AVAQMD Rules and Regulations. Compliance with applicable regulations shall ensure that haul trucks are operating within acceptable conditions. The water stored at the sedimentation plant would not constitute a substantial source of odors. Impacts would be less than significant and no mitigation is required.

Mitigation Measures

No significant impacts have been identified for the proposed project. Therefore, no mitigation measures are required.

3.6 ASSESSMENT OF CUMULATIVE IMPACTS

Refer to **Criterion 3.5-3**, above, for a discussion of the potential cumulative impacts. The AVAQMD has indicated that the project-level air quality significance thresholds in conjunction with Rules and Regulations compliance may be used as an indicator to determine if project emissions contribute considerably to an existing cumulative impact. As discussed in **Criterion 3.5-2**, air pollutant emissions associated with construction and operation of the proposed project would not exceed and would be substantially below all applicable AVAQMD air quality thresholds of significance. Therefore, the proposed project would not contribute to a cumulatively considerable net increase of criteria pollutants. Cumulative impacts would be less than significant.

4.0 REFERENCES

Antelope Valley Air Quality Management District, *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines*, August 2016.

California Air Pollution Control Officers Association, *California Emissions Estimator Model (CalEEMod v2016.3.1) User's Guide*, September 2016.

California Air Pollution Control Officers Association, *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions Subject to the California Environmental Quality Act*, January 2008.

California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005.

California Air Resources Board, *Air Quality Data Statistics: Top 4 Summary,* http://www.arb.ca.gov/adam/topfour/topfour1.php, accessed August 24, 2017.

California Air Resources Board, *Ambient Air Quality Standards*, July 23, 2015.

California Air Resources Board, *Area Designation Maps*, available at http://www.arb.ca.gov/desig/adm/adm.htm, accessed August 24, 2017.

California Air Resources Board, *California Greenhouse Gas Inventory 2000-2014*, March 30, 2016.

California Air Resources Board, *Clean Air Standards - Pavley, Assembly Bill 1493,* May 6, 2013.

California Air Resources Board, *First Update to the Climate Change Scoping Plan*, May 2014.

California Air Resources Board, *Proposed Early Action Measures to Mitigate Climate Change in California*, April 20, 2007.

California Air Resources Board, *The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target*, January 20, 2017.

California Energy Commission, *California's Energy Efficiency Standards for Residential and Nonresidential Buildings, Title 24, Part 6, of the California Code of Regulations*, June 2015.

California Energy Commission, *California's Energy Future – The View to 2050*, May 2011.

California Environmental Protection Agency, *Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

Intergovernmental Panel on Climate Change, *Climate Change*, 2007.

Natural Resources Conservation Service, *Web Soil Survey,* United States Department of Agriculture. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

South Coast Air Quality Management District, *Air Quality Issues Regarding Land Use,* http://www.aqmd.gov/docs/default-source/planning/air-quality-guidance/chapter-2---air-quality-issues-regarding-land-use.pdf?sfvrsn=2.

South Coast Air Quality Management District, *CEQA Air Quality Handbook*, 1993.

South Coast Air Quality Management District, *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold,* October 2006.

South Coast Air Quality Management District, *Final 2016 Air Quality Management Plan,* February 2017.

South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology Appendix C Mass Rate Lookup Tables*, http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2, updated October 21, 2009.

South Coast Air Quality Management District, *Final Program Environmental Impact Report for the 2016 AQMP*, January 2017.

South Coast Air Quality Management District, *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions,* December 2002.

South Coast Air Quality Management District, *Minutes for the GHG CEQA Significance Threshold Stakeholder Working Group #15,* September 28, 2010, http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-minutes.pdf?sfvrsn=2, accessed August 24, 2017.

South Coast Air Quality Management District, *White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution Appendix D: Cumulative Impact Analysis Requirements Pursuant to CEQA*, August 2003.

Southern California Association of Governments, *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy*, April 2016.

The Center for Food Security and Public Health, *Coccidioidomycosis.* Iowa State University, College of Veterinary Medicine, 2010. http://www.cfsph.iastate.edu/Factsheets/pdfs/coccidioidomycosis.pdf.

The White House, *Fact Sheet: U.S.-China Joint Announcement on Climate Change and Clean Energy Cooperation*, November 11, 2014.

The White House, *Fact Sheet: United States Key Deliverables for the 2016 North American Leaders' Summit*, June 29, 2016.

The White House, Office of the Press Secretary, http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/, May 19, 2009.

United States Environmental Protection Agency, *Draft Endangerment Finding, 74 Fed. Reg. 18886, 18904*, April 24, 2009.

United States Environmental Protection Agency, *EPA and NHTSA Propose Historic Nation Program*, 2009.

United States Environmental Protection Agency, *The Green Book Nonattainment Areas for Criteria Pollutants*, http://www.epa.gov/air/oaqps/greenbk/index.html, December 2013.

Valley Fever Center for Excellence, *Valley Fever in People*, The University of Arizona Health Sciences, College of Medicine, 2017. http://vfce.arizona.edu/valley-fever-people

Western Regional Climate Center, *Local Climate Data Summaries*, available at http://www.wrrc.dri.edu, accessed September 18, 2017.

APPENDIX

Air Quality Emissions Calculations

Emissions Calculations Spreadsheet

Year	Description	Duration (Days)	Equipment Emissions (lb/day)						Equipment Emissions (ton/phase)					
			ROG	CO	NOX	SOX	PM10	PM25	ROG	CO	NOX	SOX	PM10	PM25
2020	Access Road Paving	60	1.169	11.085	12.776	0.021	0.578	0.533	0.035	0.333	0.383	0.001	0.017	0.016
2020	Site Mobilization	40	0.618	4.903	6.822	0.012	0.263	0.242	0.012	0.098	0.136	0.000	0.005	0.005
2020	LAAS Realignment	100	4.926	24.317	53.033	0.056	2.411	2.220	0.246	1.216	2.652	0.003	0.121	0.111
2021	Reservoir Demo & Relining+LAAS Realignment	60	6.652	34.344	70.650	0.082	3.160	2.903	0.200	1.030	2.119	0.002	0.095	0.087
2021	Reservoir Demo & Relining+LAAS Realignment	80	5.718	36.199	59.642	0.075	2.777	2.552	0.229	1.448	2.386	0.003	0.111	0.102
2021	Plant Excavation & Grading	80	6.099	31.532	66.737	0.076	2.931	2.694	0.244	1.261	2.669	0.003	0.117	0.108
2021	Plant Structural	20	0.412	1.983	4.849	0.006	0.197	0.181	0.004	0.020	0.048	0.000	0.002	0.002
2022	Plant Structural	80	1.125	9.933	11.815	0.019	0.571	0.526	0.045	0.397	0.473	0.001	0.023	0.021
2022	Plant Construction & Finishing	160	1.054	10.238	11.846	0.023	0.468	0.430	0.084	0.819	0.948	0.002	0.037	0.034
2023	Plant Construction & Finishing	140	0.985	10.150	10.805	0.023	0.415	0.381	0.069	0.711	0.756	0.002	0.029	0.027
2023	Demobilization	20	0.459	4.768	4.203	0.012	0.165	0.151	0.005	0.048	0.042	0.000	0.002	0.002

Year	Description	Duration (Days)	Mobile Source Emissions (lb/day)						Mobile Source Emissions (ton/phase)					
			ROG	CO	NOX	SOX	PM10	PM25	ROG	CO	NOX	SOX	PM10	PM25
2020	Access Road Paving	60	0.237	2.441	4.715	0.024	0.225	0.103	0.007	0.073	0.141	0.001	0.007	0.003
2020	Site Mobilization	40	0.127	1.248	1.848	0.009	0.101	0.049	0.003	0.025	0.037	0.000	0.002	0.001
2020	LAAS Realignment	100	0.514	4.300	8.718	0.041	0.411	0.198	0.026	0.215	0.436	0.002	0.021	0.010
2021	Reservoir Demo & Relining+LAAS Realignment	60	0.810	8.582	18.680	0.106	0.912	0.394	0.024	0.257	0.560	0.003	0.027	0.012
2021	Reservoir Demo & Relining+LAAS Realignment	80	0.714	9.656	15.629	0.094	0.868	0.373	0.029	0.386	0.625	0.004	0.035	0.015
2021	Plant Excavation & Grading	80	0.468	4.348	9.849	0.040	0.359	0.158	0.019	0.174	0.394	0.002	0.014	0.006
2021	Plant Structural	20	0.189	2.819	3.961	0.024	0.234	0.101	0.002	0.028	0.040	0.000	0.002	0.001
2022	Plant Structural	80	0.491	5.213	10.755	0.072	0.594	0.251	0.020	0.209	0.430	0.003	0.024	0.010
2022	Plant Construction & Finishing	160	0.167	2.250	3.459	0.021	0.208	0.089	0.013	0.180	0.277	0.002	0.017	0.007
2023	Plant Construction & Finishing	140	0.133	2.069	2.638	0.021	0.202	0.084	0.009	0.145	0.185	0.001	0.014	0.006
2023	Demobilization	20	0.059	1.467	1.044	0.009	0.109	0.045	0.001	0.015	0.010	0.000	0.001	0.000

Emissions Calculations Spreadsheet

Year	Description	Duration (Days)	Fugitive Dust + Paving Emissions (lb/day)						Fugitive Dust +Paving Emissions (ton/phase)					
			ROG	CO	NOX	SOX	PM10	PM25	ROG	CO	NOX	SOX	PM10	PM25
2020	Access Road Paving	60	1.083				0.108	0.016	0.032				0.003	0.000
2020	Site Mobilization	40					0.017	0.003					0.000	0.000
2020	LAAS Realignment	100					19.562	10.645					0.978	0.532
2021	Reservoir Demo & Relining+LAAS Realignment	60					26.396	14.240					0.792	0.427
2021	Reservoir Demo & Relining+LAAS Realignment	80					19.828	10.685					0.793	0.427
2021	Plant Excavation & Grading	80					19.993	10.747					0.800	0.430
2021	Plant Structural	20					0.083	0.013					0.001	0.000
2022	Plant Structural	80					0.399	0.060					0.016	0.002
2022	Plant Construction & Finishing	160					0.067	0.010					0.005	0.001
2023	Plant Construction & Finishing	140					0.067	0.010					0.005	0.001
2023	Demobilization	20					0.017	0.003					0.000	0.000

Year	Description	Duration (Days)	Total (lb/day)						Total (ton/phase)					
			ROG	CO	NOX	SOX	PM10	PM25	ROG	CO	NOX	SOX	PM10	PM25
2020	Access Road Paving	60	2.5	13.5	17.5	0.0	0.9	0.7	0.075	0.406	0.525	0.001	0.027	0.020
2020	Site Mobilization	40	0.7	6.2	8.7	0.0	0.4	0.3	0.015	0.123	0.173	0.000	0.008	0.006
2020	LAAS Realignment	100	5.4	28.6	61.8	0.1	22.4	13.1	0.272	1.431	3.088	0.005	1.119	0.653
2021	Reservoir Demo & Relining+LAAS Realignment	60	7.5	42.9	89.3	0.2	30.5	17.5	0.2	1.3	2.7	0.0	0.9	0.5
2021	Reservoir Demo & Relining+LAAS Realignment	80	6.4	45.9	75.3	0.2	23.5	13.6	0.3	1.8	3.0	0.0	0.9	0.5
2021	Plant Excavation & Grading	80	6.6	35.9	76.6	0.1	23.3	13.6	0.3	1.4	3.1	0.0	0.9	0.5
2021	Plant Structural	20	0.6	4.8	8.8	0.0	0.5	0.3	0.0	0.0	0.1	0.0	0.0	0.0
2022	Plant Structural	80	1.6	15.1	22.6	0.1	1.6	0.8	0.1	0.6	0.9	0.0	0.1	0.0
2022	Plant Construction & Finishing	160	1.2	12.5	15.3	0.0	0.7	0.5	0.1	1.0	1.2	0.0	0.1	0.0
2023	Plant Construction & Finishing	140	1.1	12.2	13.4	0.0	0.7	0.5	0.1	0.9	0.9	0.0	0.0	0.0
2023	Demobilization	20	0.5	6.2	5.2	0.0	0.3	0.2	0.0	0.1	0.1	0.0	0.0	0.0

Construction Equipment Emissions Calculations

SCEN	Year	Description	Length (months)	Length (days)
1	2020	Access Road Paving	3	60
1	2020	Access Road Paving	3	60
1	2020	Access Road Paving	3	60
1	2020	Access Road Paving	3	60
1	2020	Access Road Paving	3	60
2	2020	Site Mobilization	2	40
2	2020	Site Mobilization	2	40
3	2020	LAAS REALIGNMENT	5	100
3	2020	LAAS REALIGNMENT	5	100
3	2020	LAAS REALIGNMENT	5	100
3	2020	LAAS REALIGNMENT	5	100
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
6	2021	Plant Excavation & Grading	4	80
6	2021	Plant Excavation & Grading	4	80
6	2021	Plant Excavation & Grading	4	80
6	2021	Plant Excavation & Grading	4	80
6	2021	Plant Excavation & Grading	4	80
6	2021	Plant Excavation & Grading	4	80
7	2021	Plant Structural	1	20
8	2022	Plant Structural	4	80
8	2022	Plant Structural	4	80
9	2022	Plant Construction & Finishing	8	160
9	2022	Plant Construction & Finishing	8	160
9	2022	Plant Construction & Finishing	8	160
9	2022	Plant Construction & Finishing	8	160
10	2023	Plant Construction & Finishing	7	140
10	2023	Plant Construction & Finishing	7	140
10	2023	Plant Construction & Finishing	7	140
10	2023	Plant Construction & Finishing	7	140
11	2023	Demobilization	1	20
11	2023	Demobilization	1	20

Construction Equipment Emissions Calculations

SCEN	Year	Equipment	Count	Usage (hours/day)	HP	Load Factor
1	2020	Excavators	1	8	158	0.38
1	2020	RubberTiredLoaders	1	8	203	0.36
1	2020	Pavers	1	8	130	0.42
1	2020	Rollers	1	8	80	0.38
1	2020	SkidSteerLoaders	1	8	65	0.37
2	2020	Excavators	1	8	158	0.38
2	2020	RubberTiredLoaders	1	8	203	0.36
3	2020	Excavators	2	8	158	0.38
3	2020	RubberTiredLoaders	2	8	203	0.36
3	2020	RubberTiredDozers	3	8	247	0.4
3	2020	Cranes	1	8	231	0.29
4	2021	Excavators	3	8	158	0.38
4	2021	RubberTiredLoaders	4	8	203	0.36
4	2021	RubberTiredDozers	4	8	247	0.4
4	2021	Cranes	1	8	231	0.29
5	2021	Excavators	2	8	158	0.38
5	2021	RubberTiredLoaders	2	8	203	0.36
5	2021	RubberTiredDozers	3	8	247	0.4
5	2021	Rollers	1	8	80	0.38
5	2021	Pavers	1	8	130	0.42
5	2021	Cranes	1	8	231	0.29
5	2021	OtherMaterialHandlingEquipment	2	8	168	0.4
6	2021	RubberTiredLoaders	3	8	203	0.36
6	2021	Rollers	2	8	80	0.38
6	2021	Excavators	1	8	158	0.38
6	2021	RubberTiredDozers	3	8	247	0.4
6	2021	OtherConstructionEquipment	1	8	172	0.42
6	2021	Graders	2	8	187	0.41
7	2021	Cranes	1	8	231	0.29
8	2022	Cranes	1	8	231	0.29
8	2022	OtherConstructionEquipment	2	8	172	0.42
9	2022	RubberTiredLoaders	1	8	203	0.36
9	2022	Cranes	1	8	231	0.29
9	2022	Tractors/Loaders/Backhoes	1	8	97	0.37
9	2022	RoughTerrainForklifts	2	8	100	0.4
10	2023	RubberTiredLoaders	1	8	203	0.36
10	2023	Cranes	1	8	231	0.29
10	2023	Tractors/Loaders/Backhoes	1	8	97	0.37
10	2023	RoughTerrainForklifts	2	8	100	0.4
11	2023	Excavators	1	8	158	0.38
11	2023	RubberTiredLoaders	1	8	203	0.36

Construction Equipment Emissions Calculations

		Emission Factors (g/bhp-hr)						Emissions (lb/day)					
SCEN	Year	ROG	CO	NOX	SO2	PM10	PM25	ROG	CO	NOX	SO2	PM10	PM25
1	2020	0.23	3.09	2.28	0.01	0.11	0.10	0.24	3.27	2.41	0.01	0.12	0.11
1	2020	0.29	1.27	3.42	0.01	0.11	0.10	0.37	1.64	4.41	0.01	0.15	0.13
1	2020	0.27	3.01	2.92	0.01	0.14	0.13	0.26	2.90	2.81	0.00	0.14	0.13
1	2020	0.39	3.53	3.88	0.01	0.25	0.23	0.21	1.89	2.08	0.00	0.13	0.12
1	2020	0.19	3.28	2.50	0.01	0.11	0.10	0.08	1.39	1.06	0.00	0.05	0.04
2	2020	0.23	3.09	2.28	0.01	0.11	0.10	0.24	3.27	2.41	0.01	0.12	0.11
2	2020	0.29	1.27	3.42	0.01	0.11	0.10	0.37	1.64	4.41	0.01	0.15	0.13
3	2020	0.23	3.09	2.28	0.01	0.11	0.10	0.49	6.54	4.83	0.01	0.23	0.22
3	2020	0.29	1.27	3.42	0.01	0.11	0.10	0.75	3.27	8.82	0.01	0.29	0.27
3	2020	0.62	2.37	6.50	0.01	0.32	0.29	3.24	12.39	34.00	0.03	1.66	1.53
3	2020	0.38	1.79	4.56	0.01	0.19	0.17	0.45	2.12	5.39	0.01	0.22	0.20
4	2021	0.22	3.09	2.03	0.01	0.10	0.09	0.69	9.82	6.46	0.02	0.31	0.29
4	2021	0.27	1.24	3.00	0.01	0.10	0.09	1.37	6.39	15.46	0.03	0.52	0.47
4	2021	0.60	2.32	6.30	0.01	0.31	0.28	4.18	16.15	43.89	0.03	2.13	1.96
4	2021	0.35	1.68	4.10	0.01	0.17	0.15	0.41	1.98	4.85	0.01	0.20	0.18
5	2021	0.22	3.09	2.03	0.01	0.10	0.09	0.46	6.54	4.31	0.01	0.21	0.19
5	2021	0.27	1.24	3.00	0.01	0.10	0.09	0.69	3.20	7.73	0.01	0.26	0.24
5	2021	0.60	2.32	6.30	0.01	0.31	0.28	3.14	12.11	32.91	0.03	1.60	1.47
5	2021	0.35	3.51	3.59	0.01	0.22	0.20	0.19	1.88	1.92	0.00	0.12	0.11
5	2021	0.26	3.02	2.69	0.01	0.13	0.12	0.25	2.90	2.60	0.00	0.13	0.12
5	2021	0.35	1.68	4.10	0.01	0.17	0.15	0.41	1.98	4.85	0.01	0.20	0.18
5	2021	0.25	3.20	2.25	0.01	0.11	0.11	0.59	7.58	5.32	0.01	0.27	0.25
6	2021	0.27	1.24	3.00	0.01	0.10	0.09	1.03	4.80	11.59	0.02	0.39	0.36
6	2021	0.35	3.51	3.59	0.01	0.22	0.20	0.38	3.76	3.85	0.01	0.23	0.22
6	2021	0.22	3.09	2.03	0.01	0.10	0.09	0.23	3.27	2.15	0.01	0.10	0.10
6	2021	0.60	2.32	6.30	0.01	0.31	0.28	3.14	12.11	32.91	0.03	1.60	1.47
6	2021	0.33	3.18	3.44	0.01	0.18	0.17	0.42	4.06	4.38	0.01	0.23	0.21
6	2021	0.34	1.31	4.38	0.01	0.14	0.13	0.91	3.53	11.85	0.01	0.38	0.35
7	2021	0.35	1.68	4.10	0.01	0.17	0.15	0.41	1.98	4.85	0.01	0.20	0.18
8	2022	0.32	1.60	3.54	0.01	0.15	0.14	0.37	1.89	4.18	0.01	0.17	0.16
8	2022	0.30	3.16	2.99	0.01	0.16	0.14	0.75	8.04	7.63	0.01	0.40	0.37
9	2022	0.23	1.19	2.35	0.01	0.08	0.07	0.29	1.53	3.02	0.01	0.10	0.09
9	2022	0.32	1.60	3.54	0.01	0.15	0.14	0.37	1.89	4.18	0.01	0.17	0.16
9	2022	0.26	3.54	2.65	0.01	0.14	0.13	0.16	2.24	1.68	0.00	0.09	0.08
9	2022	0.16	3.24	2.10	0.01	0.07	0.07	0.22	4.58	2.96	0.01	0.10	0.09
10	2023	0.21	1.17	2.06	0.01	0.07	0.06	0.27	1.51	2.65	0.01	0.09	0.08
10	2023	0.30	1.55	3.23	0.01	0.14	0.12	0.35	1.83	3.82	0.01	0.16	0.15
10	2023	0.24	3.53	2.43	0.01	0.12	0.11	0.15	2.23	1.54	0.00	0.08	0.07
10	2023	0.15	3.24	1.98	0.01	0.06	0.06	0.21	4.57	2.80	0.01	0.09	0.08
11	2023	0.18	3.08	1.46	0.01	0.07	0.07	0.19	3.26	1.55	0.01	0.08	0.07
11	2023	0.21	1.17	2.06	0.01	0.07	0.06	0.27	1.51	2.65	0.01	0.09	0.08

Construction Equipment Emissions Calculations

SCEN	Year	Emissions (lb/phase) ROG	CO	Nox	SO2	PM10	PM25
1	2020	14.68	196.07	144.76	0.32	6.99	6.48
1	2020	22.43	98.13	264.57	0.39	8.82	8.04
1	2020	15.77	173.90	168.62	0.29	8.20	7.57
1	2020	12.48	113.60	124.87	0.16	7.95	7.33
1	2020	4.78	83.40	63.74	0.13	2.75	2.55
2	2020	9.78	130.71	96.51	0.21	4.66	4.32
2	2020	14.95	65.42	176.38	0.26	5.88	5.36
3	2020	48.92	653.56	482.53	1.06	23.30	21.60
3	2020	74.76	327.09	881.91	1.29	29.39	26.81
3	2020	323.59	1239.49	3399.68	2.61	166.24	153.17
3	2020	45.37	211.54	539.15	0.59	22.21	20.44
4	2021	41.17	588.93	387.61	0.95	18.87	17.35
4	2021	82.28	383.69	927.30	1.55	30.93	28.46
4	2021	250.93	969.07	2633.11	2.09	127.97	117.52
4	2021	24.74	118.97	290.96	0.35	11.84	10.85
5	2021	36.60	523.49	344.54	0.85	16.77	15.42
5	2021	54.86	255.79	618.20	1.03	20.62	18.97
5	2021	250.93	969.07	2633.11	2.09	127.97	117.52
5	2021	15.14	150.43	153.94	0.21	9.39	8.66
5	2021	19.72	232.38	207.60	0.39	10.01	9.24
5	2021	32.99	158.63	387.95	0.47	15.78	14.46
5	2021	47.22	606.14	425.98	0.95	21.62	19.91
6	2021	82.28	383.69	927.30	1.55	30.93	28.46
6	2021	30.28	300.87	307.88	0.43	18.79	17.33
6	2021	18.30	261.75	172.27	0.42	8.39	7.71
6	2021	250.93	969.07	2633.11	2.09	127.97	117.52
6	2021	33.64	324.41	350.48	0.51	18.35	16.82
6	2021	72.48	282.75	947.93	1.08	30.07	27.69
7	2021	8.25	39.66	96.99	0.12	3.95	3.62
8	2022	29.87	151.39	334.74	0.47	13.89	12.76
8	2022	60.14	643.24	610.42	1.02	31.80	29.36
9	2022	46.61	245.00	484.00	1.03	16.29	14.85
9	2022	59.74	302.77	669.48	0.95	27.79	25.52
9	2022	26.33	358.07	268.10	0.51	14.38	13.27
9	2022	35.89	732.29	473.70	1.13	16.48	15.13
10	2023	37.89	211.37	371.66	0.90	12.45	11.37
10	2023	49.13	256.82	534.17	0.83	22.33	20.51
10	2023	21.18	312.38	215.00	0.44	10.63	9.75
10	2023	29.63	640.44	391.83	0.99	12.64	11.65
11	2023	3.77	65.16	30.97	0.11	1.52	1.40
11	2023	5.41	30.20	53.09	0.13	1.78	1.62

OFFRAOD Default Horsepower Load Factor

OFFROAD Equipment Type	Horsepower	Load Factor
AerialLifts	63	0.31
AirCompressors	78	0.48
Bore/DrillRigs	221	0.5
CementandMortarMixers	9	0.56
Concrete/IndustrialSaws	81	0.73
Cranes	231	0.29
CrawlerTractors	212	0.43
Crushing/Proc.Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	158	0.38
Forklifts	89	0.2
GeneratorSets	84	0.74
Graders	187	0.41
Off-HighwayTractors	124	0.44
Off-HighwayTrucks	402	0.38
OtherConstructionEquipment	172	0.42
OtherGeneralIndustrialEquipment	88	0.34
OtherMaterialHandlingEquipment	168	0.4
Pavers	130	0.42
PavingEquipment	132	0.36
PlateCompactors	8	0.43
PressureWashers	13	0.3
Pumps	84	0.74
Rollers	80	0.38
RoughTerrainForklifts	100	0.4
RubberTiredDozers	247	0.4
RubberTiredLoaders	203	0.36
Scrapers	367	0.48
SignalBoards	6	0.82
SkidSteerLoaders	65	0.37
SurfacingEquipment	263	0.3
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37
Trenchers	78	0.5
Welders	46	0.45

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
AerialLifts	2020	6	15	0.199447	0.168	3.09942	2.95486	0.005	0.031	0.028	525.0743	0.17
AerialLifts	2020	16	25	0.199447	0.168	3.09942	2.95486	0.005	0.031	0.028	525.0743	0.17
AerialLifts	2020	26	50	0.199447	0.168	3.09942	2.95486	0.005	0.031	0.028	525.0743	0.17
AerialLifts	2020	51	120	0.136778	0.115	3.1768	1.86859	0.005	0.042	0.038	472.1142	0.153
AerialLifts	2020	251	500	0.081859	0.069	0.94623	0.63803	0.005	0.009	0.008	472.0545	0.153
AerialLifts	2020	501	750	26.846	0.2	1.013	1.868	0.005	0.057	0.057	568.299	0.018
AerialLifts	2021	6	15	0.196174	0.165	3.11369	2.92238	0.005	0.027	0.024	525.0743	0.17
AerialLifts	2021	16	25	0.196174	0.165	3.11369	2.92238	0.005	0.027	0.024	525.0743	0.17
AerialLifts	2021	26	50	0.196174	0.165	3.11369	2.92238	0.005	0.027	0.024	525.0743	0.17
AerialLifts	2021	51	120	0.129509	0.109	3.17624	1.74368	0.005	0.033	0.031	472.1142	0.153
AerialLifts	2021	251	500	0.08573	0.072	0.95107	0.64021	0.005	0.009	0.008	472.0545	0.153
AerialLifts	2021	501	750	25.065	0.187	1.004	1.61	0.005	0.05	0.05	568.299	0.016
AerialLifts	2022	6	15	0.192664	0.162	3.11231	2.90676	0.005	0.024	0.022	525.0743	0.17
AerialLifts	2022	16	25	0.192664	0.162	3.11231	2.90676	0.005	0.024	0.022	525.0743	0.17
AerialLifts	2022	26	50	0.192664	0.162	3.11231	2.90676	0.005	0.024	0.022	525.0743	0.17
AerialLifts	2022	51	120	0.124613	0.105	3.17602	1.62659	0.005	0.03	0.028	472.1142	0.153
AerialLifts	2022	251	500	0.089601	0.075	0.95591	0.64238	0.005	0.009	0.008	472.0545	0.153
AerialLifts	2022	501	750	23.788	0.177	0.998	1.424	0.005	0.044	0.044	568.299	0.016
AerialLifts	2023	6	15	0.19346	0.163	3.12196	2.89722	0.005	0.023	0.021	525.0743	0.17
AerialLifts	2023	16	25	0.19346	0.163	3.12196	2.89722	0.005	0.023	0.021	525.0743	0.17
AerialLifts	2023	26	50	0.19346	0.163	3.12196	2.89722	0.005	0.023	0.021	525.0743	0.17
AerialLifts	2023	51	120	0.119594	0.1	3.17029	1.5481	0.005	0.027	0.025	472.1142	0.153
AerialLifts	2023	251	500	0.093472	0.079	0.96074	0.64456	0.005	0.009	0.008	472.0545	0.153
AerialLifts	2023	501	750	22.675	0.169	0.995	1.265	0.005	0.038	0.038	568.299	0.015
AirCompressors	2020	6	15	1.907	0.731	3.546	4.542	0.008	0.227	0.227	568.299	0.066
AirCompressors	2020	16	25	4.009	0.769	2.473	4.538	0.007	0.212	0.212	568.3	0.069
AirCompressors	2020	26	50	8.048	1.001	5.164	4.397	0.007	0.25	0.25	568.299	0.09
AirCompressors	2020	51	120	8.287	0.489	3.698	3.4	0.006	0.224	0.224	568.299	0.044
AirCompressors	2020	121	175	11.957	0.374	3.203	2.558	0.006	0.133	0.133	568.299	0.033
AirCompressors	2020	176	250	13.668	0.288	1.121	2.172	0.006	0.069	0.069	568.299	0.026
AirCompressors	2020	251	500	23.406	0.279	1.076	1.935	0.005	0.067	0.067	568.299	0.025
AirCompressors	2020	501	750	36.303	0.28	1.076	1.982	0.005	0.067	0.067	568.299	0.025
AirCompressors	2020	751	1000	53.87	0.306	1.158	3.828	0.005	0.093	0.093	568.3	0.027
AirCompressors	2021	6	15	1.87	0.717	3.531	4.462	0.008	0.214	0.214	568.299	0.064
AirCompressors	2021	16	25	3.923	0.752	2.446	4.497	0.007	0.201	0.201	568.299	0.067
AirCompressors	2021	26	50	7.136	0.887	5.021	4.221	0.007	0.212	0.212	568.299	0.08
AirCompressors	2021	51	120	7.502	0.442	3.67	3.083	0.006	0.19	0.19	568.299	0.039
AirCompressors	2021	121	175	10.967	0.343	3.192	2.218	0.006	0.115	0.115	568.299	0.03
AirCompressors	2021	176	250	12.728	0.268	1.108	1.859	0.006	0.06	0.06	568.299	0.024
AirCompressors	2021	251	500	21.887	0.261	1.064	1.663	0.005	0.058	0.058	568.299	0.023

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
AirCompressors	2021	501	750	33.933	0.262	1.064	1.699	0.005	0.058	0.058	568.299	0.023
AirCompressors	2021	751	1000	49.951	0.284	1.134	3.565	0.005	0.082	0.082	568.3	0.025
AirCompressors	2021	751	1000	49.951	0.284	1.134	3.565	0.005	0.082	0.082	568.3	0.025
AirCompressors	2022	6	15	1.844	0.707	3.519	4.408	0.008	0.203	0.203	568.299	0.063
AirCompressors	2022	16	25	3.857	0.739	2.426	4.47	0.007	0.193	0.193	568.299	0.066
AirCompressors	2022	26	50	6.549	0.814	4.959	4.093	0.007	0.183	0.183	568.299	0.073
AirCompressors	2022	51	120	7.001	0.413	3.662	2.844	0.006	0.165	0.165	568.299	0.037
AirCompressors	2022	121	175	10.29	0.322	3.194	1.959	0.006	0.101	0.101	568.299	0.029
AirCompressors	2022	176	250	12.099	0.255	1.102	1.617	0.006	0.052	0.052	568.3	0.023
AirCompressors	2022	251	500	20.881	0.249	1.059	1.472	0.005	0.051	0.051	568.299	0.022
AirCompressors	2022	501	750	32.363	0.25	1.059	1.502	0.005	0.051	0.051	568.299	0.022
AirCompressors	2022	751	1000	47.338	0.269	1.117	3.378	0.005	0.075	0.075	568.3	0.024
AirCompressors	2023	6	15	1.82	0.698	3.508	4.359	0.008	0.194	0.194	568.299	0.063
AirCompressors	2023	16	25	3.798	0.728	2.407	4.447	0.007	0.186	0.186	568.299	0.065
AirCompressors	2023	26	50	6.056	0.753	4.913	3.975	0.007	0.156	0.156	568.299	0.067
AirCompressors	2023	51	120	6.568	0.387	3.657	2.631	0.006	0.143	0.143	568.299	0.034
AirCompressors	2023	121	175	9.693	0.303	3.197	1.748	0.006	0.089	0.089	568.299	0.027
AirCompressors	2023	176	250	11.532	0.243	1.099	1.42	0.006	0.045	0.045	568.299	0.021
AirCompressors	2023	251	500	19.964	0.238	1.055	1.305	0.005	0.044	0.044	568.299	0.021
AirCompressors	2023	501	750	30.933	0.239	1.055	1.331	0.005	0.044	0.044	568.299	0.021
AirCompressors	2023	751	1000	44.985	0.256	1.102	3.221	0.005	0.068	0.068	568.299	0.023
Bore/DrillRigs	2020	6	15	0.851825	0.716	4.51013	4.6451	0.006	0.294	0.271	535.2948	0.173
Bore/DrillRigs	2020	16	25	0.851825	0.716	4.51013	4.6451	0.006	0.294	0.271	535.2948	0.173
Bore/DrillRigs	2020	26	50	0.851825	0.716	4.51013	4.6451	0.006	0.294	0.271	535.2948	0.173
Bore/DrillRigs	2020	51	120	0.292949	0.246	3.32347	3.06601	0.005	0.159	0.146	463.5827	0.15
Bore/DrillRigs	2020	121	175	0.207426	0.174	2.96948	1.87149	0.005	0.082	0.076	477.722	0.155
Bore/DrillRigs	2020	176	250	0.169462	0.142	1.06766	1.80732	0.005	0.052	0.048	466.8342	0.151
Bore/DrillRigs	2020	251	500	0.148188	0.125	1.01263	1.40938	0.005	0.045	0.041	466.8219	0.151
Bore/DrillRigs	2020	501	750	0.129293	0.109	0.97413	1.23085	0.005	0.041	0.038	473.6679	0.153
Bore/DrillRigs	2020	751	1000	0.158163	0.133	0.98839	3.05008	0.005	0.061	0.056	471.8492	0.153
Bore/DrillRigs	2021	6	15	0.845639	0.711	4.54836	4.63432	0.006	0.291	0.268	535.3782	0.173
Bore/DrillRigs	2021	16	25	0.845639	0.711	4.54836	4.63432	0.006	0.291	0.268	535.3782	0.173
Bore/DrillRigs	2021	26	50	0.845639	0.711	4.54836	4.63432	0.006	0.291	0.268	535.3782	0.173
Bore/DrillRigs	2021	51	120	0.258162	0.217	3.30573	2.73675	0.005	0.131	0.12	464.9725	0.15
Bore/DrillRigs	2021	121	175	0.183454	0.154	2.9614	1.5983	0.005	0.07	0.064	477.0482	0.154
Bore/DrillRigs	2021	176	250	0.157647	0.132	1.06418	1.55102	0.005	0.047	0.043	467.9916	0.151
Bore/DrillRigs	2021	251	500	0.139268	0.117	1.01479	1.22069	0.005	0.041	0.038	469.8158	0.152
Bore/DrillRigs	2021	501	750	0.116134	0.098	0.97176	0.95517	0.005	0.033	0.031	474.079	0.153
Bore/DrillRigs	2021	751	1000	0.161679	0.136	0.99261	3.05759	0.005	0.061	0.057	471.8158	0.153
Bore/DrillRigs	2022	6	15	0.751445	0.631	4.33356	4.28474	0.005	0.241	0.221	529.8703	0.171

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Bore/DrillRigs	2022	16	25	0.751445	0.631	4.33356	4.28474	0.005	0.241	0.221	529.8703	0.171
Bore/DrillRigs	2022	26	50	0.751445	0.631	4.33356	4.28474	0.005	0.241	0.221	529.8703	0.171
Bore/DrillRigs	2022	51	120	0.227425	0.191	3.25974	2.42459	0.005	0.107	0.099	462.2674	0.15
Bore/DrillRigs	2022	121	175	0.162807	0.137	2.95431	1.28831	0.005	0.057	0.052	477.3719	0.154
Bore/DrillRigs	2022	176	250	0.136848	0.115	1.04734	1.16293	0.005	0.037	0.034	468.7604	0.152
Bore/DrillRigs	2022	251	500	0.12801	0.108	1.00212	1.03525	0.005	0.035	0.032	467.1923	0.151
Bore/DrillRigs	2022	501	750	0.10809	0.091	0.97519	0.77309	0.005	0.028	0.026	477.141	0.154
Bore/DrillRigs	2022	751	1000	0.067607	0.057	0.9452	2.27813	0.005	0.018	0.017	472.9214	0.153
Bore/DrillRigs	2023	6	15	0.721105	0.606	4.31077	4.20831	0.005	0.226	0.208	531.9856	0.172
Bore/DrillRigs	2023	16	25	0.721105	0.606	4.31077	4.20831	0.005	0.226	0.208	531.9856	0.172
Bore/DrillRigs	2023	26	50	0.721105	0.606	4.31077	4.20831	0.005	0.226	0.208	531.9856	0.172
Bore/DrillRigs	2023	51	120	0.222828	0.187	3.25754	2.35656	0.005	0.102	0.093	461.214	0.149
Bore/DrillRigs	2023	121	175	0.149078	0.125	2.9693	1.07773	0.005	0.048	0.044	479.6465	0.155
Bore/DrillRigs	2023	176	250	0.131367	0.11	1.04309	1.04653	0.005	0.034	0.031	469.7058	0.152
Bore/DrillRigs	2023	251	500	0.120261	0.101	0.98883	0.89764	0.005	0.03	0.028	464.0407	0.15
Bore/DrillRigs	2023	501	750	0.108039	0.091	0.98235	0.71664	0.005	0.026	0.024	479.2199	0.155
Bore/DrillRigs	2023	751	1000	0.062646	0.053	0.93615	2.26246	0.005	0.018	0.016	472.0201	0.153
CementandMortarMixers	2020	6	15	1.075	0.661	3.47	4.142	0.008	0.161	0.161	568.299	0.059
CementandMortarMixers	2020	16	25	3.265	0.723	2.397	4.442	0.007	0.187	0.187	568.299	0.065
CementandMortarMixers	2021	6	15	1.075	0.661	3.469	4.142	0.008	0.161	0.161	568.299	0.059
CementandMortarMixers	2021	16	25	3.219	0.712	2.381	4.419	0.007	0.18	0.18	568.299	0.064
CementandMortarMixers	2023	6	15	1.075	0.661	3.469	4.142	0.008	0.161	0.161	568.299	0.059
CementandMortarMixers	2023	16	25	3.151	0.697	2.356	4.382	0.007	0.172	0.172	568.299	0.062
CementandMortarMixers	2024	6	15	1.075	0.661	3.469	4.142	0.008	0.161	0.161	568.299	0.059
CementandMortarMixers	2024	16	25	3.129	0.693	2.349	4.369	0.007	0.17	0.17	568.299	0.062
Concrete/IndustrialSaws	2020	16	25	1.532	0.685	2.339	4.332	0.007	0.161	0.161	568.299	0.061
Concrete/IndustrialSaws	2020	26	50	3.271	0.798	4.552	4.196	0.007	0.212	0.212	568.299	0.072
Concrete/IndustrialSaws	2020	51	120	4.042	0.401	3.535	3.163	0.006	0.19	0.19	568.299	0.036
Concrete/IndustrialSaws	2020	121	175	6.669	0.306	3.072	2.324	0.006	0.114	0.114	568.299	0.027
Concrete/IndustrialSaws	2021	16	25	1.532	0.685	2.34	4.332	0.007	0.161	0.161	568.299	0.061
Concrete/IndustrialSaws	2021	26	50	2.959	0.722	4.481	4.063	0.007	0.184	0.184	568.3	0.065
Concrete/IndustrialSaws	2021	51	120	3.721	0.369	3.523	2.913	0.006	0.166	0.166	568.299	0.033
Concrete/IndustrialSaws	2021	121	175	6.227	0.286	3.072	2.055	0.006	0.101	0.101	568.299	0.025
Concrete/IndustrialSaws	2022	16	25	1.532	0.685	2.339	4.332	0.007	0.161	0.161	568.299	0.061
Concrete/IndustrialSaws	2022	26	50	2.705	0.66	4.422	3.936	0.007	0.158	0.158	568.3	0.059
Concrete/IndustrialSaws	2022	51	120	3.457	0.343	3.514	2.686	0.006	0.144	0.144	568.299	0.031
Concrete/IndustrialSaws	2022	121	175	5.819	0.267	3.072	1.806	0.006	0.089	0.089	568.3	0.024
Concrete/IndustrialSaws	2023	16	25	1.532	0.685	2.34	4.332	0.007	0.161	0.161	568.299	0.061
Concrete/IndustrialSaws	2023	26	50	2.484	0.606	4.372	3.815	0.007	0.134	0.134	568.299	0.054
Concrete/IndustrialSaws	2023	51	120	3.223	0.32	3.507	2.478	0.006	0.123	0.123	568.3	0.028

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Concrete/IndustrialSaws	2023	121	175	5.453	0.25	3.072	1.599	0.006	0.077	0.077	568.299	0.022
Cranes	2020	26	50	2.47956	2.084	7.37625	5.98471	0.005	0.624	0.574	517.9263	0.168
Cranes	2020	51	120	0.871016	0.732	4.17141	6.38117	0.005	0.453	0.417	469.8821	0.152
Cranes	2020	121	175	0.638941	0.537	3.56232	5.5697	0.005	0.298	0.274	474.5939	0.153
Cranes	2020	176	250	0.45669	0.384	1.7904	4.56329	0.005	0.188	0.173	472.9488	0.153
Cranes	2020	251	500	0.381547	0.321	2.66037	3.86243	0.005	0.155	0.142	472.5579	0.153
Cranes	2020	501	750	0.287724	0.242	1.44353	3.10471	0.005	0.116	0.107	470.4254	0.152
Cranes	2020	1001	9999	0.216797	0.182	0.99943	2.3614	0.005	0.06	0.056	472.0545	0.153
Cranes	2021	26	50	2.516467	2.115	7.48883	6.01375	0.005	0.631	0.581	517.8995	0.167
Cranes	2021	51	120	0.77522	0.651	4.06507	5.73085	0.005	0.398	0.366	469.8867	0.152
Cranes	2021	121	175	0.593174	0.498	3.51648	5.1125	0.005	0.273	0.251	474.5458	0.153
Cranes	2021	176	250	0.415905	0.349	1.67824	4.10439	0.005	0.167	0.153	472.9057	0.153
Cranes	2021	251	500	0.351498	0.295	2.44833	3.44253	0.005	0.139	0.127	472.4553	0.153
Cranes	2021	501	750	0.271141	0.228	1.43956	2.72739	0.005	0.107	0.098	470.5495	0.152
Cranes	2021	1001	9999	0.228304	0.192	1.00751	2.37402	0.005	0.061	0.056	472.0545	0.153
Cranes	2022	26	50	2.41359	2.028	7.36828	5.8991	0.005	0.603	0.555	517.8722	0.167
Cranes	2022	51	120	0.687651	0.578	3.97198	5.14893	0.005	0.346	0.318	469.9929	0.152
Cranes	2022	121	175	0.543527	0.457	3.4753	4.6169	0.005	0.246	0.227	474.5887	0.153
Cranes	2022	176	250	0.375691	0.316	1.60164	3.54149	0.005	0.147	0.135	472.9832	0.153
Cranes	2022	251	500	0.31051	0.261	2.21201	2.89369	0.005	0.117	0.108	472.1806	0.153
Cranes	2022	501	750	0.238348	0.2	1.28309	2.25087	0.005	0.089	0.082	470.4755	0.152
Cranes	2022	1001	9999	0.239599	0.201	1.01544	2.38641	0.005	0.062	0.057	472.0545	0.153
Cranes	2023	26	50	2.435567	2.047	7.45254	5.9225	0.005	0.608	0.559	517.8722	0.167
Cranes	2023	51	120	0.656595	0.552	3.9444	4.87461	0.005	0.323	0.297	469.8891	0.152
Cranes	2023	121	175	0.503663	0.423	3.44284	4.22184	0.005	0.224	0.206	474.595	0.153
Cranes	2023	176	250	0.353966	0.297	1.55262	3.22938	0.005	0.135	0.124	472.9738	0.153
Cranes	2023	251	500	0.281202	0.236	2.01	2.5105	0.005	0.102	0.093	472.294	0.153
Cranes	2023	501	750	0.23207	0.195	1.28213	2.07257	0.005	0.084	0.077	470.2508	0.152
Cranes	2023	1001	9999	0.250681	0.211	1.02322	2.39857	0.005	0.063	0.058	472.0545	0.153
CrawlerTractors	2020	26	50	2.443056	2.053	7.3	5.64276	0.005	0.591	0.544	515.679	0.167
CrawlerTractors	2020	51	120	0.850709	0.715	4.04412	6.00933	0.005	0.5	0.46	476.3284	0.154
CrawlerTractors	2020	121	175	0.566576	0.476	3.33989	4.87226	0.005	0.272	0.25	471.015	0.152
CrawlerTractors	2020	176	250	0.428471	0.36	1.55491	4.63225	0.005	0.175	0.161	472.941	0.153
CrawlerTractors	2020	251	500	0.358593	0.301	2.0875	3.62175	0.005	0.141	0.13	475.2338	0.154
CrawlerTractors	2020	501	750	0.304872	0.256	1.31018	3.13716	0.005	0.115	0.106	473.3119	0.153
CrawlerTractors	2020	751	1000	0.551035	0.463	2.02764	7.23682	0.005	0.212	0.195	475.6525	0.154
CrawlerTractors	2021	26	50	2.456387	2.064	7.34869	5.61511	0.005	0.591	0.543	516.1077	0.167
CrawlerTractors	2021	51	120	0.800723	0.673	4.00549	5.65746	0.005	0.466	0.428	476.437	0.154
CrawlerTractors	2021	121	175	0.518367	0.436	3.30982	4.3947	0.005	0.245	0.225	471.421	0.152
CrawlerTractors	2021	176	250	0.407794	0.343	1.51456	4.33394	0.005	0.163	0.15	472.9246	0.153

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
CrawlerTractors	2021	251	500	0.337066	0.283	2.02434	3.27633	0.005	0.129	0.119	474.4843	0.153
CrawlerTractors	2021	501	750	0.284829	0.239	1.26985	2.82478	0.005	0.104	0.095	473.0941	0.153
CrawlerTractors	2021	751	1000	0.475256	0.399	1.89563	6.3992	0.005	0.182	0.167	471.8224	0.153
CrawlerTractors	2022	26	50	2.25944	1.899	7.04118	5.37962	0.005	0.539	0.496	516.1476	0.167
CrawlerTractors	2022	51	120	0.714244	0.6	3.92498	5.10103	0.005	0.408	0.375	476.0219	0.154
CrawlerTractors	2022	121	175	0.463094	0.389	3.26382	3.82659	0.005	0.214	0.197	471.5674	0.153
CrawlerTractors	2022	176	250	0.364117	0.306	1.43975	3.73672	0.005	0.141	0.13	472.0975	0.153
CrawlerTractors	2022	251	500	0.30258	0.254	1.91628	2.74435	0.005	0.111	0.102	474.4115	0.153
CrawlerTractors	2022	501	750	0.235465	0.198	1.18638	2.12552	0.005	0.079	0.073	472.876	0.153
CrawlerTractors	2022	751	1000	0.424397	0.357	1.73227	5.92299	0.005	0.162	0.149	470.7007	0.152
CrawlerTractors	2023	26	50	2.228685	1.873	7.02687	5.32514	0.005	0.526	0.484	516.1587	0.167
CrawlerTractors	2023	51	120	0.663952	0.558	3.88936	4.76208	0.005	0.373	0.343	476.1575	0.154
CrawlerTractors	2023	121	175	0.41309	0.347	3.23526	3.33004	0.005	0.185	0.17	471.7805	0.153
CrawlerTractors	2023	176	250	0.328767	0.276	1.39549	3.18735	0.005	0.124	0.114	471.6244	0.153
CrawlerTractors	2023	251	500	0.286276	0.241	1.85216	2.47635	0.005	0.102	0.094	474.6128	0.153
CrawlerTractors	2023	501	750	0.218505	0.184	1.15892	1.86667	0.005	0.069	0.064	472.5297	0.153
CrawlerTractors	2023	751	1000	0.319268	0.268	1.6104	4.76968	0.005	0.118	0.109	473.6655	0.153
Crushing/Proc.Equipment	2020	26	50	2.489	0.947	5.211	4.347	0.007	0.233	0.233	568.299	0.085
Crushing/Proc.Equipment	2020	51	120	2.348	0.473	3.722	3.249	0.006	0.206	0.206	568.299	0.042
Crushing/Proc.Equipment	2020	121	175	3.673	0.367	3.234	2.392	0.006	0.124	0.124	568.299	0.033
Crushing/Proc.Equipment	2020	176	250	4.222	0.289	1.125	2.014	0.006	0.065	0.065	568.299	0.026
Crushing/Proc.Equipment	2020	251	500	6.283	0.281	1.078	1.799	0.005	0.063	0.063	568.299	0.025
Crushing/Proc.Equipment	2020	501	750	9.884	0.281	1.077	1.835	0.005	0.063	0.063	568.299	0.025
Crushing/Proc.Equipment	2020	1001	9999	25.755	0.329	1.153	3.699	0.005	0.089	0.089	568.299	0.029
Crushing/Proc.Equipment	2021	26	50	2.265	0.862	5.136	4.211	0.007	0.201	0.201	568.299	0.077
Crushing/Proc.Equipment	2021	51	120	2.176	0.438	3.711	2.989	0.006	0.178	0.178	568.299	0.039
Crushing/Proc.Equipment	2021	121	175	3.442	0.344	3.235	2.114	0.006	0.109	0.109	568.299	0.031
Crushing/Proc.Equipment	2021	176	250	4.009	0.274	1.119	1.756	0.006	0.057	0.057	568.299	0.024
Crushing/Proc.Equipment	2021	251	500	5.988	0.268	1.072	1.574	0.005	0.055	0.055	568.3	0.024
Crushing/Proc.Equipment	2021	501	750	9.434	0.268	1.072	1.606	0.005	0.055	0.055	568.299	0.024
Crushing/Proc.Equipment	2021	1001	9999	24.586	0.314	1.136	3.487	0.005	0.08	0.08	568.299	0.028
Crushing/Proc.Equipment	2022	26	50	2.09	0.795	5.081	4.083	0.007	0.172	0.172	568.299	0.071
Crushing/Proc.Equipment	2022	51	120	2.036	0.41	3.704	2.758	0.006	0.154	0.154	568.299	0.037
Crushing/Proc.Equipment	2022	121	175	3.231	0.323	3.237	1.861	0.006	0.095	0.095	568.299	0.029
Crushing/Proc.Equipment	2022	176	250	3.808	0.26	1.114	1.521	0.006	0.05	0.05	568.299	0.023
Crushing/Proc.Equipment	2022	251	500	5.706	0.255	1.067	1.389	0.005	0.048	0.048	568.299	0.023
Crushing/Proc.Equipment	2022	501	750	9.002	0.256	1.067	1.416	0.005	0.048	0.048	568.299	0.023
Crushing/Proc.Equipment	2022	1001	9999	23.492	0.3	1.121	3.31	0.005	0.073	0.073	568.299	0.027
Crushing/Proc.Equipment	2023	26	50	1.944	0.739	5.039	3.962	0.007	0.146	0.146	568.299	0.066
Crushing/Proc.Equipment	2023	51	120	1.914	0.385	3.7	2.552	0.006	0.132	0.132	568.299	0.034

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EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Crushing/Proc.Equipment	2023	121	175	3.042	0.304	3.24	1.654	0.006	0.083	0.083	568.299	0.027
Crushing/Proc.Equipment	2023	176	250	3.623	0.248	1.111	1.33	0.006	0.043	0.043	568.299	0.022
Crushing/Proc.Equipment	2023	251	500	5.444	0.244	1.064	1.227	0.005	0.042	0.042	568.299	0.022
Crushing/Proc.Equipment	2023	501	750	8.598	0.244	1.065	1.251	0.005	0.042	0.042	568.3	0.022
Crushing/Proc.Equipment	2023	1001	9999	22.463	0.287	1.107	3.16	0.005	0.066	0.066	568.299	0.025
Dumpers/Tenders	2021	16	25	0.819	0.685	2.339	4.333	0.007	0.163	0.163	568.299	0.061
Dumpers/Tenders	2022	16	25	0.819	0.685	2.339	4.332	0.007	0.162	0.162	568.299	0.061
Dumpers/Tenders	2022	16	25	0.819	0.685	2.339	4.332	0.007	0.162	0.162	568.299	0.061
Dumpers/Tenders	2023	16	25	0.819	0.685	2.339	4.332	0.007	0.162	0.162	568.299	0.061
Excavators	2020	16	25	0.705964	0.593	4.50032	4.03131	0.005	0.222	0.204	525.3675	0.17
Excavators	2020	26	50	0.705964	0.593	4.50032	4.03131	0.005	0.222	0.204	525.3675	0.17
Excavators	2020	51	120	0.356064	0.299	3.50495	3.08964	0.005	0.185	0.17	468.0546	0.151
Excavators	2020	121	175	0.275327	0.231	3.08597	2.27838	0.005	0.11	0.102	472.2891	0.153
Excavators	2020	176	250	0.211076	0.177	1.11778	2.02738	0.005	0.061	0.056	471.8828	0.153
Excavators	2020	251	500	0.182542	0.153	1.1016	1.57199	0.005	0.052	0.048	470.2956	0.152
Excavators	2020	501	750	0.202011	0.17	1.14543	1.79718	0.005	0.061	0.056	468.8706	0.152
Excavators	2021	16	25	0.669315	0.562	4.46094	3.91866	0.005	0.202	0.186	525.3774	0.17
Excavators	2021	26	50	0.669315	0.562	4.46094	3.91866	0.005	0.202	0.186	525.3774	0.17
Excavators	2021	51	120	0.327314	0.275	3.49196	2.84891	0.005	0.161	0.148	467.7906	0.151
Excavators	2021	121	175	0.257574	0.216	3.08975	2.03357	0.005	0.099	0.091	472.3586	0.153
Excavators	2021	176	250	0.193738	0.163	1.10324	1.70572	0.005	0.052	0.048	471.7931	0.153
Excavators	2021	251	500	0.170127	0.143	1.08777	1.33174	0.005	0.045	0.041	469.6156	0.152
Excavators	2021	501	750	0.196683	0.165	1.14978	1.61856	0.005	0.056	0.052	469.547	0.152
Excavators	2022	16	25	0.568779	0.478	4.27341	3.70039	0.005	0.16	0.147	525.4468	0.17
Excavators	2022	26	50	0.568779	0.478	4.27341	3.70039	0.005	0.16	0.147	525.4468	0.17
Excavators	2022	51	120	0.299503	0.252	3.47329	2.60649	0.005	0.138	0.127	467.6256	0.151
Excavators	2022	121	175	0.22749	0.191	3.074	1.6781	0.005	0.081	0.075	472.1917	0.153
Excavators	2022	176	250	0.176606	0.148	1.09157	1.38616	0.005	0.044	0.04	472.0412	0.153
Excavators	2022	251	500	0.152263	0.128	1.06126	1.03988	0.005	0.035	0.032	469.7105	0.152
Excavators	2022	501	750	0.178436	0.15	1.144	1.2865	0.005	0.047	0.043	469.2892	0.152
Excavators	2023	16	25	0.535724	0.45	4.23393	3.59356	0.005	0.139	0.128	525.4286	0.17
Excavators	2023	26	50	0.535724	0.45	4.23393	3.59356	0.005	0.139	0.128	525.4286	0.17
Excavators	2023	51	120	0.273823	0.23	3.45367	2.38066	0.005	0.116	0.107	467.1573	0.151
Excavators	2023	121	175	0.212046	0.178	3.07648	1.46245	0.005	0.072	0.066	472.277	0.153
Excavators	2023	176	250	0.168964	0.142	1.08965	1.20943	0.005	0.039	0.036	472.2131	0.153
Excavators	2023	251	500	0.145171	0.122	1.05093	0.89311	0.005	0.03	0.028	469.8892	0.152
Excavators	2023	501	750	0.171247	0.144	1.13199	1.15865	0.005	0.043	0.04	468.6826	0.152
Forklifts	2020	26	50	1.337399	1.124	5.70563	4.68572	0.005	0.36	0.331	525.4833	0.17
Forklifts	2020	51	120	0.545921	0.459	3.75954	4.13299	0.005	0.308	0.283	471.5285	0.153
Forklifts	2020	121	175	0.402357	0.338	3.24885	3.3196	0.005	0.18	0.165	472.1062	0.153

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Forklifts	2020	176	250	0.348476	0.293	1.44178	3.24149	0.005	0.126	0.116	473.3255	0.153
Forklifts	2020	251	500	0.299035	0.251	1.47807	2.43991	0.005	0.097	0.089	473.6151	0.153
Forklifts	2021	26	50	1.192536	1.002	5.53477	4.5202	0.005	0.318	0.292	525.4833	0.17
Forklifts	2021	51	120	0.490261	0.412	3.72	3.75592	0.005	0.267	0.245	471.5285	0.153
Forklifts	2021	121	175	0.366939	0.308	3.23128	2.9207	0.005	0.158	0.145	472.1062	0.153
Forklifts	2021	176	250	0.296154	0.249	1.33672	2.58195	0.005	0.099	0.091	473.3255	0.153
Forklifts	2021	251	500	0.301833	0.254	1.48481	2.30266	0.005	0.094	0.086	473.6151	0.153
Forklifts	2022	26	50	1.02259	0.859	5.30418	4.31214	0.005	0.27	0.248	525.4833	0.17
Forklifts	2022	51	120	0.430627	0.362	3.67507	3.36021	0.005	0.223	0.205	471.5285	0.153
Forklifts	2022	121	175	0.324265	0.272	3.19749	2.47982	0.005	0.132	0.122	472.1062	0.153
Forklifts	2022	176	250	0.280841	0.236	1.3171	2.31941	0.005	0.09	0.083	473.3255	0.153
Forklifts	2022	251	500	0.275829	0.232	1.21922	1.99119	0.005	0.077	0.071	473.6151	0.153
Forklifts	2023	26	50	0.911766	0.766	5.16597	4.15219	0.005	0.232	0.213	525.4833	0.17
Forklifts	2023	51	120	0.388709	0.327	3.64655	3.0569	0.005	0.189	0.174	471.5285	0.153
Forklifts	2023	121	175	0.289923	0.244	3.1799	2.11214	0.005	0.111	0.102	472.1062	0.153
Forklifts	2023	176	250	0.242474	0.204	1.23515	1.80718	0.005	0.069	0.063	473.3255	0.153
Forklifts	2023	251	500	0.261765	0.22	1.21596	1.78772	0.005	0.069	0.063	473.6151	0.153
GeneratorSets	2020	6	15	1.715	0.646	3.546	4.516	0.008	0.212	0.212	568.299	0.058
GeneratorSets	2020	16	25	3.307	0.721	2.473	4.538	0.007	0.205	0.205	568.299	0.065
GeneratorSets	2020	26	50	5.508	0.691	3.995	4.075	0.007	0.194	0.194	568.299	0.062
GeneratorSets	2020	51	120	7.383	0.364	3.38	3.173	0.006	0.179	0.179	568.299	0.032
GeneratorSets	2020	121	175	9.884	0.267	2.93	2.38	0.006	0.105	0.105	568.299	0.024
GeneratorSets	2020	176	250	10.963	0.198	1.026	2.016	0.006	0.057	0.057	568.299	0.017
GeneratorSets	2020	251	500	16.528	0.188	1.005	1.816	0.005	0.055	0.055	568.299	0.017
GeneratorSets	2020	501	750	27.045	0.191	1.005	1.858	0.005	0.056	0.056	568.299	0.017
GeneratorSets	2020	1001	9999	66.08	0.242	1.082	3.608	0.005	0.079	0.079	568.3	0.021
GeneratorSets	2021	6	15	1.683	0.634	3.531	4.441	0.008	0.201	0.201	568.299	0.057
GeneratorSets	2021	16	25	3.268	0.712	2.446	4.497	0.007	0.196	0.196	568.299	0.064
GeneratorSets	2021	26	50	4.884	0.613	3.905	3.916	0.007	0.165	0.165	568.299	0.055
GeneratorSets	2021	51	120	6.62	0.326	3.361	2.888	0.006	0.153	0.153	568.299	0.029
GeneratorSets	2021	121	175	8.995	0.243	2.925	2.068	0.006	0.091	0.091	568.299	0.021
GeneratorSets	2021	176	250	10.146	0.183	1.016	1.73	0.006	0.049	0.049	568.299	0.016
GeneratorSets	2021	251	500	15.395	0.175	0.996	1.562	0.005	0.048	0.048	568.299	0.015
GeneratorSets	2021	501	750	25.135	0.177	0.996	1.596	0.005	0.048	0.048	568.299	0.016
GeneratorSets	2021	1001	9999	60.247	0.22	1.06	3.372	0.005	0.07	0.07	568.3	0.019
GeneratorSets	2022	6	15	1.662	0.626	3.519	4.39	0.008	0.193	0.193	568.299	0.056
GeneratorSets	2022	16	25	3.242	0.706	2.426	4.47	0.007	0.188	0.188	568.299	0.063
GeneratorSets	2022	26	50	4.466	0.56	3.858	3.796	0.007	0.143	0.143	568.299	0.05
GeneratorSets	2022	51	120	6.113	0.301	3.353	2.671	0.006	0.134	0.134	568.299	0.027
GeneratorSets	2022	121	175	8.363	0.226	2.926	1.83	0.006	0.081	0.081	568.299	0.02

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EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
GeneratorSets	2022	176	250	9.575	0.173	1.01	1.508	0.006	0.043	0.043	568.299	0.015
GeneratorSets	2022	251	500	14.616	0.166	0.99	1.384	0.005	0.042	0.042	568.299	0.015
GeneratorSets	2022	501	750	23.822	0.168	0.99	1.412	0.005	0.043	0.043	568.299	0.015
GeneratorSets	2022	1001	9999	56.346	0.206	1.045	3.202	0.005	0.063	0.063	568.299	0.018
GeneratorSets	2023	6	15	1.643	0.618	3.508	4.345	0.008	0.186	0.186	568.299	0.055
GeneratorSets	2023	16	25	3.219	0.701	2.407	4.447	0.007	0.182	0.182	568.299	0.063
GeneratorSets	2023	26	50	4.102	0.514	3.819	3.685	0.007	0.124	0.124	568.299	0.046
GeneratorSets	2023	51	120	5.671	0.279	3.347	2.477	0.006	0.117	0.117	568.299	0.025
GeneratorSets	2023	121	175	7.812	0.211	2.927	1.635	0.006	0.071	0.071	568.299	0.019
GeneratorSets	2023	176	250	9.077	0.164	1.006	1.328	0.006	0.038	0.038	568.299	0.014
GeneratorSets	2023	251	500	13.922	0.158	0.986	1.228	0.005	0.037	0.037	568.299	0.014
GeneratorSets	2023	501	750	22.664	0.16	0.986	1.253	0.005	0.037	0.037	568.299	0.014
GeneratorSets	2023	1001	9999	53.06	0.194	1.031	3.058	0.005	0.058	0.058	568.299	0.017
Graders	2020	26	50	2.994737	2.516	8.13394	5.82549	0.005	0.709	0.652	492.8615	0.159
Graders	2020	51	120	1.161574	0.976	4.56142	7.72513	0.005	0.622	0.572	469.3371	0.152
Graders	2020	121	175	0.674427	0.567	3.62102	5.53045	0.005	0.309	0.284	478.0403	0.155
Graders	2020	176	250	0.41877	0.352	1.34183	4.67787	0.005	0.15	0.138	475.3037	0.154
Graders	2020	251	500	0.383198	0.322	1.5256	3.10731	0.005	0.121	0.111	471.9795	0.153
Graders	2020	501	750	12.961	0.319	1.229	2.031	0.005	0.072	0.072	568.299	0.028
Graders	2021	26	50	2.660206	2.235	7.62621	5.48468	0.005	0.631	0.581	492.9352	0.159
Graders	2021	51	120	1.072144	0.901	4.45175	7.12535	0.005	0.57	0.524	469.0701	0.152
Graders	2021	121	175	0.601372	0.505	3.55896	4.83947	0.005	0.27	0.248	478.5289	0.155
Graders	2021	176	250	0.398657	0.335	1.30687	4.38134	0.005	0.139	0.128	474.5386	0.153
Graders	2021	251	500	0.383194	0.322	1.46044	3.01257	0.005	0.117	0.108	471.8981	0.153
Graders	2021	501	750	12.333	0.303	1.207	1.808	0.005	0.064	0.064	568.299	0.027
Graders	2022	26	50	2.506375	2.106	7.42848	5.33188	0.005	0.595	0.547	493.0249	0.159
Graders	2022	51	120	0.947815	0.796	4.32966	6.36004	0.005	0.493	0.453	469.6301	0.152
Graders	2022	121	175	0.524016	0.44	3.49283	4.12488	0.005	0.229	0.211	478.5664	0.155
Graders	2022	176	250	0.365229	0.307	1.27327	3.8881	0.005	0.124	0.114	474.239	0.153
Graders	2022	251	500	0.370143	0.311	1.38967	2.80191	0.005	0.108	0.1	471.9278	0.153
Graders	2022	501	750	11.747	0.289	1.187	1.606	0.005	0.057	0.057	568.299	0.026
Graders	2023	26	50	2.316861	1.947	7.19094	5.14799	0.005	0.549	0.505	494.0202	0.16
Graders	2023	51	120	0.855685	0.719	4.22811	5.74006	0.005	0.436	0.401	469.2859	0.152
Graders	2023	121	175	0.463941	0.39	3.45006	3.54785	0.005	0.195	0.18	478.4629	0.155
Graders	2023	176	250	0.337478	0.284	1.25173	3.44101	0.005	0.111	0.103	473.9256	0.153
Graders	2023	251	500	0.367269	0.309	1.38481	2.70451	0.005	0.105	0.097	471.0306	0.152
Graders	2023	501	750	11.215	0.276	1.17	1.425	0.005	0.051	0.051	568.3	0.024
OtherConstructionEquipment	2020	6	15	1.276029	1.072	5.40446	5.03626	0.005	0.405	0.373	527.9656	0.171
OtherConstructionEquipment	2020	16	25	1.276029	1.072	5.40446	5.03626	0.005	0.405	0.373	527.9656	0.171
OtherConstructionEquipment	2020	26	50	1.276029	1.072	5.40446	5.03626	0.005	0.405	0.373	527.9656	0.171

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
OtherConstructionEquipment	2020	51	120	0.617777	0.519	3.73189	4.7712	0.005	0.354	0.325	472.2162	0.153
OtherConstructionEquipment	2020	121	175	0.461441	0.388	3.23528	4.11203	0.005	0.217	0.2	469.9837	0.152
OtherConstructionEquipment	2020	251	500	0.266788	0.224	1.6338	2.63672	0.005	0.096	0.088	475.2326	0.154
OtherConstructionEquipment	2021	6	15	1.201423	1.01	5.30749	4.90234	0.005	0.382	0.351	527.7834	0.171
OtherConstructionEquipment	2021	16	25	1.201423	1.01	5.30749	4.90234	0.005	0.382	0.351	527.7834	0.171
OtherConstructionEquipment	2021	26	50	1.201423	1.01	5.30749	4.90234	0.005	0.382	0.351	527.7834	0.171
OtherConstructionEquipment	2021	51	120	0.573212	0.482	3.70304	4.4558	0.005	0.323	0.298	472.275	0.153
OtherConstructionEquipment	2021	121	175	0.392185	0.33	3.18275	3.43847	0.005	0.18	0.165	469.7642	0.152
OtherConstructionEquipment	2021	251	500	0.256006	0.215	1.59874	2.42822	0.005	0.09	0.082	475.2124	0.154
OtherConstructionEquipment	2022	6	15	1.094466	0.92	5.16732	4.74117	0.005	0.348	0.32	529.1825	0.171
OtherConstructionEquipment	2022	16	25	1.094466	0.92	5.16732	4.74117	0.005	0.348	0.32	529.1825	0.171
OtherConstructionEquipment	2022	26	50	1.094466	0.92	5.16732	4.74117	0.005	0.348	0.32	529.1825	0.171
OtherConstructionEquipment	2022	51	120	0.523663	0.44	3.66623	4.09846	0.005	0.288	0.265	472.3178	0.153
OtherConstructionEquipment	2022	121	175	0.351187	0.295	3.15539	2.99437	0.005	0.156	0.144	469.6126	0.152
OtherConstructionEquipment	2022	251	500	0.223796	0.188	1.43828	1.97544	0.005	0.074	0.068	475.9983	0.154
OtherConstructionEquipment	2023	6	15	1.030598	0.866	5.07368	4.59446	0.005	0.322	0.296	529.3389	0.171
OtherConstructionEquipment	2023	16	25	1.030598	0.866	5.07368	4.59446	0.005	0.322	0.296	529.3389	0.171
OtherConstructionEquipment	2023	26	50	1.030598	0.866	5.07368	4.59446	0.005	0.322	0.296	529.3389	0.171
OtherConstructionEquipment	2023	51	120	0.482844	0.406	3.63188	3.79013	0.005	0.259	0.238	471.9899	0.153
OtherConstructionEquipment	2023	121	175	0.325455	0.273	3.14152	2.69821	0.005	0.14	0.129	469.5579	0.152
OtherConstructionEquipment	2023	251	500	0.214667	0.18	1.39596	1.81226	0.005	0.069	0.063	476.1847	0.154
OtherGeneralIndustrialEquipment	2020	6	15	1.125869	0.946	5.50397	4.62219	0.005	0.334	0.307	526.1761	0.17
OtherGeneralIndustrialEquipment	2020	16	25	1.125869	0.946	5.50397	4.62219	0.005	0.334	0.307	526.1761	0.17
OtherGeneralIndustrialEquipment	2020	26	50	1.125869	0.946	5.50397	4.62219	0.005	0.334	0.307	526.1761	0.17
OtherGeneralIndustrialEquipment	2020	51	120	0.53075	0.446	3.77073	4.06079	0.005	0.296	0.272	469.9998	0.152
OtherGeneralIndustrialEquipment	2020	121	175	0.319281	0.268	3.22922	2.57503	0.005	0.135	0.124	471.8502	0.153
OtherGeneralIndustrialEquipment	2020	176	250	0.281815	0.237	1.23914	2.66782	0.005	0.09	0.083	473.2231	0.153
OtherGeneralIndustrialEquipment	2020	251	500	0.247036	0.208	1.34424	2.06187	0.005	0.072	0.067	472.929	0.153
OtherGeneralIndustrialEquipment	2020	501	750	0.207847	0.175	1.46184	1.67591	0.005	0.062	0.057	473.4638	0.153
OtherGeneralIndustrialEquipment	2020	751	1000	0.322174	0.271	1.085	4.85721	0.005	0.119	0.109	472.0545	0.153
OtherGeneralIndustrialEquipment	2021	6	15	0.989462	0.831	5.31354	4.42532	0.005	0.289	0.266	526.1761	0.17
OtherGeneralIndustrialEquipment	2021	16	25	0.989462	0.831	5.31354	4.42532	0.005	0.289	0.266	526.1761	0.17
OtherGeneralIndustrialEquipment	2021	26	50	0.989462	0.831	5.31354	4.42532	0.005	0.289	0.266	526.1761	0.17
OtherGeneralIndustrialEquipment	2021	51	120	0.480398	0.404	3.74029	3.7177	0.005	0.256	0.235	469.9998	0.152
OtherGeneralIndustrialEquipment	2021	121	175	0.302394	0.254	3.23421	2.34745	0.005	0.121	0.111	471.8502	0.153
OtherGeneralIndustrialEquipment	2021	176	250	0.242448	0.204	1.17138	2.0939	0.005	0.07	0.064	473.2231	0.153
OtherGeneralIndustrialEquipment	2021	251	500	0.232592	0.195	1.32956	1.79624	0.005	0.064	0.059	472.929	0.153
OtherGeneralIndustrialEquipment	2021	501	750	0.197551	0.166	1.46305	1.38672	0.005	0.054	0.05	473.4638	0.153
OtherGeneralIndustrialEquipment	2021	751	1000	0.328625	0.276	1.09291	4.87557	0.005	0.12	0.11	472.0545	0.153
OtherGeneralIndustrialEquipment	2022	6	15	0.835231	0.702	5.07591	4.19687	0.005	0.238	0.219	526.1761	0.17

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EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
OtherGeneralIndustrialEquipment	2022	16	25	0.835231	0.702	5.07591	4.19687	0.005	0.238	0.219	526.1761	0.17
OtherGeneralIndustrialEquipment	2022	26	50	0.835231	0.702	5.07591	4.19687	0.005	0.238	0.219	526.1761	0.17
OtherGeneralIndustrialEquipment	2022	51	120	0.403101	0.339	3.66821	3.19968	0.005	0.199	0.183	469.9998	0.152
OtherGeneralIndustrialEquipment	2022	121	175	0.289798	0.244	3.23346	2.14959	0.005	0.111	0.102	471.8502	0.153
OtherGeneralIndustrialEquipment	2022	176	250	0.222216	0.187	1.13752	1.75874	0.005	0.057	0.052	473.2231	0.153
OtherGeneralIndustrialEquipment	2022	251	500	0.208015	0.175	1.17139	1.43348	0.005	0.05	0.046	472.929	0.153
OtherGeneralIndustrialEquipment	2022	501	750	0.177285	0.149	1.45658	1.06247	0.005	0.046	0.042	473.4638	0.153
OtherGeneralIndustrialEquipment	2022	751	1000	0.223076	0.187	1.03925	3.942	0.005	0.079	0.073	472.0545	0.153
OtherGeneralIndustrialEquipment	2023	6	15	0.717857	0.603	4.88317	3.99304	0.005	0.194	0.178	526.1761	0.17
OtherGeneralIndustrialEquipment	2023	16	25	0.717857	0.603	4.88317	3.99304	0.005	0.194	0.178	526.1761	0.17
OtherGeneralIndustrialEquipment	2023	26	50	0.717857	0.603	4.88317	3.99304	0.005	0.194	0.178	526.1761	0.17
OtherGeneralIndustrialEquipment	2023	51	120	0.366077	0.308	3.64703	2.92394	0.005	0.168	0.155	469.9998	0.152
OtherGeneralIndustrialEquipment	2023	121	175	0.238568	0.2	3.17453	1.60937	0.005	0.08	0.074	471.8502	0.153
OtherGeneralIndustrialEquipment	2023	176	250	0.214876	0.181	1.14024	1.53043	0.005	0.051	0.047	473.2231	0.153
OtherGeneralIndustrialEquipment	2023	251	500	0.195172	0.164	1.12057	1.25618	0.005	0.043	0.04	472.929	0.153
OtherGeneralIndustrialEquipment	2023	501	750	0.131565	0.111	1.10458	0.62571	0.005	0.023	0.021	473.4638	0.153
OtherGeneralIndustrialEquipment	2023	751	1000	0.229255	0.193	1.04852	3.95649	0.005	0.08	0.073	472.0545	0.153
OtherMaterialHandlingEquipment	2020	26	50	1.481858	1.245	6.1671	5.13925	0.005	0.439	0.404	523.7088	0.169
OtherMaterialHandlingEquipment	2020	51	120	0.36479	0.307	3.58938	3.10396	0.005	0.182	0.168	473.5884	0.153
OtherMaterialHandlingEquipment	2020	121	175	0.299922	0.252	3.17089	2.36653	0.005	0.118	0.109	472.2193	0.153
OtherMaterialHandlingEquipment	2020	176	250	0.346024	0.291	1.31882	3.59889	0.005	0.115	0.106	471.482	0.152
OtherMaterialHandlingEquipment	2020	251	500	0.336187	0.282	1.52346	3.20974	0.005	0.12	0.11	470.2972	0.152
OtherMaterialHandlingEquipment	2020	1001	9999	0.238473	0.2	1.04898	3.61407	0.005	0.078	0.072	472.0545	0.153
OtherMaterialHandlingEquipment	2021	26	50	1.318509	1.108	5.95956	4.96638	0.005	0.396	0.364	523.7088	0.169
OtherMaterialHandlingEquipment	2021	51	120	0.349969	0.294	3.60203	2.95622	0.005	0.166	0.152	473.5884	0.153
OtherMaterialHandlingEquipment	2021	121	175	0.296084	0.249	3.19638	2.24633	0.005	0.114	0.105	472.2193	0.153
OtherMaterialHandlingEquipment	2021	176	250	0.32063	0.269	1.30911	3.08193	0.005	0.102	0.094	471.482	0.152
OtherMaterialHandlingEquipment	2021	251	500	0.302407	0.254	1.44188	2.60166	0.005	0.101	0.093	470.2972	0.152
OtherMaterialHandlingEquipment	2021	1001	9999	0.086228	0.072	0.97159	2.3179	0.005	0.019	0.018	472.0545	0.153
OtherMaterialHandlingEquipment	2022	26	50	1.313129	1.103	5.98386	4.92048	0.005	0.385	0.354	523.7088	0.169
OtherMaterialHandlingEquipment	2022	51	120	0.294157	0.247	3.55673	2.56673	0.005	0.121	0.111	473.5884	0.153
OtherMaterialHandlingEquipment	2022	121	175	0.268495	0.226	3.17607	1.89383	0.005	0.103	0.095	472.2193	0.153
OtherMaterialHandlingEquipment	2022	176	250	0.272302	0.229	1.23917	2.42542	0.005	0.083	0.076	471.482	0.152
OtherMaterialHandlingEquipment	2022	251	500	0.269417	0.226	1.34592	2.06254	0.005	0.083	0.077	470.2972	0.152
OtherMaterialHandlingEquipment	2022	1001	9999	0.090526	0.076	0.97804	2.32798	0.005	0.02	0.018	472.0545	0.153
OtherMaterialHandlingEquipment	2023	26	50	1.203044	1.011	5.75727	4.68435	0.005	0.34	0.313	523.7088	0.169
OtherMaterialHandlingEquipment	2023	51	120	0.267491	0.225	3.51535	2.29768	0.005	0.104	0.095	473.5884	0.153
OtherMaterialHandlingEquipment	2023	121	175	0.25813	0.217	3.17066	1.76898	0.005	0.096	0.088	472.2193	0.153
OtherMaterialHandlingEquipment	2023	176	250	0.246291	0.207	1.20917	2.00366	0.005	0.069	0.064	471.482	0.152
OtherMaterialHandlingEquipment	2023	251	500	0.258837	0.217	1.34382	1.87023	0.005	0.078	0.072	470.2972	0.152

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
OtherMaterialHandlingEquipment	2023	1001	9999	0.064735	0.054	0.93935	2.26751	0.005	0.018	0.017	472.0545	0.153
Pavers	2020	16	25	1.568718	1.318	5.52345	4.76401	0.005	0.402	0.37	526.2098	0.17
Pavers	2020	26	50	1.568718	1.318	5.52345	4.76401	0.005	0.402	0.37	526.2098	0.17
Pavers	2020	51	120	0.558949	0.47	3.60405	4.42718	0.005	0.325	0.299	469.8815	0.152
Pavers	2020	121	175	0.324615	0.273	3.0097	2.91833	0.005	0.142	0.131	472.7746	0.153
Pavers	2020	176	250	0.209036	0.176	1.02834	2.77699	0.005	0.076	0.07	472.8337	0.153
Pavers	2020	251	500	0.195949	0.165	0.98677	2.13394	0.005	0.077	0.071	466.2059	0.151
Pavers	2021	16	25	1.43708	1.208	5.30162	4.60183	0.005	0.37	0.34	526.5153	0.17
Pavers	2021	26	50	1.43708	1.208	5.30162	4.60183	0.005	0.37	0.34	526.5153	0.17
Pavers	2021	51	120	0.499355	0.42	3.56251	4.02622	0.005	0.285	0.262	469.7736	0.152
Pavers	2021	121	175	0.304315	0.256	3.01647	2.6948	0.005	0.13	0.12	472.5552	0.153
Pavers	2021	176	250	0.196899	0.165	1.02422	2.4844	0.005	0.07	0.064	472.4765	0.153
Pavers	2021	251	500	0.195105	0.164	0.9877	2.05298	0.005	0.074	0.068	465.5908	0.151
Pavers	2022	16	25	1.299052	1.092	5.11433	4.42092	0.005	0.33	0.303	526.8963	0.17
Pavers	2022	26	50	1.299052	1.092	5.11433	4.42092	0.005	0.33	0.303	526.8963	0.17
Pavers	2022	51	120	0.443951	0.373	3.52511	3.65932	0.005	0.248	0.228	470.1854	0.152
Pavers	2022	121	175	0.255688	0.215	2.99478	2.17958	0.005	0.104	0.095	472.7599	0.153
Pavers	2022	176	250	0.167123	0.14	1.01231	1.89985	0.005	0.055	0.05	472.3718	0.153
Pavers	2022	251	500	0.178545	0.15	0.98238	1.81028	0.005	0.063	0.058	466.0042	0.151
Pavers	2023	16	25	1.198318	1.007	5.00667	4.28484	0.005	0.299	0.275	526.8595	0.17
Pavers	2023	26	50	1.198318	1.007	5.00667	4.28484	0.005	0.299	0.275	526.8595	0.17
Pavers	2023	51	120	0.415607	0.349	3.50733	3.42661	0.005	0.226	0.208	470.0839	0.152
Pavers	2023	121	175	0.237199	0.199	2.99398	1.95517	0.005	0.092	0.085	472.7178	0.153
Pavers	2023	176	250	0.154288	0.13	1.01018	1.6106	0.005	0.047	0.043	472.6051	0.153
Pavers	2023	251	500	0.18061	0.152	0.98653	1.77101	0.005	0.062	0.057	466.0038	0.151
PavingEquipment	2020	16	25	0.73951	0.621	4.22322	3.9519	0.005	0.217	0.2	520.1235	0.168
PavingEquipment	2020	26	50	0.73951	0.621	4.22322	3.9519	0.005	0.217	0.2	520.1235	0.168
PavingEquipment	2020	51	120	0.472907	0.397	3.58172	3.78064	0.005	0.256	0.235	473.3249	0.153
PavingEquipment	2020	121	175	0.294586	0.248	3.02393	2.55498	0.005	0.128	0.118	470.7359	0.152
PavingEquipment	2020	176	250	0.289784	0.243	1.25215	3.2202	0.005	0.111	0.102	472.1514	0.153
PavingEquipment	2021	16	25	0.698022	0.587	4.21072	3.88226	0.005	0.2	0.184	520.3965	0.168
PavingEquipment	2021	26	50	0.698022	0.587	4.21072	3.88226	0.005	0.2	0.184	520.3965	0.168
PavingEquipment	2021	51	120	0.422572	0.355	3.5537	3.45065	0.005	0.219	0.201	473.2205	0.153
PavingEquipment	2021	121	175	0.272687	0.229	3.03229	2.31505	0.005	0.114	0.105	470.6495	0.152
PavingEquipment	2021	176	250	0.250607	0.211	1.20904	2.58202	0.005	0.092	0.085	472.151	0.153
PavingEquipment	2022	16	25	0.68013	0.571	4.24448	3.83611	0.005	0.188	0.173	520.6594	0.168
PavingEquipment	2022	26	50	0.68013	0.571	4.24448	3.83611	0.005	0.188	0.173	520.6594	0.168
PavingEquipment	2022	51	120	0.351718	0.296	3.50075	2.99968	0.005	0.171	0.157	473.4475	0.153
PavingEquipment	2022	121	175	0.253077	0.213	3.03777	2.07331	0.005	0.101	0.093	470.6646	0.152
PavingEquipment	2022	176	250	0.232653	0.195	1.20363	2.22813	0.005	0.083	0.076	472.169	0.153

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
PavingEquipment	2023	16	25	0.644074	0.541	4.24108	3.77446	0.005	0.173	0.159	521.1138	0.169
PavingEquipment	2023	26	50	0.644074	0.541	4.24108	3.77446	0.005	0.173	0.159	521.1138	0.169
PavingEquipment	2023	51	120	0.331302	0.278	3.50331	2.83717	0.005	0.152	0.14	473.427	0.153
PavingEquipment	2023	121	175	0.242414	0.204	3.05059	1.91255	0.005	0.093	0.086	470.663	0.152
PavingEquipment	2023	176	250	0.208228	0.175	1.16523	1.88495	0.005	0.07	0.065	472.169	0.153
PlateCompactors	2020	6	15	0.79	0.661	3.469	4.142	0.008	0.161	0.161	568.299	0.059
PlateCompactors	2021	6	15	0.79	0.661	3.469	4.142	0.008	0.161	0.161	568.299	0.059
PlateCompactors	2022	6	15	0.79	0.661	3.469	4.142	0.008	0.161	0.161	568.299	0.059
PlateCompactors	2023	6	15	0.79	0.661	3.469	4.142	0.008	0.161	0.161	568.299	0.059
PressureWashers	2020	6	15	1.78	0.646	3.546	4.516	0.008	0.212	0.212	568.299	0.058
PressureWashers	2020	16	25	2.904	0.721	2.473	4.538	0.007	0.205	0.205	568.299	0.065
PressureWashers	2020	26	50	4.025	0.499	3.393	3.917	0.007	0.161	0.161	568.299	0.045
PressureWashers	2020	51	120	4.048	0.298	3.225	3.036	0.006	0.151	0.151	568.299	0.026
PressureWashers	2020	121	175	16.638	0.258	2.907	2.383	0.006	0.104	0.104	568.299	0.023
PressureWashers	2020	176	250	8.005	0.098	0.986	0.265	0.006	0.009	0.009	568.299	0.008
PressureWashers	2021	6	15	1.747	0.634	3.531	4.441	0.008	0.201	0.201	568.299	0.057
PressureWashers	2021	16	25	2.87	0.712	2.446	4.497	0.007	0.196	0.196	568.299	0.064
PressureWashers	2021	26	50	3.542	0.439	3.329	3.765	0.007	0.136	0.136	568.299	0.039
PressureWashers	2021	51	120	3.592	0.264	3.21	2.766	0.006	0.129	0.129	568.299	0.023
PressureWashers	2021	121	175	15.389	0.238	2.907	2.118	0.006	0.093	0.093	568.299	0.021
PressureWashers	2021	176	250	8.005	0.098	0.986	0.265	0.006	0.009	0.009	568.299	0.008
PressureWashers	2022	6	15	1.725	0.626	3.519	4.39	0.008	0.193	0.193	568.299	0.056
PressureWashers	2022	16	25	2.847	0.706	2.426	4.47	0.007	0.188	0.188	568.299	0.063
PressureWashers	2022	26	50	3.213	0.398	3.291	3.649	0.007	0.117	0.117	568.3	0.035
PressureWashers	2022	51	120	3.281	0.241	3.202	2.56	0.006	0.112	0.112	568.299	0.021
PressureWashers	2022	121	175	14.252	0.221	2.907	1.871	0.006	0.082	0.082	568.299	0.019
PressureWashers	2022	176	250	8.005	0.098	0.986	0.265	0.006	0.009	0.009	568.299	0.008
PressureWashers	2023	6	15	1.706	0.618	3.508	4.345	0.008	0.186	0.186	568.299	0.055
PressureWashers	2023	16	25	2.827	0.701	2.407	4.447	0.007	0.182	0.182	568.299	0.063
PressureWashers	2023	26	50	2.928	0.363	3.26	3.541	0.007	0.101	0.101	568.299	0.032
PressureWashers	2023	51	120	3.012	0.222	3.196	2.377	0.006	0.097	0.097	568.299	0.02
PressureWashers	2023	121	175	13.244	0.205	2.907	1.665	0.006	0.072	0.072	568.299	0.018
PressureWashers	2023	176	250	8.005	0.098	0.986	0.265	0.006	0.009	0.009	568.299	0.008
Pumps	2020	6	15	1.593	0.731	3.546	4.542	0.008	0.227	0.227	568.299	0.066
Pumps	2020	16	25	4.396	0.769	2.473	4.538	0.007	0.212	0.212	568.299	0.069
Pumps	2020	26	50	7.613	0.755	4.197	4.128	0.007	0.206	0.206	568.299	0.068
Pumps	2020	51	120	8.832	0.386	3.432	3.219	0.006	0.189	0.189	568.299	0.034
Pumps	2020	121	175	11.744	0.285	2.974	2.418	0.006	0.111	0.111	568.299	0.025
Pumps	2020	176	250	12.575	0.212	1.042	2.05	0.006	0.06	0.06	568.299	0.019
Pumps	2020	251	500	20.565	0.203	1.017	1.841	0.005	0.057	0.057	568.3	0.018

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Pumps	2020	501	750	34.373	0.205	1.017	1.884	0.005	0.058	0.058	568.299	0.018
Pumps	2020	1001	9999	101.462	0.255	1.096	3.649	0.005	0.081	0.081	568.3	0.023
Pumps	2021	6	15	1.563	0.717	3.531	4.462	0.008	0.214	0.214	568.299	0.064
Pumps	2021	16	25	4.302	0.752	2.446	4.497	0.007	0.201	0.201	568.299	0.067
Pumps	2021	26	50	6.761	0.671	4.099	3.966	0.007	0.175	0.175	568.299	0.06
Pumps	2021	51	120	7.94	0.347	3.412	2.928	0.006	0.162	0.162	568.3	0.031
Pumps	2021	121	175	10.713	0.26	2.968	2.101	0.006	0.096	0.096	568.299	0.023
Pumps	2021	176	250	11.658	0.197	1.031	1.759	0.006	0.052	0.052	568.299	0.017
Pumps	2021	251	500	19.186	0.189	1.007	1.584	0.005	0.05	0.05	568.299	0.017
Pumps	2021	501	750	32.005	0.191	1.007	1.618	0.005	0.05	0.05	568.299	0.017
Pumps	2021	1001	9999	92.954	0.233	1.074	3.409	0.005	0.072	0.072	568.3	0.021
Pumps	2022	6	15	1.54	0.707	3.519	4.408	0.008	0.203	0.203	568.299	0.063
Pumps	2022	16	25	4.229	0.739	2.426	4.47	0.007	0.193	0.193	568.299	0.066
Pumps	2022	26	50	6.194	0.614	4.048	3.846	0.007	0.152	0.152	568.299	0.055
Pumps	2022	51	120	7.351	0.321	3.404	2.708	0.006	0.142	0.142	568.299	0.029
Pumps	2022	121	175	9.985	0.242	2.969	1.86	0.006	0.085	0.085	568.299	0.021
Pumps	2022	176	250	11.025	0.186	1.025	1.534	0.006	0.045	0.045	568.299	0.016
Pumps	2022	251	500	18.249	0.18	1.001	1.404	0.005	0.044	0.044	568.3	0.016
Pumps	2022	501	750	30.396	0.181	1.001	1.432	0.005	0.044	0.044	568.3	0.016
Pumps	2022	1001	9999	87.313	0.219	1.058	3.236	0.005	0.065	0.065	568.299	0.019
Pumps	2023	6	15	1.521	0.698	3.508	4.359	0.008	0.194	0.194	568.299	0.063
Pumps	2023	16	25	4.165	0.728	2.407	4.447	0.007	0.186	0.186	568.299	0.065
Pumps	2023	26	50	5.699	0.565	4.007	3.734	0.007	0.131	0.131	568.299	0.051
Pumps	2023	51	120	6.838	0.299	3.398	2.511	0.006	0.123	0.123	568.299	0.026
Pumps	2023	121	175	9.349	0.227	2.971	1.662	0.006	0.075	0.075	568.299	0.02
Pumps	2023	176	250	10.47	0.177	1.021	1.351	0.006	0.04	0.04	568.299	0.015
Pumps	2023	251	500	17.411	0.171	0.998	1.246	0.005	0.038	0.038	568.3	0.015
Pumps	2023	501	750	28.971	0.173	0.998	1.271	0.005	0.039	0.039	568.299	0.015
Pumps	2023	1001	9999	82.523	0.207	1.043	3.09	0.005	0.059	0.059	568.299	0.018
Rollers	2020	6	15	1.102095	0.926	4.72504	4.53426	0.005	0.329	0.303	525.8798	0.17
Rollers	2020	16	25	1.102095	0.926	4.72504	4.53426	0.005	0.329	0.303	525.8798	0.17
Rollers	2020	26	50	1.102095	0.926	4.72504	4.53426	0.005	0.329	0.303	525.8798	0.17
Rollers	2020	51	120	0.462004	0.388	3.53135	3.88153	0.005	0.247	0.228	473.8594	0.153
Rollers	2020	121	175	0.256128	0.215	2.93333	2.45176	0.005	0.113	0.104	471.9177	0.153
Rollers	2020	176	250	0.248138	0.209	1.25343	2.75095	0.005	0.089	0.082	473.3669	0.153
Rollers	2020	251	500	0.279691	0.235	2.11346	2.82823	0.005	0.109	0.101	479.3254	0.155
Rollers	2021	6	15	1.008559	0.847	4.59681	4.35097	0.005	0.294	0.27	525.7908	0.17
Rollers	2021	16	25	1.008559	0.847	4.59681	4.35097	0.005	0.294	0.27	525.7908	0.17
Rollers	2021	26	50	1.008559	0.847	4.59681	4.35097	0.005	0.294	0.27	525.7908	0.17
Rollers	2021	51	120	0.42061	0.353	3.50719	3.5889	0.005	0.219	0.202	473.9012	0.153

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Rollers	2021	121	175	0.229571	0.193	2.9256	2.11691	0.005	0.097	0.09	471.9799	0.153
Rollers	2021	176	250	0.23384	0.196	1.22849	2.49332	0.005	0.081	0.075	473.4704	0.153
Rollers	2021	251	500	0.26246	0.221	1.94995	2.58936	0.005	0.1	0.092	479.3294	0.155
Rollers	2022	6	15	0.878567	0.738	4.40241	4.12773	0.005	0.25	0.23	525.691	0.17
Rollers	2022	16	25	0.878567	0.738	4.40241	4.12773	0.005	0.25	0.23	525.691	0.17
Rollers	2022	26	50	0.878567	0.738	4.40241	4.12773	0.005	0.25	0.23	525.691	0.17
Rollers	2022	51	120	0.369089	0.31	3.46973	3.21896	0.005	0.186	0.171	473.9291	0.153
Rollers	2022	121	175	0.195547	0.164	2.91331	1.71408	0.005	0.079	0.072	471.9475	0.153
Rollers	2022	176	250	0.221959	0.187	1.22821	2.2116	0.005	0.077	0.071	473.5135	0.153
Rollers	2022	251	500	0.259221	0.218	1.95495	2.46341	0.005	0.097	0.089	478.9817	0.155
Rollers	2023	6	15	0.786211	0.661	4.25236	3.9211	0.005	0.212	0.195	525.8616	0.17
Rollers	2023	16	25	0.786211	0.661	4.25236	3.9211	0.005	0.212	0.195	525.8616	0.17
Rollers	2023	26	50	0.786211	0.661	4.25236	3.9211	0.005	0.212	0.195	525.8616	0.17
Rollers	2023	51	120	0.341189	0.287	3.45461	3.00302	0.005	0.165	0.152	473.9363	0.153
Rollers	2023	121	175	0.1784	0.15	2.90949	1.4833	0.005	0.068	0.062	471.9351	0.153
Rollers	2023	176	250	0.223864	0.188	1.23448	2.17272	0.005	0.076	0.07	473.5164	0.153
Rollers	2023	251	500	0.25159	0.211	1.95626	2.29003	0.005	0.093	0.085	478.3028	0.155
RoughTerrainForklifts	2020	26	50	1.188595	0.999	4.68594	4.4946	0.005	0.316	0.291	525.6222	0.17
RoughTerrainForklifts	2020	51	120	0.225188	0.189	3.25575	2.45218	0.005	0.103	0.094	472.9842	0.153
RoughTerrainForklifts	2020	121	175	0.170092	0.143	2.84466	1.86888	0.005	0.068	0.063	471.7152	0.153
RoughTerrainForklifts	2020	176	250	0.132727	0.112	0.97848	1.60906	0.005	0.037	0.034	472.5671	0.153
RoughTerrainForklifts	2020	251	500	0.105484	0.089	0.94184	1.30199	0.005	0.028	0.026	465.7709	0.151
RoughTerrainForklifts	2021	26	50	1.152538	0.968	4.65658	4.41145	0.005	0.304	0.279	525.3844	0.17
RoughTerrainForklifts	2021	51	120	0.207836	0.175	3.25191	2.28534	0.005	0.089	0.081	473.11	0.153
RoughTerrainForklifts	2021	121	175	0.154972	0.13	2.8447	1.61661	0.005	0.06	0.055	471.7575	0.153
RoughTerrainForklifts	2021	176	250	0.136824	0.115	0.98379	1.61186	0.005	0.037	0.034	472.5469	0.153
RoughTerrainForklifts	2021	251	500	0.109168	0.092	0.94604	1.30199	0.005	0.028	0.026	465.7442	0.151
RoughTerrainForklifts	2022	26	50	0.93878	0.789	4.3038	4.04131	0.005	0.238	0.219	525.0151	0.17
RoughTerrainForklifts	2022	51	120	0.18871	0.159	3.24374	2.0983	0.005	0.073	0.067	473.089	0.153
RoughTerrainForklifts	2022	121	175	0.142314	0.12	2.84439	1.40475	0.005	0.051	0.047	471.6773	0.153
RoughTerrainForklifts	2022	176	250	0.140994	0.118	0.98924	1.61688	0.005	0.037	0.034	472.5408	0.153
RoughTerrainForklifts	2022	251	500	0.081218	0.068	0.93709	0.55798	0.005	0.009	0.008	466.5598	0.151
RoughTerrainForklifts	2023	26	50	0.82158	0.69	4.12519	3.85338	0.005	0.204	0.187	524.8024	0.17
RoughTerrainForklifts	2023	51	120	0.178416	0.15	3.24217	1.9836	0.005	0.064	0.059	473.1584	0.153
RoughTerrainForklifts	2023	121	175	0.132417	0.111	2.84289	1.21796	0.005	0.043	0.04	471.6217	0.153
RoughTerrainForklifts	2023	176	250	0.137509	0.116	0.98987	1.47399	0.005	0.034	0.032	472.7784	0.153
RoughTerrainForklifts	2023	251	500	0.082146	0.069	0.93788	0.55845	0.005	0.009	0.008	466.554	0.151
RubberTiredDozers	2020	121	175	0.864425	0.726	3.89288	7.18525	0.005	0.411	0.378	473.0116	0.153
RubberTiredDozers	2020	176	250	0.737248	0.619	2.37104	6.50332	0.005	0.318	0.293	474.7928	0.154
RubberTiredDozers	2020	251	500	0.636621	0.535	4.41134	5.64089	0.005	0.259	0.238	479.7569	0.155

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
RubberTiredDozers	2020	501	750	0.543245	0.456	2.60108	6.12255	0.005	0.218	0.201	473.0562	0.153
RubberTiredDozers	2020	751	1000	7.811	0.522	2.164	5.306	0.005	0.16	0.16	568.299	0.047
RubberTiredDozers	2021	121	175	0.822557	0.691	3.84814	6.79037	0.005	0.386	0.355	472.9751	0.153
RubberTiredDozers	2021	176	250	0.714624	0.6	2.31719	6.29617	0.005	0.306	0.281	474.7984	0.154
RubberTiredDozers	2021	251	500	0.585817	0.492	4.04107	5.081	0.005	0.232	0.214	478.9868	0.155
RubberTiredDozers	2021	501	750	0.545338	0.458	2.60396	6.12254	0.005	0.218	0.201	473.0459	0.153
RubberTiredDozers	2021	751	1000	7.448	0.497	2.057	5.095	0.005	0.15	0.15	568.299	0.044
RubberTiredDozers	2022	121	175	0.714312	0.6	3.75194	5.80781	0.005	0.326	0.3	473.9122	0.153
RubberTiredDozers	2022	176	250	0.571708	0.48	2.05563	5.04648	0.005	0.24	0.22	474.6166	0.154
RubberTiredDozers	2022	251	500	0.565033	0.475	3.89489	4.80775	0.005	0.22	0.202	479.3107	0.155
RubberTiredDozers	2022	501	750	0.547387	0.46	2.60677	6.12245	0.005	0.218	0.201	473.035	0.153
RubberTiredDozers	2022	751	1000	7.106	0.475	1.961	4.896	0.005	0.14	0.14	568.299	0.042
RubberTiredDozers	2023	121	175	0.700073	0.588	3.7664	5.65638	0.005	0.316	0.291	473.9009	0.153
RubberTiredDozers	2023	176	250	0.467601	0.393	1.78266	4.09011	0.005	0.184	0.169	474.5967	0.153
RubberTiredDozers	2023	251	500	0.531484	0.447	3.68617	4.40835	0.005	0.202	0.185	479.4678	0.155
RubberTiredDozers	2023	501	750	0.502999	0.423	2.59131	5.33389	0.005	0.196	0.18	473.0234	0.153
RubberTiredDozers	2023	751	1000	6.786	0.453	1.874	4.709	0.005	0.131	0.131	568.299	0.04
RubberTiredLoaders	2020	16	25	1.761913	1.48	6.76793	5.25369	0.005	0.474	0.436	524.6967	0.17
RubberTiredLoaders	2020	26	50	1.761913	1.48	6.76793	5.25369	0.005	0.474	0.436	524.6967	0.17
RubberTiredLoaders	2020	51	120	0.661113	0.556	3.94839	4.68644	0.005	0.367	0.338	465.6735	0.151
RubberTiredLoaders	2020	121	175	0.450696	0.379	3.36809	3.51735	0.005	0.194	0.178	471.2135	0.152
RubberTiredLoaders	2020	176	250	0.345399	0.29	1.26885	3.42116	0.005	0.114	0.104	469.5127	0.152
RubberTiredLoaders	2020	251	500	0.343959	0.289	1.6304	3.01666	0.005	0.112	0.103	466.7831	0.151
RubberTiredLoaders	2020	501	750	0.329462	0.277	1.39991	2.76722	0.005	0.107	0.099	462.193	0.149
RubberTiredLoaders	2020	751	1000	0.370676	0.311	1.20366	5.25309	0.005	0.139	0.127	469.9352	0.152
RubberTiredLoaders	2021	16	25	1.577419	1.325	6.44855	4.97419	0.005	0.409	0.376	524.5505	0.17
RubberTiredLoaders	2021	26	50	1.577419	1.325	6.44855	4.97419	0.005	0.409	0.376	524.5505	0.17
RubberTiredLoaders	2021	51	120	0.592559	0.498	3.8917	4.21491	0.005	0.316	0.291	466.4213	0.151
RubberTiredLoaders	2021	121	175	0.411896	0.346	3.35381	3.11886	0.005	0.171	0.157	471.0804	0.152
RubberTiredLoaders	2021	176	250	0.316703	0.266	1.24034	2.9977	0.005	0.1	0.092	469.5642	0.152
RubberTiredLoaders	2021	251	500	0.314488	0.264	1.52922	2.61037	0.005	0.097	0.09	467.9277	0.151
RubberTiredLoaders	2021	501	750	0.322962	0.271	1.39703	2.64092	0.005	0.102	0.094	462.0548	0.149
RubberTiredLoaders	2021	751	1000	0.350105	0.294	1.2055	4.97489	0.005	0.128	0.118	471.2577	0.152
RubberTiredLoaders	2022	16	25	1.402643	1.179	6.20445	4.74817	0.005	0.354	0.326	524.7914	0.17
RubberTiredLoaders	2022	26	50	1.402643	1.179	6.20445	4.74817	0.005	0.354	0.326	524.7914	0.17
RubberTiredLoaders	2022	51	120	0.523774	0.44	3.83931	3.7684	0.005	0.267	0.245	466.4936	0.151
RubberTiredLoaders	2022	121	175	0.350975	0.295	3.30208	2.5181	0.005	0.136	0.125	470.9274	0.152
RubberTiredLoaders	2022	176	250	0.269035	0.226	1.188	2.34693	0.005	0.079	0.072	469.9041	0.152
RubberTiredLoaders	2022	251	500	0.281674	0.237	1.441	2.17525	0.005	0.081	0.075	468.1288	0.151
RubberTiredLoaders	2022	501	750	0.27713	0.233	1.31524	2.0971	0.005	0.08	0.074	463.8194	0.15

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
RubberTiredLoaders	2022	751	1000	0.229104	0.193	1.16216	3.61655	0.005	0.074	0.069	472.8577	0.153
RubberTiredLoaders	2023	16	25	1.248748	1.049	5.97233	4.52113	0.005	0.304	0.279	524.304	0.17
RubberTiredLoaders	2023	26	50	1.248748	1.049	5.97233	4.52113	0.005	0.304	0.279	524.304	0.17
RubberTiredLoaders	2023	51	120	0.490267	0.412	3.82678	3.51183	0.005	0.238	0.219	466.5584	0.151
RubberTiredLoaders	2023	121	175	0.320411	0.269	3.29198	2.19586	0.005	0.118	0.108	470.6601	0.152
RubberTiredLoaders	2023	176	250	0.249759	0.21	1.17136	2.05963	0.005	0.069	0.063	469.824	0.152
RubberTiredLoaders	2023	251	500	0.258421	0.217	1.38396	1.86629	0.005	0.069	0.064	468.466	0.152
RubberTiredLoaders	2023	501	750	0.269537	0.226	1.32307	1.92719	0.005	0.074	0.069	464.5553	0.15
RubberTiredLoaders	2023	751	1000	0.229405	0.193	1.17379	3.52792	0.005	0.071	0.065	472.3032	0.153
SignalBoards	2020	6	15	1.04	0.661	3.469	4.142	0.008	0.161	0.161	568.299	0.059
SignalBoards	2020	26	50	7.28	0.788	4.448	4.132	0.007	0.206	0.206	568.299	0.071
SignalBoards	2020	51	120	8.081	0.395	3.504	3.134	0.006	0.187	0.187	568.299	0.035
SignalBoards	2020	121	175	11.756	0.298	3.043	2.309	0.006	0.11	0.11	568.299	0.026
SignalBoards	2020	176	250	14.813	0.274	1.281	2.35	0.007	0.071	0.071	686.695	0.024
SignalBoards	2021	6	15	1.04	0.661	3.469	4.142	0.008	0.161	0.161	568.299	0.059
SignalBoards	2021	26	50	6.598	0.714	4.38	4.002	0.007	0.179	0.179	568.299	0.064
SignalBoards	2021	51	120	7.434	0.363	3.493	2.889	0.006	0.162	0.162	568.299	0.032
SignalBoards	2021	121	175	10.965	0.278	3.043	2.043	0.006	0.098	0.098	568.299	0.025
SignalBoards	2021	176	250	14.033	0.26	1.273	2.053	0.007	0.063	0.063	686.695	0.023
SignalBoards	2022	6	15	1.04	0.661	3.469	4.142	0.008	0.161	0.161	568.3	0.059
SignalBoards	2022	26	50	6.047	0.655	4.325	3.88	0.007	0.154	0.154	568.299	0.059
SignalBoards	2022	51	120	6.908	0.337	3.484	2.668	0.006	0.141	0.141	568.299	0.03
SignalBoards	2022	121	175	10.249	0.26	3.044	1.801	0.006	0.086	0.086	568.299	0.023
SignalBoards	2022	176	250	13.317	0.247	1.266	1.782	0.007	0.055	0.055	686.695	0.022
SignalBoards	2023	6	15	1.04	0.661	3.469	4.142	0.008	0.161	0.161	568.299	0.059
SignalBoards	2023	26	50	5.57	0.603	4.282	3.767	0.007	0.132	0.132	568.299	0.054
SignalBoards	2023	51	120	6.449	0.315	3.478	2.472	0.006	0.122	0.122	568.299	0.028
SignalBoards	2023	121	175	9.619	0.244	3.045	1.602	0.006	0.075	0.075	568.299	0.022
SignalBoards	2023	176	250	12.678	0.235	1.263	1.562	0.007	0.048	0.048	686.695	0.021
SkidSteerLoaders	2020	16	25	0.522771	0.439	3.76397	3.69113	0.005	0.145	0.133	527.7577	0.171
SkidSteerLoaders	2020	26	50	0.522771	0.439	3.76397	3.69113	0.005	0.145	0.133	527.7577	0.171
SkidSteerLoaders	2020	51	120	0.224183	0.188	3.2771	2.5046	0.005	0.108	0.1	471.9075	0.153
SkidSteerLoaders	2021	16	25	0.486515	0.409	3.73158	3.57304	0.005	0.126	0.116	527.4501	0.171
SkidSteerLoaders	2021	26	50	0.486515	0.409	3.73158	3.57304	0.005	0.126	0.116	527.4501	0.171
SkidSteerLoaders	2021	51	120	0.211817	0.178	3.27687	2.36588	0.005	0.096	0.089	471.9774	0.153
SkidSteerLoaders	2022	16	25	0.434318	0.365	3.65597	3.43256	0.005	0.103	0.095	527.2726	0.171
SkidSteerLoaders	2022	26	50	0.434318	0.365	3.65597	3.43256	0.005	0.103	0.095	527.2726	0.171
SkidSteerLoaders	2022	51	120	0.195311	0.164	3.27037	2.18922	0.005	0.081	0.075	472.4321	0.153
SkidSteerLoaders	2023	16	25	0.420524	0.353	3.65358	3.37057	0.005	0.093	0.086	527.4231	0.171
SkidSteerLoaders	2023	26	50	0.420524	0.353	3.65358	3.37057	0.005	0.093	0.086	527.4231	0.171

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
SkidSteerLoaders	2023	51	120	0.182613	0.153	3.26613	2.03854	0.005	0.069	0.063	472.656	0.153
SkidSteerLoaders	2024	16	25	0.415881	0.349	3.67076	3.34552	0.005	0.089	0.082	527.8005	0.171
SkidSteerLoaders	2024	26	50	0.415881	0.349	3.67076	3.34552	0.005	0.089	0.082	527.8005	0.171
SkidSteerLoaders	2024	51	120	0.174841	0.147	3.26403	1.94841	0.005	0.063	0.058	472.847	0.153
SurfacingEquipment	2020	26	50	0.637406	0.536	3.93357	4.23906	0.006	0.216	0.199	535.5275	0.173
SurfacingEquipment	2020	51	120	0.392345	0.33	3.43932	3.61216	0.005	0.206	0.19	473.8188	0.153
SurfacingEquipment	2020	121	175	0.365927	0.307	2.93068	3.67232	0.005	0.175	0.161	469.2079	0.152
SurfacingEquipment	2020	176	250	0.252128	0.212	1.21774	3.22243	0.005	0.097	0.089	476.4261	0.154
SurfacingEquipment	2020	251	500	0.173203	0.146	1.21902	1.83755	0.005	0.067	0.062	471.6331	0.153
SurfacingEquipment	2020	501	750	0.168871	0.142	0.99569	2.09374	0.005	0.074	0.068	469.6252	0.152
SurfacingEquipment	2021	26	50	0.60314	0.507	3.93231	4.18875	0.006	0.204	0.188	535.784	0.173
SurfacingEquipment	2021	51	120	0.370907	0.312	3.43619	3.46112	0.005	0.191	0.175	474.0906	0.153
SurfacingEquipment	2021	121	175	0.307112	0.258	2.91895	3.09858	0.005	0.145	0.134	469.1687	0.152
SurfacingEquipment	2021	176	250	0.245986	0.207	1.21854	2.99364	0.005	0.092	0.085	476.8023	0.154
SurfacingEquipment	2021	251	500	0.167588	0.141	1.20226	1.75282	0.005	0.064	0.058	471.7484	0.153
SurfacingEquipment	2021	501	750	0.148862	0.125	0.99181	1.59712	0.005	0.062	0.057	470.4087	0.152
SurfacingEquipment	2022	26	50	0.509163	0.428	3.77243	3.9114	0.006	0.154	0.142	535.8364	0.173
SurfacingEquipment	2022	51	120	0.34882	0.293	3.40936	3.24974	0.005	0.175	0.161	473.6362	0.153
SurfacingEquipment	2022	121	175	0.283918	0.239	2.90957	2.70137	0.005	0.13	0.12	469.1259	0.152
SurfacingEquipment	2022	176	250	0.233135	0.196	1.21737	2.66709	0.005	0.085	0.078	476.9511	0.154
SurfacingEquipment	2022	251	500	0.157417	0.132	1.16047	1.5573	0.005	0.057	0.053	470.5248	0.152
SurfacingEquipment	2022	501	750	0.136805	0.115	0.98819	1.35503	0.005	0.052	0.048	470.4004	0.152
SurfacingEquipment	2023	26	50	0.51987	0.437	3.83184	3.92432	0.006	0.155	0.143	535.9295	0.173
SurfacingEquipment	2023	51	120	0.321277	0.27	3.39556	3.05811	0.005	0.157	0.144	474.4698	0.153
SurfacingEquipment	2023	121	175	0.267066	0.224	2.91383	2.45516	0.005	0.119	0.11	470.0141	0.152
SurfacingEquipment	2023	176	250	0.22795	0.192	1.21946	2.50162	0.005	0.082	0.075	476.9606	0.154
SurfacingEquipment	2023	251	500	0.156473	0.131	1.16329	1.47556	0.005	0.056	0.051	470.3746	0.152
SurfacingEquipment	2023	501	750	0.119512	0.1	0.98543	1.08063	0.005	0.04	0.037	472.4466	0.153
Sweepers/Scrubbers	2020	16	25	1.599203	1.344	6.1554	5.09515	0.005	0.463	0.426	525.3284	0.17
Sweepers/Scrubbers	2020	26	50	1.599203	1.344	6.1554	5.09515	0.005	0.463	0.426	525.3284	0.17
Sweepers/Scrubbers	2020	51	120	0.618762	0.52	3.82752	4.4821	0.005	0.36	0.331	474.1157	0.153
Sweepers/Scrubbers	2020	121	175	0.549287	0.462	3.35909	4.60809	0.005	0.237	0.218	473.1221	0.153
Sweepers/Scrubbers	2020	176	250	0.246498	0.207	1.13655	2.4856	0.005	0.079	0.073	470.1263	0.152
Sweepers/Scrubbers	2021	6	15	1.450842	1.219	5.89996	4.84946	0.005	0.412	0.379	525.3284	0.17
Sweepers/Scrubbers	2021	16	25	1.450842	1.219	5.89996	4.84946	0.005	0.412	0.379	525.3284	0.17
Sweepers/Scrubbers	2021	26	50	1.450842	1.219	5.89996	4.84946	0.005	0.412	0.379	525.3284	0.17
Sweepers/Scrubbers	2021	51	120	0.523878	0.44	3.75746	3.96194	0.005	0.291	0.268	474.1157	0.153
Sweepers/Scrubbers	2021	121	175	0.457963	0.385	3.24726	3.70723	0.005	0.187	0.172	473.1221	0.153
Sweepers/Scrubbers	2021	176	250	0.195441	0.164	1.1084	1.75821	0.005	0.055	0.051	470.1263	0.152
Sweepers/Scrubbers	2022	6	15	1.199805	1.008	5.45118	4.49049	0.005	0.335	0.308	525.3284	0.17

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Sweepers/Scrubbers	2022	16	25	1.199805	1.008	5.45118	4.49049	0.005	0.335	0.308	525.3284	0.17
Sweepers/Scrubbers	2022	26	50	1.199805	1.008	5.45118	4.49049	0.005	0.335	0.308	525.3284	0.17
Sweepers/Scrubbers	2022	51	120	0.443216	0.372	3.69196	3.47218	0.005	0.232	0.214	474.1157	0.153
Sweepers/Scrubbers	2022	121	175	0.382446	0.321	3.22176	3.00243	0.005	0.145	0.133	473.1221	0.153
Sweepers/Scrubbers	2022	176	250	0.181362	0.152	1.10147	1.60484	0.005	0.05	0.046	470.1263	0.152
Sweepers/Scrubbers	2023	6	15	0.903476	0.759	4.97095	4.12735	0.005	0.248	0.229	525.3284	0.17
Sweepers/Scrubbers	2023	16	25	0.903476	0.759	4.97095	4.12735	0.005	0.248	0.229	525.3284	0.17
Sweepers/Scrubbers	2023	26	50	0.903476	0.759	4.97095	4.12735	0.005	0.248	0.229	525.3284	0.17
Sweepers/Scrubbers	2023	51	120	0.417244	0.351	3.69499	3.28536	0.005	0.21	0.193	474.1157	0.153
Sweepers/Scrubbers	2023	121	175	0.347747	0.292	3.22298	2.60853	0.005	0.126	0.116	473.1221	0.153
Sweepers/Scrubbers	2023	176	250	0.188622	0.158	1.11413	1.61028	0.005	0.05	0.046	470.1263	0.152
Tractors/Loaders/Backhoes	2020	16	25	0.987255	0.83	5.03491	4.39784	0.005	0.288	0.265	515.874	0.167
Tractors/Loaders/Backhoes	2020	26	50	0.987255	0.83	5.03491	4.39784	0.005	0.288	0.265	515.874	0.167
Tractors/Loaders/Backhoes	2020	51	120	0.393883	0.331	3.60147	3.32571	0.005	0.21	0.193	475.1543	0.154
Tractors/Loaders/Backhoes	2020	121	175	0.29217	0.246	3.10518	2.41467	0.005	0.122	0.112	467.5132	0.151
Tractors/Loaders/Backhoes	2020	176	250	0.268036	0.225	1.19592	2.73794	0.005	0.09	0.083	470.4998	0.152
Tractors/Loaders/Backhoes	2020	251	500	0.230511	0.194	1.35815	2.07976	0.005	0.073	0.067	468.2447	0.151
Tractors/Loaders/Backhoes	2020	501	750	0.318709	0.268	1.60984	3.11926	0.005	0.117	0.108	468.6602	0.152
Tractors/Loaders/Backhoes	2021	16	25	0.899672	0.756	4.90172	4.22643	0.005	0.254	0.234	515.1213	0.167
Tractors/Loaders/Backhoes	2021	26	50	0.899672	0.756	4.90172	4.22643	0.005	0.254	0.234	515.1213	0.167
Tractors/Loaders/Backhoes	2021	51	120	0.35209	0.296	3.57072	2.995	0.005	0.177	0.162	475.3621	0.154
Tractors/Loaders/Backhoes	2021	121	175	0.263016	0.221	3.0907	2.06221	0.005	0.104	0.096	467.5285	0.151
Tractors/Loaders/Backhoes	2021	176	250	0.249239	0.209	1.18606	2.36922	0.005	0.08	0.074	470.5716	0.152
Tractors/Loaders/Backhoes	2021	251	500	0.213479	0.179	1.34147	1.776	0.005	0.064	0.059	469.3025	0.152
Tractors/Loaders/Backhoes	2021	501	750	0.294477	0.247	1.43254	2.75417	0.005	0.104	0.096	466.4564	0.151
Tractors/Loaders/Backhoes	2022	16	25	0.818675	0.688	4.75954	4.03024	0.005	0.218	0.2	514.4613	0.166
Tractors/Loaders/Backhoes	2022	26	50	0.818675	0.688	4.75954	4.03024	0.005	0.218	0.2	514.4613	0.166
Tractors/Loaders/Backhoes	2022	51	120	0.309669	0.26	3.53551	2.64718	0.005	0.142	0.131	475.8975	0.154
Tractors/Loaders/Backhoes	2022	121	175	0.237945	0.2	3.07944	1.75274	0.005	0.089	0.082	467.8004	0.151
Tractors/Loaders/Backhoes	2022	176	250	0.222521	0.187	1.16248	1.94251	0.005	0.067	0.062	470.1236	0.152
Tractors/Loaders/Backhoes	2022	251	500	0.190771	0.16	1.28026	1.43694	0.005	0.053	0.049	469.2562	0.152
Tractors/Loaders/Backhoes	2022	501	750	0.276438	0.232	1.35272	2.4532	0.005	0.094	0.087	466.6327	0.151
Tractors/Loaders/Backhoes	2023	16	25	0.738634	0.621	4.62935	3.85698	0.005	0.185	0.17	513.7962	0.166
Tractors/Loaders/Backhoes	2023	26	50	0.738634	0.621	4.62935	3.85698	0.005	0.185	0.17	513.7962	0.166
Tractors/Loaders/Backhoes	2023	51	120	0.284572	0.239	3.52504	2.42607	0.005	0.12	0.11	476.4307	0.154
Tractors/Loaders/Backhoes	2023	121	175	0.219196	0.184	3.0777	1.52095	0.005	0.077	0.07	468.821	0.152
Tractors/Loaders/Backhoes	2023	176	250	0.201205	0.169	1.14809	1.58768	0.005	0.058	0.053	469.7518	0.152
Tractors/Loaders/Backhoes	2023	251	500	0.180818	0.152	1.27923	1.24708	0.005	0.047	0.043	469.4652	0.152
Tractors/Loaders/Backhoes	2023	501	750	0.278685	0.234	1.36081	2.41861	0.005	0.095	0.087	466.6756	0.151
Trenchers	2020	6	15	1.076913	0.905	4.8331	4.67651	0.005	0.356	0.328	527.0962	0.17

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EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Trenchers	2020	16	25	1.076913	0.905	4.8331	4.67651	0.005	0.356	0.328	527.0962	0.17
Trenchers	2020	26	50	1.076913	0.905	4.8331	4.67651	0.005	0.356	0.328	527.0962	0.17
Trenchers	2020	51	120	0.726229	0.61	3.83272	5.51952	0.005	0.413	0.38	475.1265	0.154
Trenchers	2020	121	175	0.500709	0.421	3.32968	4.46042	0.005	0.228	0.21	467.7348	0.151
Trenchers	2020	176	250	0.466499	0.392	1.77405	4.8091	0.005	0.195	0.179	473.5951	0.153
Trenchers	2020	251	500	0.276702	0.233	1.85932	2.775	0.005	0.105	0.097	470.6367	0.152
Trenchers	2020	501	750	0.083454	0.07	0.95004	0.56006	0.005	0.009	0.008	472.6556	0.153
Trenchers	2021	6	15	0.962829	0.809	4.66576	4.45891	0.005	0.313	0.288	527.0165	0.17
Trenchers	2021	16	25	0.962829	0.809	4.66576	4.45891	0.005	0.313	0.288	527.0165	0.17
Trenchers	2021	26	50	0.962829	0.809	4.66576	4.45891	0.005	0.313	0.288	527.0165	0.17
Trenchers	2021	51	120	0.661739	0.556	3.78912	5.10594	0.005	0.371	0.341	475.287	0.154
Trenchers	2021	121	175	0.483838	0.407	3.30363	4.27237	0.005	0.219	0.201	467.7343	0.151
Trenchers	2021	176	250	0.42408	0.356	1.66826	4.36036	0.005	0.172	0.158	473.8538	0.153
Trenchers	2021	251	500	0.263326	0.221	1.86493	2.49105	0.005	0.1	0.092	470.701	0.152
Trenchers	2021	501	750	0.078358	0.066	0.94677	0.47513	0.005	0.009	0.008	472.5289	0.153
Trenchers	2022	6	15	0.859634	0.722	4.51833	4.26873	0.005	0.275	0.253	527.0258	0.17
Trenchers	2022	16	25	0.859634	0.722	4.51833	4.26873	0.005	0.275	0.253	527.0258	0.17
Trenchers	2022	26	50	0.859634	0.722	4.51833	4.26873	0.005	0.275	0.253	527.0258	0.17
Trenchers	2022	51	120	0.629528	0.529	3.77843	4.91345	0.005	0.348	0.32	475.3262	0.154
Trenchers	2022	121	175	0.470645	0.395	3.31289	4.10333	0.005	0.211	0.195	467.7337	0.151
Trenchers	2022	176	250	0.398562	0.335	1.66329	3.85292	0.005	0.16	0.148	473.8512	0.153
Trenchers	2022	251	500	0.252168	0.212	1.87233	2.21226	0.005	0.094	0.086	470.5845	0.152
Trenchers	2022	501	750	0.067683	0.057	0.94489	0.30138	0.005	0.009	0.008	474.2887	0.153
Trenchers	2023	6	15	0.763609	0.642	4.30164	3.95873	0.005	0.22	0.202	527.0954	0.17
Trenchers	2023	16	25	0.763609	0.642	4.30164	3.95873	0.005	0.22	0.202	527.0954	0.17
Trenchers	2023	26	50	0.763609	0.642	4.30164	3.95873	0.005	0.22	0.202	527.0954	0.17
Trenchers	2023	51	120	0.599816	0.504	3.76842	4.70045	0.005	0.326	0.3	475.6903	0.154
Trenchers	2023	121	175	0.427489	0.359	3.29061	3.65725	0.005	0.185	0.171	467.7332	0.151
Trenchers	2023	176	250	0.390278	0.328	1.6386	3.7365	0.005	0.155	0.143	473.8485	0.153
Trenchers	2023	251	500	0.236268	0.199	1.72273	2.00504	0.005	0.085	0.078	471.6125	0.153
Trenchers	2023	501	750	0.071688	0.06	0.95111	0.30278	0.005	0.009	0.008	474.4705	0.153
Welders	2020	6	15	1.835	0.731	3.546	4.542	0.008	0.227	0.227	568.299	0.066
Welders	2020	16	25	3.507	0.769	2.473	4.538	0.007	0.212	0.212	568.299	0.069
Welders	2020	26	50	9.83	0.937	4.84	4.304	0.007	0.238	0.238	568.299	0.084
Welders	2020	51	120	7.278	0.455	3.605	3.351	0.006	0.216	0.216	568.299	0.041
Welders	2020	121	175	13.663	0.344	3.122	2.523	0.006	0.127	0.127	568.299	0.031
Welders	2020	176	250	12.577	0.261	1.093	2.143	0.006	0.066	0.066	568.299	0.023
Welders	2020	251	500	17.094	0.252	1.055	1.91	0.005	0.064	0.064	568.299	0.022
Welders	2021	6	15	1.8	0.717	3.531	4.462	0.008	0.214	0.214	568.299	0.064
Welders	2021	16	25	3.431	0.752	2.446	4.497	0.007	0.201	0.201	568.299	0.067

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Welders	2021	26	50	8.704	0.829	4.708	4.133	0.007	0.203	0.203	568.299	0.074
Welders	2021	51	120	6.572	0.411	3.579	3.042	0.006	0.184	0.184	568.299	0.037
Welders	2021	121	175	12.512	0.315	3.112	2.189	0.006	0.11	0.11	568.299	0.028
Welders	2021	176	250	11.711	0.243	1.081	1.836	0.006	0.057	0.057	568.299	0.021
Welders	2021	251	500	15.998	0.236	1.044	1.642	0.005	0.055	0.055	568.299	0.021
Welders	2022	6	15	1.774	0.707	3.519	4.408	0.008	0.203	0.203	568.3	0.063
Welders	2022	16	25	3.374	0.739	2.426	4.47	0.007	0.193	0.193	568.299	0.066
Welders	2022	26	50	7.959	0.758	4.645	4.007	0.007	0.175	0.175	568.299	0.068
Welders	2022	51	120	6.112	0.382	3.57	2.808	0.006	0.16	0.16	568.299	0.034
Welders	2022	121	175	11.714	0.295	3.113	1.935	0.006	0.097	0.097	568.3	0.026
Welders	2022	176	250	11.128	0.231	1.074	1.598	0.006	0.05	0.05	568.299	0.02
Welders	2022	251	500	15.267	0.225	1.038	1.454	0.005	0.049	0.049	568.3	0.02
Welders	2023	6	15	1.751	0.698	3.508	4.359	0.008	0.194	0.194	568.3	0.063
Welders	2023	16	25	3.322	0.728	2.407	4.447	0.007	0.186	0.186	568.299	0.065
Welders	2023	26	50	7.318	0.697	4.596	3.891	0.007	0.151	0.151	568.299	0.062
Welders	2023	51	120	5.713	0.357	3.564	2.599	0.006	0.139	0.139	568.299	0.032
Welders	2023	121	175	11.013	0.277	3.115	1.726	0.006	0.085	0.085	568.299	0.025
Welders	2023	176	250	10.606	0.22	1.071	1.404	0.006	0.044	0.044	568.299	0.019
Welders	2023	251	500	14.602	0.215	1.034	1.289	0.005	0.042	0.042	568.299	0.019

Vehicle Trips Emissions Calculations

WORKERS

SCEN	Year	Description	Length (months)	Length (days)	Workers	Trips (/day)	Trip Length	W-VMT (mi/day)
1	2020	Access Road Paving	3	60	15	30	15	450
2	2020	Site Mobilization	2	40	10	20	15	300
3	2020	LAAS REALIGNMENT	5	100	25	50	15	750
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60	45	90	15	1350
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80	75	150	15	2250
6	2021	Plant Excavation & Grading	4	80	25	50	15	750
7	2021	Plant Structural	1	20	25	50	15	750
8	2022	Plant Structural	4	80	25	50	15	750
9	2022	Plant Construction & Finishing	8	160	20	40	15	600
10	2023	Plant Construction & Finishing	7	140	20	40	15	600
11	2023	Demobilization	1	20	20	40	15	600

HAUL TRUCKS (OFFSITE)

SCEN	Year	Description	Length (months)	Length (days)	Workers	Haul Trips (one-way/day)	Trip Length	H-VMT (mi/day)
1	2020	Access Road Paving	3	60	15	26	20	520
2	2020	Site Mobilization	2	40	10	4	20	80
3	2020	LAAS REALIGNMENT	5	100	25	32	20	640
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60	45	118	20	2360
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80	75	96	20	1920
6	2021	Plant Excavation & Grading	4	80	25	12	20	240
7	2021	Plant Structural	1	20	25	20	20	400
8	2022	Plant Structural	4	80	25	96	20	1920
9	2022	Plant Construction & Finishing	8	160	20	16	20	320
10	2023	Plant Construction & Finishing	7	140	20	16	20	320
11	2023	Demobilization	1	20	20	4	20	80

Vehicle Trips Emissions Calculations

WORKERS

SCEN	Year	Worker Emission Rates (g/mi)						Worker Emissions (lb/day)						Worker Emissions (lb/phase)					
		ROG	CO	NOX	SOX	PM10	PM2_5	ROG	CO	NOX	SOX	PM10	PM2.5	ROG	CO	NOX	SOX	PM10	PM2.5
1	2020	0.020349	1.119085	0.10409	0.002757	0.046707	0.019554	0.0201877	1.1102225	0.1032653	0.002735	0.0463371	0.0193987	1.211261	66.61335	6.1959185	0.164102	2.780224	1.163924
2	2020	0.020349	1.119085	0.10409	0.002757	0.046707	0.019554	0.0134585	0.7401483	0.0688435	0.0018234	0.0308914	0.0129325	0.538338	29.60593	2.7537416	0.072934	1.235655	0.5173
3	2020	0.020349	1.119085	0.10409	0.002757	0.046707	0.019554	0.0336461	1.8503708	0.1721088	0.0045584	0.0772284	0.0323312	3.364614	185.0371	17.210885	0.455838	7.722843	3.233123
4	2021	0.018488	1.033811	0.094401	0.002665	0.046638	0.01949	0.0550233	3.0768735	0.280961	0.0079328	0.1388062	0.0580066	3.301399	184.6124	16.857661	0.475969	8.328372	3.480397
5	2021	0.018488	1.033811	0.094401	0.002665	0.046638	0.01949	0.0917055	5.1281225	0.4682684	0.0132214	0.2313437	0.0966777	7.336442	410.2498	37.46147	1.057708	18.50749	7.734216
6	2021	0.018488	1.033811	0.094401	0.002665	0.046638	0.01949	0.0305685	1.7093742	0.1560895	0.0044071	0.0771146	0.0322259	2.445481	136.7499	12.487157	0.352569	6.169164	2.578072
7	2021	0.018488	1.033811	0.094401	0.002665	0.046638	0.01949	0.0305685	1.7093742	0.1560895	0.0044071	0.0771146	0.0322259	0.61137	34.18748	3.1217891	0.088142	1.542291	0.644518
8	2022	0.016788	0.957636	0.085802	0.002572	0.046575	0.019431	0.0277589	1.5834213	0.1418711	0.0042533	0.0770103	0.0321294	2.22071	126.6737	11.349692	0.340261	6.160821	2.570348
9	2022	0.016788	0.957636	0.085802	0.002572	0.046575	0.019431	0.0222071	1.266737	0.1134969	0.0034026	0.0616082	0.0257035	3.553136	202.6779	18.159507	0.544418	9.857313	4.112557
10	2023	0.015227	0.887061	0.078084	0.002475	0.04652	0.019381	0.0201417	1.1733818	0.1032871	0.0032744	0.0615359	0.0256365	2.819838	164.2735	14.460201	0.458417	8.615032	3.589113
11	2023	0.015227	0.887061	0.078084	0.002475	0.04652	0.019381	0.0201417	1.1733818	0.1032871	0.0032744	0.0615359	0.0256365	0.402834	23.46764	2.0657429	0.065488	1.230719	0.51273

HAUL TRUCKS (OFFSITE)

SCEN	Year	Truck Emission Rates (g/mi)						Truck Emissions (lb/day)						Off-Site Truck Emissions (lb/phase)					
1	2020	0.106577	0.848913	2.919718	0.014901	0.111809	0.049045	0.1221808	0.9731976	3.3471782	0.0170828	0.1281782	0.0562253	7.330848	58.39186	200.83069	1.024967	7.690689	3.373519
2	2020	0.106577	0.848913	2.919718	0.014901	0.111809	0.049045	0.018797	0.1497227	0.5149505	0.0026281	0.0197197	0.00865	0.751882	5.988908	20.59802	0.105125	0.788789	0.346002
3	2020	0.106577	0.848913	2.919718	0.014901	0.111809	0.049045	0.1503764	1.1977817	4.1196039	0.021025	0.1577577	0.0692004	15.03764	119.7782	411.96039	2.102497	15.77577	6.920038
4	2021	0.100014	0.798659	2.52465	0.014716	0.110087	0.047392	0.5203665	4.1553533	13.135535	0.0765668	0.5727708	0.246576	31.22199	249.3212	788.13208	4.594006	34.36625	14.79456
5	2021	0.100014	0.798659	2.52465	0.014716	0.110087	0.047392	0.423349	3.3806264	10.686537	0.0622916	0.465983	0.2006042	33.86792	270.4501	854.92293	4.983328	37.27864	16.04834
6	2021	0.100014	0.798659	2.52465	0.014716	0.110087	0.047392	0.0529186	0.4225783	1.3358171	0.0077865	0.0582479	0.0250755	4.23349	33.80626	106.86537	0.622916	4.65983	2.006042
7	2021	0.100014	0.798659	2.52465	0.014716	0.110087	0.047392	0.0881977	0.7042972	2.2263618	0.0129774	0.0970798	0.0417925	1.763954	14.08594	44.527236	0.259548	1.941596	0.835851
8	2022	0.093674	0.768136	2.134969	0.014523	0.10811	0.045496	0.396509	3.2514266	9.0370655	0.0614736	0.4576154	0.1925784	31.72072	260.1141	722.96524	4.917886	36.60923	15.40627
9	2022	0.093674	0.768136	2.134969	0.014523	0.10811	0.045496	0.0660848	0.5419044	1.5061776	0.0102456	0.0762692	0.0320964	10.57357	86.70471	240.98841	1.639295	12.20308	5.135425
10	2023	0.072466	0.711757	1.155444	0.014135	0.10324	0.040834	0.0511234	0.5021302	0.8151426	0.0099721	0.0728339	0.0288074	7.157274	70.29822	114.11996	1.396099	10.19675	4.033033
11	2023	0.072466	0.711757	1.155444	0.014135	0.10324	0.040834	0.0127808	0.1255325	0.2037856	0.002493	0.0182085	0.0072018	0.255617	2.510651	4.075713	0.049861	0.36417	0.144037

Vehicle Trips Emissions Calculations

HAUL TRUCKS (ON-SITE)

SCEN	Year	Description	Length (months)	Length (days)	Workers	Haul Trips (one-way/day)	Trip Length	H-VMT (mi/day)
1	2020	Access Road Paving	3	60	15		0.25	0
2	2020	Site Mobilization	2	40	10		0.25	0
3	2020	LAAS REALIGNMENT	5	100	25		0.25	0
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60	45		0.25	0
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80	75		0.25	0
6	2021	Plant Excavation & Grading	4	80	25	676	0.25	169
7	2021	Plant Structural	1	20	25		0.25	0
8	2022	Plant Structural	4	80	25		0.25	0
9	2022	Plant Construction & Finishing	8	160	20		0.25	0
10	2023	Plant Construction & Finishing	7	140	20		0.25	0
11	2023	Demobilization	1	20	20		0.25	0

DUMP/PICKUP/WATER (ON-SITE)

SCEN	Year	Description	Length (months)	Length (days)	Count	Trips (one-way/day)	Trip Length	H-VMT (mi/day)
1	2020	Access Road Paving	3	60	4	480	0.25	120
2	2020	Site Mobilization	2	40	4	480	0.25	120
3	2020	LAAS REALIGNMENT	5	100	14	1680	0.25	420
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60	20	2400	0.25	600
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80	17	2040	0.25	510
6	2021	Plant Excavation & Grading	4	80	18	2160	0.25	540
7	2021	Plant Structural	1	20	6	720	0.25	180
8	2022	Plant Structural	4	80	6	720	0.25	180
9	2022	Plant Construction & Finishing	8	160	7	840	0.25	210
10	2023	Plant Construction & Finishing	7	140	7	840	0.25	210
11	2023	Demobilization	1	20	3	360	0.25	90

Vehicle Trips Emissions Calculations

HAUL TRUCKS (ON-SITE)

SCEN	Year	Truck Emission Rates (g/mi)						Truck Emissions (lb/day)						On-Site Truck Emissions (lb/phase)					
1	2020	0.496458	2.797273	10.05811	0.021859	0.120046	0.056925	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	2020	0.496458	2.797273	10.05811	0.021859	0.120046	0.056925	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	2020	0.496458	2.797273	10.05811	0.021859	0.120046	0.056925	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	2021	0.46598	2.686791	9.715166	0.02153	0.116937	0.053946	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	2021	0.46598	2.686791	9.715166	0.02153	0.116937	0.053946	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	2021	0.46598	2.686791	9.715166	0.02153	0.116937	0.053946	0.174	1.001	3.620	0.008	0.044	0.020	13.889	80.084	289.575	0.642	3.485	1.608
7	2021	0.46598	2.686791	9.715166	0.02153	0.116937	0.053946	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	2022	0.437678	2.611046	9.349267	0.021184	0.114259	0.051378	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	2022	0.437678	2.611046	9.349267	0.021184	0.114259	0.051378	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	2023	0.338014	2.399378	8.587147	0.020478	0.106393	0.04385	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	2023	0.338014	2.399378	8.587147	0.020478	0.106393	0.04385	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

DUMP/PICKUP/WATER (ON-SITE)

SCEN	Year	Truck Emission Rates (g/mi)						Truck Emissions (lb/day)						On-Site Dump/Pickup/Water Emissions (lb/phase)					
1	2020	0.356848	1.352496	4.780462	0.016757	0.189694	0.104151	0.094406	0.3578095	1.2646947	0.0044332	0.0501846	0.0275536	5.66436	21.46857	75.881685	0.265989	3.011074	1.653215
2	2020	0.356848	1.352496	4.780462	0.016757	0.189694	0.104151	0.094406	0.3578095	1.2646947	0.0044332	0.0501846	0.0275536	3.77624	14.31238	50.58779	0.177326	2.007383	1.102143
3	2020	0.356848	1.352496	4.780462	0.016757	0.189694	0.104151	0.330421	1.2523334	4.4264316	0.015516	0.175646	0.0964375	33.0421	125.2333	442.64316	1.551603	17.5646	9.643754
4	2021	0.177171	1.02054	3.979015	0.016564	0.151646	0.067748	0.2343568	1.3499443	5.2633401	0.02191	0.2005933	0.0896159	14.06141	80.99666	315.80041	1.3146	12.0356	5.376955
5	2021	0.177171	1.02054	3.979015	0.016564	0.151646	0.067748	0.1992033	1.1474526	4.4738391	0.0186235	0.1705043	0.0761735	15.93626	91.79621	357.90713	1.48988	13.64034	6.093883
6	2021	0.177171	1.02054	3.979015	0.016564	0.151646	0.067748	0.2109211	1.2149499	4.7370061	0.019719	0.180534	0.0806543	16.87369	97.19599	378.96049	1.57752	14.44272	6.452346
7	2021	0.177171	1.02054	3.979015	0.016564	0.151646	0.067748	0.070307	0.4049833	1.579002	0.006573	0.060178	0.0268848	1.406141	8.099666	31.580041	0.13146	1.20356	0.537696
8	2022	0.168935	0.954008	3.971849	0.01648	0.150876	0.067012	0.0670388	0.3785813	1.5761585	0.0065396	0.0598725	0.0265925	5.363104	30.2865	126.09268	0.523171	4.789798	2.127401
9	2022	0.168935	0.954008	3.971849	0.01648	0.150876	0.067012	0.0782119	0.4416781	1.8388516	0.0076296	0.0698512	0.0310246	12.51391	70.6685	294.21625	1.220733	11.17619	4.963936
10	2023	0.133729	0.849365	3.714006	0.016285	0.146867	0.063176	0.0619127	0.3932316	1.7194778	0.0075395	0.0679951	0.0292488	8.667772	55.05243	240.72689	1.055528	9.519318	4.094836
11	2023	0.133729	0.849365	3.714006	0.016285	0.146867	0.063176	0.026534	0.1685278	0.736919	0.0032312	0.0291408	0.0125352	0.53068	3.370557	14.738381	0.064624	0.582815	0.250704

Vehicle Trips Emissions Calculations

		Total Mobile Source Emissions (Exhaust lb/day)						Total Mobile Source Emissions (Exhaust lb/phase)					
SCEN	Year	ROG	CO	NOX	SOX	PM10	PM2.5	ROG	CO	NOX	SOX	PM10	PM2.5
1	2020	0.237	2.441	4.715	0.024	0.225	0.103	14.206	146.474	282.908	1.455	13.482	6.191
2	2020	0.127	1.248	1.848	0.009	0.101	0.049	5.066	49.907	73.940	0.355	4.032	1.965
3	2020	0.514	4.300	8.718	0.041	0.411	0.198	51.444	430.049	871.814	4.110	41.063	19.797
4	2021	0.810	8.582	18.680	0.106	0.912	0.394	48.585	514.930	1120.790	6.385	54.730	23.652
5	2021	0.714	9.656	15.629	0.094	0.868	0.373	57.141	772.496	1250.292	7.531	69.426	29.876
6	2021	0.468	4.348	9.849	0.040	0.359	0.158	37.442	347.836	787.888	3.195	28.757	12.644
7	2021	0.189	2.819	3.961	0.024	0.234	0.101	3.781	56.373	79.229	0.479	4.687	2.018
8	2022	0.491	5.213	10.755	0.072	0.594	0.251	39.305	417.074	860.408	5.781	47.560	20.104
9	2022	0.167	2.250	3.459	0.021	0.208	0.089	26.641	360.051	553.364	3.404	33.237	14.212
10	2023	0.133	2.069	2.638	0.021	0.202	0.084	18.645	289.624	369.307	2.910	28.331	11.717
11	2023	0.059	1.467	1.044	0.009	0.109	0.045	1.189	29.349	20.880	0.180	2.178	0.907

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2020	Los Angeles (MD)	HHDT	RUNEX	15	CH4	0.0558
2020	Los Angeles (MD)	LDA	RUNEX	15	CH4	0.0159
2020	Los Angeles (MD)	LDT1	RUNEX	15	CH4	0.0506
2020	Los Angeles (MD)	LDT2	RUNEX	15	CH4	0.0220
2020	Los Angeles (MD)	MHDT	RUNEX	15	CH4	0.0268
2020	Los Angeles (MD)	HHDT	RUNEX	40	CH4	0.0123
2020	Los Angeles (MD)	LDA	RUNEX	40	CH4	0.0047
2020	Los Angeles (MD)	LDT1	RUNEX	40	CH4	0.0164
2020	Los Angeles (MD)	LDT2	RUNEX	40	CH4	0.0067
2020	Los Angeles (MD)	MHDT	RUNEX	40	CH4	0.0070
2020	Los Angeles (MD)	HHDT	RUNEX	15	CO	2.7973
2020	Los Angeles (MD)	LDA	RUNEX	15	CO	1.1022
2020	Los Angeles (MD)	LDT1	RUNEX	15	CO	3.4054
2020	Los Angeles (MD)	LDT2	RUNEX	15	CO	1.4941
2020	Los Angeles (MD)	MHDT	RUNEX	15	CO	1.3525
2020	Los Angeles (MD)	HHDT	RUNEX	40	CO	0.8489
2020	Los Angeles (MD)	LDA	RUNEX	40	CO	0.7104
2020	Los Angeles (MD)	LDT1	RUNEX	40	CO	2.0924
2020	Los Angeles (MD)	LDT2	RUNEX	40	CO	0.9632
2020	Los Angeles (MD)	MHDT	RUNEX	40	CO	0.5541
2020	Los Angeles (MD)	HHDT	RUNEX	15	CO2	2296.7607
2020	Los Angeles (MD)	LDA	RUNEX	15	CO2	504.9740
2020	Los Angeles (MD)	LDT1	RUNEX	15	CO2	620.0575
2020	Los Angeles (MD)	LDT2	RUNEX	15	CO2	693.2800
2020	Los Angeles (MD)	MHDT	RUNEX	15	CO2	1742.2173
2020	Los Angeles (MD)	HHDT	RUNEX	40	CO2	1565.6308
2020	Los Angeles (MD)	LDA	RUNEX	40	CO2	238.7100
2020	Los Angeles (MD)	LDT1	RUNEX	40	CO2	292.9571
2020	Los Angeles (MD)	LDT2	RUNEX	40	CO2	327.5569
2020	Los Angeles (MD)	MHDT	RUNEX	40	CO2	1135.6515
2020	Los Angeles (MD)	HHDT	RUNEX	15	NOx	10.0581
2020	Los Angeles (MD)	LDA	RUNEX	15	NOx	0.0863
2020	Los Angeles (MD)	LDT1	RUNEX	15	NOx	0.2944
2020	Los Angeles (MD)	LDT2	RUNEX	15	NOx	0.1477
2020	Los Angeles (MD)	MHDT	RUNEX	15	NOx	4.7805
2020	Los Angeles (MD)	HHDT	RUNEX	40	NOx	2.9197
2020	Los Angeles (MD)	LDA	RUNEX	40	NOx	0.0594
2020	Los Angeles (MD)	LDT1	RUNEX	40	NOx	0.1976
2020	Los Angeles (MD)	LDT2	RUNEX	40	NOx	0.1000
2020	Los Angeles (MD)	MHDT	RUNEX	40	NOx	1.6090
2020	Los Angeles (MD)	HHDT	PMBW	0	PM10	0.0617
2020	Los Angeles (MD)	HHDT	PMTW	0	PM10	0.0358
2020	Los Angeles (MD)	LDA	PMBW	0	PM10	0.0367
2020	Los Angeles (MD)	LDA	PMTW	0	PM10	0.0080
2020	Los Angeles (MD)	LDT1	PMBW	0	PM10	0.0367
2020	Los Angeles (MD)	LDT1	PMTW	0	PM10	0.0080

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2020	Los Angeles (MD)	LDT2	PMBW	0	PM10	0.0367
2020	Los Angeles (MD)	LDT2	PMTW	0	PM10	0.0080
2020	Los Angeles (MD)	MHDT	PMBW	0	PM10	0.1303
2020	Los Angeles (MD)	MHDT	PMTW	0	PM10	0.0120
2020	Los Angeles (MD)	HHDT	RUNEX	15	PM10	0.0225
2020	Los Angeles (MD)	LDA	RUNEX	15	PM10	0.0052
2020	Los Angeles (MD)	LDT1	RUNEX	15	PM10	0.0101
2020	Los Angeles (MD)	LDT2	RUNEX	15	PM10	0.0052
2020	Los Angeles (MD)	MHDT	RUNEX	15	PM10	0.0474
2020	Los Angeles (MD)	HHDT	RUNEX	40	PM10	0.0142
2020	Los Angeles (MD)	LDA	RUNEX	40	PM10	0.0016
2020	Los Angeles (MD)	LDT1	RUNEX	40	PM10	0.0032
2020	Los Angeles (MD)	LDT2	RUNEX	40	PM10	0.0015
2020	Los Angeles (MD)	MHDT	RUNEX	40	PM10	0.0404
2020	Los Angeles (MD)	HHDT	PMBW	0	PM2_5	0.0265
2020	Los Angeles (MD)	HHDT	PMTW	0	PM2_5	0.0090
2020	Los Angeles (MD)	LDA	PMBW	0	PM2_5	0.0157
2020	Los Angeles (MD)	LDA	PMTW	0	PM2_5	0.0020
2020	Los Angeles (MD)	LDT1	PMBW	0	PM2_5	0.0157
2020	Los Angeles (MD)	LDT1	PMTW	0	PM2_5	0.0020
2020	Los Angeles (MD)	LDT2	PMBW	0	PM2_5	0.0157
2020	Los Angeles (MD)	LDT2	PMTW	0	PM2_5	0.0020
2020	Los Angeles (MD)	MHDT	PMBW	0	PM2_5	0.0559
2020	Los Angeles (MD)	MHDT	PMTW	0	PM2_5	0.0030
2020	Los Angeles (MD)	HHDT	RUNEX	15	PM2_5	0.0215
2020	Los Angeles (MD)	LDA	RUNEX	15	PM2_5	0.0048
2020	Los Angeles (MD)	LDT1	RUNEX	15	PM2_5	0.0093
2020	Los Angeles (MD)	LDT2	RUNEX	15	PM2_5	0.0047
2020	Los Angeles (MD)	MHDT	RUNEX	15	PM2_5	0.0453
2020	Los Angeles (MD)	HHDT	RUNEX	40	PM2_5	0.0136
2020	Los Angeles (MD)	LDA	RUNEX	40	PM2_5	0.0014
2020	Los Angeles (MD)	LDT1	RUNEX	40	PM2_5	0.0029
2020	Los Angeles (MD)	LDT2	RUNEX	40	PM2_5	0.0014
2020	Los Angeles (MD)	MHDT	RUNEX	40	PM2_5	0.0386
2020	Los Angeles (MD)	HHDT	RUNEX	15	ROG	0.4965
2020	Los Angeles (MD)	LDA	RUNEX	15	ROG	0.0403
2020	Los Angeles (MD)	LDT1	RUNEX	15	ROG	0.1262
2020	Los Angeles (MD)	LDT2	RUNEX	15	ROG	0.0548
2020	Los Angeles (MD)	MHDT	RUNEX	15	ROG	0.3568
2020	Los Angeles (MD)	HHDT	RUNEX	40	ROG	0.1066
2020	Los Angeles (MD)	LDA	RUNEX	40	ROG	0.0120
2020	Los Angeles (MD)	LDT1	RUNEX	40	ROG	0.0409
2020	Los Angeles (MD)	LDT2	RUNEX	40	ROG	0.0166
2020	Los Angeles (MD)	MHDT	RUNEX	40	ROG	0.0847
2020	Los Angeles (MD)	HHDT	RUNEX	15	SOx	0.0219
2020	Los Angeles (MD)	LDA	RUNEX	15	SOx	0.0051

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2020	Los Angeles (MD)	LDT1	RUNEX	15	SOx	0.0062
2020	Los Angeles (MD)	LDT2	RUNEX	15	SOx	0.0069
2020	Los Angeles (MD)	MHDT	RUNEX	15	SOx	0.0168
2020	Los Angeles (MD)	HHDT	RUNEX	40	SOx	0.0149
2020	Los Angeles (MD)	LDA	RUNEX	40	SOx	0.0024
2020	Los Angeles (MD)	LDT1	RUNEX	40	SOx	0.0030
2020	Los Angeles (MD)	LDT2	RUNEX	40	SOx	0.0033
2020	Los Angeles (MD)	MHDT	RUNEX	40	SOx	0.0109
2021	Los Angeles (MD)	HHDT	RUNEX	15	CH4	0.0521
2021	Los Angeles (MD)	LDA	RUNEX	15	CH4	0.0143
2021	Los Angeles (MD)	LDT1	RUNEX	15	CH4	0.0464
2021	Los Angeles (MD)	LDT2	RUNEX	15	CH4	0.0200
2021	Los Angeles (MD)	MHDT	RUNEX	15	CH4	0.0165
2021	Los Angeles (MD)	HHDT	RUNEX	40	CH4	0.0114
2021	Los Angeles (MD)	LDA	RUNEX	40	CH4	0.0043
2021	Los Angeles (MD)	LDT1	RUNEX	40	CH4	0.0150
2021	Los Angeles (MD)	LDT2	RUNEX	40	CH4	0.0060
2021	Los Angeles (MD)	MHDT	RUNEX	40	CH4	0.0043
2021	Los Angeles (MD)	HHDT	RUNEX	15	CO	2.6868
2021	Los Angeles (MD)	LDA	RUNEX	15	CO	1.0194
2021	Los Angeles (MD)	LDT1	RUNEX	15	CO	3.1480
2021	Los Angeles (MD)	LDT2	RUNEX	15	CO	1.3665
2021	Los Angeles (MD)	MHDT	RUNEX	15	CO	1.0205
2021	Los Angeles (MD)	HHDT	RUNEX	40	CO	0.7987
2021	Los Angeles (MD)	LDA	RUNEX	40	CO	0.6574
2021	Los Angeles (MD)	LDT1	RUNEX	40	CO	1.9381
2021	Los Angeles (MD)	LDT2	RUNEX	40	CO	0.8824
2021	Los Angeles (MD)	MHDT	RUNEX	40	CO	0.3716
2021	Los Angeles (MD)	HHDT	RUNEX	15	CO2	2262.2529
2021	Los Angeles (MD)	LDA	RUNEX	15	CO2	486.6508
2021	Los Angeles (MD)	LDT1	RUNEX	15	CO2	604.1234
2021	Los Angeles (MD)	LDT2	RUNEX	15	CO2	669.4416
2021	Los Angeles (MD)	MHDT	RUNEX	15	CO2	1722.1635
2021	Los Angeles (MD)	HHDT	RUNEX	40	CO2	1546.2359
2021	Los Angeles (MD)	LDA	RUNEX	40	CO2	230.0547
2021	Los Angeles (MD)	LDT1	RUNEX	40	CO2	285.4285
2021	Los Angeles (MD)	LDT2	RUNEX	40	CO2	316.2961
2021	Los Angeles (MD)	MHDT	RUNEX	40	CO2	1134.8120
2021	Los Angeles (MD)	HHDT	RUNEX	15	NOx	9.7152
2021	Los Angeles (MD)	LDA	RUNEX	15	NOx	0.0781
2021	Los Angeles (MD)	LDT1	RUNEX	15	NOx	0.2710
2021	Los Angeles (MD)	LDT2	RUNEX	15	NOx	0.1312
2021	Los Angeles (MD)	MHDT	RUNEX	15	NOx	3.9790
2021	Los Angeles (MD)	HHDT	RUNEX	40	NOx	2.5246
2021	Los Angeles (MD)	LDA	RUNEX	40	NOx	0.0536
2021	Los Angeles (MD)	LDT1	RUNEX	40	NOx	0.1816

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2021	Los Angeles (MD)	LDT2	RUNEX	40	NOx	0.0888
2021	Los Angeles (MD)	MHDT	RUNEX	40	NOx	0.9463
2021	Los Angeles (MD)	HHDT	PMBW	0	PM10	0.0617
2021	Los Angeles (MD)	HHDT	PMTW	0	PM10	0.0358
2021	Los Angeles (MD)	LDA	PMBW	0	PM10	0.0368
2021	Los Angeles (MD)	LDA	PMTW	0	PM10	0.0080
2021	Los Angeles (MD)	LDT1	PMBW	0	PM10	0.0367
2021	Los Angeles (MD)	LDT1	PMTW	0	PM10	0.0080
2021	Los Angeles (MD)	LDT2	PMBW	0	PM10	0.0368
2021	Los Angeles (MD)	LDT2	PMTW	0	PM10	0.0080
2021	Los Angeles (MD)	MHDT	PMBW	0	PM10	0.1303
2021	Los Angeles (MD)	MHDT	PMTW	0	PM10	0.0120
2021	Los Angeles (MD)	HHDT	RUNEX	15	PM10	0.0194
2021	Los Angeles (MD)	LDA	RUNEX	15	PM10	0.0051
2021	Los Angeles (MD)	LDT1	RUNEX	15	PM10	0.0096
2021	Los Angeles (MD)	LDT2	RUNEX	15	PM10	0.0051
2021	Los Angeles (MD)	MHDT	RUNEX	15	PM10	0.0093
2021	Los Angeles (MD)	HHDT	RUNEX	40	PM10	0.0125
2021	Los Angeles (MD)	LDA	RUNEX	40	PM10	0.0015
2021	Los Angeles (MD)	LDT1	RUNEX	40	PM10	0.0030
2021	Los Angeles (MD)	LDT2	RUNEX	40	PM10	0.0015
2021	Los Angeles (MD)	MHDT	RUNEX	40	PM10	0.0055
2021	Los Angeles (MD)	HHDT	PMBW	0	PM2_5	0.0265
2021	Los Angeles (MD)	HHDT	PMTW	0	PM2_5	0.0090
2021	Los Angeles (MD)	LDA	PMBW	0	PM2_5	0.0158
2021	Los Angeles (MD)	LDA	PMTW	0	PM2_5	0.0020
2021	Los Angeles (MD)	LDT1	PMBW	0	PM2_5	0.0157
2021	Los Angeles (MD)	LDT1	PMTW	0	PM2_5	0.0020
2021	Los Angeles (MD)	LDT2	PMBW	0	PM2_5	0.0158
2021	Los Angeles (MD)	LDT2	PMTW	0	PM2_5	0.0020
2021	Los Angeles (MD)	MHDT	PMBW	0	PM2_5	0.0559
2021	Los Angeles (MD)	MHDT	PMTW	0	PM2_5	0.0030
2021	Los Angeles (MD)	HHDT	RUNEX	15	PM2_5	0.0185
2021	Los Angeles (MD)	LDA	RUNEX	15	PM2_5	0.0047
2021	Los Angeles (MD)	LDT1	RUNEX	15	PM2_5	0.0088
2021	Los Angeles (MD)	LDT2	RUNEX	15	PM2_5	0.0047
2021	Los Angeles (MD)	MHDT	RUNEX	15	PM2_5	0.0089
2021	Los Angeles (MD)	HHDT	RUNEX	40	PM2_5	0.0120
2021	Los Angeles (MD)	LDA	RUNEX	40	PM2_5	0.0014
2021	Los Angeles (MD)	LDT1	RUNEX	40	PM2_5	0.0028
2021	Los Angeles (MD)	LDT2	RUNEX	40	PM2_5	0.0014
2021	Los Angeles (MD)	MHDT	RUNEX	40	PM2_5	0.0053
2021	Los Angeles (MD)	HHDT	RUNEX	15	ROG	0.4660
2021	Los Angeles (MD)	LDA	RUNEX	15	ROG	0.0364
2021	Los Angeles (MD)	LDT1	RUNEX	15	ROG	0.1158
2021	Los Angeles (MD)	LDT2	RUNEX	15	ROG	0.0497

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2021	Los Angeles (MD)	MHDT	RUNEX	15	ROG	0.1772
2021	Los Angeles (MD)	HHDT	RUNEX	40	ROG	0.1000
2021	Los Angeles (MD)	LDA	RUNEX	40	ROG	0.0108
2021	Los Angeles (MD)	LDT1	RUNEX	40	ROG	0.0375
2021	Los Angeles (MD)	LDT2	RUNEX	40	ROG	0.0150
2021	Los Angeles (MD)	MHDT	RUNEX	40	ROG	0.0396
2021	Los Angeles (MD)	HHDT	RUNEX	15	SOx	0.0215
2021	Los Angeles (MD)	LDA	RUNEX	15	SOx	0.0049
2021	Los Angeles (MD)	LDT1	RUNEX	15	SOx	0.0061
2021	Los Angeles (MD)	LDT2	RUNEX	15	SOx	0.0067
2021	Los Angeles (MD)	MHDT	RUNEX	15	SOx	0.0166
2021	Los Angeles (MD)	HHDT	RUNEX	40	SOx	0.0147
2021	Los Angeles (MD)	LDA	RUNEX	40	SOx	0.0023
2021	Los Angeles (MD)	LDT1	RUNEX	40	SOx	0.0029
2021	Los Angeles (MD)	LDT2	RUNEX	40	SOx	0.0032
2021	Los Angeles (MD)	MHDT	RUNEX	40	SOx	0.0109
2022	Los Angeles (MD)	HHDT	RUNEX	15	CH4	0.0489
2022	Los Angeles (MD)	LDA	RUNEX	15	CH4	0.0130
2022	Los Angeles (MD)	LDT1	RUNEX	15	CH4	0.0426
2022	Los Angeles (MD)	LDT2	RUNEX	15	CH4	0.0182
2022	Los Angeles (MD)	MHDT	RUNEX	15	CH4	0.0145
2022	Los Angeles (MD)	HHDT	RUNEX	40	CH4	0.0107
2022	Los Angeles (MD)	LDA	RUNEX	40	CH4	0.0038
2022	Los Angeles (MD)	LDT1	RUNEX	40	CH4	0.0137
2022	Los Angeles (MD)	LDT2	RUNEX	40	CH4	0.0055
2022	Los Angeles (MD)	MHDT	RUNEX	40	CH4	0.0037
2022	Los Angeles (MD)	HHDT	RUNEX	15	CO	2.6110
2022	Los Angeles (MD)	LDA	RUNEX	15	CO	0.9478
2022	Los Angeles (MD)	LDT1	RUNEX	15	CO	2.9020
2022	Los Angeles (MD)	LDT2	RUNEX	15	CO	1.2595
2022	Los Angeles (MD)	MHDT	RUNEX	15	CO	0.9540
2022	Los Angeles (MD)	HHDT	RUNEX	40	CO	0.7681
2022	Los Angeles (MD)	LDA	RUNEX	40	CO	0.6118
2022	Los Angeles (MD)	LDT1	RUNEX	40	CO	1.7915
2022	Los Angeles (MD)	LDT2	RUNEX	40	CO	0.8154
2022	Los Angeles (MD)	MHDT	RUNEX	40	CO	0.3275
2022	Los Angeles (MD)	HHDT	RUNEX	15	CO2	2225.9086
2022	Los Angeles (MD)	LDA	RUNEX	15	CO2	468.2379
2022	Los Angeles (MD)	LDT1	RUNEX	15	CO2	587.2545
2022	Los Angeles (MD)	LDT2	RUNEX	15	CO2	645.2626
2022	Los Angeles (MD)	MHDT	RUNEX	15	CO2	1713.5262
2022	Los Angeles (MD)	HHDT	RUNEX	40	CO2	1525.9555
2022	Los Angeles (MD)	LDA	RUNEX	40	CO2	221.3561
2022	Los Angeles (MD)	LDT1	RUNEX	40	CO2	277.4582
2022	Los Angeles (MD)	LDT2	RUNEX	40	CO2	304.8739
2022	Los Angeles (MD)	MHDT	RUNEX	40	CO2	1130.2966

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2022	Los Angeles (MD)	HHDT	RUNEX	15	NOx	9.3493
2022	Los Angeles (MD)	LDA	RUNEX	15	NOx	0.0710
2022	Los Angeles (MD)	LDT1	RUNEX	15	NOx	0.2493
2022	Los Angeles (MD)	LDT2	RUNEX	15	NOx	0.1176
2022	Los Angeles (MD)	MHDT	RUNEX	15	NOx	3.9718
2022	Los Angeles (MD)	HHDT	RUNEX	40	NOx	2.1350
2022	Los Angeles (MD)	LDA	RUNEX	40	NOx	0.0486
2022	Los Angeles (MD)	LDT1	RUNEX	40	NOx	0.1666
2022	Los Angeles (MD)	LDT2	RUNEX	40	NOx	0.0795
2022	Los Angeles (MD)	MHDT	RUNEX	40	NOx	0.8609
2022	Los Angeles (MD)	HHDT	PMBW	0	PM10	0.0617
2022	Los Angeles (MD)	HHDT	PMTW	0	PM10	0.0358
2022	Los Angeles (MD)	LDA	PMBW	0	PM10	0.0367
2022	Los Angeles (MD)	LDA	PMTW	0	PM10	0.0080
2022	Los Angeles (MD)	LDT1	PMBW	0	PM10	0.0367
2022	Los Angeles (MD)	LDT1	PMTW	0	PM10	0.0080
2022	Los Angeles (MD)	LDT2	PMBW	0	PM10	0.0368
2022	Los Angeles (MD)	LDT2	PMTW	0	PM10	0.0080
2022	Los Angeles (MD)	MHDT	PMBW	0	PM10	0.1303
2022	Los Angeles (MD)	MHDT	PMTW	0	PM10	0.0120
2022	Los Angeles (MD)	HHDT	RUNEX	15	PM10	0.0167
2022	Los Angeles (MD)	LDA	RUNEX	15	PM10	0.0050
2022	Los Angeles (MD)	LDT1	RUNEX	15	PM10	0.0091
2022	Los Angeles (MD)	LDT2	RUNEX	15	PM10	0.0051
2022	Los Angeles (MD)	MHDT	RUNEX	15	PM10	0.0085
2022	Los Angeles (MD)	HHDT	RUNEX	40	PM10	0.0105
2022	Los Angeles (MD)	LDA	RUNEX	40	PM10	0.0015
2022	Los Angeles (MD)	LDT1	RUNEX	40	PM10	0.0028
2022	Los Angeles (MD)	LDT2	RUNEX	40	PM10	0.0015
2022	Los Angeles (MD)	MHDT	RUNEX	40	PM10	0.0051
2022	Los Angeles (MD)	HHDT	PMBW	0	PM2_5	0.0265
2022	Los Angeles (MD)	HHDT	PMTW	0	PM2_5	0.0090
2022	Los Angeles (MD)	LDA	PMBW	0	PM2_5	0.0157
2022	Los Angeles (MD)	LDA	PMTW	0	PM2_5	0.0020
2022	Los Angeles (MD)	LDT1	PMBW	0	PM2_5	0.0157
2022	Los Angeles (MD)	LDT1	PMTW	0	PM2_5	0.0020
2022	Los Angeles (MD)	LDT2	PMBW	0	PM2_5	0.0158
2022	Los Angeles (MD)	LDT2	PMTW	0	PM2_5	0.0020
2022	Los Angeles (MD)	MHDT	PMBW	0	PM2_5	0.0559
2022	Los Angeles (MD)	MHDT	PMTW	0	PM2_5	0.0030
2022	Los Angeles (MD)	HHDT	RUNEX	15	PM2_5	0.0160
2022	Los Angeles (MD)	LDA	RUNEX	15	PM2_5	0.0046
2022	Los Angeles (MD)	LDT1	RUNEX	15	PM2_5	0.0084
2022	Los Angeles (MD)	LDT2	RUNEX	15	PM2_5	0.0047
2022	Los Angeles (MD)	MHDT	RUNEX	15	PM2_5	0.0082
2022	Los Angeles (MD)	HHDT	RUNEX	40	PM2_5	0.0101

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2022	Los Angeles (MD)	LDA	RUNEX	40	PM2_5	0.0014
2022	Los Angeles (MD)	LDT1	RUNEX	40	PM2_5	0.0026
2022	Los Angeles (MD)	LDT2	RUNEX	40	PM2_5	0.0014
2022	Los Angeles (MD)	MHDT	RUNEX	40	PM2_5	0.0048
2022	Los Angeles (MD)	HHDT	RUNEX	15	ROG	0.4377
2022	Los Angeles (MD)	LDA	RUNEX	15	ROG	0.0329
2022	Los Angeles (MD)	LDT1	RUNEX	15	ROG	0.1060
2022	Los Angeles (MD)	LDT2	RUNEX	15	ROG	0.0453
2022	Los Angeles (MD)	MHDT	RUNEX	15	ROG	0.1689
2022	Los Angeles (MD)	HHDT	RUNEX	40	ROG	0.0937
2022	Los Angeles (MD)	LDA	RUNEX	40	ROG	0.0097
2022	Los Angeles (MD)	LDT1	RUNEX	40	ROG	0.0342
2022	Los Angeles (MD)	LDT2	RUNEX	40	ROG	0.0136
2022	Los Angeles (MD)	MHDT	RUNEX	40	ROG	0.0374
2022	Los Angeles (MD)	HHDT	RUNEX	15	SOx	0.0212
2022	Los Angeles (MD)	LDA	RUNEX	15	SOx	0.0047
2022	Los Angeles (MD)	LDT1	RUNEX	15	SOx	0.0059
2022	Los Angeles (MD)	LDT2	RUNEX	15	SOx	0.0065
2022	Los Angeles (MD)	MHDT	RUNEX	15	SOx	0.0165
2022	Los Angeles (MD)	HHDT	RUNEX	40	SOx	0.0145
2022	Los Angeles (MD)	LDA	RUNEX	40	SOx	0.0022
2022	Los Angeles (MD)	LDT1	RUNEX	40	SOx	0.0028
2022	Los Angeles (MD)	LDT2	RUNEX	40	SOx	0.0031
2022	Los Angeles (MD)	MHDT	RUNEX	40	SOx	0.0108
2023	Los Angeles (MD)	HHDT	RUNEX	15	CH4	0.0426
2023	Los Angeles (MD)	LDA	RUNEX	15	CH4	0.0118
2023	Los Angeles (MD)	LDT1	RUNEX	15	CH4	0.0389
2023	Los Angeles (MD)	LDT2	RUNEX	15	CH4	0.0166
2023	Los Angeles (MD)	MHDT	RUNEX	15	CH4	0.0116
2023	Los Angeles (MD)	HHDT	RUNEX	40	CH4	0.0094
2023	Los Angeles (MD)	LDA	RUNEX	40	CH4	0.0035
2023	Los Angeles (MD)	LDT1	RUNEX	40	CH4	0.0125
2023	Los Angeles (MD)	LDT2	RUNEX	40	CH4	0.0050
2023	Los Angeles (MD)	MHDT	RUNEX	40	CH4	0.0030
2023	Los Angeles (MD)	HHDT	RUNEX	15	CO	2.3994
2023	Los Angeles (MD)	LDA	RUNEX	15	CO	0.8835
2023	Los Angeles (MD)	LDT1	RUNEX	15	CO	2.6586
2023	Los Angeles (MD)	LDT2	RUNEX	15	CO	1.1705
2023	Los Angeles (MD)	MHDT	RUNEX	15	CO	0.8494
2023	Los Angeles (MD)	HHDT	RUNEX	40	CO	0.7118
2023	Los Angeles (MD)	LDA	RUNEX	40	CO	0.5708
2023	Los Angeles (MD)	LDT1	RUNEX	40	CO	1.6471
2023	Los Angeles (MD)	LDT2	RUNEX	40	CO	0.7595
2023	Los Angeles (MD)	MHDT	RUNEX	40	CO	0.2805
2023	Los Angeles (MD)	HHDT	RUNEX	15	CO2	2151.8140
2023	Los Angeles (MD)	LDA	RUNEX	15	CO2	449.8968

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2023	Los Angeles (MD)	LDT1	RUNEX	15	CO2	569.4104
2023	Los Angeles (MD)	LDT2	RUNEX	15	CO2	618.5496
2023	Los Angeles (MD)	MHDT	RUNEX	15	CO2	1693.2831
2023	Los Angeles (MD)	HHDT	RUNEX	40	CO2	1485.2917
2023	Los Angeles (MD)	LDA	RUNEX	40	CO2	212.6907
2023	Los Angeles (MD)	LDT1	RUNEX	40	CO2	269.0272
2023	Los Angeles (MD)	LDT2	RUNEX	40	CO2	292.2542
2023	Los Angeles (MD)	MHDT	RUNEX	40	CO2	1120.9666
2023	Los Angeles (MD)	HHDT	RUNEX	15	NOx	8.5871
2023	Los Angeles (MD)	LDA	RUNEX	15	NOx	0.0648
2023	Los Angeles (MD)	LDT1	RUNEX	15	NOx	0.2290
2023	Los Angeles (MD)	LDT2	RUNEX	15	NOx	0.1059
2023	Los Angeles (MD)	MHDT	RUNEX	15	NOx	3.7140
2023	Los Angeles (MD)	HHDT	RUNEX	40	NOx	1.1554
2023	Los Angeles (MD)	LDA	RUNEX	40	NOx	0.0442
2023	Los Angeles (MD)	LDT1	RUNEX	40	NOx	0.1524
2023	Los Angeles (MD)	LDT2	RUNEX	40	NOx	0.0715
2023	Los Angeles (MD)	MHDT	RUNEX	40	NOx	0.5030
2023	Los Angeles (MD)	HHDT	PMBW	0	PM10	0.0617
2023	Los Angeles (MD)	HHDT	PMTW	0	PM10	0.0358
2023	Los Angeles (MD)	LDA	PMBW	0	PM10	0.0368
2023	Los Angeles (MD)	LDA	PMTW	0	PM10	0.0080
2023	Los Angeles (MD)	LDT1	PMBW	0	PM10	0.0367
2023	Los Angeles (MD)	LDT1	PMTW	0	PM10	0.0080
2023	Los Angeles (MD)	LDT2	PMBW	0	PM10	0.0368
2023	Los Angeles (MD)	LDT2	PMTW	0	PM10	0.0080
2023	Los Angeles (MD)	MHDT	PMBW	0	PM10	0.1303
2023	Los Angeles (MD)	MHDT	PMTW	0	PM10	0.0120
2023	Los Angeles (MD)	HHDT	RUNEX	15	PM10	0.0088
2023	Los Angeles (MD)	LDA	RUNEX	15	PM10	0.0049
2023	Los Angeles (MD)	LDT1	RUNEX	15	PM10	0.0087
2023	Los Angeles (MD)	LDT2	RUNEX	15	PM10	0.0051
2023	Los Angeles (MD)	MHDT	RUNEX	15	PM10	0.0045
2023	Los Angeles (MD)	HHDT	RUNEX	40	PM10	0.0057
2023	Los Angeles (MD)	LDA	RUNEX	40	PM10	0.0014
2023	Los Angeles (MD)	LDT1	RUNEX	40	PM10	0.0027
2023	Los Angeles (MD)	LDT2	RUNEX	40	PM10	0.0015
2023	Los Angeles (MD)	MHDT	RUNEX	40	PM10	0.0027
2023	Los Angeles (MD)	HHDT	PMBW	0	PM2_5	0.0265
2023	Los Angeles (MD)	HHDT	PMTW	0	PM2_5	0.0090
2023	Los Angeles (MD)	LDA	PMBW	0	PM2_5	0.0158
2023	Los Angeles (MD)	LDA	PMTW	0	PM2_5	0.0020
2023	Los Angeles (MD)	LDT1	PMBW	0	PM2_5	0.0157
2023	Los Angeles (MD)	LDT1	PMTW	0	PM2_5	0.0020
2023	Los Angeles (MD)	LDT2	PMBW	0	PM2_5	0.0158
2023	Los Angeles (MD)	LDT2	PMTW	0	PM2_5	0.0020

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2023	Los Angeles (MD)	MHDT	PMBW	0	PM2_5	0.0559
2023	Los Angeles (MD)	MHDT	PMTW	0	PM2_5	0.0030
2023	Los Angeles (MD)	HHDT	RUNEX	15	PM2_5	0.0084
2023	Los Angeles (MD)	LDA	RUNEX	15	PM2_5	0.0045
2023	Los Angeles (MD)	LDT1	RUNEX	15	PM2_5	0.0080
2023	Los Angeles (MD)	LDT2	RUNEX	15	PM2_5	0.0047
2023	Los Angeles (MD)	MHDT	RUNEX	15	PM2_5	0.0043
2023	Los Angeles (MD)	HHDT	RUNEX	40	PM2_5	0.0054
2023	Los Angeles (MD)	LDA	RUNEX	40	PM2_5	0.0013
2023	Los Angeles (MD)	LDT1	RUNEX	40	PM2_5	0.0025
2023	Los Angeles (MD)	LDT2	RUNEX	40	PM2_5	0.0014
2023	Los Angeles (MD)	MHDT	RUNEX	40	PM2_5	0.0026
2023	Los Angeles (MD)	HHDT	RUNEX	15	ROG	0.3380
2023	Los Angeles (MD)	LDA	RUNEX	15	ROG	0.0299
2023	Los Angeles (MD)	LDT1	RUNEX	15	ROG	0.0966
2023	Los Angeles (MD)	LDT2	RUNEX	15	ROG	0.0413
2023	Los Angeles (MD)	MHDT	RUNEX	15	ROG	0.1337
2023	Los Angeles (MD)	HHDT	RUNEX	40	ROG	0.0725
2023	Los Angeles (MD)	LDA	RUNEX	40	ROG	0.0088
2023	Los Angeles (MD)	LDT1	RUNEX	40	ROG	0.0310
2023	Los Angeles (MD)	LDT2	RUNEX	40	ROG	0.0123
2023	Los Angeles (MD)	MHDT	RUNEX	40	ROG	0.0296
2023	Los Angeles (MD)	HHDT	RUNEX	15	SOx	0.0205
2023	Los Angeles (MD)	LDA	RUNEX	15	SOx	0.0045
2023	Los Angeles (MD)	LDT1	RUNEX	15	SOx	0.0057
2023	Los Angeles (MD)	LDT2	RUNEX	15	SOx	0.0062
2023	Los Angeles (MD)	MHDT	RUNEX	15	SOx	0.0163
2023	Los Angeles (MD)	HHDT	RUNEX	40	SOx	0.0141
2023	Los Angeles (MD)	LDA	RUNEX	40	SOx	0.0021
2023	Los Angeles (MD)	LDT1	RUNEX	40	SOx	0.0027
2023	Los Angeles (MD)	LDT2	RUNEX	40	SOx	0.0029
2023	Los Angeles (MD)	MHDT	RUNEX	40	SOx	0.0108

Fugitive Dust Emissions Calculations

Grading (6)

EF-PM10 (lb/vmt)	EF-PM2.5 (lb/vmt)	VMT	PM10 (lb/day/grader)	PM2.5 (lb/day/grader)	2 graders	2 graders
1.542546	0.16655879	0.34375	0.2569	0.0573	0.51384919	0.114509
0.051*(7.1^2)*0.6	0.04*(7.1^2.5)*0.031					

Bulldozing (3,4,5,6)

	EF (lb/hr)	lb/8-hrs/dozer	lb/day (3 dozers)	lb/day (4 dozers)
EF-PM10 = 0.75*(1.0*(6.9)^1.5)/(7.5^1.4)	0.809560166	6.47648	19.4	25.9
EF-PM2.5 = 0.105*(5.7*(6.9)^1.2)/(7.5^1.3)	0.442693781	3.54155	10.6	14.2

SCEN	Description	Length (days)	Equipment	Count
3	LAAS REALIGNMENT	100	RubberTiredDozers	3
4	Reservoir Demo+LAAS Realignment	60	RubberTiredDozers	4
5	Reservoir Demo+LAAS Realignment	80	RubberTiredDozers	3
6	Plant Excavation & Grading	80	RubberTiredDozers	3

Fugitive Dust Emissions Calculations

Truck Loading (1-11)

EF-PM10 (lbPM10/Ton-throughput)	EF-pm2.5 (lb2.5/Ton-throughput)	Tons per Cubic Yard
0.000260093	3.93855E-05	1.2641662
0.35*(0.0032)*((11.2/5)^1.3)/((12/2)^1.4)	0.053*(0.0032)*((11.2/5)^1.3)/((12/2)^1.4)	

PM10 (lb/day)	PM2.5 (lb/day)	Scenario	T/DAY	CY/Day (from timeline)
0.108	0.016	1	328.683212	260
0.017	0.003	2	50.566648	40
0.133	0.020	3	404.533184	320
0.490	0.074	4	1491.716116	1180
0.399	0.060	5	1213.599552	960
0.050	0.008	6	151.699944	120
0.083	0.013	7	252.83324	200
0.399	0.060	8	1213.599552	960
0.067	0.010	9	202.266592	160
0.067	0.010	10	202.266592	160
0.017	0.003	11	50.566648	40

Total Fug PM10	Total Fug PM2.5	Scenario
0.108	0.016	1
0.017	0.003	2
19.562	10.645	3
26.396	14.240	4
19.828	10.685	5
19.993	10.747	6
0.083	0.013	7
0.399	0.060	8
0.067	0.010	9
0.067	0.010	10
0.017	0.003	11

Paving Emissions

EF (CalEEMod)	2.62	lb/acre
Total SF	360000	
SF/acre	43560	
Total acres	8.264463	
Days	20	
Acres/day	0.413223	
Emissions (lb/day)	1.1	

APPENDIX B

Evaluation Form for Environmental Review and Federal Coordination

Evaluation Form for Environmental Review and Federal Coordination

Applicant Name: Los Angeles Department of Water and Power

Project Title: Fairmont Sedimentation Plant Project

1. Clean Air Act:

Air Basin Name: Mojave Desert Air Basin - Antelope Valley

Local Air District for Project Area: Antelope Valley Air Quality Management District

Is the project subject to a State Implementation Plan (SIP) conformity determination?

☐ No - The project is in an attainment or unclassified area for all federal criteria pollutants.

☑ Yes - The project is in a nonattainment area or attainment area subject to maintenance plans for a federal criteria pollutant. Include information to indicate the nonattainment designation (e.g. moderate, serious, severe, or extreme), if applicable. If estimated emissions (below) are above the federal *de minimis* levels, but the project is sized to meet only the needs of current population projections that are used in the approved SIP for air quality, then quantitatively indicate how the proposed capacity increase was calculated using population projections.

- **The Lead Agency shall provide the estimated project construction and operational air emissions (in tons per year) in the chart below, and attach supporting calculations, regardless of attainment status.**

- **Also, attach any air quality studies that have been done for the project.**

Pollutant	Federal Status (Attainment, Nonattainment, Maintenance, or Unclassified)	Nonattainment Rates (i.e., moderate, serious, severe, or extreme)	Threshold of Significance for Project Air Basin (if applicable)	Construction Emissions (Tons/Year)	Operation Emissions (Tons/Year)
Ozone (O_3)	Nonattainment	Pending (Severe)	25	9.5 (NOx + ROG)	1.6 (NOx + ROG)
Carbon Monoxide (CO)	Attainment	Not Applicable	Not Applicable	4.6	0.9
Oxides of Nitrogen (NO_x)	No Standard	Not Applicable	25	8.8	1.5
Reactive Organic Gases (ROG)	No Standard	Not Applicable	25	0.7	0.1
Volatile Organic Compounds (VOC)	No Standard	Not Applicable	25	0.7	0.1
Lead (Pb)	Attainment	Not Applicable	Not Applicable	<0.1	<0.1
Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$)	Unclassified/ Attainment	Not Applicable	Not Applicable	1.6	<0.1
Particulate Matter less than 10 microns in diameter (PM_{10})	Unclassified/ Attainment	Not Applicable	Not Applicable	2.8	0.1
Sulfur Dioxide (SO_2)	Attainment/ Unclassified	Not Applicable	Not Applicable	<0.1	<0.1

BIOLOGICAL TECHNICAL REPORT
AND
PRELIMINARY JURISDICTIONAL DELINEATION

FAIRMONT SEDIMENTATION PLANT PROJECT

Prepared for:

Los Angeles Department of Water and Power
111 North Hope Street
Los Angeles, California 90012

Prepared by:

AECOM
One Cal Plaza
300 S Grand Avenue
Los Angeles, California 90071

April 2018

TABLE OF CONTENTS

LIST OF FIGURES

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CHAPTER 1.0
INTRODUCTION

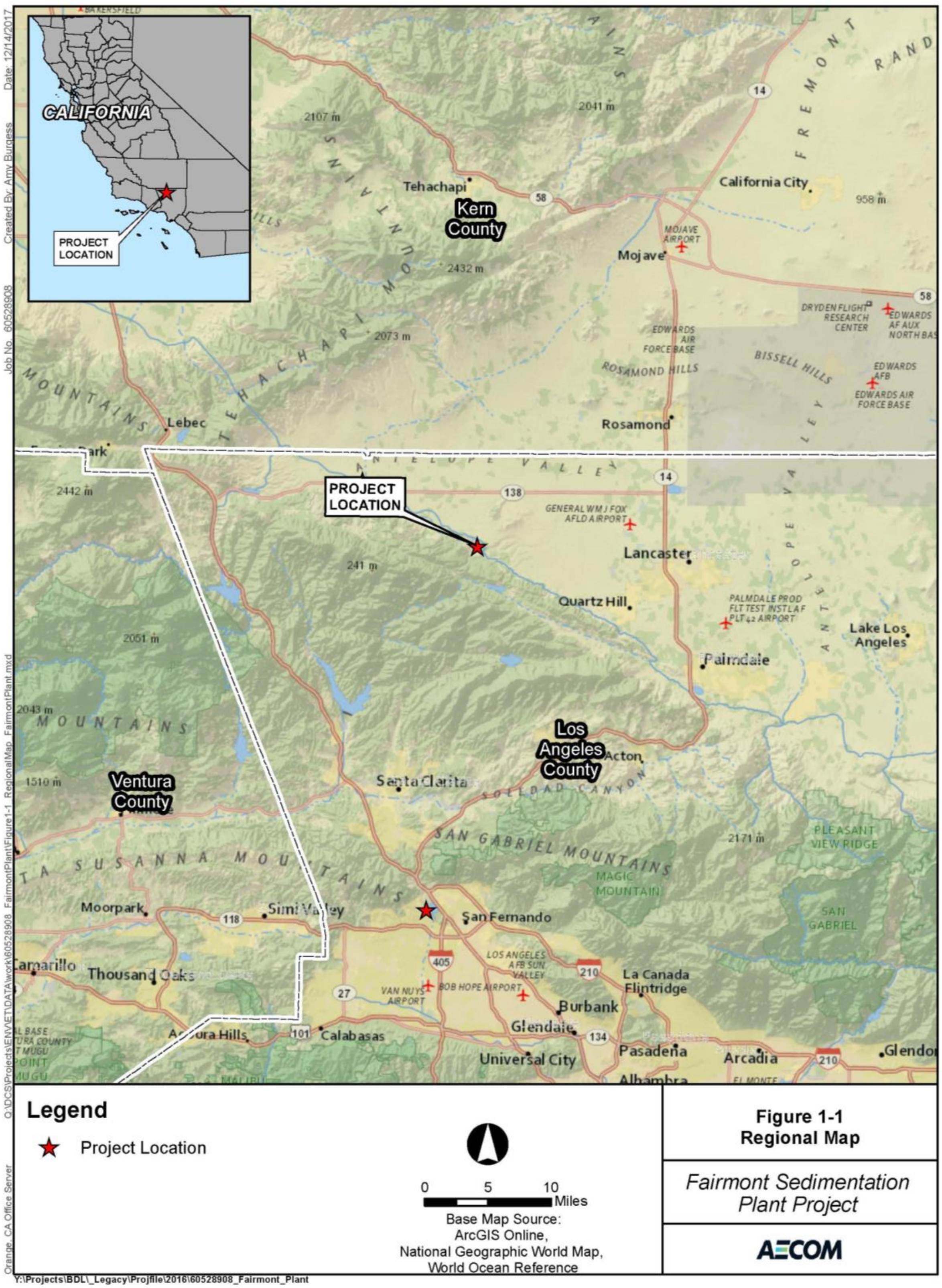
To maintain the quality and reliability of the City of Los Angeles' potable water supply, the Los Angeles Department of Water and Power (LADWP) is proposing to implement the Fairmont Sedimentation Plant Project (proposed project or project) to improve raw water quality through a reduction in sediment in the water delivered by the First and Second Los Angeles Aqueducts (LAA1 and LAA2) to the Los Angeles Aqueduct Filtration Plant (LAAFP), where it receives additional treatment and disinfection before entering the City's potable water distribution system. The proposed sedimentation plant would utilize plate settler technology to increase the efficiency and effectiveness of the sediment removal process and minimize the new plant's required footprint.

AECOM was retained by LADWP to prepare a biological resource assessment of the Fairmont Sedimentation Plant Project in support of the California Environmental Quality Act (CEQA). In addition, LADWP is currently pursuing funding through the State Water Resources Control Board (SWRCB) Clean Water State Revolving Fund (SRF) for the project. Per requirements of the SRF Environmental Package application, a biological resources assessment prepared in support of the project is required. Therefore, this report has been prepared in accordance with CEQA and the requirements of the SRF application.

1.1 PROJECT LOCATION

The proposed project site is located on LADWP-owned property adjacent to LADWP Fairmont Reservoir #2. The Fairmont Reservoir property is located at West Avenue H and 170th Street West, approximately 6 miles west of the City of Lancaster, in the Antelope Valley in northwest Los Angeles County (see Figure 1-1). Regional access to the site is provided by State Highway 138, an east-west thoroughfare that is located approximately 4 miles north of the property and provides linkage between State Highway 14 (about 15 miles east of the project site) and Interstate Route 5 (about 20 miles west of the project site). The nearest paved road to the project site is Lancaster Road, which is approximately 1 mile to the northeast at its closest point. Immediate access to the site is provided by unpaved roads.

The original Fairmont Reservoir (now referred to as Fairmont Reservoir #1) was constructed in the early part of the 20th century as part of the LAA1 system. It was used to regulate flows in LAA1 to San Francisquito Canyon Power Plants #1 and #2, downstream of the reservoir. LAA1, which is a buried pipeline at the Fairmont Reservoir property, emptied into the reservoir, and water exited the reservoir through the Elizabeth Tunnel, which carries water beneath the crest of


CALIFORNIA
PROJECT LOCATION
Kern County
Los Angeles County
Ventura County
Tehachapi
California City
Mojave
Rosamond
Lebec
Lancaster
Quartz Hill
Palmdale
Lake Los Angeles
Acton
Santa Clarita
Moorpark
Simi Valley
San Fernando
Camarillo
Thousand Oaks
Calabasas
La Canada Flintridge
Burbank
Glendale
Universal City
Pasadena
Arcadia
TEHACHAPI MOUNTAINS
FREMONT RAND
ANTELOPE VALLEY
SAN GABRIEL MOUNTAINS
SOLEDAD CANYON
ROSAMOND HILLS
BISSELL HILLS
MOJAVE AIRPORT
EDWARDS AIR FORCE BASE
GENERAL WM J FOX AFLD AIRPORT
PALMDALE PROD FLT TEST INSTLAF PLT 42 AIRPORT
VAN NUYS AIRPORT
BOB HOPE AIRPORT
MAGIC MOUNTAIN
Legend
Project Location
0 5 10 Miles
Base Map Source:
ArcGIS Online,
National Geographic World Map,
World Ocean Reference
Figure 1-1
Regional Map
Fairmont Sedimentation Plant Project
AECOM
Y:\Projects\BDL_Legacy\Projfile\2016\60528908_Fairmont_Plant

the San Gabriel Mountains. In 1970, LAA2 was completed to provide additional water supply to the City. It is also a buried pipeline at the reservoir property and, like LAA1, it emptied into Fairmont Reservoir #1. The combined flows of both aqueducts were then carried through Elizabeth Tunnel as water exited the reservoir. In 1982, Fairmont Reservoir #1 was replaced due to seismic concerns. The approximately 160 million-gallon (MG) Fairmont Reservoir #2 was constructed north of Fairmont Reservoir #1, and the original reservoir was drained and removed from service. LAA1 now empties into Fairmont Reservoir #2, which, similar to Fairmont Reservoir #1, is used to regulate flows to Power Plants #1 and #2. Water exits Fairmont Reservoir #2 into an outlet pipeline that connects to Elizabeth Tunnel. LAA2 bypasses Fairmont Reservoir #2 and connects directly to the outlet pipeline downstream of the reservoir. The outlet pipeline carries the combined flows of LAA1 and LAA2 to Elizabeth Tunnel.

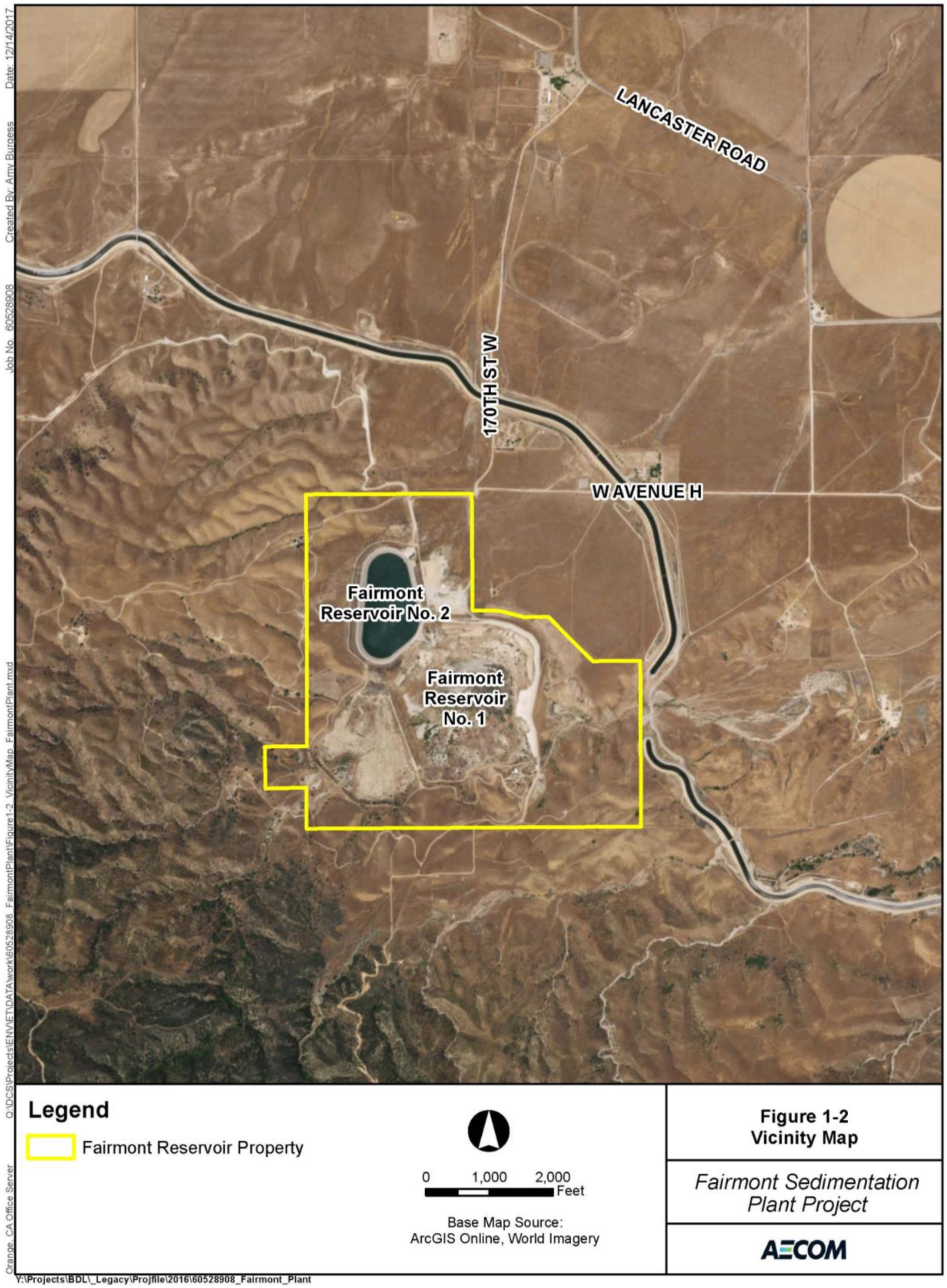
The proposed project site consists of an approximately 20-acre vacant parcel located just northeast of Fairmont Reservoir #2. The parcel is relatively flat, sparsely vegetated, and maintained by tilling. An ephemeral drainage course, which contains vegetation, crosses the site generally from southwest to northeast. Along its northern and eastern edges, the site is bounded by a chain-link fence, which is part of the LADWP Fairmont Reservoir property perimeter security fence (see Figure 1-2).

1.2 PROJECT DESCRIPTION

1.2.1 Project Overview

Currently, aqueduct water is treated in a two-step process at two separate locations along the LAA system. The initial step includes pretreatment at the Cottonwood Treatment Plant (CTP) in the Owens Valley, California, through the addition of coagulants and flocculants into LAA1, which aids in sediment particle settling as flow velocities decrease when the aqueduct empties into North Haiwee Reservoir, approximately 16 miles south of CTP. Although the coagulants and flocculants are added only to LAA1, this process also provides pretreatment for water carried in LAA2 because it originates at the south end of North Haiwee Reservoir, via the South Haiwee Reservoir Bypass Channel.

Final treatment of LAA1 and LAA2 then occurs at the LAAFP, which is located within the LADWP Van Norman Complex in the Sylmar area of Los Angeles. The treatment process at the LAAFP involves ozonation, biological filtration, ultraviolet disinfection, and chlorination followed by chloramination, which provides residual disinfection within the potable water distribution system.



LANCASTER ROAD
170TH ST W
W AVENUE H
Fairmont Reservoir No. 2
Fairmont Reservoir No. 1
Legend
Fairmont Reservoir Property
0
1,000
2,000
Feet
Base Map Source:
ArcGIS Online, World Imagery
Figure 1-2
Vicinity Map
Fairmont Sedimentation Plant Project
AECOM

While this current two-step process has been successful in treating LAA water to meet water quality goals and regulatory requirements, it is approaching its operational limits. The sediment that has settled out in North Haiwee Reservoir as a result of several decades of the coagulation/flocculation process at CTP has contributed to periodically limiting hydraulic conditions where built-up sediment deposits have created restrictive channels in the reservoir. The continued utilization of North Haiwee Reservoir as a settling basin is not a sustainable long-term solution and creates the potential for substantially restricted flows through the LAAs.

In addition, although the CTP coagulation/flocculation process removes a substantial quantity of sediment, the amount of sediment in the LAA water after leaving North and South Haiwee Reservoirs can nonetheless sometimes overburden the capabilities of the treatment system at the LAAFP. This buildup of sediment can significantly reduce the efficiency, effectiveness, and operational flexibility of the plant in treating and delivering potable water to the City. Furthermore, LADWP has recently completed the Neenach Pump Station in the Antelope Valley, connecting LAA1 to the State Water Project (SWP) East Branch and enabling the transfer of SWP water to LAA1. SWP East Branch water may experience elevated levels of sediment on occasion that could contribute to reduced treatment capacity of the LAAFP.

1.2.2 Project Components

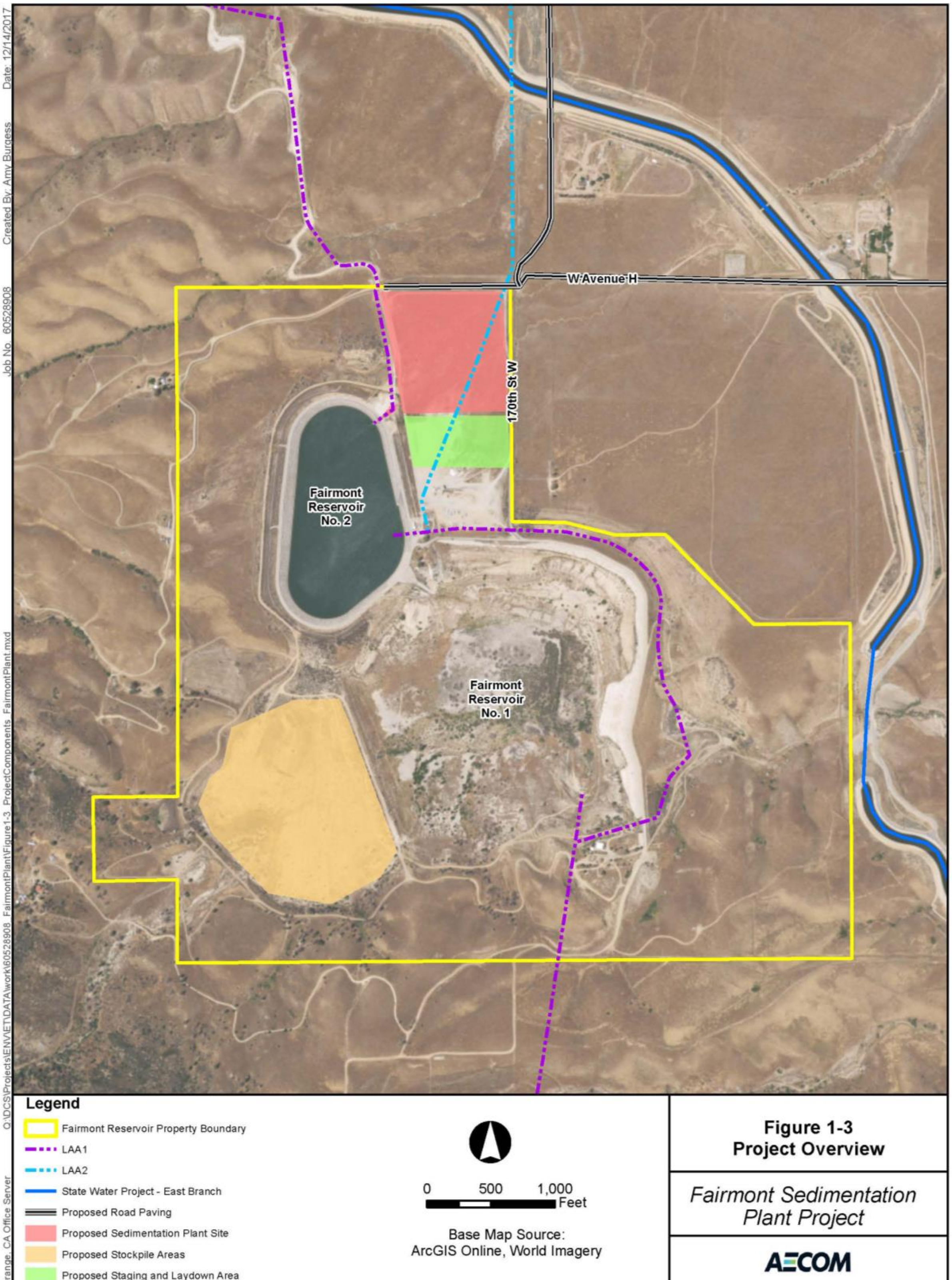
The proposed project would include the following primary facilities and components. Figure 1-3 provides an overview of the project site, and Figure 1-4 provides a conceptual site plan.

LAA Realignment

As discussed above, LAA1 and LAA2 converge at the Fairmont Reservoir property. However, the actual convergence occurs downstream of the Fairmont Reservoir #2, at the outlet pipeline of the reservoir, and downstream of the proposed sedimentation plant site. Currently, only LAA1 water passes through the Fairmont Reservoir #2, while LAA2 is routed directly to the outlet pipeline. In order to allow both LAA1 and LAA2 to flow to the proposed sedimentation plant, they would be diverted into a new buried pipeline located upstream of the reservoir and connected to the plant intake facility. The existing buried aqueduct pipelines would remain in place with new isolation valves to allow for bypassing the sedimentation plant if necessary.

Intake Facility

An intake facility would meter total flow into the plant from the LAAs to determine the hydraulic conditions for plant operations. The intake facility would also include coarse screens to capture algae and larger debris.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Orange, CA Office Server
W Avenue H
170th St W
Fairmont Reservoir No. 2
Fairmont Reservoir No. 1
Legend
Fairmont Reservoir Property Boundary
LAA1
LAA2
State Water Project - East Branch
Proposed Road Paving
Proposed Sedimentation Plant Site
Proposed Stockpile Areas
Proposed Staging and Laydown Area
0 500 1,000 Feet
Base Map Source: ArcGIS Online, World Imagery
Figure 1-3
Project Overview
Fairmont Sedimentation Plant Project
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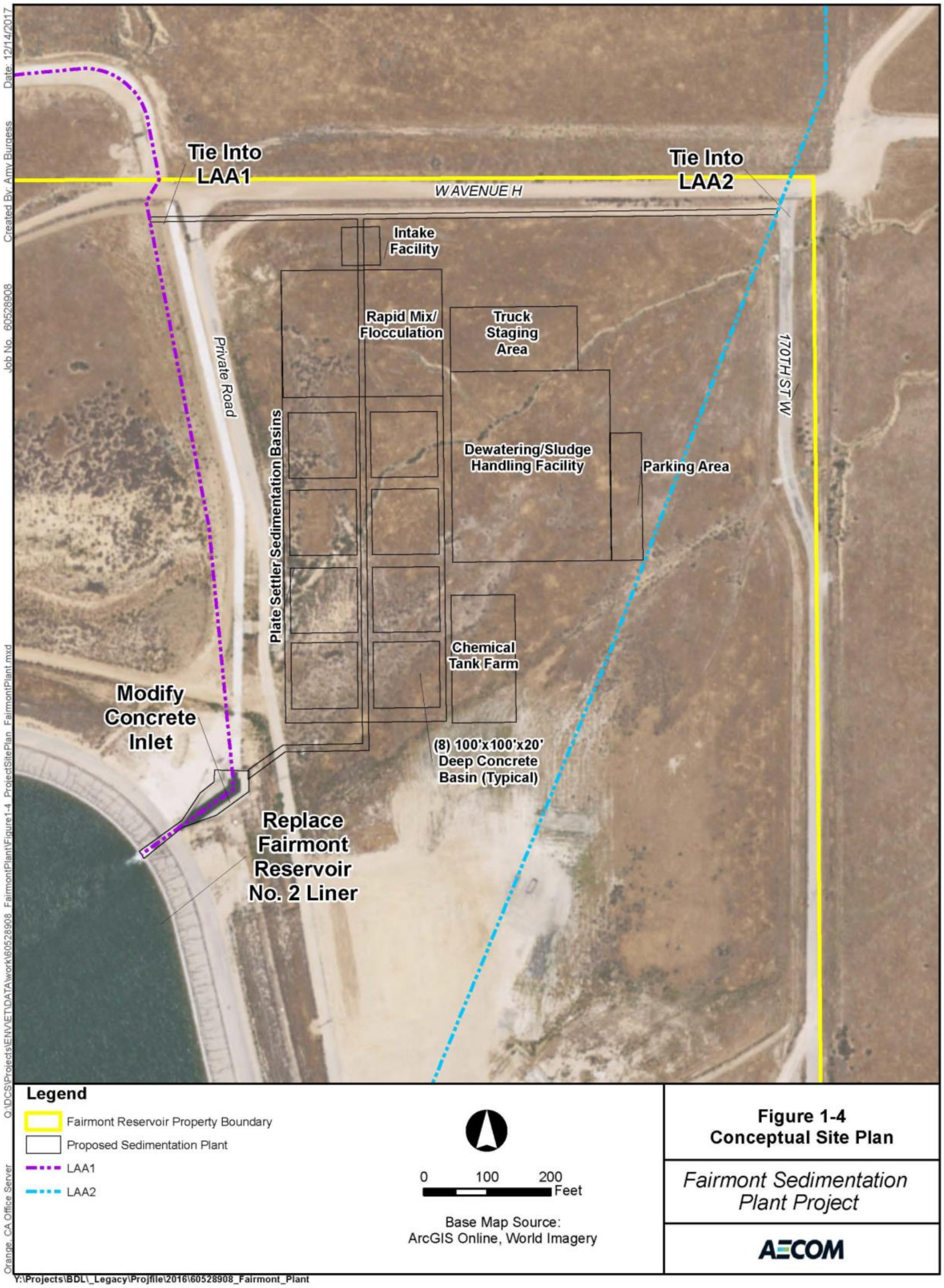
Tie Into LAA1
Tie Into LAA2
W AVENUE H
Intake Facility
Rapid Mix/ Flocculation
Truck Staging Area
Private Road
170TH ST W
Plate Settler Sedimentation Basins
Dewatering/Sludge Handling Facility
Parking Area
Chemical Tank Farm
Modify Concrete Inlet
(8) 100'x100'x20' Deep Concrete Basin (Typical)
Replace Fairmont Reservoir No. 2 Liner
Legend
Fairmont Reservoir Property Boundary
Proposed Sedimentation Plant
LAA1
LAA2
0 100 200 Feet
Base Map Source: ArcGIS Online, World Imagery
Figure 1-4
Conceptual Site Plan
Fairmont Sedimentation Plant Project
AECOM
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Rapid Mix Coagulation/Flocculation

Following the intake facility but prior to the sedimentation basins, the water would pass through rapid mix coagulation/flocculation tanks. The application of coagulants/flocculants would improve the settling rate of sediment, resulting in more effective and efficient treatment and allowing for increased flow velocities through the sedimentation basins. Chemical storage tanks, with appropriate safety measures, including spill containment, would be required to store the coagulants/flocculants.

Plate Settler Sedimentation Basins

The sedimentation plant would include a series of basins sized to accommodate the maximum and operable minimum flow conditions at Fairmont. Each individual basin would contain plate settlers and could be operated independently of the other basins, as required.

Sludge Processing Facility

The plate settler treatment process would result in the accumulation of sediment on the bottom of the sedimentation basins. The accumulated sediment would be removed from the basins by means of a mechanical system to a collection pit. The sediment would then be conveyed to a sludge thickening facility consisting of rapid mix coagulation settling tanks and equalization basins. The thickened sludge would then be conveyed to a mechanical dewatering facility where additional coagulants may be added and mechanical dewatering equipment would separate solid material from the water in the sludge. The resulting residual sludge would be temporarily stored in a hopper or loaded directly into trucks at an on-site staging facility to be transported to a suitable off-site landfill.

Administration and Support Facilities

To operate the sedimentation plant, support facilities including, but not limited to, offices and other administrative spaces, a control room, laboratory, and necessary shop and materials storage areas would be provided.

Sanitary Waste and Water Treatment

Given the location of the proposed project, a septic system would be required to handle sanitary waste. Since the effluent from the sedimentation plant would not be considered potable, a small on-site potable water treatment system and storage tank would be required to provide for personnel and operational needs.

Access Road Paving

As mentioned above, immediate access to the project site is currently provided via unpaved roads. To provide a stable and durable road surface for trucks and to minimize the creation of dust from vehicle travel on the unpaved road surfaces, approximately 3 miles of existing access roads would be paved prior to the outset of construction activities at the project site. This would entail paving Avenue H east of the project site to 160th Street and 160th Street north of Avenue H to its intersection with Lancaster Road, which is a paved roadway. In addition, 170th Street would be paved north of the project site to its intersection with Lancaster Road. This would provide two paved ingress/egress routes to the site.

Fairmont Reservoir #2 Modifications

Reservoir Inlet Structure

As discussed above, LAA1 currently empties into Fairmont Reservoir #2, and LAA2 intercepts the outflow from the Fairmont Reservoir #2 at the outlet pipeline directly downstream of the reservoir. However, under the proposed project, both LAA1 and LAA2 would flow into the sedimentation plant, and after treatment, the effluent from the plant, which would consist of the combined flows of both aqueducts, would be directed to Fairmont Reservoir #2. Modification of the open-channel concrete inlet structure for the reservoir would be required to accommodate the combined flow from the plant.

Reservoir Relining

Fairmont Reservoir #2 is fully lined with asphalt. However, this lining has not been replaced since the reservoir was first constructed in 1982, and it has deteriorated to the extent that maintenance of the reservoir is difficult. Since LAA1 would be out of service for a period of time during project construction (and therefore not flowing into Fairmont Reservoir #2), the opportunity to reline the reservoir would be available. This relining would include asphalt sidewalls and a concrete bottom for durability and maintenance.

Electrical Power

Electrical power for the project would be drawn from the existing Southern California Edison (SCE) power feed to the Fairmont Reservoir property, which currently enters the property near the northwest corner of the sedimentation plant site. A diesel-powered backup power generator would also be installed to support minimal critical treatment processes as well as communications, human-machine interface, and alarm systems in the event of an outage on the SCE feed.

1.2.3 Project Construction

Construction of the proposed project is scheduled to begin in early 2020 and would consist of several tasks, including access road paving; LAA1 and LAA2 realignment; Fairmont Reservoir #2 modifications; excavation and grading for the sedimentation plant; construction of the structural elements of the plant (e.g., concrete foundations, basins, and tanks); and installation of the plant equipment and support facility construction. The general work that would occur in each of these phases is described below. While these phases are distinct and generally must precede or be preceded by others, some work associated with various phases could occur concurrently at different locations within the project site as construction of the plant proceeds. The exact sequencing of various tasks would be determined prior to the start of construction, but the total construction period, from mobilization to completion of the plant is anticipated to last approximately 3.5 years, including a plant commissioning period of several months.

Construction activities would normally occur Mondays through Fridays during the daytime hours, generally beginning no earlier than 7:00 a.m. and ending by late afternoon/early evening. Contractors and LADWP would require temporary trailers for construction management activities and temporary laydown areas and storage facilities for construction materials and equipment. All required administrative, staging, storage, and laydown areas related to project construction would be located within the existing Fairmont Reservoir property boundaries. Direct vehicular access to the site during construction would be provided along 170th Street West and West Avenue H, which, as discussed below, would be paved in the first phase of the project.

Construction phases are described below.

Access Road Paving

The roads that provide direct access to the Fairmont Reservoir property are currently unpaved. Because construction and operation of the plant would involve the delivery of heavy loads to the site (during construction) and the hauling of heavy loads from the site (during both construction and operation), access roads would be paved to provide a stable and durable surface and minimize dust that would be generated by travel on the unpaved roads. The road paving would occur before work at the reservoir property would begin.

The paving would involve portions of 170th Street West, West Avenue H, and 160th Street West to link the project site to Lancaster Road in two different locations. The total length of road included in the paving would be approximately 15,000 feet, and the width of the paved surface would be 24 feet. The road would consist of 4 inches of structural base material and 2 inches of asphalt paving. Some grading of the existing unpaved road surface may be required prior to paving. The road paving would involve several pieces of equipment, including an excavator, dump truck, front end loader, asphalt paving machine, and compaction roller. It is estimated that approximately eight truckloads of base material and four truckloads of hot mix asphalt would be delivered each day. Approximately 15 construction personnel would be required throughout the paving phase, which is anticipated to take approximately 3 months to complete.

LAA1 and LAA2 Realignment

LAA1 and LAA2 physically converge at the Fairmont Reservoir property downstream of the Fairmont Reservoir #2 outlet. To feed into the proposed sedimentation plant, they would need to be realigned, so that they converge upstream of Fairmont Reservoir #2. The 120-inch diameter LAA1 crosses into the property at the northwest corner of the project site, and the 90-inch diameter LAA2 crosses into the property at the northeast corner of the site. New supply lines of similar size would be installed below grade across the northern end of the site to connect each aqueduct to the sedimentation plant intake facility as depicted in Figure 1-4. Isolation valves would be installed at the existing LAA connection points to allow for the temporary shutoff of flows to the plant from one or both LAAs. In addition, double block and bleed bypass valves would be installed on the existing LAA1 and LAA2 (both of which would remain in place) downstream of each new connection point. This would completely isolate the existing lines during normal operating conditions at the plant but also allow for flows to be temporarily diverted around the plant through the lines if necessary. The flow in each LAA would be discontinued non-concurrently while these valves were installed. After the installation of the valves, flows would continue through the existing LAA lines during the duration of plant construction.

The installation of the new line, which would be approximately 1,000 feet in length, would entail the excavation of a trench, with the excavated material stockpiled adjacent to the trench to be used as backfill once the line was installed. Because of the width and depth of the trench, shoring would be required. Energy dissipaters or other controls may also be installed to ensure proper inlet velocities at the plant intake facility from the combined flows of the two LAAs. Pipe sections and other material would be delivered to the site, and some demolition material and debris would be hauled from the site. This would involve an average of 16 daily truck roundtrips throughout the phase.

Numerous pieces of equipment would be needed to install the realigned LAA pipeline, including excavators, dump trucks, front end loaders, bulldozers, and a crawler crane. An average of about

22 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Approximately 25 construction personnel would be required throughout the pipeline installation, which is anticipated to take approximately 12 months to complete.

Fairmont Reservoir #2 Modifications

The current concrete inlet structure for Fairmont Reservoir #2 was constructed to accommodate the flows from only LAA1. As discussed above, LAA2 currently bypasses Fairmont Reservoir #2 and connects to the outlet pipeline immediately downstream of the reservoir. However, after completion of the sedimentation plant, the reservoir would accept the combined flows of LAA1 and LAA2 discharged from the plant. Therefore, at the location depicted in Figure 1-4, the existing inlet structure would be enlarged to accommodate this combined flow. This would require the demolition and reconstruction of at least a portion of the existing inlet structure.

In addition, because Fairmont Reservoir #2 was constructed 35 years ago, the original asphalt lining has deteriorated. Since the enlargement of the inlet structure, as well as the realignment of LAA1, would mean that discharges to the reservoir would be paused for a period of time, an opportunity would be provided to replace the existing liner when the reservoir could be emptied. This replacement would involve the demolition of the liner and the repaving of the reservoir side walls with asphalt and the reservoir bottom with unreinforced concrete.

The demolition of the existing reservoir liner would involve the removal of approximately 18,000 cubic yards (CY) of asphalt, which would be hauled off site. This would result in approximately 43 haul truck roundtrips per day for about 3 months. The relining of the reservoir bottom would require approximately 3,000 CY of asphalt and 22,000 CY of concrete, which would result in approximately 32 delivery truck roundtrips per day for about 4 months.

The demolition and relining of the reservoir would require numerous pieces of equipment, including dump trucks, front end loaders, concrete pump trucks, a bulldozer, an asphalt paver, and a compaction roller. A peak of 10 pieces of equipment (including pickup trucks and water trucks) would be in operation daily for about 3 months, during demolition. A peak of approximately 50 daily construction personnel would be required during the relining operation. The entire reservoir modification phase is anticipated to take about 7 months to complete.

The number of daily truck trips, construction equipment, and personnel described above relate to the reservoir modification work only. However, as discussed above, this work would occur concurrently with the LAA realignment phase because discharges to the reservoir would temporarily cease during the aqueduct realignment. Because these two phases of work would overlap, the actual daily peak of construction activity at the Fairmont Reservoir property during the 7-month reservoir modification would be higher. The combined work under these two phases would result in a peak of approximately 59 truck roundtrips and 32 pieces of operating equipment per day during the 3-month demolition task and 75 construction personnel per day during the 4-month repaving task.

Sedimentation Plant Excavation and Grading

The LAAs operate via gravity flow, and in order to maintain this gravity flow, the various plant components depicted in Figure 1-4 must be situated at the appropriate elevation so that water would continue to flow through the plant and discharge into Fairmont Reservoir #2 without pumping. This would require excavation and grading for the proposed sedimentation basins and the rapid mix coagulation/flocculation tanks, which would each need to be about 20 feet deep, and the sludge processing facility, which would need to be about 10 feet deep. Because of the depth of excavation, shoring may be required in locations stable slopes cannot be built. Suitable excavated material would be used as necessary as fill to achieve the proper elevation across the entire plant. However, it is estimated that over 200,000 CY of excess material may be generated during the excavation and grading for the plant. This excess material would be placed into the empty Fairmont Reservoir #1, as indicated in Figure 1-3. To stabilize the material placed in Reservoir #1 to reduce erosion and windborne dust, it would be seeded with locally adapted native species and temporarily irrigated as appropriate to facilitate germination and growth. During the grading phase, runoff currently carried in the open drainage course that crosses the proposed project site would be intercepted redirected. The final drainage plan would be designed and permitted in consultation with the appropriate regulatory agencies (i.e., California Department of Fish and Wildlife, Regional Water Quality Control Board).

The excavation and grading phase would require numerous pieces of equipment, including dump trucks, excavators, front end loaders, bulldozers, and motor graders, and compaction rollers. An average of about 30 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Although most excavated material would remain on site, about six off-site haul truck round trips per day would be required to remove general debris during this phase. Approximately 25 construction personnel would be required throughout the excavation and grading phase, which is anticipated to take approximately 4 months to complete.

Sedimentation Plant Structures

The foundations for the sedimentation plant and ancillary facilities are depicted in Figure 1-4, as well as the walls for the plate settler sedimentation basins, the rapid mix coagulation/flocculation tanks, and the sludge processing facility would require substantial quantities of concrete. The total volume of concrete for the structures is estimated at approximately 30,000 CY, which would require a total of 3,000 concrete truck roundtrips over the 4 to 5 months of this phase of work. Along with the delivery of materials, such as reinforcing steel and form material, and the hauling of construction debris from the site, the peak number of daily off-site truck roundtrips would be about 48.

The primary pieces of on-site equipment required to complete the structures would be concrete pump trucks and a crawler crane. A peak of 9 pieces of equipment (including pickup trucks and water trucks) would be in operation daily for about 4 months. Approximately 25 construction personnel would be required throughout the structures phase, which is anticipated to take approximately 5 months to complete.

Plant Equipment and Support Facilities

The final phase of the sedimentation plant construction involves the installation of the plant equipment and the construction and finishing of the support facilities. The equipment includes: flow meters, regulators, and screens at the intake facility; mechanical mixers and chemical feed apparatus at the rapid mix coagulation/flocculation tanks; plate settlers and mechanical sediment removal systems in the sedimentation basins; chemical feed apparatus, mechanical mixers, and centrifuge dewatering systems at the sludge processing facility; conveyance systems to transfer processed sludge to trucks at the truck staging area; and chemical storage tanks for coagulants and flocculants. Support facility construction would involve structural and architectural elements and exterior and interior finishing, including plant control rooms, laboratories, administrative space, security systems, and personnel support facilities. In addition, septic and potable water treatment systems would be constructed during this phase.

The delivery of materials and the hauling of construction debris would result in about 8 truck roundtrips through the plant equipment and support facilities phase. Equipment required would include a front end loader, crawler crane, backhoe, and forklifts. An average of about 12 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Approximately 20 construction personnel would be required throughout the phase, which is anticipated to take approximately 15 months to complete.

1.2.4 Plant Operations and Maintenance

The sedimentation plant would generally be in operations 24 hours per day, 7 days per week, whenever the LAAs are flowing. The plant would require up to ten personnel, who would be distributed between two to three shifts during a day.

After commissioning of the sedimentation plant, CTP would be taken out of operation. However, the existing equipment would remain in place, and if circumstances required, it could be used to add coagulants and flocculants to LAA1 at CTP, as is currently done.

Although both LAA1 and LAA2 would flow through Fairmont Reservoir #2 after completion of the sedimentation pant, the reservoir would continue to operate with approximately the same freeboard elevation as it currently does, providing storage and regulating flows to Power Plants #1 and #2.

Based on a flow of 320 cubic feet per second (cfs) and turbidity of 14 Nephelometric Turbidity Units (NTU) averaged across the last 10 years of available LAA water quality data, approximately 144 wet tons of residual sludge would be processed on average each day. However, at peak flow and sediment concentration levels for the LAAs, approximately 346 wet tons of residual sludge would be processed in 1 day. Because arsenic, a naturally occurring trace element in LAA water, would be present in the sludge, it would be treated as California hazardous waste and disposed of at an approved hazardous waste landfill. Based on the average sludge production rate, it would require about 10 truck trips a day, Monday through Friday (typical landfill operating days), to transport about 200 tons of sludge. The sludge hopper at the plant would be sized to accommodate a minimum of 1 week of processed sludge to help maintain uniformity in the number of daily haul trucks trips.

Under emergency conditions when the Fairmont Sedimentation Plant must be shut down, the LAA1 and LAA2 isolation valves would be closed to shut off flow to the plant, and the double block and bleed bypass valves on the original aqueduct lines would be opened to allow water to flow through. As currently happens, LAA1 water would flow through Fairmont Reservoir #2, and LAA2 water would flow into the reservoir outlet pipeline downstream of the reservoir. If during the emergency shutdown it is determined, based on the concentrations of sediment in the LAA water or on the length of the shutdown, that the LAAFP cannot adequately treat the water, coagulants and flocculants would be added to LAA1 at CTP as described above, inducing sediment to settle out in North Haiwee Reservoir.

Scheduled maintenance of the plant would occur during lower-flow periods of the LAAs, generally between October 1 and March 31. During maintenance in normal precipitation years, the LAA1 and LAA2 isolation valves would be closed to shut off flow to the plant, and the double block and bleed bypass valves on LAA1 and/or LAA2 would be opened to allow flows through to Elizabeth Tunnel and the LAAFP, which would have the capability to temporarily treat the relatively low volumes of water without pretreatment at the Fairmont Sedimentation Plant. During high precipitation years, the plant shutdown during maintenance would be similar, but greater control of flows from the various sources (i.e., LAA1, LAA2, and SWP East Branch) may be necessary, depending on the sediment load in each source.

CHAPTER 2.0
EXISTING BIOLOGICAL CONDITIONS

2.1 PROJECT SETTING

The project is situated along the northern edge of the San Gabriel Mountains and the western edge of the Mojave Desert and is located on the Lake Hughes, California U.S. Geological Survey (USGS) 7.5-minute quadrangle map. Elevations in the Biological Survey Area (BSA) generally range between 3,010 and 3,070 feet above mean sea level (amsl). Other than several agricultural properties that include residences, the closest of which is about 1,000 feet northeast of the project site, the area surrounding the project is primarily undeveloped. The nearest communities to the Fairmont Reservoir property are Lake Hughes (population of less than 1,000), located about 2.5 miles to the south, and Elizabeth Lake (population of less than 2,000), located about 4 miles to the southeast. As mentioned above, the City of Lancaster, with a population of about 160,000, is located approximately 6 miles to the east; however, developed portions of the City are located approximately 10 miles from the project site. There are numerous large-scale solar energy developments in the Antelope Valley to the east and north of the project site. The 1,800-acre Antelope Valley California Poppy Reserve, which is administered by the California Department of Parks and Recreation, is located approximately 1.5 miles northeast of the project site.

2.2 FIELD SURVEYS AND DATABASE REVIEW

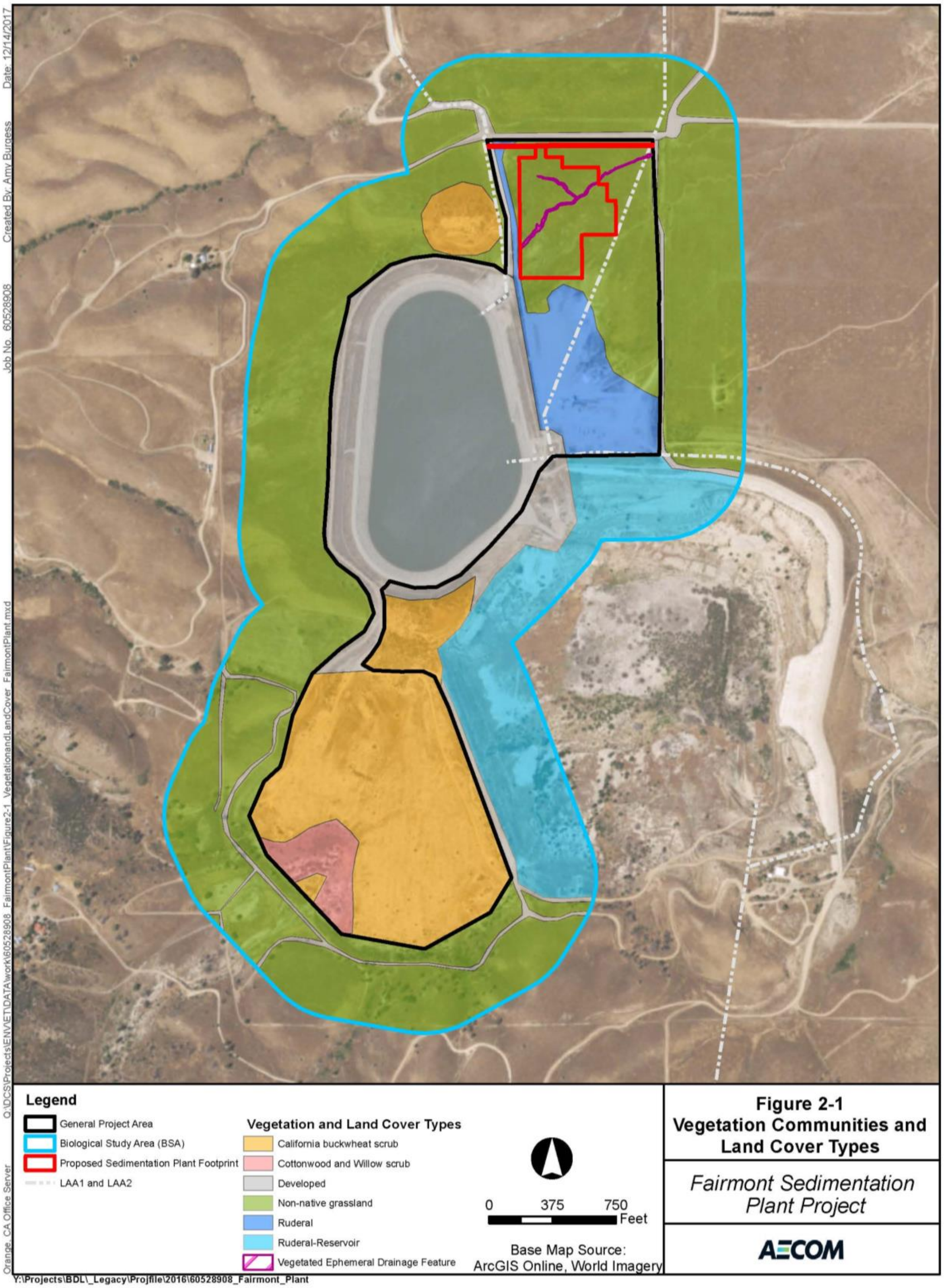
Prior to conducting a field survey, California Department of Fish and Wildlife (CDFW), California Native Plant Society (CNPS), and U.S. Fish and Wildlife Service (USFWS) special-status species and sensitive community occurrence databases were reviewed for the project vicinity. These sources are cited in relevant sections of the following report. AECOM biologists Art Popp and John Parent conducted an initial survey of the project site on January 17, 2017, to evaluate potential site constraints related to biological resources and jurisdictional waters. A second field survey was conducted by Mr. Popp and Mr. Parent on May 18, 2017, to formally document existing biological resources and potential jurisdictional waters in the project area. This survey was timed to coincide with the blooming period of many of the flowering plants in the region. A third survey was conducted by Mr. Parent on September 22, 2017, to document existing conditions at the proposed stockpile area identified for the project and to further evaluate potential jurisdictional features in the BSA. This report presents results of the surveys and background review and is intended as an evaluation of on-site habitat types and an assessment of the potential for the occurrence of special-status plant and wildlife species.

Vegetation communities and land cover types, plant species, and wildlife species found within the project area plus a 500-foot survey buffer around project components, combined the BSA, were surveyed and noted. The project area evaluated in this report includes the proposed sedimentation plant site, staging and laydown area, stockpile area, and Fairmont Reservoir #2. Project components and the BSA are depicted in Figure 2-1. Vegetation communities and land cover types beyond the BSA, such as adjacent to the roads that will be paved under the project, were also noted. Binoculars were utilized to scan for evidence of wildlife activity and for potential avian nest sites outside the BSA. Seasonal, species-specific botanical and wildlife surveys were not conducted as part of this evaluation. Observations of existing conditions made during the field surveys would not necessarily rule out some special-status species; however, based on assessments of the BSA, habitats preferred by regional special-status plant and wildlife species generally do not occur in the BSA, limiting potential for their occurrence in the BSA.

2.3 VEGETATIVE COMMUNITIES AND LAND COVER TYPES

Vegetation communities and land cover types observed within the BSA during the field surveys have generally been altered by construction and subsequent operation of the Fairmont reservoirs and other water supply infrastructure in the vicinity (i.e. LAA1, LAA2, SWP). The BSA is comprised of varying densities of native and non-native vegetation, and developed areas, such as the Fairmont reservoirs, roadways, and a staging area for equipment and materials. As a result of the disturbed and developed nature of the reservoir complex, vegetation communities within the BSA do not correspond directly with natural vegetation classifications typically used to describe on-site vegetation. Where appropriate, the Manual of California Vegetation, Second Edition (Sawyer et al. 2009) and/or Holland (1986) were utilized to classify vegetation communities.

Vegetation throughout the Project vicinity is largely characteristic of the western Mojave Desert, with influences from the nearby San Gabriel Mountains. Plant species diversity is typical of a large area extending along the northern alluvial plain of the San Gabriel Mountains. No vegetation components exist within the BSA that are unique from the surrounding area. A list of plant species recorded, with a focus on those species occurring within the footprints of the proposed sedimentation plant, staging and laydown area, and stockpile area, is included in Appendix B, Table A. During field surveys, 31 plant species were noted, 18 of which are native. Few trees exist within the BSA. Some willow (*Salix* spp.), cottonwood (*Populus* spp.), and pine (*Pinus* spp.) trees occur in dry Fairmont Reservoir #1 and on grass-covered hillsides to the south and east of the BSA. No trees coincide with the proposed sedimentation plant site and the staging and laydown area. No plant species listed under the federal or state Endangered Species Acts, or species otherwise listed or protected were observed during the field surveys. Regional special-status plant species are discussed further in Chapter 3.1.



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Biological Study Area (BSA)
Proposed Sedimentation Plant Footprint
LAA1 and LAA2
Vegetation and Land Cover Types
California buckwheat scrub
Cottonwood and Willow scrub
Developed
Non-native grassland
Ruderal
Ruderal-Reservoir
Vegetated Ephemeral Drainage Feature
0
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Base Map Source:
ArcGIS Online, World Imagery
Figure 2-1
Vegetation Communities and Land Cover Types
Fairmont Sedimentation Plant Project
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Acreages of the vegetation communities and land cover types mapped within the BSA are presented below in Table 2-1 and are depicted in Figure 2-1. Photos of existing habitats and land cover types are included in Appendix A.

Table 2-1
Vegetation Communities and Land Cover Types

Vegetation Community/Land Cover Type	**Acres in Project Area**	**Total Acreage in BSA**
Non-Native Grassland	21.95	142.24
Developed	50.05	63.96
Eriogonum fasciculatum Shrubland Alliance (Sawyer et al.) Coastal sage scrub (Holland)	36.65	44.78
Ruderal-Reservoir	-	32.04
Ruderal	12.65	12.65
Cottonwood and Willow Scrub	4.46	4.46
TOTAL	**125.76**	**300.13**

Non-Native Grassland

This Holland vegetation community type dominates the BSA. The community consists primarily of red brome (*Bromus madritensis* ssp. *rubens*), ripgut brome (*B. diandrus*), and wild oat (*Avena fatua*). Other grass species including common barley (*Hordeum vulgare*) and squirreltail (*Elymus elymoides*) were also observed. In the proposed location for the sedimentation plant, rubber rabbitbrush (*Ericameria nauseosus*), California buckwheat (*Eriogonum fasciculatum*), and common sandaster (*Corethrogyne filaginifolia*) is intermixed with grasses, their growth restricted by annual mowing/disking of the site. This community stretches across the vegetated ephemeral drainage feature that transects the proposed sedimentation plant site. Views of the community at the proposed plant site are included as Photos 1 and 2 in Appendix A. Much of the area surrounding the BSA is also composed of grassland habitat with scrub and tree species interspersed.

California Buckwheat Scrub (Eriogonum fasciculatum Shrubland Alliance)

The stockpile area is composed primarily of a sparse cover of California buckwheat. Non-native grasses and California encelia (*Encelia californica*) are also present in this community. A buckwheat community also occurs in the BSA north of Fairmont Reservoir #2, where non-native grassland habitat surrounds a community of California buckwheat.

Cottonwood and Willow Scrub

This community consists of cottonwood and willow tree saplings in the southern portion of the stockpile area (see Photo 12, Appendix A). The proposed stockpile area is located within a portion of Fairmont Reservoir #1. This community is likely remnant riparian habitat that has emerged since the reservoir was taken out of service. Mulefat (*Baccharis salicifolia*) was also noted in this community, with California buckwheat scrub habitat occurring across the remainder of the stockpile area.

Ruderal

No habitat equivalent of this cover type is described by Sawyer et al. (2009) or Holland (1986). Ruderal areas have often been altered by past anthropogenic activities where existing vegetative cover has been altered and ground disturbance may have occurred. Such areas often consist of bare ground or are colonized by invasive, non-native herbaceous plants. Ruderal areas in the BSA occur at the proposed staging and laydown area and within a portion of the proposed sedimentation plant site (see Photos 3 and 4, Appendix A). Currently these areas consist of a mix of bare ground, gravel, and ruderal vegetation, including primarily non-native grasses, mustard (*Brassica* sp.), dove weed (*Croton setigerus*), and London rocket (*Sisymbrium irio*).

Ruderal-Reservoir

A second ruderal community, one specific to the now-dry Fairmont Reservoir #1, has also been mapped. Steep slopes from the western perimeter of the reservoir, down to its bottom, are included in the BSA and differentiated here from the ruderal community identified in the proposed sedimentation plant site and staging and laydown area to the north. Currently, side slopes include large areas of bare ground and areas sparsely vegetated by non-native grasses, with occasional pine trees and California buckwheat shrubs. Similar habitat conditions exist within the remainder of the reservoir east of the BSA. The dry reservoir includes large areas of bare ground, occasional pine, willow, and cottonwood, clumps of rubber rabbitbrush and California buckwheat, and non-native grassland species. A fire in the reservoir in 2013 reduced vegetative cover from previous conditions. Photos of the reservoir are included as Photos 10 and 11, in Appendix A.

Developed

No habitat equivalent of this cover type is described by Sawyer et al. (2009) or Holland (1986). Developed lands are areas that have been altered by clearing and construction activities to support man-made structures such as buildings, roads, parking lots, and sidewalks, which often include associated ornamental landscaped areas. As depicted on Figure 2-1, developed areas within the BSA include Fairmont Reservoir #2, paved and unpaved roadways, and a residential parcel west of Fairmont Reservoir #2. A photo of the reservoir is included as Photo 9 in Appendix A. Developed areas mapped in the BSA also include incidental areas of bare ground and where the natural vegetation community has been altered by activities associated with construction and operation of the Fairmont Reservoir complex.

2.3 WILDLIFE SPECIES

Wildlife detected during the field surveys included 22 bird species, five mammals, and three reptiles. No active nests or bird breeding behaviors were observed in the BSA, and areas immediately adjacent to the BSA, during the surveys. All bird observations were of individuals that were resting or foraging on the ground in the BSA, or flying overhead both inside and outside the BSA. A list of wildlife species detected during the surveys is included in Appendix B, Table B.

No wildlife species listed under the federal or state Endangered Species Acts were detected during the field surveys. California horned lark (*Eremophila alpestris actia*), a CDFW Watch List species and loggerhead shrike (*Lanius ludovicianus*), a CDFW Species of Special Concern, were observed. Regional special-status wildlife species are discussed further in Chapter 3.2.

2.4 WILDLIFE MOVEMENT CORRIDORS

A wildlife migration corridor can be defined as a linear landscape feature of sufficient width and buffer to allow animal movement between two comparatively undisturbed habitat fragments, or between a habitat fragment and some vital resource that encourages population growth and diversity. Habitat fragments are isolated patches of habitat separated by otherwise foreign or inhospitable areas, such as urban/suburban tracts, agricultural lands, or highways. Habitat fragments can isolate species populations by limiting migration, foraging, and breeding opportunities. Isolation of populations can have many harmful impacts and may contribute significantly to local species extinction.

Two types of wildlife migration corridors are regional corridors, defined as those linking two or more large areas of natural open space, and local corridors, defined as those allowing resident animals to access critical resources (food, cover, and water) in a smaller area that might otherwise be isolated by development. Wildlife migration corridors are essential in geographically diverse settings, and especially in urban settings, for the sustainability of healthy and diverse animal communities. At a minimum, corridors promote colonization of habitat and genetic variability by connecting fragments of like habitat and help sustain individual species distributed in and among habitat fragments. They are also important features for dispersal, seasonal migration, foraging, and breeding.

The project is located within the Antelope Valley, which likely provides regional corridors for wildlife movement between the San Gabriel (to the south) and Tehachapi Mountains (to the north) across the valley floor, as well as for the local movement of individuals and populations occurring in the valley. The project vicinity includes large, undeveloped expanses of grassland and desert scrub communities that provide suitable habitat opportunities for movement between mountain ranges and across the valley floor. Changes in topography and vegetation communities along the northern slope of the San Gabriel Mountains, foothills, and down into the adjacent valley floor likely attracts a higher diversity of wildlife species that inhabit these areas (County of Los Angeles 2014).

The Los Angeles County Significant Ecological Areas Technical Advisory Committee (SEATAC) has identified areas in and around existing and proposed Significant Ecological Areas (SEAs) in Los Angeles County that are conducive to or a hindrance to wildlife movement between SEAs (SEAs are further discussed in Chapter 5.3). The BSA partially occurs within the San Andreas SEA and this map, the Constriction and Connectivity Areas Map (County of Los Angeles 2014), indicates three movement corridors (San Andres [SAN] 027, SAN028, and SAN029) in or within close proximity of the BSA. These three provide linkages between large natural areas, generally following natural topography, such as a streambed or ridgeline. The two corridors occurring outside the BSA (SAN027 and SAN028), are located 0.50 to 1.0 mile north-northwest of the BSA at bridge crossings that provide movement over the SWP. These linkages are located at an anthropogenic feature (the SWP) that may prevent, impede, or slow movement within or outside the San Andreas SEA. As a result they serve as important funnel corridors over an anthropogenic feature at a distinct location. The corridor coinciding with the BSA (SAN029) occurs between the area around Fairmont Reservoir #1 and larger contiguous natural areas to the south, in the foothills of the San Gabriel Mountains. Movement from the BSA into the foothills then theoretically provides further movement to the south and west into the San Gabriel Mountains, where additional large undisturbed natural areas exist in the Angeles National Forest.

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CHAPTER 3.0
SPECIAL-STATUS BIOLOGICAL RESOURCES

The California Natural Diversity Data Base (CNDDB) (CDFW 2017a) and the CNPS on-line Inventory of Rare and Endangered Plants of California (CNPS 2017) were reviewed in January 2017 prior to the first field survey for the most recent distribution information for regional special-status plant and wildlife species and sensitive natural communities within the Lake Hughes quadrangle and the surrounding eight quadrangles including: Burnt Peak, Del Sur, Fairmont Butte, Green Valley, Little Buttes, Neenach School, Sleepy Valley, and Warm Springs Mountain. The USFWS Information for Planning and Conservation (IPaC) (USFWS 2017) on-line database was also reviewed for special-status species, sensitive natural communities, and protected areas known from the project vicinity. These databases were reviewed again in November 2017 to determine if additional special-status species would be identified. One additional special-status plant and one additional special-status wildlife species were identified in the updated search. The results of database reviews presented in this report reflect results of the November 2017 database review, and are included in Appendix C.

Information on special-status plant and wildlife species was also compiled through a review of:

- State and Federally Listed Endangered, Threatened, and Rare Plants of California (CDFW 2017b)
- Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2017c)
- State and Federally Listed Endangered and Threatened Animals of California (CDFW 2017d)
- Special Animals List (CDFW 2017e)

3.1 SPECIAL-STATUS PLANTS

Special-status plant species include those listed as Endangered, Threatened, Rare or those species proposed for listing by the USFWS under the federal Endangered Species Act (FESA) and CDFW under the California Endangered Species Act (CESA) (CDFW 2017b). The CNPS inventory is sanctioned by the CDFW and serves essentially as the list of candidate plant species for state listing. CNPS's California Rare Plant Rank (CRPR) 1B and 2 species are considered eligible for state listing as endangered or threatened.

Three plant species known from the Lake Hughes and surrounding eight quadrangles are federally and/or state-listed as threatened, endangered, rare, or candidates for listing, including:

- Nevin's barberry (*Berberis nevinii*), federally and state-listed endangered
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*), federal candidate for listing as threatened and state-listed endangered
- spreading navarretia (*Navarretia fossalis*), federally-listed threatened

Results of the database reviews indicate that no records of special-status plant species listed under the FESA or CESA coincide with the BSA. Additionally, no USFWS-designated critical habitat for plants listed under FESA coincides with the BSA.

A total of 26 special-status plant species were identified from searches of the CNDDB and CNPS on-line inventory to have historically been recorded from the Lake Hughes and surrounding eight quadrangles, and from a search of IPaC for the project area. The species identified from a search of these databases are provided in Appendix D, Table A. The potential for special-status plant (and wildlife species presented in Chapter 3.2) identified during the database search to occur within the BSA are classified as "Not Expected," "Low," "Moderate," "High," or "Present." These classifications are derived from an evaluation comparing existing habitat in the BSA to the presence and suitability of habitats preferred by the species of interest.

The potential for each plant (and wildlife) species to occur within the BSA is based on the following guidelines.

- **Present**: Species was observed in or immediately adjacent to the BSA during the field survey, or survey conducted within the past five years.
- **High**: Habitat (including soils and elevation factors) and known historical range for the species occurs in the BSA and a known occurrence has been recorded from within five miles within the past 30 years.
- **Moderate**: Habitat for the species occurs in the BSA and a known occurrence exists from between five and ten miles of the BSA, within the past 30 years.
- **Low**: Limited habitat for the species occurs in the BSA and a known occurrence is from greater than 10 miles from the BSA or over 30 years old, or habitat to support the species is of marginal quantity or quality. A low potential to occur is also assigned when focused surveys for a species have been conducted numerous times within the past 10 years without positive results.
- **Not Expect**: Beyond those factors listed for Low Potential, the species is easily identifiable throughout the year and was not observed, or specific habitat requirements are not found within or adjacent to the BSA.

Upon evaluating the habitat requirements of the regional special-status plant species listed in Appendix D, Table A, against conditions in the BSA, taking into consideration that no special-status species were identified during surveys in support of this report, it was determined that none of the 26 special-status plant species known from the region are expected to occur within the BSA. Much of the vegetation in the BSA has been disturbed by past anthropogenic activities in the reservoir complex, and is of marginal quality to provide habitat suitable for regional special-status plants.

3.2 SPECIAL-STATUS WILDLIFE

Special-status wildlife species include those listed as Endangered, Threatened, or those species proposed for listing by the USFWS under FESA and CDFW under CESA (CDFW 2017d). Additional species receive federal protection under the Bald Eagle Protection Act (e.g., bald eagle, golden eagle), the Migratory Bird Treaty Act (MBTA), and state protection under the California Environmental Quality Act (CEQA) Section 15380(d).

All birds, except European starlings, English house sparrows, rock doves (pigeons), and non-migratory game birds such as quail, pheasant, and grouse are protected under the MBTA. However, non-migratory game birds are protected under California Fish and Game Code (CFGC) Section 3503. Many other species are considered by CDFW to be California species of special concern (SSC), listed in Remsen (1978), Williams (1986) and CDFW (2017e), and others are on a CDFW Watch List (WL) (CDFW 2017e). The CNDDB tracks species within California for which there is conservation concern, including many that are not formally listed, and assigns them a CNDDB Rank (CDFW 2017e). Although SSC and WL species, and species that are tracked by the CNDDB, but not formally listed, are afforded no official legal status, they may receive special consideration during the CEQA review process.

CDFW further classifies some species under the following categories: "Fully Protected", "Protected birds" (CDFW Code §3511), "Protected mammals" (CDFW Code §4700), "Protected amphibian" (CDFW Code §5050 and Chapter 5, §41), "Protected reptile" (CDFW Code §5050 and Chapter 5, §42), and "Protected fish" (CDFW Code §5515). The designation "Protected" indicates that a species may not be taken or possessed except under special permit from CDFW; "Fully Protected" indicates that a species can be taken for scientific purposes by permit only (CDFW 2017e). CDFW Code §3503, 3505, and 3800 prohibit the take, destruction or possession of any bird, nest or egg of any bird except English house sparrows and European starlings unless express authorization is obtained from CDFW.

Eight wildlife species known from the Lake Hughes and surrounding eight quadrangles are federally and/or state-listed as threatened, endangered, or as candidates for listing, or otherwise protected by federal or state law, including:

- unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), federally and state-listed endangered
- California red-legged frog (*Rana draytonii*), federally-listed endangered, CDFW Species of Special Concern
- desert tortoise (*Gopherus agassizii*), federally and state-listed threatened
- golden eagle (*Aquila chrysaetos*), federally-protected under Bald and Golden Eagle Protection Act, CDFW Fully Protected
- Swainson's hawk (*Buteo swainsoni*), state-listed threatened
- California condor (*Gymnogyps califonianus*), federally and state-listed endangered, CDFW Fully Protected
- bald eagle (*Haliaeetus leucocephalus*), federally-protected under Bald and Golden Eagle Protection Act, state-listed endangered, and CDFW Fully Protected
- least Bell's vireo (*Vireo bellii pusillus*), federally and state-listed endangered

A total of 32 special-status wildlife species were identified from the CNDDB search to have historically been recorded from the Lake Hughes and surrounding eight quadrangles, and from a search of IPaC for the project area. The occurrence of one special-status wildlife species, tricolored blackbird (*Agelauis tricolor*), a candidate species for listing as endangered under CESA, coincides with the BSA. Additional records of this species, and other special-status wildlife, occur within close proximity of the BSA. The status, habitat requirements, and potential for the regional special-status wildlife species to occur within the project area are provided in Appendix D, Table B. No USFWS-designated critical habitat for wildlife listed under FESA coincides with the BSA.

As previously indicated, natural vegetation communities in the BSA have generally been altered by construction and subsequent operation of the Fairmont reservoirs. However, an assessment of the habitat requirements of the regional special-status wildlife species listed in Appendix D, Table B, indicates the BSA likely provides habitat potentially suitable for some special-status wildlife. When evaluated against the potential for occurrence guidelines presented in Chapter 3.1, it was determined that five special-status wildlife species have moderate potential and ten species a low potential to occur within the BSA. As previously indicated, two special-status wildlife were detected within the BSA during the field surveys. The total of 17 special-status wildlife species with a potential to occur within the BSA, or that were detected during field surveys within the BSA, are presented in Table 3.1.

Table 3-1
Regional Special-Status Wildlife Species[1] with Potential to Occur in the BSA

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent	Potential for Occurrence in the BSA[5,6]
Reptiles				
California glossy snake *Arizona elegans occidentalis*	Federal: None State: None Other: SSC	Most common is desert habitats but also occur in chaparral, sagebrush, valley-foothill hardwood, pine-juniper, and annual grass.	Present	**Low:** Habitat potentially suitable for this species is present in the BSA; however, the only regional occurrence is 15 plus miles southwest of the BSA near Castaic, and is from 1946.
coastal whiptail *Aspidoscelis tigris stejnegeri*	Federal: None State: None Other: SSC	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage - chaparral, woodland, and riparian areas.	Present	**Low**: Although limited, habitat conditions potentially suitable for this species are present in the BSA. The nearest historical record of this species is from approximately 4 miles southwest of the BSA in the vicinity of Lake Elizabeth, from 2003.
coast horned lizard *Phrynosoma blainvillii*	Federal: None State: None Other: SSC	Inhabits coastal sage scrub and chaparral in arid and semiarid climates. Prefers friable, rocky, or shallow sandy soils.	Absent	**Low**: Habitats potentially suitable for this species are generally absent from the BSA; however, a historical record of this species from 2010 occurs approximately 1.6 miles southeast of the BSA. Additionally, multiple records from 2008 are located 7 miles southeast of the BSA.

Table 3-1
Regional Special-Status Wildlife Species[1] with Potential to Occur in the BSA

Common Name ***Scientific Name[2]***	**Status[3]**	**General Habitat Description[4]**	**Potentially Suitable Habitat Present/ Absent**	**Potential for Occurrence in the BSA[5,6]**
Birds				
tricolored blackbird *Agelaius tricolor*	Federal: None State: SC Other: SSC	Inhabits annual grasslands, wet and dry vernal pools, seasonal wetlands. Frequently found in and around agricultural areas.	Present	**Moderate:** Although habitat in the BSA is marginal for this species, potentially suitable conditions exist within and immediately adjacent to the BSA. Historical observations of this species have been made “in the vicinity of Fairmont Reservoir” between 2008-2012. There are also multiple records between 2008-2011 from within 3 miles southeast of the BSA.
golden eagle *Aquila chrysaetos*	Federal: BGEPA State: None Other: FP,WL	Uses rolling foothills and mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, and cliffs and rock outcrops.	Present	**Low:** Although suitable nesting habitat for this species is absent from the BSA, it does provide potentially suitable foraging habitat. The nearest known occurrence is from approximately 10 miles northeast of the BSA, from 2010. May occur as transient in BSA.

Table 3-1
Regional Special-Status Wildlife Species[1] with Potential to Occur in the BSA

Common Name ***Scientific Name***[2]	**Status**[3]	**General Habitat Description**[4]	**Potentially Suitable Habitat Present/ Absent**	**Potential for Occurrence in the BSA**[5,6]
burrowing owl *Athene cunicularia*	Federal: None State: None Other: SSC	A yearlong resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. Formerly common in appropriate habitats throughout the state, excluding the humid northwest coastal forests and high mountains. Frequents open grasslands and shrublands with perches and burrows.	Present	**Low:** Habitat potentially suitable for this species occurs in the BSA and there are multiple records from between 2007-2011 within 5 miles to the north and east of the BSA. However, no sign or burrows potentially suitable for this species were detected during field surveys.
ferruginous hawk *Buteo regalis*	Federal: None State: None Other: WL	Fairly common winter resident of grasslands and agricultural areas in southwestern California. Casual in northeast in summer. Frequents open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys, and fringes of pinyon-juniper habitats. Requires large, open tracts of grasslands, sparse shrub, or desert habitats with elevated structures for nesting.	Present	**Moderate:** Although suitable nesting habitat for this species is marginal in the BSA, it provides potentially suitable foraging habitat. Additionally, there are multiple records from 2011 of this species within 6 miles east of the BSA.

Table 3-1
Regional Special-Status Wildlife Species[1] with Potential to Occur in the BSA

Common Name ***Scientific Name[2]***	**Status[3]**	**General Habitat Description[4]**	**Potentially Suitable Habitat Present/ Absent**	**Potential for Occurrence in the BSA[5,6]**
Swainson's hawk *Buteo swainsoni*	Federal: None State: ST	Typical habitat is open desert, grassland, or cropland containing scattered, large trees or small groves. Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures.	Present	**Moderate:** Although suitable nesting habitat for this species is marginal in the BSA, it may occur as a foraging transient. A record from 2011 of this species occurs 5 miles east of the BSA.
mountain plover *Charadrius montanus*	Federal: None State: None Other: SSC	Frequents open plains with low, herbaceous or scattered shrub vegetation. Found in foothill valleys west of San Joaquin Valley, Imperial Valley, plowed fields of Los Angeles and western San Bernardino counties, and along the central Colorado River valley. Generally nest in scrapes on ground in open, featureless grasslands.	Present	**Moderate:** Habitat potentially suitable for nesting and foraging is present in the BSA. A record from 2004 of this species occurs in the vicinity of the Antelope Valley California Poppy Preserve approximately 1.5 miles northeast of the BSA. An additional record from 2011 occurs 5 miles east of the BSA.
California horned lark *Eremophila alpestris actia*	Federal: None State: None Other: WL	Open areas dominated by sparse low herbaceous vegetation or widely scattered low shrubs. Nests in hollow on ground often next to grass tuft or clod of earth or manure.	Present	**Present:** This species was detected in the BSA during the May 18, 2017 field survey.

Table 3-1
Regional Special-Status Wildlife Species[1] with Potential to Occur in the BSA

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent	Potential for Occurrence in the BSA[5,6]
merlin *Falco columbarius*	Federal: None State: None Other: WL	Frequents open habitats at low elevation near water and tree stands. Favors coastlines, lakeshores, wetlands.	Present	**Moderate:** Although suitable nesting habitat for this species is marginal in the BSA, it may occur as a foraging transient. A record from 2011 of this species occurs 6 miles north of the BSA.
California condor *Gymnogyps califonianus*	Federal: FE State: SE Other: FP	Aerial, cliff, grassland/herbaceous, savanna, shrubland/chaparral, conifer woodland, hardwood woodland, mixed woodlands, standing snag/hollow tree. Usual habitat is mountainous country at low and moderate elevations, especially rocky and brushy areas with cliffs available for nest sites, with foraging habitat encompassing grasslands, oak savannas, mountain plateaus, ridges, and canyons. Condors often roost in snags or tall open-branched trees near important foraging grounds.	Absent	**Low:** Although suitable nesting habitat for this species is absent in the BSA, it provides potentially suitable foraging habitat. A record from 2011 of this species occurs 5 miles east of the BSA. May occur as transient in BSA.
bald eagle *Haliaeetus leucocephalus*	Federal: Delisted, BGEPA State: SE	Requires large, old-growth trees or snags in remote, mixed stands near water.	Absent	**Low**: Habitat potentially suitable for this species is generally absent from the BSA; however, this species was recorded in 2009 approximately 3 miles southeast along Lake Elizabeth. May occur as transient in BSA.

Table 3-1
Regional Special-Status Wildlife Species[1] with Potential to Occur in the BSA

Common Name *Scientific Name*[2]	**Status**[3]	**General Habitat Description**[4]	**Potentially Suitable Habitat Present/ Absent**	**Potential for Occurrence in the BSA**[5,6]
loggerhead shrike *Lanius ludovicianus*	Federal: None State: None Other: SSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low or sparse herbaceous cover.	Present	**Present:** This species was detected in the BSA during the January 17, 2017 field survey.
Le Conte's thrasher *Toxostoma lecontei*	Federal: None State: None Other: SSC	Frequents desert washes and flats with scattered shrubs and large areas of open, sandy, or alkaline terrain in desert wash, desert scrub, alkali desert scrub, and desert succulent shrub habitats.	Present	**Low:** Although suitable nesting habitat for this species is absent in the BSA, it provides potentially suitable foraging habitat. A record from 1968 of this species occurs 10 miles north-northeast of the BSA. May occur as transient in BSA.
Mammals				
hoary bat *Lasiurus cinereus*	Federal: None State: None Other: WBWG-M	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding.	Present	**Low:** Habitat potentially suitable for this species is present in the BSA; however, the only regional record of this species occurs approximately 2.5 miles south of the BSA near Lake Hughes and is from 1938.
American badger *Taxidea taxus*	Federal: None State: None Other: SSC	Uncommon, permanent resident found throughout most of the state, except in the northern North Coast area. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Dig burrows in friable soil for cover.	Present	**Low**: Although habitat potentially suitable for this species occurs in the BSA and an occurrence in 1988 occurs approximately 1.5 miles southwest of the BSA near Lake Elizabeth, no burrows potentially suitable for this species were detected during the field surveys.

[1] Special-Status species known from the CNDDB to occur on the Lake Hughes, Burnt Peak, Del Sur, Fairmont Butte, Green Valley, Little Buttes, Neenach School, Sleepy Valley, and Warm Springs Mountain quadrangles

[2] Nomenclature for special-status wildlife conforms to CNDDB.

[3] Sensitivity Status Codes

Federal
- **FT** - Federally Threatened under Federal Endangered Species Act (FESA)
- **FE** - Federally Endangered under FESA
- **BGEPA -** Bald and Golden Eagle Protection Act

State
- **ST** - State Threatened under California Endangered Species Act (CESA)
- **SE** - State Endangered under CESA
- **SC -** State Candidate for listing under CESA

Other
- **SSC -** Designated as a Species of Special Concern by CDFW
- **WL -** Designated as a Watch List species by California Department of Fish and Wildlife (CDFW)
- **CNDDB** - Tracked by CDFW in the California Natural Diversity Data Base or considered locally sensitive
- **WBWG-H** - Designated by the Western Bat Working Group (WBWG 2015) as High Priority - species that are imperiled or are at high risk of imperilment
- **WBWG-M** - Designated by the WBWG (2015) as Medium Priority – a level of concern that should warrant closer evaluation, more research, and conservation actions of both species and possible threats.

[4] General Habitat Descriptions from CNDDB (CDFW 2017a).

[5] Historical occurrence information from CDFW (2017a).

[6] Potential for each species to occur within the BSA is based on the following general guidelines:

- Present: Species was observed in or immediately adjacent to the BSA during the field survey, or survey conducted within the past five years.
- High: Habitat (including soils and elevation factors) and known historical range for the species occurs in the BSA and a known occurrence has been recorded from within five miles within the past 30 years.
- Moderate: Habitat for the species occurs in the BSA and a known occurrence exists from between five and ten miles of the BSA, within the past 30 years.
- Low: Limited habitat for the species occurs in the BSA and a known occurrence is from greater than 10 miles from the BSA or over 30 years old, or habitat to support the species is of marginal quantity or quality. A low potential to occur is also assigned when focused surveys for a species have been conducted numerous times within the past 10 years without positive results.
- Not Expect: Beyond those factors listed for Low Potential, the species is easily identifiable throughout the year and was not observed, or specific habitat requirements are not found within or adjacent to the BSA.

Special-status wildlife detected in the BSA during field surveys and those with a moderate potential to occur are discussed further below. A general discussion of other regional special-status wildlife also follows.

Birds

Raptors

Common raptor species, such as red-tailed hawk (*Buteo jamaicensis*) and turkey vulture (*Cathartes aura*) observed during field surveys, and the regional special-status raptors listed in Table 3.1 above, build nests in mature, large coniferous or deciduous trees, using twigs or branches as nesting material, or nest in cavities in trees or on cliffs. Although nesting habitat preferred by raptors is limited, common and special-status raptors could nest in and adjacent to the BSA, in particular in trees in and along Fairmont Reservoir #1, and in scattered trees on hillsides to the south and west of the project area. The nesting period for raptors generally occurs between December 15 and August 31.

Raptors generally have a greater potential to forage over the mix of disturbed, desert scrub, and grassland habitats that occur in and adjacent to the BSA, than nest in it. Large special-status raptors such as golden and bald eagle, and California condor, typically prefer large trees or cliffs that are in surrounding mountains, more removed from human disturbance than the edge of the valley floor were the BSA occurs. Special-status raptors more common on the valley floor, such as Ferriguous hawk, Swainson's hawk, and merlin also have marginal nesting opportunities in trees occurring within the BSA, making it unlikely that they would nest in the vicinity of the project either. Additionally, no burrows potentially suitable for burrowing owl were observed during the field surveys. Therefore as a group, raptors are not expected or have only low potential to nest within the BSA.

Regional special-status raptor species that have potential to nest and/or forage in and adjacent to the BSA are discussed below.

Ferriguous Hawk

The ferruginous hawk (*Buteo regalis*), a CDFW Watch List species, is a large raptor that inhabits open habitats in the Great Basin and northern Great Plains during the breeding season, and arid to semi-arid areas of California in the winter. They generally do not breed in California, but have been occasionally documented nesting in the far northeast of the state (Peeters and Peeters 2005). They prefer open grasslands for foraging and have also been observed utilizing agricultural areas. The primary prey of ferruginous hawks are mammals, including rabbits, ground squirrels, and prairie dogs, although birds and reptiles are also eaten (Bechard and Schmutz 1995). Ferruginous hawks often perch on the ground, using sit-and-wait tactics to capture prey. They arrive in California between September and October, and depart between February and April. They typically congregate in grasslands and deserts where mammalian prey is abundant.

There are multiple records from 2011 of ferruginous hawk within six miles east of the BSA (CDFW 2017a). Mixed scrub and grassland habitats provide foraging opportunities within the BSA. Based on the presence of nearby occurrences and the presence of suitable foraging habitat on-site, ferruginous hawk is considered to have a moderate potential to forage within the study area. However, the study area is outside of their breeding range, and they are not expected to nest on-site.

Swainson's Hawk

The Swainson's hawk (*Buteo swainsoni*), state-listed threatened, occurs in open habitats throughout much of the western United States, Canada, and northern Mexico. Swainson's hawks breed in North America and winter in the open grassland areas of southern South America (pampas) as well as parts of Mexico. In the Central Valley, Swainson's hawks arrive at nesting areas in late February and early March, 4-6 weeks earlier than they arrive at nesting sites in northeastern California. They begin to depart for wintering areas in early September.

In California, they breed in desert, shrub steppe, agricultural, and grassland habitats. Swainson's hawks construct their nests in a variety of tree species in existing riparian forests, remnant riparian trees, shade trees at residences and alongside roads, planted windbreaks, and solitary upland oaks. However, they typically do not nest in large continuous patches of woodland other than along edges next to open habitats (England et al. 1997). The diet of this hawk varies considerably during breeding and non-breeding seasons. They depend largely on small mammals during the breeding season and shift to feeding on insects during the non-breeding season, particularly crickets and grasshoppers. During the breeding season, Swainson's hawks will travel long distances (up to 18 miles) in search of suitable foraging habitat that provides abundant prey (Estep 1989). CDFW considers whether or not a project will affect suitable foraging habitat within a ten-mile radius of an active Swainson's hawk nest (used during one or more of the last 5 years) (CDFG 1994). Suitable Swainson's hawk foraging habitats are those identified by Bechard (1983), Bloom (1980), and Estep (1989), and include grassland and ruderal areas as well as open scrub habitats. They have also become highly dependent on foraging in agricultural fields throughout their range. The agricultural crops considered small mammal and insect foraging habitat for Swainson's hawk include alfalfa, fallow fields, beet, tomato, and other low-growing row or field crops, dry-land and irrigated pasture, and cereal grain crops (including corn after harvest).

Three records of Swainson's hawk have been recorded from within 10 miles of the BSA (CDFW 2017a). These records occur between 5-8 miles north and east of the BSA. Active nests were observed as recently as 2011 at these sites; however, since that time, all three have been reported as failed. Nest sites are typically considered active if nesting pairs have been observed in the last five years. There is a low incidence of active Swainson's hawk nests in the vicinity of the BSA that have been reported to the CNDDB.

There is low potential for Swainson's hawks to use large trees in and around Fairmont Reservoir #1 and trees further to the south and west of the BSA for nesting. Biologists did not observe any Swainson's hawks on-site or flying over the BSA or vicinity during the field surveys. As a result, Swainson's hawks are considered to have a moderate potential to occur on-site, primarily as a foraging transient.

Merlin

The merlin (*Falco columbarius*) is a CDFW Watch List species. It is a small falcon that breeds in wooded areas of the Pacific Northwest, Canada, and Alaska. Although merlins do not nest in California, they winter in grasslands, savannas, and other open habitats throughout the state from October through March. Once a common winter resident in California, numbers have declined markedly since the 1960's (Remsen 1978). Merlin prey almost exclusively on small birds, although they may also take small mammals and insects. In California, wintering merlin are concentrated along the coast and in the Central Valley, but occur statewide.

A pair of overwintering merlin is documented in the CNDDB (CDFW 2017a) from 2010 and 2011 at a site approximately six miles north of the BSA. The BSA generally supports an adequate prey base for foraging merlin and therefore the species has a moderate potential to occur on-site as a transient forager during the winter (non-breeding) season.

Special-Status Passerine and Non-Passerine Landbirds

Passerines (perching birds) are a taxonomic grouping that consists of several families including swallows (*Hirundinidae*); larks (*Alaudidae*); crows, ravens, and jays (*Corvidae*); shrikes (*Laniidae*); vireos (*Vireonidae*); finches (*Fringillidae*); and Emberizids (*Emberizidae*; warblers, sparrows, blackbirds, etc.), among others. Non-passerine land birds are a non-taxonomic-based grouping typically used by ornithologists to categorize a loose assemblage of birds. Families grouped into this category include kingfishers (*Alcedinidae*), woodpeckers (*Picidae*), swifts (*Apodidae*), hummingbirds (*Trochilidae*), and pigeons and doves (*Columbidae*), among others. Habitat, nesting, and foraging requirements for these species are wide ranging; therefore, outlining generic habitat requirements for this grouping is difficult. These species typically use most habitat types and are known to nest on the ground; in shrubs and trees; on buildings; under bridges; and within cavities, crevices, and manmade structures. Many of these species migrate over long distances and all species, except starlings, English house sparrows, and rock doves (pigeons), are protected under the federal MBTA and CFGC. The nesting period for passerines and non-passerine land birds generally occurs between February 15 and September 15, depending on species and climatic conditions. Suitable nesting and foraging habitat is present within the BSA for passerine and non-passerine land birds that were observed during the field surveys.

Several special-status passerine and non-passerine land bird species were considered during the preparation of this report because the project falls within the vicinity of historical occurrences of such species, including tricolored blackbird (*Agelaius tricolor*), southern California rufous-crowned sparrow (*Aimphila ruficeps canescens*), Bell's sage sparrow (*Amphispiza belli belli*), mountain plover (*Charadrius montanus*), California horned lark, loggerhead shrike, Le Conte's thrasher (*Toxostoma lecontei*), and least Bell's vireo. Potentially suitable habitat, primarily for foraging, occurs within the BSA for some of these species, including those observed during field surveys (California horned lark and loggerhead shrike), and for tricolored blackbird and mountain plover, which have a moderate potential to occur within the BSA (see Table 3.1 above). These four species are discussed further below. The remaining four species listed above have low potential or are not expected to occur in the BSA due to a lack of suitable habitat and are not evaluated further.

California Horned Lark

The California horned lark, a CDFW Watch List species, is a ground-dwelling bird common in open, sparsely vegetated areas such as grasslands, deserts, and agricultural areas. They congregate in moderately sized flocks, feeding mostly on insects and other small invertebrates. California horned larks nest on the ground, building a small grass-lined cup in slight depressions in the open. They are year-round residents in much of California, though they are not found at high altitudes in the Sierra Nevada or in dense forests in the northwest of the state. They breed in open areas throughout their range (Zeiner et al. 1990).

California horned larks are a common year-round resident in the Antelope Valley, and an individual of this species was observed flying across the BSA during the field survey conducted on May 18, 2017. Though generally disturbed, the BSA contains suitable grassland nesting and foraging habitat preferred by this species. The one regional occurrence of this species is from 15 plus miles to the southwest, in the vicinity of Castaic Lake (CDFW 2017a).

Loggerhead Shrike

The loggerhead shrike, a CDFW Species of Special Concern, is a wide-ranging species that occupies open habitats including grassland, scrub and open woodland communities. They typically nest in densely vegetated, isolated trees and shrubs and occasionally man-made structures and at the margins of open grasslands. Loggerhead shrikes feed on a variety of small prey including arthropods, mammals, amphibians, reptiles and birds (Yosef 1996). Because it lacks talons, the loggerhead shrike often impales prey on thorns or barbed wire. They are year-round residents in much of California, though they are generally absent from high altitudes in the Sierra Nevadas and dense forests in the northwest of the state. Loggerhead shrikes are highly territorial, with pairs maintaining territories during the breeding season and individuals maintaining territories during the winter (Yosef 1996).

Several loggerhead shrikes were detected flying across the BSA during the January and May 2017 field surveys. Trees within and adjacent to the BSA, as well as rubber rabbitbrush shrubs provide potentially suitable nesting sites and the BSA provides suitable foraging habitat for. The nearest historical occurrence of this species in the CDNDDB (CDFW 2017a) is from approximately nine miles northeast of the BSA, where a brood of loggerhead shrikes were recorded in 2009. Three other regional occurrences of this species are from greater than 10 miles from the BSA.

Tricolored Blackbird

Tricolored blackbird, a CDFW Species of Special Concern, inhabits coastal areas of central and southern California, as well as the Central Valley. The species typically requires freshwater marshes with emergent vegetation surrounded by water for nesting, although thorny brambles, nettles, dense willows, and agricultural fields near water are also used. The habitats selected for nesting must provide protection from numerous avian, mammalian, and reptilian predators. Tricolored blackbirds are highly colonial, and congregate in large colonies during the breeding season.

Breeding is highly synchronous. The species is nomadic and smaller colonies will often nest in different areas from year to year. Juveniles are not likely to return to the sites where they were born (DeHaven et al. 1975). Tricolored blackbirds are regularly observed foraging and roosting in mixed colonies with other blackbird species, especially during the non-breeding season. They forage on seeds and insects in grassland and cropland, the latter primarily during the breeding season (Skorupa et al. 1980). Nesting colonies can be highly susceptible to human disturbance; in extreme cases, disturbances can result in entire colonies being abandoned. Agricultural activities in particular threaten colonies.

A record of tricolored blackbird coincides with the BSA, three records are from within 2-3 miles east-southeast of the BSA, and one record occurs 4.5 miles to the southeast in the vicinity of Elizabeth Lake. The record coinciding with the project area documented the occurrence of this species between 2005-2012 “in the vicinity of Fairmont Reservoir” (i.e. Fairmont Reservoir #1). In 2005, 200 individuals were estimated, dropping to 30 in 2008, and up to 250-1,000 in 2011, the last year any information regarding the status of this species at the site is included in the CNDDB (CDFW 2017a). A review of the Tricolored Blackbird Portal maintained by the University of California-Davis indicates that no tricolored blackbirds were observed at the Fairmont site as recently as 2013, likely due to the dry nature of the reservoir (ICE 2017). No individuals of this species were detected during the three field surveys conducted in support of this report and Fairmont Reservoir #1 remains dry. As a result, suitable nesting habitat for the species remains absent from the Fairmont site.

The four records from a few miles east to southeast of the BSA generally include observations made between 2005 and 2011, when tens to hundreds of individuals of this species, including nesting pairs, were observed. However, no information on the continued status of the species at these sites occurs after 2011. No other occurrences are present within ten miles.

Tricolored blackbirds typically do not travel more than about 3.1 miles (5 kilometers) away from their nesting colonies to forage (Beedy 2008), making the BSA and adjacent areas with grassland habitat potentially suitable for foraging tricolored blackbirds that may occur in the project vicinity. Surface water resources in the area, such as Fairmont Reservoir #2 and the SWP, lack emergent vegetation, making them unsuitable for nesting. As a result, tricolored blackbirds have moderate potential to occur in the BSA, most likely as transient foragers.

Mountain Plover

Mountain plover, a CDFW Watch List species, winters in central and southern California, primarily in the Central and Imperial valleys. The species is strongly associated with flat, sparse grassland and shrubland habitats that are often nearly devoid of vegetation and fallow or cultivated agricultural fields (Knopf 1996). Breeding sites require similar habitat conditions; short vegetation with some bare ground in grassland habitats, prairie dog colonies, agricultural lands, and semidesert areas.

A record of an individual mountain plover from 2004 occurs approximately 1.5 miles east of the BSA in the vicinity of the Antelope Valley California Poppy Preserve, while a record from 2011 approximately 5 miles east of the BSA documents a flock of about 200 wintering individuals in December 2010, down to 20-50 individuals by January 2011. Additional occurrence have been documented approximately 7 miles north and northeast of the BSA, where wintering flocks, generally numbering between 20-100 individuals, were recorded between 1999 and 2011 (CDFW 2017a). No individuals of this species were detected during the three field surveys conducted in support of this report; however, habitats within the BSA are potentially suitable for breeding and foraging mountain plovers, and as a result this species has moderate potential to occur within the BSA.

Mammals

The eight special-status mammal species known from the region are not expected, or have only low potential to occur in the BSA, generally due to the absence of habitats preferred by these species (see Appendix D, Table B). Although two records of American badger (*Taxidea taxus*, CDFW SCC) occur in the CNDDB, one from less than one mile north of the BSA and another from 1.5 miles southwest of the BSA in the vicinity of Lake Hughes, and conditions in the BSA could provide potentially suitable habitat for the species, these records are from 30 plus years ago and no burrows potentially suitable for the species were detected during the three field surveys conducted in support of this report. A record of Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*, CDFW SCC) and hoary bat (*Lasiurus cinereus*, tracked by CNDDB) also occur within the vicinity of Lake Hughes; however, these species are not expected, or have a low potential to occur within the BSA.

Reptiles

The six special-status reptile species known from the region are not expected, or have only low potential to occur in the BSA, generally due to the absence of habitats preferred by these species (see Appendix D, Table B). Although a record of coast horned lizard (*Phrynosoma blainvillii*, CDFW SCC) occurs approximately two miles north of the BSA and a second two miles east of the BSA; the records are from 30 plus years ago or the species was recorded in habitats that are absent from the BSA. A record of western pond turtle (*Emys marmorata*, CDFW SCC) and another record of coast horned lizard occur 2-3 miles south of the BSA in the vicinity of Lake Hughes and Lake Elizabeth; however, these records are from 30 plus years ago or are from habitats not present within the BSA. Other special-status reptiles have occurrences that are 10 plus miles from the BSA and/or were recorded more than 30 years ago.

Invertebrates, Fish, and Amphibians

The one regional special-status invertebrate, one fish, and one amphibian species are not expected, or have only low potential to occur in the BSA, generally due to the absence of habitats preferred by these species (see Appendix D, Table B).

3.3 SENSITIVE NATURAL COMMUNITIES

Sensitive natural communities are those that are designated as rare in the region by the CNDDB, support special-status plant or wildlife species, or receive regulatory protection (i.e., Section 404 of the Clean Water Act (CWA) and/or Sections 1600 et seq. of the CFGC). Rare communities are given the highest inventory priority (Holland 1986; CDFG 2010). Based on a review of the CNDDB (CDFW 2017a), 11 sensitive vegetative communities have been recorded within the Lake Hughes and surrounding eight quadrangles, including:

- Southern California Threespine Stickleback Stream
- Southern Coast Live Oak Riparian Forest
- Southern Cottonwood Willow Riparian Forest
- Southern Mixed Riparian Forest
- Southern Riparian Forest
- Southern Riparian Scrub
- Southern Sycamore Alder Riparian Woodland
- Southern Willow Scrub
- Valley Needlegrass Grassland
- Valley Oak Woodland
- Wildflower Field

None of these sensitive natural communities coincide with the BSA. They are primarily known from the San Gabriel Mountains occurring south and west of the BSA in the Angeles National Forest. As previously presented, the cottonwood and willow community consisting of sapling-size individuals in the southern portion of the proposed stockpile area is likely remnant of some previous natural community that has developed since Fairmont Reservoir #1 was removed from service and drained. Potential jurisdictional waters that receive regulatory protection are present in the BSA and are discussed further below.

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CHAPTER 4.0
WATERS OF THE U.S. AND STATE

This chapter presents an assessment of the vegetated ephemeral drainage feature depicted on Figure 2-1 that transects the site of the proposed sedimentation plant, its potential jurisdiction as waters of the U.S. under the regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE), and/or as waters of the State subject to the permitting authority of the Lahontan (Region 6) Regional Water Quality Control Board (RWQCB) and CDFW.

4.1 REGULATORY SETTING

4.1.1 Waters of the U.S.

Pursuant to Section 404 of the CWA, USACE is authorized to regulate any activity that would result in the discharge of dredged or fill material into jurisdictional waters of the U.S., which include those waters listed in 33 Code of Federal Regulations (CFR) 328 (Definitions). USACE, with oversight by U.S. Environmental Protection Agency (USEPA), has the principal authority to issue CWA Section 404 Permits.

Pursuant to Section 401 of the CWA, the RWQCB certifies that any discharge into jurisdictional waters of the U.S. will comply with state water quality standards. RWQCB, as delegated by USEPA, has the principal authority to issue a CWA Section 401 water quality certification or waiver.

USACE and USEPA may not assert jurisdiction over small drainage features characterized by low volume, infrequent, or short duration flow, such as the on-site drainage feature. A jurisdictional tributary to a traditional navigable water has a significant effect (more than speculative or insubstantial) on the chemical, physical, and biological integrity of a traditional navigable water. If an Approved Jurisdictional Determination is requested, USACE and EPA will apply the significant nexus standard to assess the flow characteristics and functions of the tributary drainage to determine if it significantly affects the chemical, physical and biological integrity of downstream traditional navigable waters. Based on the Rapanos guidance, the USACE and EPA will decide jurisdiction over non-navigable tributaries to traditional navigable waters that are not relatively permanent based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water. The USACE's jurisdictional determination applicable to the Project area is presented below in Chapter 4.3.1.

4.1.2 Waters of the State

In addition to having principle authority to issue a CWA Section 401 water quality certification or waiver, the RWQCB, pursuant to Section 13000 *et seq*. of the California Water Code (CWC) (the 1969 Porter-Cologne Water Quality Control Act [Porter-Cologne]), is authorized to regulate any activity that would result in discharges of waste and fill material to waters of the State (including saline waters) and "isolated" waters and/or wetlands (e.g., vernal pools and seeps) and groundwater within the boundaries of the state (CWC § 13050[e]). The RWQCB has the authority to issue Waste Discharge Requirements (WDR), pursuant to Porter-Cologne, for impacts to isolated waters of the State, including isolated wetlands. The RWQCB's jurisdiction applicable to the project area is presented below in Chapter 4.3.2.

4.1.3 CDFW

Under CFGC Section 1600 et seq., CDFW's jurisdiction extends over the bed, bank, or channel of a river, stream, or lake for activities that would disrupt the natural flow or alter the channel, bed, or bank of any lake, river, or stream. Substantially diverting or obstructing the natural flow or substantially changing the bed, channel or bank of any river, stream, or lake resulting in a substantial effect on a fish or wildlife resource requires notification to the CDFW and completion of the Lake and Streambed Alteration Agreement (LSAA) process. CDFW jurisdiction encompasses the physical bed and bank of the channel, as well as all associated riparian vegetation. CDFW's jurisdiction applicable to the Project area is presented below in Chapter 4.3.3.

4.2 STUDY METHODS

As mentioned in Chapter 2.2, during the May 18, 2017, and September 22, 2017, field surveys, an assessment for potential jurisdictional features in the BSA was conducted, focusing on the drainage feature transecting the proposed sedimentation plant site. A Trimble sub-meter accuracy Global Positioning System (GPS) unit was used to delineate the extent of the drainage feature's banks. An area of standing water observed during the January field survey occurring within the BSA north of Fairmont Reservoir #2 was also assessed.

The jurisdictional determination was conducted pursuant to standard methods and guidance, including:

- USACE Wetland Delineation Manual (EL 1987)

- USACE Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0; EL 2008)
- Rapanos and Carabell guidance (e.g., JD Handbook, USACE 2007)

As specified in the 1987 Manual and the 2008 Supplement, the on-site field investigation involved inspection of the survey area to identify areas that satisfy the three wetland parameters: the concurrence of a predominance of hydrophytic (wetland) vegetation, wetland hydrology, and hydric soils. To make a determination that an area is a wetland, the 1987 Manual requires that, under "normal circumstances," a minimum of one primary wetland indicator be confirmed for each of the three wetland parameters.

Soils

Seven soil types and Water are mapped by the Natural Resource Conservation Service (NRCS) (2017) in the BSA. The types and areas of soils taken from an online review of the Web Soil Survey are included in Table 2.1 below.

Table 4-1
Soils Mapped in the Project Area

Soil Type	Percent Slope	% of Soil Type on Study Area	Approximate Acres[1]
Amargosa rocky coarse sandy loam, eroded	9-55	3.1%	15.5
Greenfield sandy loam	2-9	11.6	58.4
Hanford gravelly sandy loam	2-9	3.0%	15.0
Ramona coarse sandy loam	5-9	10.6%	53.2
Ramona coarse sandy loam	9-15	10%	49.9
Terrace escarpments	_	9%	45.3
Vista coarse sandy loam, eroded	30-50	17.8%	89.2
Water	_	34.9%	174.8

[1] Acreage calculated based upon approximate percentages of soil types on site as determined by maps generated on the USDA NRCS Web Soil Survey (USDA 2011)

No soils types listed as hydric were mapped on-site. Additionally, an investigation of soil conditions in the area of standing water (within the BSA, north of the existing Fairmont Reservoir #2) observed during the January survey, was conducted during the September field survey. No indications of hydric soils were observed in a soil pit excavated in the area that formerly contained standing water.

Hydrology

The vegetated ephemeral drainage feature and area of standing water observed during the January survey were investigated for the presence of wetland hydrological field indicators such as standing water, inundations, saturation, water marks, drift lines, drainage patterns, and sediment deposits. Drainage patterns and drift lines were observed within the banks of the vegetated ephemeral drainage. No surface flows were present during the three field surveys. Standing water was observed in January in an area north of Fairmont Reservoir #2. No standing water was observed during the July and September surveys in this area; however, drift lines and dead/decaying vegetation was evident (see Photo 8, Appendix A).

Vegetation

The ephemeral drainage feature is vegetated with a similar species composition as adjacent uplands, including California buckwheat, mustard, horehound, ripgut brome, narrow leaf milkweed, and phacelia. Photos of the drainage feature are included as Photos 5-7 in Appendix A. The area of standing water north of Fairmont Reservoir #2 is dominated by California buckwheat, a species that is not known to grow under wetland conditions.

4.3 JURISDICTIONAL DELINEATION

A summary of the potential jurisdictional features subject to the permitting authority of the USACE, CDFW, and the Lahontan RWQCB is presented below.

4.3.1 Waters of the U.S.

As presented above, the ephemeral drainage feature is vegetated with a similar species composition as adjacent uplands. The channel flows northeast across the proposed sedimentation plant site, remains in a defined channel for approximately 500 feet beyond the boundary of the Fairmont reservoir complex, before losing an indefinable channel and appearing to dissipate as surface flows within West Avenue H. Evidence of surface flows on the opposite side of West Avenue H and further northeast towards the SWP were observed in the field; however, no surface connection between the on-site vegetated ephemeral drainage feature and the SWP, or any other water feature in the vicinity, was detected during the field surveys.

The BSA occurs in the Amargosa Creek watershed, and is within the Myrick Canyon subwatershed. It is in the Antelope Hydrologic Unit, Lancaster Hydrologic Area, with a 12-digit Hydrologic Unit Code of 180902061402 (Caltrans 2017). USACE completed a Non-Jurisdictional Determination for the Amargosa Creek watershed in June 2004 (File No. 2004-01295-AOA), which determined that Amargosa Creek is a *non-navigable isolated water body* that does not exhibit a substantial nexus to interstate commerce and therefore is not subject to USACE jurisdiction and is not a regulated water of the U.S. As a result, no permit from USACE pursuant to Section 404 of the CWA is required for impacts to the vegetated ephemeral drainage feature.

It was determined during field surveys that the area of standing water observed in the BSA north of Fairmont Reservoir #2 during the January 2017 survey does not constitute a wetland subject to USACE jurisdiction. The area is dominated by California buckwheat and a field investigation of soils in the area indicated they are not hydric. Discussions with LADWP indicate the area in question was previously used as a stockpile area during construction of Fairmont Reservoir #2 and subsequently graded to establish the current contour. It appears now that stormwater runoff around Fairmont Reservoir #2 collects in the area investigated.

4.3.2 Waters of the State

The CWC Section 13050(e) defines the waters of the State separately and uniquely from the federal definition as "…*any surface water or groundwater, including saline waters, within the boundaries of the State*." The state definition places no limitation on the area and length of impact to drainages, as is the case for waters of the U.S. The Ordinary High Water Mark (OHWM) concept utilized to delineate waters of the U.S. is not used to determine waters of the State, nor is it used by the CDFW to delineate stream boundaries for the purpose of determining CFGC jurisdiction. The OWWM concept; however, is used in the context of a Section 401 Certification, which is required when a Section 404 permit is required.

The term "waters of the State" applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes within the state of California, including wetland and/or riparian vegetation and fish and wildlife resources. This designation includes isolated, depressional wetlands, and vernal pools. Waters of the State are regulated by the State Water Resources Control Board (SWRCB) and RWQCBs. A new policy is in the process of being introduced that will provide increased clarification with respect to waters of the State, especially wetlands, and will introduce additional regulatory requirements.

The vegetated ephemeral drainage feature occurring within the site of the proposed sedimentation plant represents a jurisdictional feature under the jurisdiction of the RWQCB pursuant to Porter-Cologne. No other waters of the State were identified in the BSA.

4.3.3 CDFW

Within the Project site, the vegetated ephemeral drainage feature exhibits a defined bed, bank, and channel, and is therefore potentially subject to CDFW's permitting authority under Section 1600 et seq. of the CFGC. As presented in Chapter 4.3.1, vegetation occurring within drainage similar to the community surrounding it on the site of the proposed sedimentation plant. No riparian vegetation occurs along the drainage feature. As a result, the extent of CDFW jurisdiction is restricted to the area between the drainage feature's banks, where a total of 0.28 acres, representing approximately 1,235 linear feet, occurs as potential jurisdictional waters of the State. On average, the bank to bank width of the channel is approximately four feet. No other waters under CDFW jurisdiction were identified within the BSA.

Impacts to CDFW jurisdictional streambed habitat would require authorization in the form of a LSAA from CDFW. The LSAA issued for the project would contain terms and conditions governing the nature of the impacts allowed, and may include restrictions on the locations, methods, or timing of project activities affecting the drainage feature. Final determination regarding jurisdiction and the type of impacts (permanent versus temporary) that would occur under the project would be confirmed through consultation with the regulatory agencies.

Prior to undertaking ground-disturbing activities within any RWQCB and CDFW-jurisdictional resources, LADWP will coordinate with the appropriate regulatory agencies to verify jurisdictional delineation results and obtain all discretionary permits and authorizations.

CHAPTER 5.0
APPLICABLE REGULATIONS

As discussed in some of the previous chapters, several regulations have been established by federal, state, and local agencies to protect and conserve biological resources. The descriptions below provide an overview of agency regulations that may be applicable to the resources that occur within the project components and regulations that require an analysis per requirements of the SRF Environmental Package application. The final determination of whether permits are required is made by the regulating agencies.

5.1 FEDERAL REGULATIONS AND STANDARDS

Federal Endangered Species Act (ESA)

Enacted in 1973, the federal ESA provides for the conservation of threatened and endangered species and their ecosystems (United States Code [U.S.C.] Title 16, Chapter 35, Sections 1531–1544). The ESA prohibits the "take" of threatened and endangered species except under certain circumstances and only with authorization from USFWS through a permit under Section 4(d), 7 or 10(a) of the ESA. "Take" under the ESA is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

Formal consultation under Section 7 of the ESA would be required if the project had the potential to affect a federally-listed species that has been detected within or adjacent to the BSA. No federally-listed species were detected during field surveys of the BSA or have been recorded in the CNDDB in the project vicinity. Additionally, regional federally-listed species are not anticipated to be affected by the project as habitat potentially suitable for most of these species does not occur within the BSA, or the species' known distribution does not coincide with the BSA (see Appendix D). Therefore, formal consultation is not anticipated.

Migratory Bird Treaty Act

Congress passed the MBTA in 1918 to prohibit the kill or transport of native migratory birds, or any part, nest, or egg of any such bird unless allowed by another regulation adopted in accordance with the MBTA (U.S.C. Title 16, Chapter 7, Subchapter II, Sections 703–712). The prohibition applies to birds included in the respective international conventions between the United States and Great Britain, the United States and Mexico, the United States and Japan, and the United States and Russia.

No permit is issued under the MBTA; however, the project would employ measures such as avoidance and minimization measure BIO-B outlined in Chapter 7, that would avoid or minimize impacts on protected migratory birds.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (the Eagle Act) amended in 1962, was originally implemented for the protection of bald eagles. In 1962, Congress amended the Eagle Act to also cover golden eagles, a move that was partially an attempt to strengthen protection of bald eagles, since the latter were often killed by people mistaking them for golden eagles. This act makes it illegal to import, export, take (which includes molest or disturb), sell, purchase, or barter any bald eagle or golden eagle or part thereof.

As presented in Chapter 3.2, bald and golden eagles have low potential to occur within the BSA, most likely as foraging transients. With the implementation of avoidance and minimization measures BIO-A and BIO-B outlined in Chapter 7, impacts to foraging bald and golden eagle are not anticipated and the project would not be expected to take bald or golden eagle.

Clean Water Act

Under Section 404 of the CWA, the Corps regulates the discharge of dredged or fill material into jurisdictional waters of the U.S., which include those waters listed in 33 CFR 328.3 (Definitions) (U.S.C. Title 33, Chapter 26, Sections 101–607). Section 401 of the CWA requires a water quality certification from the state for all permits issued by the Corps under Section 404 of the CWA. RWQCB is the state agency in charge of issuing a CWA Section 401 water quality certification or waiver.

As presented in Chapter 4, a vegetated ephemeral drainage feature transects the site of the proposed sedimentation plant. The drainage does not present a significant nexus to a traditional navigable waterway, such as the Pacific Ocean, and as a result is considered an isolated feature, and thereby does not trigger the need for a permit from the USACE authorizing impacts to the drainage. This assumption will be verified with USACE during project permitting.

West Mojave Plan

The West Mojave Plan (WEMO) is a multiagency plan that protects and conserves natural resources while simultaneously balancing human uses across 9.3 million acres. The purpose of WEMO is to develop management strategies for the desert tortoise, Mohave ground squirrel, and over 100 other sensitive plants and animals that would conserve those species throughout the western Mojave Desert, while at the same time establishing a streamlined program for compliance with requirements of the FESA and CESA (BLM 2005). It includes a frame work to encourage development on lands that lack listed species while discouraging development on lands that are important habitat for special-status species.

The BSA occurs along the western fringe of the WEMO plan area. Since the project occurs exclusively on privately-owned (DWP) land; is not anticipated to significantly impact a federal or state-listed species, or species identified for management under the WEMO; and will not impact the WEMO off-highway vehicle (OHV) route network (BLM 2017), stipulations by a federal or state agency to comply with the WEMO is not anticipated.

Magnuson-Stevens Fishery Conservation and Management Act

Under the purview of the National Oceanic and Atmospheric Association's National Marine Fisheries Service (NMFS), amendments in 1996 to the Magnuson-Stevens Fishery Conservation and Management Act set forth a number of mandates for NMFS, Regional Fishery Management Councils, and federal action agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NMFS, are required to delineate Essential Fish Habitat (EFH) in fishery management plans for all managed species. EFH is defined to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (in the 1997 Interim Final Rule [62 Fed. Reg. 66551, Section 600.10 Definitions]). Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include historic areas if appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (PFMC 2016).

The BSA is located within the Antelope Valley in the northwest portion of Los Angeles County and does not include EFH, nor is it connected to any EFH.

Protection of Wetlands – Executive Order Numbers 11990 and 12608

Under this Executive Order (EO) issued May 24, 1977 and amended by EO 12608, Federal agencies must provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands (42 CFR 26961; 3 CFR 1977 Comp., p. 121). Each agency, to the extent permitted by law, must avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds: there is no practical alternative to such construction; the proposed action includes all practical measures to minimize harm to wetlands that may result from such use. In making this finding, the head of the agency may take into account economic, environmental and other pertinent factors. Each agency must also provide opportunity for early public review of any plans or proposals for new construction in wetlands (FedCenter 2017).

As presented in Chapter 4, wetlands or other waters of the U.S. were not identified within the BSA.

Wild and Scenic Rivers Act

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection (NWSRS 2017a).

An online review of designated Wild and Scenic Rivers was conducted and it was determined that the project is not located within the watershed of a wild and scenic river (NWSRS 2017b).

Coastal Zone Management Act

The U.S. Congress recognized the importance of meeting the challenge of continued growth in the coastal zone by passing the Coastal Zone Management Act in 1972 (Public Law 109-58; 16 U.S.C. 1451 et seq.). This act, administered by NOAA, provides for the management of the nation's coastal resources, including the Great Lakes. The goal is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone."

The project site is not located in the City of Los Angeles Coastal Zone or the State Coastal Zone.

5.2 STATE REGULATIONS AND STANDARDS

California Fish and Game Code

CFGC regulates the taking or possession of birds, mammals, fish, amphibians, and reptiles, as well as impacts to natural resources such as wetlands and waters of the state. It includes the

California Endangered Species Act (CESA) (Sections 2050–2115) and LSAA regulations (Section 1600 et seq.).

Wildlife "take" is defined by CDFW as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Protection extends to the animals, dead or alive, and all their body parts. Section 2081 of CESA allows CDFW to issue an incidental take permit for state-listed threatened or endangered species, should the proposed project have the potential to "take" a state-listed species that has been detected within or adjacent to the project. Certain criteria are required under CESA prior to the issuance of such a permit, including the requirement that impacts of the take are minimized and fully mitigated.

No state-listed species are anticipated to be affected by the project as habitat potentially suitable for such species does not occur within the BSA, or the species' known distribution does not coincide with the BSA. As a result, a permit under Section 2081 is not anticipated for the project.

The vegetated ephemeral drainage that transects the proposed sedimentation plant site constitutes a potentially-regulated streambed under the jurisdiction of CDFW. As a result, coordination with CDFW and potentially the subsequent issuance of an LSAA is anticipated for this project.

Porter-Cologne Water Quality Control Act

Under Section 13000 et seq., of the Porter-Cologne Act, RWQCB is the agency that regulates discharges of waste and fill material within any region that could affect a water of the state (CWC 13260[a]), (including wetlands and isolated waters) as defined by CWC Section 13050(e).

A Water Discharge Report under Porter-Cologne is anticipated as project activities would impact the vegetated ephemeral drainage feature, potentially considered as waters of the state and under the jurisdiction of the RWQCB.

California Water Code Division 3. Dams and Reservoirs

Laws pertaining to the California dam safety program were originally adopted in 1929 and are amended in the California Water Code (CWC) Division 3, Section 6000-6501, last amended in 2003. Regulations are in California Administrative Code Title 23 Chapter 2, Articles 1-301 to Articles 5-333, adopted in 1986. The code defines *jurisdictional dams* according to size, function and structure. A jurisdictional dam is any artificial barrier that is six feet or more in height and with a storage capacity of more than 50 acre-feet, or 25 feet in height with a storage capacity of more than 15 acre-feet (CWC 1.6002 and 1.6003). Fairmont Reservoir #2 is a jurisdictional dam and thus under regulation of the Department of Water Resources, Division of Safety of Dams (DSOD).

DSOD requires approval of an *Application for Approval of Plans and Specifications for the Alteration of a Dam and Reservoir* prior to the initiation of project construction that would modify or alter any dam or reservoir under their jurisdiction. As a jurisdictional dam, it is anticipated that LADWP will be required to complete the application for DSOD approval for modifications at the inlet and relining of Fairmont Reservoir #2.

California Environmental Quality Act[2]

CEQA requires that biological resources be considered when assessing the environmental impacts resulting from proposed actions. CEQA does not specifically define what constitutes an "adverse effect" on a biological resource. Instead, lead agencies are charged with determining what specifically should be considered an impact. This report has been prepared for project compliance with CEQA.

California Desert Native Plants Act

The California Desert Native Plants Act (CDNPA) protects California desert native plants from unlawful harvesting on both public and privately owned lands within Imperial, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego Counties. The following native plants, or any part thereof, may not be harvested except under a permit issued by the commissioner or the sheriff of the county in which the native plants are growing: all species of the Agavaceae (century plants, nolinas, and yuccas); all species of the family Cactaceae; all species of the family Fouquieriaceae (ocotillo, candlewood); all species of the genus *Prosopis* (mesquites); all species of the genus *Cercidium* (palo verde); catclaw acacia (*Acacia greggii*); desert holly (*Atriplex hymenelytra*); smoke tree (*Dalea spinosa*); and desert ironwood (*Olneya tesota*), both dead and alive (provision 80073). This provision excludes any plant that is declared to be a rare, endangered, or threatened species by federal or State law or regulations, including, but not limited to, the CFGC.

None of the plant species listed above were observed within the BSA during the field surveys.

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[2] PRC Section 21000 et seq. and the State CEQA Guidelines, California Code of Regulations, Section 15000 et seq.

5.3 LOCAL REGULATIONS AND STANDARDS

Significant Ecological Area Program

Los Angeles County first began to inventory biotic resources and identify important areas of biological diversity in the 1970s. Today, the primary mechanism used by the County to conserve biological diversity is a planning overlay called Significant Ecological Areas (SEAs) designated in the County's General Plan Conservation/Open Space Element (County of Los Angeles 2015). SEAs are ecologically important land and water systems that support valuable habitat for plants and animals, often integral to the preservation of rare, threatened, or endangered species and the conservation of biological diversity in Los Angeles County. While SEAs are not preserves, they are areas where Los Angeles County deems it important to facilitate a balance between development and resource conservation.

Together, the General Plan overlays and a SEA conditional use permit (CUP) process are referred to as the SEA Program. The SEA Program, through goals and policies of the General Plan and the SEA ordinance (Title 22 Zoning Regulations, Section 22.56.215) help guide development within SEAs. The SEA ordinance establishes the permitting, design standards, and review process for development within SEAs, and permits are reviewed by the SEATAC. Development activities in the SEAs are reviewed closely in order to conserve water and biological resources such as streams, oak woodlands, and threatened or endangered species and their habitat.

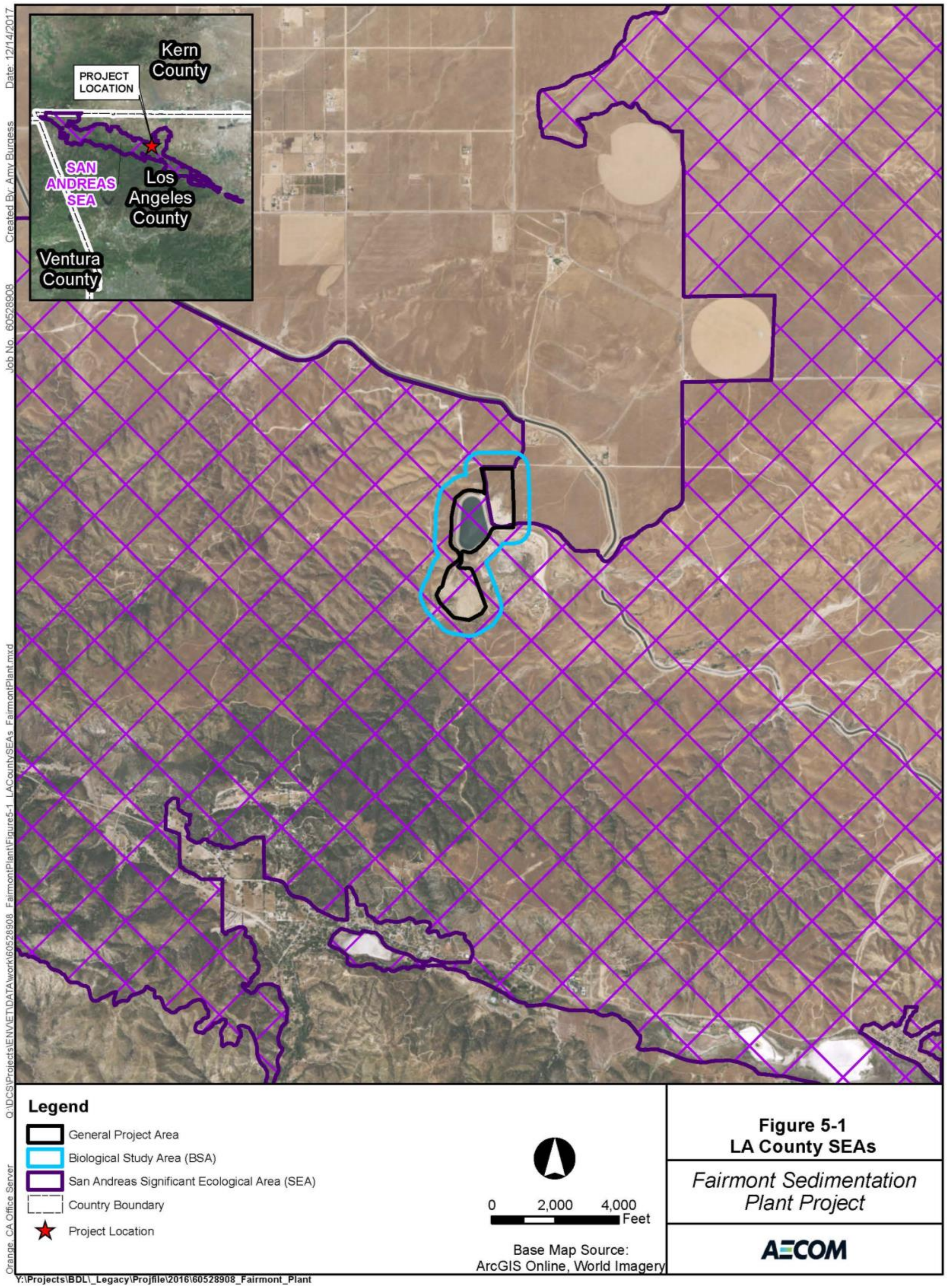
Much of the BSA occurs within the San Andreas SEA (Figure 5-1). This SEA is the second largest and includes diverse habitats including those in the Antelope Valley, Tehachapi Mountains, Coastal Mountains, Central Valley, and San Gabriel Mountains. Although the project partially occurs within the San Andreas SEA, no actual development is occurring with the SEA portion of the project site. The proposed project work within the San Andreas SEA would consist of relining the existing Fairmont Reservoir #2. There would be no change in the use, size, or general appearance of the reservoir. Therefore, the SEA program would not be applicable to the proposed project.

Los Angeles County Oak Tree Ordinance

The Los Angeles County Oak Tree Ordinance (County of Los Angeles Code of Ordinances Section 22.56.2050) recognizes oak trees as significant historical, aesthetic, and ecological resources. The goal of the ordinance is to create favorable conditions for the preservation and propagation of this unique and threatened plant heritage. By making this part of the development process, healthy oak trees will be preserved and maintained. The Los Angeles County Oak Tree

Ordinance applies to all unincorporated areas of the County. Under the ordinance, a person shall not cut, destroy, remove, relocate, inflict damage, or encroach into the protected zone of any tree of the oak tree genus, which is 8 inches or more diameter at breast height (dbh), 4.5 feet above natural grade, or, in the case of oaks with multiple trunks, a combined dbh of 12 inches or more of the two largest trunks, without first obtaining a permit from the Los Angeles County Fire Department (UCANR 2015).

No oak trees were documented in the BSA; however, should the need to remove a protected tree species arise during project implementation, LADWP would comply with this ordinance.


Kern County
PROJECT LOCATION
SAN ANDREAS SEA
Los Angeles County
Ventura County
Legend
General Project Area
Biological Study Area (BSA)
San Andreas Significant Ecological Area (SEA)
Country Boundary
Project Location
0 2,000 4,000 Feet
Base Map Source: ArcGIS Online, World Imagery
Figure 5-1
LA County SEAs
Fairmont Sedimentation Plant Project
AECOM
Orange, CA Office Server Q:\DCS\Projects\ENV\ET\DATA\work\60528908_FairmontPlant\Figure5-1_LACountySEAs_FairmontPlant.mxd Job No. 60528908 Created By: Amy Burgess Date: 12/14/2017
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CHAPTER 6.0
IMPACTS ON BIOLOGICAL RESOURCES

Biological resources may be either directly or indirectly impacted by a project. Direct and indirect impacts may be either permanent or temporary in nature. These impact categories are defined below.

Direct: Any alteration, physical disturbance, or destruction of biological resources that would result from project-related activities is considered a direct impact. Examples include clearing vegetation, loss of individual species and/or their habitats, and encroaching into wetlands or a river.

Indirect: As a result of project-related activities, biological resources may also be affected in a manner that is ancillary to physical impacts. Examples include elevated noise and dust levels, soil compaction, increased human activity, decreased water quality, and the introduction of invasive wildlife (domestic cats and dogs) and plants.

Permanent: All impacts that result in the long-term or irreversible removal of biological resources are considered permanent. Examples include constructing a building or permanent road on an area containing biological resources. New permanent impacts would occur upon construction of the proposed sedimentation plant and installation of the large pipeline tying the proposed plant to the LAAs. Construction impacts related to modification of the inlet structure and replacement of the liner at Fairmont Reservoir #2, and the paving of existing dirt roadways leading to the Fairmont complex would occur in areas previously impacted or disturbed, and are not considered new permanent impacts of the project. Additionally, soils excavated during construction of the proposed sedimentation plant would be stockpiled in an area previously disturbed by construction of Fairmont Reservoir #1 and subsequently serving as a portion of the reservoir during its operation.

Temporary: Any impacts considered to have reversible impacts on biological resources can be viewed as temporary. Examples include the generation of fugitive dust during construction, or removing vegetation for the preparation of construction activities, and either allowing the natural vegetation to recolonize or actively revegetating impacted areas. Surface disturbance that removes vegetation and disturbs the soil is considered a long-term temporary impact because of slow natural recovery in arid ecosystems. Temporary impacts would occur at the staging and laydown area, and stockpile areas where project equipment, materials, and soils would be temporarily stored and where past human disturbances associated with construction of the reservoirs and LAAs have occurred. Temporary impacts have not been quantified. All impacts would occur within previously-disturbed areas or within non-native grassland and scrub habitats that represent a very small portion of identical habitat occurring in the surrounding Antelope Valley.

Impacts on biological resources due to construction activities are described in this chapter. They could include such impacts as elevated noise and dust levels during construction. Potential direct and indirect impacts from construction and operations activities to vegetation, wildlife, special-status plant and wildlife species, sensitive natural communities, wildlife movement corridors, and potential jurisdictional features are presented in the following sections.

6.1 VEGETATION

6.1.1 Construction

6.1.1.1 Vegetation Communities

Project construction would impact developed ruderal, non-native grassland, and California buckwheat scrub vegetation. Vegetation communities and land cover types in the BSA have generally all been impacted by human activities at the reservoir complex over time, from mowing/disking on-site grasslands to operation of Fairmont Reservoir #2 (and previously Fairmont Reservoir #1).

Permanent impacts of the project on vegetation communities and land cover types would occur upon construction of the proposed sedimentation plant. The footprint of the plant and ancillary structures (depicted in Figure 1-4) represents approximately 7.40 acres of permanent impacts, all to non-native grassland habitat that covers the proposed sedimentation plant site. Additionally, permanent impacts would occur upon installation of the pipeline across the northern portion of the sedimentation plant site where a 1,000-foot long pipe will tie the LAAs into the new sedimentation plant. At 1,000 feet long with a trench potentially up to 20 feet wide, installation of the pipeline would represent an additional 0.46 acre of new permanent impacts for a total of approximately 7.86 of permanent impacts. No other new permanent impacts would occur during implementation of the project. Road paving would occur within the existing footprint of the dirt roadways to be paved; no road widening would occur. Tie-in to LAA1 and LAA2 with the new pipeline would occur within an existing access road within the reservoir complex. Inlet modification at Fairmont Reservoir #2 and replacement of the liner would occur within the existing reservoir's footprint and developed areas around it. Soils excavated at the proposed sedimentation plant site and permanently stockpiled within a portion of Fairmont Reservoir #1 would be graded, stabilized, and vegetated as required.

Permanent impacts to non-native grassland habitat resulting from construction of the proposed sedimentation plant are not considered significant, since no sensitive natural vegetation community would be affected, and the impacted grassland habitat represents an incrementally small area compared to nearly identical habitats that occur outside the BSA within the surrounding Antelope Valley.

Temporary impacts during construction of the project would occur during stockpiling of soils adjacent to the trench for the new 1,000-foot long pipeline connecting the LAAs to the sedimentation plant. Upon backfilling, areas where trench spoils where stockpiled would be restored to a condition that would facilitate operation of the sedimentation plant. Temporary impacts would also occur at work areas around the footprint of the sedimentation plant, at the laydown and staging area where materials and equipment will be stored, at the inlet to Fairmont Reservoir #2 where modifications would occur, within the reservoir during relining, and in the proposed stockpile area, where project spoils would be brought in and stockpiled by heavy equipment.

Except where temporary impacts would occur within non-native grassland habitat associated with the proposed sedimentation plant and new pipe, these temporary work areas occur within previously developed or disturbed areas and would be returned to pre-existing conditions. Areas temporarily impacted during construction of the proposed sedimentation plant would be landscaped. Since the vegetation communities (i.e. grassland and scrub habitats) that will be affected are not sensitive natural communities and are common throughout the project vicinity, temporary impacts resulting from project implementation would not be considered significant.

Indirect impacts to vegetation communities outside the project site could include the accumulation of fugitive dust, and the colonization of nonnative, invasive plant species. Other indirect impacts could include an increase in the amount of compacted or modified surfaces that, if not controlled, could increase the potential for surface runoff, increased erosion, and sediment deposition within vegetation beyond the project's footprint. With implementation of avoidance and minimization measure BIO-A outlined in Chapter 7, indirect impacts to vegetation communities outside the project would be avoided and minimized, and not be considered significant.

6.1.1.2 Special-Status Plant Species

Individual special-status plant species could be damaged or destroyed from crushing or trampling during construction activities; however, project construction would occur in developed and disturbed areas unsuitable for special-status species. No federal or state-listed plant species have previously been documented within the BSA, none were observed during the three field surveys, and potentially suitable habitat for protected plant species is generally absent from the BSA (see Appendix D, Table A). In addition, erosion control measures to control surface runoff, erosion, and sedimentation outside of the project footprint would be implemented during construction. With the implementation of avoidance and minimization measure BIO-A outlined in Chapter 7, direct or indirect impacts to special-status plant species would be further reduced below significance.

6.1.2 Operations

Operations and routine maintenance of the sedimentation plant and other project components would be conducted within previously-disturbed and developed areas. As a result impacts to vegetation communities and special-status plant species during operation and maintenance of the project are not anticipated and would not be significant.

6.2 WILDLIFE

6.2.1 Construction

Project construction could potentially affect wildlife and wildlife habitat, including construction-related noise disturbance and disruption of movement and potential wildlife mortality. Short-term impacts of construction on wildlife resources would result from wildlife avoidance of the immediate construction zone. Noise and other disturbances caused by heavy equipment and construction crews may cause wildlife to move away from the construction zone. Any vegetation removal during construction could result in the mortality of individual wildlife species. Species with limited mobility or that occupy burrows within the construction zone could be impacted during project activities.

No federal or state-listed wildlife species were identified during the field survey; however, two special-status bird species, California horned lark and loggerhead shrike, were detected within the BSA. In addition, birds protected by the MBTA and CFGC have the potential to nest within the BSA.

6.2.1.1 Birds

Raptors

Two raptors, red-tailed hawk and turkey vulture, were detected flying over the BSA. Additionally, the seven special-status raptor species known from the region to have some potential to occur within the BSA (Low or Moderate; see Appendix D, Table B) would most likely as occur as transient foragers, especially since potentially suitable nesting habitat for raptors is limited within the BSA. Since trees potentially suitable for nesting raptors would not be removed by the project, and by adhering to avoidance and minimization measures BIO-A and BIO-B outlined in Chapter 7, direct impacts to special-status raptor species during project implementation would be less than significant.

Construction noise may indirectly affect raptor species if they are present in the vicinity, causing them to change their behavior and move out of the area. If raptors are detected nesting in the vicinity of the project prior or during construction, noise-reduction measures may need to be implemented to reduce construction noise levels to acceptable levels, or work discontinued until the young have fledged. By adhering to avoidance and minimization measures BIO-A and BIO-B outlined in Chapter 7, indirect impacts to special-status raptor species are not anticipated and would be less than significant.

Nesting Birds

Birds protected by the MBTA and CFGC have the potential to nest in the BSA. Although suitable trees for nesting are limited in the BSA, existing vegetation and man-made structures in the project area could provide nesting habitat for some species. As a result, direct impacts to nesting birds could occur; however, by adhering to avoidance and minimization measures BIO-A and BIO-B outlined in Chapter 7, the impacts of project activities on nesting birds or their associated habitat are not considered significant.

Indirect impacts to nesting birds within the vicinity of the project could occur as a result of noise, increased human presence, and vibrations resulting from construction activities. Disturbances related to construction could result in changes in bird behavior, including nest abandonment or decreased feeding frequency, leading to increased nestling mortality. By adhering to avoidance and minimization measures BIO-A and BIO-B outlined in Chapter 7, direct and indirect impacts to nesting birds are not anticipated.

6.2.1.2 Mammals

No regional special-status mammal species or burrows potentially suitable for special-status fossorial species were detected during field surveys. Special-status mammals are either not expected to occur within the BSA, or have a low potential to occur (see Appendix D, Table B). Large trees that may provide potentially suitable roosting habitat for bats are limited in the BSA, and potentially suitable colonial roosting sites do not occur within the BSA, as caves are absent and large suitable structures are limited in the project vicinity. Additionally, no trees potentially suitable for roosting bats would be removed during construction. As a result, direct impacts to special-status fossorial species and bats are not anticipated.

Indirect impacts to special-status bats roosting within the vicinity of the project could occur as a result of noise, increased human presence, and vibrations resulting from construction activities. Disturbances related to construction could result in displacement from daytime roosts. Disruption of night-time roosts is not anticipated as construction will not occur during dusk or evening hours. By adhering to avoidance and minimization measure BIO-A outlined in Chapter 7, indirect impacts to special-status mammals are not anticipated.

6.2.2 Operations

Impacts during operations and routine maintenance would be limited; however, wildlife could be affected by human presence, noise, and fugitive dust. Impacts are expected to be minimal, short term, and in most cases would not directly affect wildlife. Activities would generally be conducted within previously disturbed and developed surfaces and would not encroach into adjacent habitats potentially suitable for special-status wildlife. As a result, impacts to special-status wildlife species are not anticipated during operation and maintenance of the project.

6.3 SENSITIVE NATURAL VEGETATION COMMUNITIES

6.3.1 Construction

No sensitive natural vegetation communities are present within the BSA. As a result, direct impacts to such communities would not occur during implementation of the project.

Indirect impacts to sensitive natural vegetation communities during construction could include the accumulation of fugitive dust and noise, increase of surface runoff, increase of erosion, and increase of sediment deposition within vegetation beyond the project footprint. However, by adhering to avoidance and minimization measure BIO-A outlined in Chapter 7, the potential for indirect impacts to natural communities would be reduced to a level below significance.

6.3.2 Operation

Operation and routine maintenance of the project would not coincide with any sensitive natural vegetation communities. As a result, direct and indirect impacts during operation and routine maintenance of the project would not occur and would not be significant.

6.4 WILDLIFE MOVEMENT CORRIDOR

6.4.1 Construction

Vegetation communities occurring in and within the vicinity of the BSA provide a corridor for regional wildlife movement between mountain ranges and the valley floor, and localized movement within the valley and adjacent foothills south and west of the BSA. Vegetation would be removed during project construction and as a result, direct impacts to a movement corridor would occur. However, the loss of non-native grassland habitat that will be permanently impacted by construction of the proposed sedimentation plant occurs in an area that has experienced development and disturbances associated with the Fairmont reservoir complex, and the loss represents an incrementally small area of this habitat type compared to the greater valley floor. Additionally, the movement corridor identified in the SEA Connectivity & Constrictions Map (County of Los Angeles 2014), which occurs within the BSA (as discussed in Chapter 2.4), does not coincide with the location for the proposed sedimentation plant, but is associated with the area around Fairmont Reservoir #1, which lies south of the sedimentation plant site. As a result of these factors, direct impacts to an identified wildlife movement corridor would be considered less than significant.

Indirect effects during construction due to human presence, noise, and dust could occur to the wildlife movement corridor identified in the BSA between the area of Fairmont Reservoir #1 and larger natural areas in the foothills to the south and west. In the event that vegetation communities adjacent to the project construction are indirectly impacted, they would be temporary in nature and restricted to the construction time period. Project construction activities would not occur at dusk or overnight, and, therefore, would also not indirectly impact special-status bat species. Additionally, construction in the BSA occurs at least 0.50 mile from bridges that provide corridors over the SWP, linking vegetation communities on opposite sides of the SWP. The functions and values of vegetation communities in the BSA as wildlife movement corridors would generally be unchanged from current conditions upon the completion of construction. With implementation of BIO-A in Chapter 7, long-term indirect impacts to wildlife movement corridors would be further reduced a level below significance.

6.4.2 Operation

It is anticipated that impacts to natural vegetation communities would not occur during routine operation and maintenance of the project. Operational and maintenance activities would occur in previously-disturbed areas generally void of natural vegetation and would not change conditions from those present upon project construction. As a result, operation and maintenance activities are not anticipated to significantly affect wildlife movement in the BSA and vicinity.

6.5 POTENTIAL JURISDICTIONAL FEATURES

6.5.1 Construction

Direct impacts to waters of the State during implementation of the project would occur. As the ephemeral drainage would be removed by the project, a total of 0.28-acre of streambed would be impacted by the project. As discussed above, vegetation within the drainage is dominated by upland vegetation; thus, no riparian habitat is anticipated to be impacted by the project. By coordinating with CDFW to obtain a LSAA, direct impacts to waters of the State would be less than significant level.

Indirect impacts to the ephemeral drainage feature result from stormwater runoff during construction activities where a reduction in water quality resulting from increased sedimentation or other contaminants could occur. These water quality changes could potentially reduce the quality of aquatic habitats. To avoid impacts to downstream water quality, a Stormwater Pollution Prevention Plan (SWPPP) will be developed and implemented, and will include Best Management Practices (BMP) to minimize downstream effects of stormwater runoff or conveyance of sediment or other contaminants into waterways. By adhering to avoidance and minimization measure BIO-A and BIO-B outlined in Chapter 7, the potential for indirect impacts to jurisdictional habitats would be less than significant level.

6.5.2 Operation

Operation of the project and routine maintenance activities are not anticipated to coincide with jurisdictional waters. As a result, direct and indirect impacts during operation and routine maintenance to jurisdictional waters are not anticipated.

CHAPTER 7.0
RECOMMENDED AVOIDANCE AND MINIMIZATION MEASURES

These recommendations are based on background research and the current assessment. If conditions within the project change or further information about biological resources are generated, additional surveys may become necessary.

BIO-A The following measures shall be implemented to avoid and minimize impacts to special-status species and sensitive habitats:

1. Work areas shall be clearly delineated with fencing or other boundary markers prior to the start of construction.

2. The project limits shall be clearly marked on project maps provided to the construction contractor(s) by LADWP and areas outside of the project limits shall be designated as "no construction" zones. A construction manager shall be present during all construction activities to ensure that work is limited to designated project limits.

3. During construction, construction workers shall strictly limit their activities, vehicles, equipment, and construction materials to the designated construction limits.

4. During construction, all equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other such activities shall occur in designated areas outside of jurisdictional wetlands or waters and within the project limits. Fueling of equipment shall take place within existing paved areas greater than 100 feet from water features. Contractor equipment shall be checked daily for leaks prior to operation and repaired as necessary.

5. During construction, the construction work zone shall be kept as clean of debris as possible to avoid attracting predators of sensitive wildlife. All food-related trash items shall be enclosed in sealed containers and removed daily from the construction work zone.

6. Pets of project personnel shall not be allowed on the project site during construction.

7. Prior to the start of construction, a SWPPP shall be prepared to reduce the potential for accidental releases of fuel, pesticides, and other materials. This plan shall outline refueling locations, emergency response procedures, and reporting requirements. During

construction, equipment for immediate cleanup shall be kept on-site. This plan shall also include erosion control measures to control surface runoff, erosion, and sedimentation outside of the project footprints.

BIO-B The clearance of any vegetation during construction shall occur outside of the nesting bird season (generally February 15 through September 15). If vegetation removal and other project construction outside this time period are not feasible, the following additional measures shall be employed to avoid and minimize impacts to special-status bird species and nesting birds protected under the MBTA:

1. A pre-construction nesting bird survey shall be conducted by a qualified biologist within 3 days prior to the start of construction activities to determine whether active nests are present within or directly adjacent to the construction zone. All nests found shall be recorded.

2. If construction activities must occur within 300 feet of an active nest of any passerine bird or within 500 feet of an active nest of any raptor, a qualified biologist shall monitor the nest on a weekly basis and the construction activity shall be postponed until the biologist determines that the nest is no longer active.

3. If the recommended nest avoidance zone is not feasible, the qualified biologist shall determine whether an exception is possible and obtain concurrence from the appropriate resource agency before construction work can resume within the avoidance buffer zone. All work shall cease within the avoidance buffer zone until either agency concurrence is obtained or the biologist determines that the adults and young are no longer reliant on the nest site.

CHAPTER 8.0
CONCLUSIONS

With implementation of avoidance and minimization measures provided in Chapter 7 above, the project would not result in a significant impact upon any federally listed or state-listed threatened, endangered, or candidate plant species, or other species tracked by the CNDDB and occurring or potentially occurring within the project. No direct impacts to special-status plant species are anticipated, as none were observed during the field survey and the project footprint generally lacks suitable habitat for such species. Upon implementation of avoidance and minimization measures, indirect impacts on special-status plants would also be less than significant.

Two special-status wildlife species were observed during the field survey. In addition, birds protected by the MBTA and CFGC have the potential to occur and nest in the project footprint or in proximity. Potential direct impacts to these species or their nests could occur during vegetation removal or during the use or transport of project equipment or materials, on which common birds may nest. Potential indirect impacts are associated with noise, dust, vibration, and increased human activity, which could cause individuals to change their behavior and move out of the area. Implementation of the avoidance and minimization measures in Chapter 7 would avoid disturbance of these species, resulting in less than significant impacts to special-status wildlife species and nesting birds.

Construction and operation of the project would not directly affect a wildlife movement corridor. The project footprint itself does not serve as a wildlife movement corridor and vegetation removed during construction is similar to that in the project vicinity. Additionally, by adhering to the avoidance and minimization measures in Chapter 7, indirect impacts to wildlife movement corridors occurring in the BSA or vicinity, would also be avoided and would be less than significant.

Construction of the project would result in impacts to a potential jurisdictional streambed and waters of the State under the jurisdiction of CDFW and RWQCB, respectively. However, by adhering to the avoidance and minimization measures in Chapter 7, as well as coordinating with CDFW and RWQCB to obtain a LSAA, impacts to potential jurisdictional features would be less than significant.

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CHAPTER 9.0
REFERENCES

Bechard, M.J.

1983 *Food supply and the occurrence of brood reduction in Swainson's hawk*. Wilson Bulletin 95:233-242.

Bechard, M.J., and J.K. Schmutz (Bechard and Schmutz)

1995 *Ferruginous Hawk (*Buteo regalis*)*. In A. Poole and F. Gill, editors, The Birds of North America, No. 172. Academy of Natural Sciences, Philadelphia, PA, and American Ornithologists' Union, Washington, DC.

Beedy, E.C.

2008 *Tricolored Blackbird Species Account*. In: Eds. Shuford, W. D. and T. Garaldi. *California Bird Species of Special Concern*. Studies of Western Birds No. 1. Western Field Ornithologists and the California Department of Fish and Game.

Bloom, P.H.

1980 *The status of the Swainson's hawk in California, 1979*. Federal aid in wildlife restoration, project W-54-R-12, nongame wildlife investment job final report 11-8.0. 24p+appendix.

Bureau of Land Management (BLM)

2005 Final Environmental Impact Report and Statement for the West Mojave Plan. A Habitat and Conservation Plan and California Desert Conservation Area Plan Amendment. January.

2017 West Mojave Plan Route Network. Available at: https://www.blm.gov/programs/planning-and-nepa/plans-development/california/west-mojave-plan-route-network.

California Department of Fish and Game (CDFG)

2010 *List of California Terrestrial Natural Communities Recognized by the Natural Diversity Data Base*. Natural Heritage Division. The Resources Agency. September.

1994 *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California*. November.

California Department of Fish and Wildlife (CDFW)

2017a *California Natural Diversity Data Base (CNDDB).* Full report for Lake Hughes, Burnt Peak, Del Sur, Fairmont Butte, Green Valley, Little Buttes, Neenach School, Sleepy Valley, and Warm Springs Mountain quadrangles. Generated November 16, 2017.

2017b *State and Federally Listed Endangered, Threatened, and Rare Plants of California*. California Natural Diversity Data Base, January 2016. Available at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109390&inline.

2017c *Special Vascular Plants, Bryophytes, and Lichens List*. California Natural Diversity Data Base. October. Available at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109383.

2017d *State and Federally Listed Endangered and Threatened Animals of California*. October. Natural Heritage Division, California Natural Diversity Data Base. Available at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109405&inline

2017e *Special Animals*. California Natural Diversity Data Base. October. Available at https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406

California Department of Transportation (Caltrans)

2017 Caltrans Water Quality Planning Tool. Available at: http://svctenvims.dot.ca.gov/wqpt/wqpt.aspx. Accessed November 8, 2017.

California Native Plant Society (CNPS)

2017 *Inventory of Rare and Endangered Plants* (online edition, v8-02). California Native Plant Society. Sacramento, CA. Available at http://www.rareplants.cnps.org/. Accessed November 16, 2017.

County of Los Angeles Department of Regional Planning (County of Los Angeles)

2015 General Plan 2035. Los Angeles County Department of Regional Planning, Los Angeles, Adopted October 6, 2015.

2014 County of Los Angeles SEA Ordinance. SEA Connectivity & Constrictions Map. Draft. April

DeHaven, R. W., F. T. Crase, and P. P. Woronecki (DeHaven et al.)

1975 *Breeding Status of the Tricolored Blackbird, 1969-1972*. California Fish and Game 61:166-180.

England, A.S., M.J. Bechard, and C.S. Houston (England et al.)

1997 *Swainson's Hawk (*Buteo swainsoni*)*. In: *The Birds of North America, No. 265*. A. Poole and F. Gill editors. The Academy of Natural Sciences, Philadelphia, Pennsylvania; The American Ornithologists Union, Washington, D.C.

Environmental Laboratory (EL)

1987 *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.

2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0). September.

Estep, J.A.

1989 *Biology, Movements, and Habitat Relationships of the Swainson's Hawk in the Central Valley of California, 1986-87*. California Department of Fish and Game, Nongame Bird and Mammal Section Report, 53pp.

FedCenter.gov (FedCenter)

2017 Executive Order 11990 Protection of Wetlands. Available at: https://www.fedcenter.gov/Bookmarks/index.cfm?id=585.

Garrett, K. and J. Dunn (Garrett and Dunn)

1981 Birds of southern California. Los Angeles Audubon Society. 408pp.

Grover, M.C. and L.A. DeFalco (Grover and DeFalco)

1995 *Desert Tortoise* (Gopherus agassizii): *Status-of-Knowledge Outline with References.* US Department of Agriculture Forest Service, Intermountain Research Station, General Technical Report INT-GTR-316, Ogden, UT. 134 pp.

Holland, R.

1986 *Preliminary Descriptions of the Terrestrial Natural Communities of California*. California Department of Fish and Game, The Resources Agency. 156 pp.

Information Center for the Environment (ICE)

2017 Tricolored Blackbird Portal. University of California-Davis. Available at: http://tricolor.ice.ucdavis.edu/node?page=1. Accessed November 16, 2017.

Knopf, F.L.

1996 *Mountain Plover* (Charadius montanus). In The Birds of North America, No. 211 (A Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

National Wild and Scenic Rivers System (NWSRS)

2017a About the WSR Act. Available at http://www.rivers.gov/wsr-act.php.

2017b California Designated Wild and Scenic Rivers. Available at: https://www.rivers.gov/california.php.

Natural Resource Conservation Service (NRCS)

2017 Web Soil Survey. Available at http://websoilsurvey.nrcs.usda.gov/app/ .

Pacific Fishery Management Council (PFMC)

2016 *Habitat and Communities; Habitat. What is Essential Fish Habitat (EFH)?* Available at http://www.pcouncil.org/habitat-and-communities/habitat/.

Peeters, H. and P. Peeters

2005 *Raptors of California*. University of California Press. 294. pp.

Remsen, H. V.

1978 *Bird Species of Special Concern in California: an Annotated List of Declining or Vulnerable Bird Species*. California Department of Fish and Game, The Resources Agency.

Sawyer, J.O., T. Keeler-Wolf, and Evans, J. (Sawyer et al.)

2009. A Manual of California Vegetation. Second Ed. Sacramento, CA: California Native Plant Society.

Skorupa, J.P., R.L. Hothem, and R.W. DeHaven (Skorupa et al.)

1980 *Foods of Breeding Tricolored Blackbirds in Agricultural Areas of Merced County, California*. Condor 82:465-467.

University of California Division of Agriculture and Natural Resources (UCANR)

2015. The Oak Tree Ordinance. Available at: http://ucanr.edu/sites/oak_range/files/60602.pdf.

U.S. Army Corps of Engineers (USACE)

2007 Jurisdictional Determination form Instructional Guidebook prepared jointly by USACE and USEPA.

U.S. Fish and Wildlife Service (USFWS)

2017 Information for Planning and Conservation. Available at https://ecos.fws.gov/ipac/. Accessed November 16, 2017.

2008 *Birds of Conservation Concern 2008*. Division of Migratory Bird Management, Arlington Virginia. December.

Western Bat Working Group (WBWG)

2015 Species Matrix. Available at http://wbwg.org/matrices/species-matrix/. Accessed February 23, 2016.

Williams, D. F.

1986 *Mammalian Species of Special Concern in California*. California Department of Fish and Game. Wildlife Management Division Administrative Report 86-1. 112 pp.

Yosef, Reuven

1996 *Loggerhead Shrike* (Lanius ludovicianus), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Available at: http://bna.birds.cornell.edu/bna/species/231

Zeiner, D.C., W.F. Laudenslyaer, Jr., K.E. Mayer, and M. White, eds (Zeiner et al.)

1990 *California's Wildlife*. Vol. I-III. California Department of Fish and Game, Sacramento, California. Available at: https://www.wildlife.ca.gov/Data/CWHR/Life-History-and-Range

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APPENDIX A
Site Photographs

Photo 1: Southwest-facing view of non-native grassland habitat within the site of the proposed sedimentation plant (photo taken May 18, 2017).

Photo 2: Southeast-facing view of non-native grassland habitat within the site of the proposed sedimentation plant, with the vegetated ephemeral drainage feature crossing in the middle of the photo (photo taken May 18, 2017).

Photo 3: North-facing view of ruderal habitat along the western perimeter of the proposed sedimentation plant site (photo taken May 18, 2017).

Photo 4: North-facing view of proposed staging and laydown area occurring south of the site for the proposed sedimentation plant (photo taken May 18, 2017).

Photo 5: Southwest (downstream)-facing view of the upper reach of the vegetated ephemeral drainage feature (photo taken May 18, 2017).

Photo 6: Southwest (upstream)-facing view of the middle reach of the vegetated ephemeral drainage feature (photo taken May 18, 2017).

Photo 7: Northeast (downstream)-facing view of the lower reach of the vegetated ephemeral drainage feature, prior to flowing off-site (photo taken May 18, 2017).

Photo 8: West-facing view of area north of Fairmont Reservoir #2 observed to contain standing water during the January survey. Dead/dying vegetation visible in picture is California buckwheat (photo taken May 18, 2017).

Photo 9: Northwest-facing view across Fairmont Reservoir #2, with non-native grassland habitat typical of the Project vicinity visible in background (photo taken January 17, 2017).

Photo 10: West-facing view across the bottom of dry Fairmont Reservoir #1, with the western bank of the reservoir visible in the background (photo taken January 17, 2017).

Photo 11: East-facing view of sparse vegetation along the western perimeter of dry Fairmont Reservoir #2 (photo taken January 17, 2017).

Photo 12: North-facing view of California buckwheat scrub habitat within the proposed stockpile area (photo taken September 22, 2017).

Photo 13: South-facing view of cottonwood and willow scrub in the southern portion of the proposed stockpile area (photo taken September 22, 2017).

APPENDIX B
Species Observed
Table A: Plants
Table B: Wildlife

Table A. Plants

Table A. List of Plant Species Observed During Field Surveys	
Scientific Name	**Common Name**
DICOTS (Woody and Herbaceous Plant Species)	
AMARANTHACEAE	**CARROT FAMILY**
Chenopodium album	Lamb’s quarters
Salsola tragus	Russian thistle
APOCYNACEAE	**DOGBANE FAMILY**
Asclepias fascicularis	narrow leaf milkweed
ASTERACEAE	**SUNFLOWER FAMILY**
Ambrosia psilostachya	western ragweed
Baccharis salicifolia	mulefat
Corethrogyne filaginifolia	common sandaster
Encelia californica	California encelia
Ericameria nauseosus	rubber rabbitbrush
Glebionis coronaria	crown daisy
Helianthus annuus	common sunflower
Sonchus oleraceus	sow thistle
BORAGINACEAE	**FORGET-ME-NOT FAMILY**
Phacelia imbricata	imbricate phacelia
Amsinckia tessellata	fiddleneck
BRASSICACEAE	**MUSTARD FAMILY**
Brassica sp.	mustard
Sisymbrium irio	London rocket
EUPHORBIACEAE	**SPRUGE FAMILY**
Croton setigerus	dove weed
GERANIACEAE	**GERANIUM FAMILY**
Erodium cicutarium	red-stemmed filaree
LAMIACEAE	**MINT FAMILY**
Marrubium vulgare	horehound
Salvia columbariae	Chia sage

Table A. List of Plant Species Observed During Field Surveys	
Scientific Name	**Common Name**
PAPAVERACEAE	**POPPY FAMILY**
Eschscholzia californica	California poppy
PINACEAE	**PINE FAMILY**
Pinus sp.	pine tree
POLYGONACEAE	**KNOTWEED FAMILY**
Chorizanthe staticoides	Turkish rugging
Erigonum fasciculatum	California buckwheat
SALICACEAE	**WILLOW FAMILY**
Populus fremontii	Fremont cottonwood
Salix spp.	willow trees
SOLANACEAE	**NIGHTSHADE FAMILY**
Datura wrightii	Jimsonweed
MONOCOTS (Grasses and Grass-like Plant Species)	
POACEAE	**GRASS FAMILY**
Avena fatua	wild oat
Bromus diandrus	ripgut brome
Bromus madritensis ssp. rubens	red brome
Elymus elymoides	squirreltail
Hordeum vulgare	common barley

Table B. Wildlife

Table B. List of Wildlife Species Observed During Field Surveys	
Common Name	**Scientific Name**
BIRDS	
ACCIPITRIDAE (Kites, Eagles, Hawks, and Allies)	
red-tailed hawk	*Buteo jamaicensis*
ALAUDIDAE (Larks)	
California horned lark	*Eremophila alpestris actia*
ANATIDAE (Ducks, Geese, and Swans)	
lesser scaup*	*Aythya affinis*
Bufflehead*	*Bucephala albeola*
common merganser*	*Mergus merganser*
Ruddy duck*	*Oxyura jamaicensis*
CATHARTIDAE (New World Vultures)	
turkey vulture	*Cathartes aura*
CORVIDAE (Jays, Magpies, and Crows)	
common raven	*Corvus corax*
EMBERIZIDAE (Sparrows, Juncos, and Towhees)	
song sparrow	*Melospiza melodia*
FRINGILLIDAE (Finches and Allies)	
house finch	*Haemorhous mexicanus*
HIRUNDINIDAE (Swallows and Martins)	
barn swallow	*Hirundo rustica*
northern rough-winged swallow	*Stelgidopteryx serripennis*
ICTERIDAE (Orioles and Blackbirds)	
red-winged blackbird	*Agelaius phoeniceus*
hooded oriole	*Icterus cucullatus*
western meadowlark	*Sturnella neglecta*
LANIIDAE (Shrikes)	
loggerhead shrike	*Lanius ludovicianus*
MOTACILLIDAE (Wagtails, Longclaws, and Pipits)	
American pipit	*Anthus rubescens*

Table B. List of Wildlife Species Observed During Field Surveys	
Common Name	**Scientific Name**
ODONTOPHORIDAE (New World Quails)	
California quail	*Callipepla californica*
RALLIDAE (Rails)	
American coot*	*Fulica americana*
TYRANNIDAE (Flycatchers)	
black phoebe	*Sayornis nigricans*
Say's phoebe	*Sayornis saya*
western kingbird	*Tyrannus verticalis*
MAMMALS	
CANIDAE (Dogs, Wolves, Foxes, Jackals, and Dingoes)	
coyote	*Canis latrans*
CERVIDAE (Deer)	
mule deer	*Odocoeleus hemionus*
LEPORIDAE (Rabbits and Hares)	
black-tailed jackrabbit	*Lepus californicus*
desert cottontail	*Sylvilagus audubonii*
SCIURIDAE (Squirrels, Chipmunks, Marmots, and Prairie Dogs)	
ground squirrel	*Otospermophilus beecheyi*
REPTILES	
COLUBRIDAE (Snakes)	
coachwhip	*Masticophis flagellum*
CROTAPHYTIDAE (Collared and Leopard Lizards)	
long-nosed leopard lizard	*Gambelia wislizenii*
Iguanidae (Iguanas and Related Lizards)	
western fence lizard	*Sceloporus occidentalis*

APPENDIX C

Database Search Results
California Natural Diversity Data Base (CNDDB)
California Native Plant Society (CNPS)
Information for Planning and Conservation (IPaC)

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Lake Hughes (3411864) OR Burnt Peak (3411865) OR Del Sur (3411863) OR Fairmont Butte (3411874) OR Green Valley (3411854) OR Neenach School (3411875) OR Sleepy Valley (3411853) OR Warm Springs Mountain (3411855) OR Little Buttes (3411873))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Candidate Endangered	G2G3	S1S2	SSC
Aimophila ruficeps canescens southern California rufous-crowned sparrow	ABPBX91091	None	None	G5T3	S3	WL
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Arizona elegans occidentalis California glossy snake	ARADB01017	None	None	G5T2	S2	SSC
Artemisiospiza belli belli Bell's sage sparrow	ABPBX97021	None	None	G5T2T4	S3	WL
Aspidoscelis tigris stejnegeri coastal whiptail	ARACJ02143	None	None	G5T5	S3	SSC
Astragalus hornii var. hornii Horn's milk-vetch	PDFAB0F421	None	None	G4G5T1T2	S1	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Berberis nevinii Nevin's barberry	PDBER060A0	Endangered	Endangered	G1	S1	1B.1
Bombus crotchii Crotch bumble bee	IIHYM24480	None	None	G3G4	S1S2	
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
California macrophylla round-leaved filaree	PDGER01070	None	None	G4	S4	1B.2
Calochortus clavatus var. gracilis slender mariposa-lily	PMLIL0D096	None	None	G4T2T3	S2S3	1B.2
Calochortus striatus alkali mariposa-lily	PMLIL0D190	None	None	G3	S3	1B.2
Calystegia peirsonii Peirson's morning-glory	PDCON040A0	None	None	G4	S4	4.2
Charadrius montanus mountain plover	ABNNB03100	None	None	G3	S2S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Chorizanthe parryi var. fernandina San Fernando Valley spineflower	PDPGN040J1	Proposed Threatened	Endangered	G2T1	S1	1B.1
Chorizanthe parryi var. parryi Parry's spineflower	PDPGN040J2	None	None	G3T2	S2	1B.1
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Cryptantha clokeyi Clokey's cryptantha	PDBOR0A3M0	None	None	G3	S3	1B.2
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
Falco columbarius merlin	ABNKD06030	None	None	G5	S3S4	WL
Gasterosteus aculeatus williamsoni unarmored threespine stickleback	AFCPA03011	Endangered	Endangered	G5T1	S1	FP
Gopherus agassizii desert tortoise	ARAAF01012	Threatened	Threatened	G3	S2S3	
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Lanius ludovicianus loggerhead shrike	ABPBR01030	None	None	G4	S4	SSC
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lepechinia rossii Ross' pitcher sage	PDLAM0V060	None	None	G1	S1	1B.2
Lepus californicus bennettii San Diego black-tailed jackrabbit	AMAEB03051	None	None	G5T3T4	S3S4	SSC
Navarretia fossalis spreading navarretia	PDPLM0C080	Threatened	None	G2	S2	1B.1
Neotamias speciosus speciosus lodgepole chipmunk	AMAFB02172	None	None	G4T2T3	S2S3	
Onychomys torridus ramona southern grasshopper mouse	AMAFF06022	None	None	G5T3	S3	SSC
Opuntia basilaris var. brachyclada short-joint beavertail	PDCAC0D053	None	None	G5T3	S3	1B.2
Perognathus alticolus inexpectatus Tehachapi pocket mouse	AMAFD01082	None	None	G1G2T1T2	S1S2	SSC
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
Pseudognaphalium leucocephalum white rabbit-tobacco	PDAST440C0	None	None	G4	S2	2B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Sidalcea neomexicana salt spring checkerbloom	PDMAL110J0	None	None	G4	S2	2B.2
Southern California Threespine Stickleback Stream Southern California Threespine Stickleback Stream	CARE2320CA	None	None	GNR	SNR	
Southern Coast Live Oak Riparian Forest Southern Coast Live Oak Riparian Forest	CTT61310CA	None	None	G4	S4	
Southern Cottonwood Willow Riparian Forest Southern Cottonwood Willow Riparian Forest	CTT61330CA	None	None	G3	S3.2	
Southern Mixed Riparian Forest Southern Mixed Riparian Forest	CTT61340CA	None	None	G2	S2.1	
Southern Riparian Forest Southern Riparian Forest	CTT61300CA	None	None	G4	S4	
Southern Riparian Scrub Southern Riparian Scrub	CTT63300CA	None	None	G3	S3.2	
Southern Sycamore Alder Riparian Woodland Southern Sycamore Alder Riparian Woodland	CTT62400CA	None	None	G4	S4	
Southern Willow Scrub Southern Willow Scrub	CTT63320CA	None	None	G3	S2.1	
Symphyotrichum greatae Greata's aster	PDASTE80U0	None	None	G2	S2	1B.3
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis hammondii two-striped gartersnake	ARADB36160	None	None	G4	S3S4	SSC
Toxostoma lecontei Le Conte's thrasher	ABPBK06100	None	None	G4	S3	SSC
Valley Needlegrass Grassland Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Valley Oak Woodland Valley Oak Woodland	CTT71130CA	None	None	G3	S2.1	
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
Wildflower Field Wildflower Field	CTT42300CA	None	None	G2	S2.2	

Record Count: 57

California Native Plant Society
Inventory of Rare and Endangered Plants

Nine-Quad Search: Lake Hughes, Burnt Peak, Del Sur, Fairmont Butte, Green Valley, Little Buttes, Neenach School, Sleepy Valley, and Warm Springs Mountain.

Scientific Name	Common Name	Rare Plant Rank	State Listing (CESA)	Federal Listing (FESA)
Allium howellii var. clokeyi	Mt. Pinos onion	1B.3	-	-
Androsace elongata ssp. acuta	California androsace	4.2	-	-
Berberis nevinii	Nevin's barberry	1B.1	Endangered	Endangered
California macrophylla	round-leaved filaree	1B.2	-	-
Calochortus catalinae	Catalina mariposa lily	4.2	-	-
Calochortus clavatus var. gracilis	slender mariposa lily	1B.2	-	-
Calochortus striatus	alkali mariposa lily	1B.2	-	-
Calystegia peirsonii	Peirson's morning-glory	4.2	-	-
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	1B.1	Endangered	Candidate
Chorizanthe parryi var. parryi	Parry's spineflower	1B.1	-	-
Chorizanthe spinosa	Mojave spineflower	4.2	-	-
Chorizanthe xanti var. leucotheca	white-bracted spineflower	1B.2	-	-
Clinopodium mimuloides	monkey-flower savory	4.2	-	-
Cryptantha clokeyi	Clokey's cryptantha	1B.2	-	-
Delphinium parryi ssp. purpureum	Mt. Pinos larkspur	4.3	-	-
Galium grande	San Gabriel bedstraw	1B.2	-	-
Lepechinia fragrans	fragrant pitcher sage	4.2	-	-
Lepechinia rossii	Ross' pitcher sage	1B.2	-	-
Lilium humboldtii ssp. ocellatum	ocellated Humboldt lily	4.2	-	-
Navarretia fossalis	spreading navarretia	1B.1	-	Threatened
Opuntia basilaris var. brachyclada	short-joint beavertail	1B.2	-	-
Phacelia hubbyi	Hubby's phacelia	4.2	-	-
Pseudognaphalium leucocephalum	white rabbit-tobacco	2B.2	-	-
Sidalcea neomexicana	salt spring checkerbloom	2B.2		-
Symphyotrichum greatae	Greata's aster	1B.3	-	-

CNPS, Rare Plant Program. 2017. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed 16 November 2017].

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
Phone: (760) 431-9440 Fax: (760) 431-5901
http://www.fws.gov/carlsbad/

In Reply Refer To:
Consultation Code: 08ECAR00-2018-SLI-0200
Event Code: 08ECAR00-2018-E-00461
Project Name: Fairmont Sedimentation Plant

November 16, 2017

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
(760) 431-9440

Project Summary

Consultation Code: 08ECAR00-2018-SLI-0200

Event Code: 08ECAR00-2018-E-00461

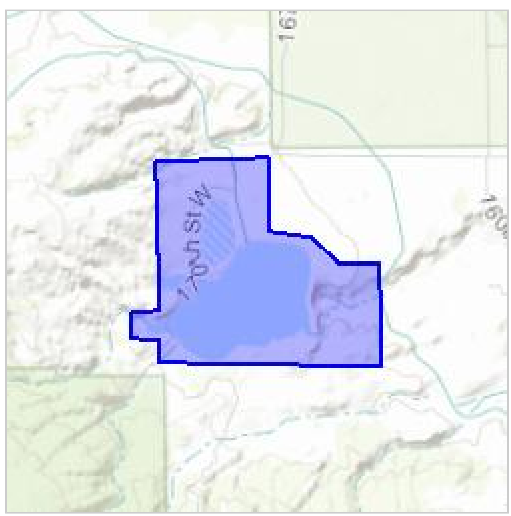
Project Name: Fairmont Sedimentation Plant

Project Type: DEVELOPMENT

Project Description: The purpose of the project is to construct a plant which would remove sediment from water transported by the First and Second Los Angeles Aqueducts (LAA1 and LAA2), as well as State Water Project East Branch (SWP-W) water in the future. Construction would include several components, including various improvements around Fairmont Reservoir #1 (out of service) and Fairmont Reservoir #2, but the plant itself would be located just east of Fairmont Reservoir #2.

Project Location:

Approximate location of the project can be viewed in Google Maps:
https://www.google.com/maps/place/34.70996476859604N118.4327785509994W



Counties: Los Angeles, CA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Birds

NAME	STATUS
California Condor *Gymnogyps californianus* Population: U.S.A. only, except where listed as an experimental population There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8193	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX D

Table A. Regional Special-Status Plant Species and Sensitive Natural Communities
Table B. Regional Special-Status Wildlife Species

Table A. Regional Special-Status Plant Species and Sensitive Natural Communities[1]

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
Plants				
Mt. Pinos onion *Allium howellii var. clokeyi*	Federal: None State: None CRPR: 1B.3	Great Basin scrub, Meadows and seeps (edges), Pinyon and juniper woodland. Prefers granitic soils. Occurs at elevations from 1,300-1,800 meters (700-6,100 feet). Blooms April-June	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
California androsace *Androsace elongata ssp. Acuta*	Federal: None State: None CRPR: 4.2	Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, valley and foothill grassland. Occurs at 150-1,305 meters (500-4,300 feet). Blooms March-June.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Horn's milk-vetch *Astragalus hornii var. hornii*	Federal: None State: None CRPR: 1B.1	Lake margins, alkaline. Meadows and seeps, playas. Occurs at 60-855 meters (200 to 2,800 feet). Blooms May-October.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent and the BSA occurs outside the known elevation range preferred by this species.
Nevin's barberry *Berberis nevinii*	Federal: FE State: SE CRPR: 1B.1	Charparral, cismontane woodland, coastal scrub, riparian scrub. Occurs at 70-825 meters (230 to 2,700 feet). Blooms (Feb) March-June.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent and the BSA occurs outside the known elevation range preferred by this species.

Common Name ***Scientific Name***[2]	**Status**[3]	**General Habitat Description**[4]	**Potentially Suitable Habitat Present/ Absent in BSA**	**Potential for Occurrence in the BSA**[5,6]
round-leaved filaree *California macrophylla*	Federal: None State: None CRPR: 1B.2	Cismontane woodland, valley and foothill grassland. Occurs at 15-1,200 meters (50-4,000 feet). Blooms March-May.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent and the BSA occurs outside the known elevation range preferred by this species.
Catalina mariposa lily *Calochortus catalinae*	Federal: None State: None CRPR: 4.2	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Occurs at 15-700 meters (50-2,300 feet). Blooms (Feb) March-June.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent and the BSA occurs outside the known elevation range preferred by this species.
slender mariposa-lily *Calochortus clavatus var. gracilis*	Federal: None State: None CRPR: 1B.2	Chaparral, coastal scrub, valley and foothill grassland. Occurs between 320-1,000 meters (1,050-3,250 feet). Blooms March-June (Nov).	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
alkali mariposa-lily *Calochortus striatus*	Federal: None State: None CRPR: 1B.2	Chaparral, chenopod scrub, mohavean desert scrub, meadows and seeps. Occurs 70-1,595 meters (230-5,200 feet). Blooms April-June.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Peirson's morning-glory *Calystegia peirsonii*	Federal: None State: None CRPR: 4.2	Found in chaparral, chenopod scrub, cismontane woodland, coastal scrub, lower montane coniferous forest and valley and foothill grassland. Occurs between 30-1,500 meters (100-4,920 feet). Blooms April-June.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.

Common Name ***Scientific Name***[2]	**Status**[3]	**General Habitat Description**[4]	**Potentially Suitable Habitat Present/ Absent in BSA**	**Potential for Occurrence in the BSA**[5,6]
San Fernando Valley spineflower *Chorizanthe parryi var. fernandina*	Federal: FC State: SE CRPR: 1B.1	Coastal scrub (sandy), valley and foothill grasslands. Occurs between 150-1,220 meters (500-4,000 feet). Blooms April-July.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Parry's spineflower *Chorizanthe parryi var. parryi*	Federal: None State: None CRPR : 1B.1	Sandy or rocky openings, chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Occurs between 275-1,220 meters (900-4,000 feet). Blooms April-June.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Mojave spineflower *Chorizanthe spinosa*	Federal: None State: None CRPR: 4.2	Sometimes alkaline, chenopod scrub, Joshua tree woodland, Mohavean desert scrub, playas. Occurs between 6-1,300 meters (20-4,300 feet). Blooms March - July.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
white-bracted spineflower *Chorizanthe xanti var. leucotheca*	Federal: None State: None CRPR: 1B.2	Sandy or gravelly habitats. Coastal scrub (alluvial fans), Mohavean desert scrub, pinyon and juniper woodland. Occurs between 300-1,200 meters (1,000-4,000 feet). Blooms April-June.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.

Common Name *Scientific Name*[2]	**Status**[3]	**General Habitat Description**[4]	**Potentially Suitable Habitat Present/ Absent in BSA**	**Potential for Occurrence in the BSA**[5,6]
monkey-flower savory *Clinopodium mimuloides*	Federal: None State: None CRPR: 4.2	Streambanks and mesic habitats. Chaparral, North Coast coniferous forest. Occurs between 305-1,800 meters (1,000-5,900 feet). Blooms June-October.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Clokey's cryptantha *Cryptantha clokeyi*	Federal: None State: None CRPR : 1B.2	Mohavean desert scrub. Occurs between 725-1,365 meters (2,400-4,500 feet). Blooms April.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Mt. Pinos larkspur *Delphinium parryi ssp. Purpureum*	Federal: None State: None CRPR: 4.3	Chaparral, Mojavean desert scrub, pinyon and juniper woodland. Occurs between 1,000-2,600 meters (3,300-8,500 feet). Blooms May-June.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent and the BSA occurs outside the known elevation range preferred by this species.
San Gabriel bedstraw *Galium grande*	Federal: None State: None CRPR: 1B.2	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest. Occurs between 425-1,500 meters(1,400-5,000 feet). Blooms January-July.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
fragrant pitcher sage *Lepechinia fragrans*	Federal: None State: None CRPR: 4.2	Chaparral. Occurs between 20-1,310 meters (70-4,300 feet). Blooms March-October.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Ross' pitcher sage *Lepechinia rossii*	Federal: None State: None CRPR : 1B.2	Chaparral. Occurs between 305-790 meters (1,000-2,600 feet). Blooms May-September.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent and the BSA occurs outside the known elevation range preferred by this species.

Common Name ***Scientific Name*** [2]	**Status** [3]	**General Habitat Description** [4]	**Potentially Suitable Habitat Present/ Absent in BSA**	**Potential for Occurrence in the BSA** [5,6]
ocellated Humboldt lily *Lilium humboldtii ssp. Ocellatum*	Federal: None State: None CRPR: 4.2	Openings. Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, riparian woodland. Occurs between 30-1,800 meters (100-6,000 feet). Blooms March-July (August).	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
spreading navarretia *Navarretia fossalis*	Federal: FT State: None CRPR : 1B.1	Chenopod scrub, marshes and swamps (assorted shallow freashwater), payas, vernal pools). Occurs between 30-655 meters (100-2,200 feet). Blooms April-June.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent and the BSA occurs outside the known elevation range preferred by this species.
short-joint beavertail *Opuntia basilaris var. brachyclada*	Federal: None State: None CRPR : 1B.2	Chaparral, Joshua tree woodland, Mojavean desert scrub. Pinyon and juniper woodland. Occurs 425-1,800 meters (1,400-5,900 feet). Blooms April-June (August).	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Hubby's phacelia *Phacelia hubbyi*	Federal: None State: None CRPR: 4.2	Often in gravelly, rocky, talus habitats. Chaparrals, coastal scrub, valley and foothill grasslands. Occurs between 0-1,000 meters (0-3,200 feet). Blooms April-July.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.

Common Name ***Scientific Name***[2]	**Status**[3]	**General Habitat Description**[4]	**Potentially Suitable Habitat Present/ Absent in BSA**	**Potential for Occurrence in the BSA**[5,6]
white rabbit-tobacco *Pseudognaphalium leucocephalum*	Federal: None State: None CRPR : 2B.2	Prefers sandy, gravelly habitats. Chaparral, cismontane woodland, coastal scrub, riparian woodland. Occurs between 0-2,100 meters (0-6,900 feet). Blooms (Jul) August-November (Dec).	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
salt spring checkerbloom *Sidalcea neomexicana*	Federal: None State: None CRPR : 2B.2	Prefers alkaline, mesic habitats in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas. Occurs between 15-1,530 meters (50-5,020 feet). Blooms March-June.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Greata's aster *Symphyotrichum greatae*	Federal: None State: None CRPR : 1B.3	Prefers mesic. habitats. Broad-leafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, riparian woodland. Occurs between 300-2,010 meters (1,000-6,600 feet). Blooms June-October.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Sensitive Natural Communities				
Southern California Threespine Stickleback Stream				**Not Present** in the BSA.
Southern Coast Live Oak Riparian Forest				**Not Present** in the BSA.

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
Southern Cottonwood Willow Riparian Forest				**Not Present** in the BSA.
Southern Mixed Riparian Forest				**Not Present** in the BSA.
Southern Riparian Forest				**Not Present** in the BSA.
Southern Riparian Scrub				**Not Present** in the BSA.
Southern Sycamore Alder Riparian Woodland				**Not Present** in the BSA.
Southern Willow Scrub				**Not Present** in the BSA.
Valley Needlegrass Grassland				**Not Present** in the BSA.
Valley Oak Woodland				**Not Present** in the BSA.
Wildflower Field				**Not Present** in the BSA.

[1] Special-Status species known from the CNDDB and CNPS to occur on the Lake Hughes, Burnt Peak, Del Sur, Fairmont Butte, Green Valley, Little Buttes, Neenach School, Sleepy Valley, and Warm Springs Mountain quadrangles.

[2] Nomenclature for special-status plant species conforms to CNPS.

[3] Sensitivity Status Codes

Federal
- **FT** - Federally Threatened under the Federal Endangered Species Act
- **FE** - Federally Endangered under the Federal Endangered Species Act
- **FC** – A Federal Candidate for listing under the Federal Endangered Species Act

State
- **ST** - State Threatened under the California Endangered Species Act
- **SE** - State Endangered under the California Endangered Species Act

CRPR
- CNPS California Rare Plant Rank (CRPR)
- **1A:** Plants presumed extinct in California
- **1B**: Plants rare, threatened, or endangered in California and elsewhere
- **2**: Plants rare, threatened, or endangered in California, but more common elsewhere
- **3**: Plants more information is needed for

4: Plants of limited distribution – a watch list

0.1: Seriously threatened in California

0.2: Fairly endangered in California

0.3: Not very endangered in California

[4] General Habitat Descriptions from CNPS (2017).

[5] Historical records from CDFW 2017a.

[6] Potential for each species to occur within the BSA is based on the following guidelines:

- Present: Species was observed in or immediately adjacent to the BSA during the field survey, or survey conducted within the past five years.
- High: Habitat (including soils and elevation factors) and known historical range for the species occurs in the BSA and a known occurrence has been recorded from within five miles within the past 30 years.
- Moderate: Habitat for the species occurs in the BSA and a known occurrence exists from between five and ten miles of the BSA, within the past 30 years.
- Low: Limited habitat for the species occurs in the BSA and a known occurrence is from greater than 10 miles from the BSA or over 30 years old, or habitat to support the species is of marginal quantity or quality. A low potential to occur is also assigned when focused surveys for a species have been conducted numerous times within the past 10 years without positive results.
- Not Expect: Beyond those factors listed for Low Potential, the species is easily identifiable throughout the year and was not observed, or specific habitat requirements are not found within or adjacent to the BSA.

Table B. Regional Special-Status Wildlife Species[1]

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
Invertebrates				
crotch bumble bee *Bombus crotchii*	Federal: None State: None Other: CNDDB	Occurs at relatively warm and dry sites, including the inner Coast Range of California and the margins of the Mojave Desert.	Present	**Low.** The BSA occurs within the known range of this species; however, the nearest regional historical record of this species is from 9.5 miles to the northwest in the vicinity of Neenach and is 40 plus years old.
Fish				
unarmored threespine stickleback *Gasterosteus aculeatus williamsoni*	Federal: FE State: SE	Very limited distribution, with the southern California population represented in only three drainages; Upper Santa Clara River (extremely limited), Bouquet Creek (extremely limited) and Soledad Canyon Creek (possibly extirpated).	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA and drainages known to support this species do not coincide with the BSA.

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
Amphibians				
California red-legged frog *Rana draytonii*	Federal: FT State: None Other: SSC	Inhabits quiet pools of streams, marshes, and occasionally ponds. Occurs along the Coast Ranges from Mendocino County south and in portions of the Sierra Nevada and Cascades ranges, usually below 1,200 meters (3,936 feet).	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Reptiles				
California glossy snake *Arizona elegans occidentalis*	Federal: None State: None Other: SSC	Most common is desert habitats but also occur in chaparral, sagebrush, valley-foothill hardwood, pine-juniper, and annual grass.	Present	**Low:** Habitat potentially suitable for this species is present in the BSA; however, the only regional occurrence is 15 plus miles southwest of the BSA near Castaic, and is from 1948.
coastal whiptail *Aspidoscelis tigris stejnegeri*	Federal: None State: None Other: SSC	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage - chaparral, woodland, and riparian areas.	Present	**Low**: Although limited, habitat conditions potentially suitable for this species are present in the BSA. The nearest historical record of this species is from approximately 4 miles southwest of the BSA in the vicinity of Lake Elizabeth, from 2003.

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
western pond turtle *Emys marmorata*	Federal: None State: None Other: SSC	The western pond turtle is uncommon to common in suitable aquatic habitat throughout California, west of the Sierra-Cascade crest and absent from desert regions, except in the Mojave Desert along the Mojave River and its tributaries. Elevation range extends from near sea level to 1,430 meters (4,690 ft). Associated with permanent or nearly permanent water in a wide variety of habitat types.	Absent	**Not Expected**: Although a permanent water body is present in the BSA in the form of Fairmont Reservoir #2, the reservoir is fenced off and does not provide the aquatic habitat conditions preferred by this species.

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
desert tortoise *Gopherus agassizii*	Federal: FT State: ST	This species is widely distributed in the Mojave, Sonoran and Colorado deserts from below sea level to 2,200 meters (7,220 feet) (Grover and DeFalco 1995). Most common in desert scrub, desert wash, and Joshua tree habitats, but occurs in almost every desert habitat except those on the most precipitous slopes. This species normally excavates a burrow under bushes, overhanging soil or rock formations, or digs into the soil in the open. Burrows are most extensive in the northern part of the range where winter temperatures are coldest. On occasion, a tortoise will take cover under a bush or any natural shelter. Desert tortoises occur in a wide variety of habitats in arid and semiarid regions. They require friable soil for burrow and nest construction. Highest densities are achieved in creosote bush communities with extensive annual wildflower blooms, such as occur in the western Mojave. However, tortoises can be found in areas of extensive lava formations, alkali flats and most other desert habitats.	Absent	**Not Expected**: Habitats potentially suitable for this species are generally absent from the BSA and no signs or burrows potentially suitable for this species were detected during the field surveys. The nearest historical record of this species is from approximately 11 miles north of the BSA, from 2010.

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
coast horned lizard *Phrynosoma blainvillii*	Federal: None State: None Other: SSC	Inhabits coastal sage scrub and chaparral in arid and semiarid climates. Prefers friable, rocky, or shallow sandy soils.	Absent	**Low**: Habitats potentially suitable for this species are generally absent from the BSA; however, a historical record of this species from 2010 occurs approximately 1.6 miles southeast of the BSA. Additionally, multiple records from 2008 are located 7 miles southeast of the BSA.
two-striped gartersnake *Thamnophis hammondii*	Federal: None State: None Other: SSC	Associated with permanent or semi-permanent bodies of water bordered by dense vegetation in a variety of habitats.	Absent	**Not Expected**: Although a permanent water body is present in the BSA in the form of Fairmont Reservoir #2, potentially suitable habitat containing dense vegetation does not exist along the reservoir.
Birds				
tricolored blackbird *Agelaius tricolor*	Federal: None State: SC Other: SSC	Inhabits annual grasslands, wet and dry vernal pools, seasonal wetlands. Frequently found in and around agricultural areas.	Present	**Moderate:** Although habitat in the BSA is marginal, potentially suitable conditions exist within and areas immediately adjacent to the BSA for this species. Historical observations have been made “in the vicinity of Fairmont Reservoir” between 2008-2012. There are also multiple records between 2008-2011 made within 3 miles southeast of the BSA.

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	Federal: None State: None Other: WL	Breeds and feeds on steep, dry, herbage-covered hillsides with scattered shrubs and rock outcrops.	Absent	**Not Expected**: Habitat potentially suitable for this species is generally absent from the BSA and the nearest known historical occurrence is from 13 miles southeast of the BSA.
golden eagle *Aquila chrysaetos*	Federal: BGEPA State: None Other: FP,WL	Uses rolling foothills and mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, and cliffs and rock outcrops.	Present	**Low:** Although suitable nesting habitat for this species is absent from the BSA, it does provide potentially suitable foraging habitat. The nearest known occurrence is from approximately 10 miles northeast of the BSA, from 2010. May occur as foraging transient in BSA.
Bell's sage sparrow *Artemisiospiza belli belli*	Federal: None State: None Other: WL	Breeds in fairly dense chaparral and desert scrub habitats and forages on ground beneath and between shrubs. Winter habitat is similar in structure to breeding habitat, but may be more open.	Absent	**Not Expected**: Habitat potentially suitable for this species is generally absent from the BSA and the nearest known historical occurrence is from 15 plus miles south of the BSA.

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
burrowing owl *Athene cunicularia*	Federal: None State: None Other: SSC	A yearlong resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. Formerly common in appropriate habitats throughout the state, excluding the humid northwest coastal forests and high mountains. Frequents open grasslands and shrublands with perches and burrows.	Present	**Low:** Habitat potentially suitable for this species occurs in the BSA and there are multiple records from between 2007-2011 within 5 miles north and east of the BSA. However, no sign or burrows potentially suitable for this species were detected during field surveys of the BSA.
ferruginous hawk *Buteo regalis*	Federal: None State: None Other: WL	Fairly common winter resident of grasslands and agricultural areas in southwestern California. Casual in northeast in summer. Frequents open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys, and fringes of pinyon-juniper habitats. Requires large, open tracts of grasslands, sparse shrub, or desert habitats with elevated structures for nesting.	Present	**Moderate:** Although suitable nesting habitat for this species is marginal in the BSA, it provides potentially suitable foraging habitat. Additionally, there are multiple records from 2011 of this species within 6 miles east of the BSA.

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
Swainson's hawk *Buteo swainsoni*	Federal: None State: ST	Typical habitat is open desert, grassland, or cropland containing scattered, large trees or small groves. Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures.	Present	**Moderate:** Although suitable nesting habitat for this species is marginal in the BSA, it may occur as a foraging transient. A record from 2011 of this species occurs 5 miles east of the BSA.
mountain plover *Charadrius montanus*	Federal: None State: None Other: SSC	Frequents open plains with low, herbaceous or scattered shrub vegetation. Found in foothill valleys west of San Joaquin Valley, Imperial Valley, plowed fields of Los Angeles and western San Bernardino counties, and along the central Colorado River valley. Generally nest in scrapes on ground in open, featureless grasslands.	Present	**Moderate:** Habitat potentially suitable for nesting and foraging is present in the BSA. A record from 2004 of this species occurs in the vicinity of the Antelope Valley California Poppy Preserve approximately 1.5 miles northeast of the BSA. An additional record from 2011 occurs 5 miles east of the BSA.
California horned lark *Eremophila alpestris actia*	Federal: None State: None Other: WL	Open areas dominated by sparse low herbaceous vegetation or widely scattered low shrubs. Nests in hollow on ground often next to grass tuft or clod of earth or manure.	Present	**Present:** This species was detected in the BSA during the May 18, 2017 field survey.

Common Name *Scientific Name*[2]	Status[3]	General Habitat Description[4]	Potentially Suitable Habitat Present/ Absent in BSA	Potential for Occurrence in the BSA[5,6]
merlin *Falco columbarius*	Federal: None State: None Other: WL	Frequents open habitats at low elevation near water and tree stands. Favors coastlines, lakeshores, wetlands.	Present	**Moderate:** Although suitable nesting habitat for this species is marginal in the BSA, it may occur as a foraging transient. A record from 2011 of this species occurs 6 miles north of the BSA.
California condor *Gymnogyps califonianus*	Federal: FE State: SE Other: FP	Aerial, cliff, grassland/herbaceous, savanna, shrubland/chaparral, conifer woodland, hardwood woodland, mixed woodlands, standing snag/hollow tree. Usual habitat is mountainous country at low and moderate elevations, especially rocky and brushy areas with cliffs available for nest sites, with foraging habitat encompassing grasslands, oak savannas, mountain plateaus, ridges, and canyons. Condors often roost in snags or tall open-branched trees near important foraging grounds.	Present	**Low:** Although suitable nesting habitat for this species is absent in the BSA, it provides potentially suitable foraging habitat. A record from 2011 of this species occurs 5 miles east of the BSA. May occur as transient in BSA.

Common Name ***Scientific Name***[2]	**Status**[3]	**General Habitat Description**[4]	**Potentially Suitable Habitat Present/ Absent in BSA**	**Potential for Occurrence in the BSA**[5,6]
bald eagle *Haliaeetus leucocephalus*	Federal: Delisted, BGEPA State: SE	Requires large, old-growth trees or snags in remote, mixed stands near water.	Absent	**Low**: Habitat potentially suitable for this species is generally absent from the BSA; however, this species was recorded in 2009 approximately 3 miles southeast along Lake Elizabeth. May occur as transient in BSA.
loggerhead shrike *Lanius ludovicianus*	Federal: None State: None Other: SSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low or sparse herbaceous cover.	Present	**Present:** This species was detected in the BSA during the January 17, 2017 field survey.
Le Conte's thrasher *Toxostoma lecontei*	Federal: None State: None Other: SSC	Frequents desert washes and flats with scattered shrubs and large areas of open, sandy, or alkaline terrain in desert wash, desert scrub, alkali desert scrub, and desert succulent shrub habitats.	Present	**Low:** Although suitable nesting habitat for this species is absent in the BSA, it provides potentially suitable foraging habitat. A record from 1968 of this species occurs 10 miles north-northeast of the BSA. May occur as transient in BSA.
least Bell's vireo *Vireo bellii pusillus*	Federal: FE State: SE	Inhabits low, dense riparian growth along water or along dry parts of intermittent streams. Typically associated with willow, cottonwood, baccharis, wild blackberry, or mesquite in desert localities.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.
Mammals				
pallid bat *Antrozous pallidus*	Federal: None State: None Other: SCC, WBWG-H	Prefers rocky outcrops, cliffs, and crevices with access to open habitats for foraging.	Absent	**Not Expected**: Habitat potentially suitable for this species is absent from the BSA.

Common Name ***Scientific Name***[2]	**Status**[3]	**General Habitat Description**[4]	**Potentially Suitable Habitat Present/ Absent in BSA**	**Potential for Occurrence in the BSA**[5,6]
Townsend's big-eared bat *Corynorhinus townsendii*	Federal: None State: None Other: SCC, WBWG-H	Prefers mesic habitats. Gleans from brush or trees or feeds along habitat edges.	Absent	**Not Expected**: Habitat potentially suitable for this species is generally absent from the BSA. The only regional record of this species occurs approximately 4.5 miles west of the BSA and is from 1941.
hoary bat *Lasiurus cinereus*	Federal: None State: None Other: WBWG-M	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding.	Present	**Low:** Habitat potentially suitable for this species is present in the BSA; however, the only regional record of this species occurs approximately 2.5 miles south of the BSA near Lake Hughes and is from 1938.
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	Federal: None State: None Other: SSC	Occurs in open areas or semi-open country, typically in grasslands, agricultural fields or sparse coastal scrub. Can be found in "thin stands" of coastal sage scrub and on the margins of citrus groves in the lower foothills of the San Gabriel Mountains; however, it is generally not found in chaparral or woodland habitats.	Absent	**Not Expected**: Habitat potentially suitable for this species is generally absent from the BSA. The only regional record of this species occurs approximately 18 miles south-southwest of the BSA and is from 2005.

Common Name *Scientific Name*[2]	**Status[3]**	**General Habitat Description[4]**	**Potentially Suitable Habitat Present/ Absent in BSA**	**Potential for Occurrence in the BSA[5,6]**
lodgepole chipmunk *Neotamias speciosus speciosus*	Federal: None State: None Other: CNDDB	In isolated populations in southern California mountains, occurs in open-canopy forests of mixed conifer, Jeffrey pine, lodgepole and limber pine, and occasionally in chaparral. Elevational range in the southern California mountains is 1950-3300 meters (6,400-10,900 feet). Uses trees for refuge, observation posts, and nests. Also uses cavities in logs, snags and stumps, and underground burrows.	Absent	**Not Expected:** Habitat potentially suitable for this species is absent from the BSA.
southern grasshopper mouse *Onychomys torridus ramona*	Federal: None State: None Other: SSC	Common in arid desert habitats of the Mojave Desert and southern Central Valley of California. Alkali desert scrub and desert scrub habitats are preferred, with somewhat lower densities expected in other desert habitats, including succulent shrub, wash, and riparian areas. Also occurs in coastal scrub, mixed chaparral, sagebrush, low sage, and bitterbrush habitats. Uncommon in valley foothill and montane riparian, and in a variety of other habitats.	Present	**Not Expected:** Habitat potentially suitable for this species is marginal in the BSA. The only regional record of this species occurs approximately 14.5 miles south-southeast of the BSA and is from 1930.

Common Name ***Scientific Name***[2]	**Status**[3]	**General Habitat Description**[4]	**Potentially Suitable Habitat Present/ Absent in BSA**	**Potential for Occurrence in the BSA**[5,6]
Tehachapi pocket mouse *Perognathus alticolus inexpectatus*	Federal: None State: None Other: SSC	Habitat at Mount Pinos (the type locality) was grassy flats among scattered yellow pine. At lower elevations, it has been reported in chaparral and sage scrub, and rangelands dominated by non-native annual grasses. In the western Tehachapi Mountains, it has been reported from Joshua tree and pinyon-juniper woodland.	Present	**Not Expected:** Habitat potentially suitable for this species is marginal in the BSA. The only regional record of this species occurs approximately 2 miles south-southeast of the BSA in the vicinity of Lakes Hughes and Elizabeth and is from 1938.
American badger *Taxidea taxus*	Federal: None State: None Other: SSC	Uncommon, permanent resident found throughout most of the state, except in the northern North Coast area. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Dig burrows in friable soil for cover.	Present	**Low**: Although habitat potentially suitable for this species occurs in the BSA and an occurrence in 1988 occurs approximately 1.5 miles southwest of the BSA near Lake Elizabeth, no burrows potentially suitable for this species were detected during the field surveys.

[1] Special-Status species known from the CNDDB to occur on the Lake Hughes, Burnt Peak, Del Sur, Fairmont Butte, Green Valley, Little Buttes, Neenach School, Sleepy Valley, and Warm Springs Mountain quadrangles.

[2] Nomenclature for special-status wildlife conforms to CNDDB.

[3] Sensitivity Status Codes

<u>Federal</u>
FT - Federally Threatened under Federal Endangered Species Act (FESA)
FE - Federally Endangered under FESA
BGEPA – Bald and Golden Eagle Protection Act

<u>State</u>
ST - State Threatened under California Endangered Species Act (CESA)
SE - State Endangered under CESA
SC – State Candidate for listing under CESA

<u>Other</u>
SSC – Designated as a Species of Special Concern by CDFW
WL – Designated as a Watch List species by CDFW

CNDDB - Tracked by CDFW in the California Natural Diversity Data Base or considered locally sensitive

WBWG-H - Designated by the Western Bat Working Group (WBWG 2015) as High Priority - species that are imperiled or are at high risk of imperilment

WBWG-M - Designated by the WBWG (2015) as Medium Priority – a level of concern that should warrant closer evaluation, more research, and conservation actions of both species and possible threats.

[4] General Habitat Descriptions from CNDDB (CDFW 2017a).

[5] Historical records from CDFW 2017a.

[6] Potential for each species to occur within the BSA is based on the following guidelines:

- Present: Species was observed in or immediately adjacent to the BSA during the field survey, or survey conducted within the past five years.
- High: Habitat (including soils and elevation factors) and known historical range for the species occurs in the BSA and a known occurrence has been recorded from within five miles within the past 30 years.
- Moderate: Habitat for the species occurs in the BSA and a known occurrence exists from between five and ten miles of the BSA, within the past 30 years.
- Low: Limited habitat for the species occurs in the BSA and a known occurrence is from greater than 10 miles from the BSA or over 30 years old, or habitat to support the species is of marginal quantity or quality. A low potential to occur is also assigned when focused surveys for a species have been conducted numerous times within the past 10 years without positive results.
- Not Expected: Beyond those factors listed for Low Potential, the species is easily identifiable throughout the year and was not observed, or specific habitat requirements are not found within or adjacent to the BSA.

Historical occurrence information from CDFW (2016a) unless otherwise noted.

CULTURAL RESOURCES IMPACT STUDY
FOR THE
FAIRMONT SEDIMENTATION PLANT PROJECT
LOS ANGELES COUNTY, CALIFORNIA

Prepared for:

Los Angeles Department of Water and Power
Environmental Services
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April 2018

USGS Quadrangle: Lake Hughes 7.5' USGS topographic map   Acreage: 38.6 acres
Keywords: Fairmont Reservoir, Elizabeth Tunnel, Los Angeles Aqueduct, P-19-002105H

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LIST OF ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AMSL	above mean sea level
APE	area of potential effects
B.P.	years before present
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
CWSRF	Clean Water State Revolving Fund
DPR	Department of Parks and Recreation
EPA	U.S. Environmental Protection Agency
GPS	global positioning system
IS	Initial Study
LAA1	First Los Angeles Aqueduct
LAA2	Second Los Angeles Aqueduct
LADWP	Los Angeles Department of Water and Power
LAWC	Los Angeles Water Company
MCA	Medieval Climatic Anomaly
MND	Mitigated Negative Declaration
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PRC	Public Resources Code
SCCIC	South Central Coastal Information Center
SLF	Sacred Lands File
WPLT	Western Pluvial Lakes Tradition

EXECUTIVE SUMMARY

AECOM was retained by the Los Angeles Department of Water and Power (LADWP) to conduct a Phase I cultural resources assessment in support of an Initial Study/Mitigated Negative Declaration for the Fairmont Sedimentation Plant Project (project). LADWP is the lead agency for this project. The proposed project is an action under the California Environmental Quality Act (CEQA) with the purpose of identifying potential impacts to cultural resources, in compliance with CEQA, Public Resources Code (PRC) Section 21000 et seq. and the State CEQA Guidelines, California Code of Regulations Section 15000 et seq. In addition, LADWP seeks assistance for the project from the Clean Water State Revolving Fund (CWSRF) Program of the California State Water Resources Control Board. The CWSRF is awarded capitalization grants by the U.S. Environmental Protection Agency (EPA). Projects carried out with EPA federal assistance are subject to EPA State Revolving Fund Program Implementation Regulations (40 Code of Federal Regulations [CFR] Part 35) and Section 106 of the National Historic Preservation Act (36 CFR Part 800). The CWSRF Program is governed by a *Programmatic Agreement on Historic Preservation for the State Revolving Fund* (Advisory Council on Historic Preservation 1990). This study was designed to conform to appropriate regulations and guidelines.

An area of potential effects (APE) was delineated for the project, which includes the three-dimensional area that will be impacted by the project. The project components fall within an area that is roughly bounded by Fairmont Reservoir #2 and a private access road to the west; 170th Street West to the east; a line approximately 1,000 feet north of and parallel to Los Angeles City Road to the south; and West Avenue H to the north. The project is located on the Lake Hughes U.S. Geological Survey 7.5-minute quadrangle (U.S. Department of Interior Geological Survey 1995).

To comply with listed regulations and guidelines, AECOM conducted a Phase I cultural resources assessment consisting of archival research and a field survey to identify and, if necessary, mitigate impacts to cultural resources within the APE. Marc A. Beherec, Ph.D., RPA, conducted a records search at the South Central Coastal Information Center (SCCIC), housed at California State University, Fullerton, on April 27, 2017. The Study Area encompassed a 0.5-mile radius around the APE and was researched to ascertain cultural resource investigations and previously recorded cultural resources within the project vicinity. The records search revealed that seven cultural resources investigations were previously conducted within 0.5 mile of the APE. Approximately 5% of the records search area, including 10% of the APE, has been previously surveyed. Eight previously recorded cultural resources were identified within the Study Area. Only one of these, P-19-002105H, the Los Angeles Aqueduct, enters the APE.

A letter was sent to the Native American Heritage Commission (NAHC) to request a Sacred Lands File (SLF) check of the APE. The SLF was consulted with negative results. A list of relevant Native American groups or individuals that might potentially have additional information or concerns relevant to the APE was provided to LADWP, and all Native American contact and consultation is being conducted by LADWP.

As part of the cultural resources field investigation, a pedestrian survey was conducted on May 18, 2017, to revisit P-19-002105H and identify the presence of any cultural resources in the proposed project footprint. The field intensive pedestrian study identified no new cultural resources within this footprint. Features associated with P-19-002105H were documented within the APE.

The First Los Angeles Aqueduct (LAA1), P-19-002105H, has been determined eligible for inclusion in the California Register of Historical Resources (CRHR) under Criteria 1, 2, and 3. The aqueduct might also be considered eligible for inclusion in the National Register of Historic Places (NRHP) under parallel Criteria A, B, and C. However, the segment of the aqueduct within the APE lacks the integrity to be included in either the CRHR or the NRHP. The aqueduct has been heavily impacted by past repairs and maintenance. The segment identified was modified in 2010 to such a degree that most of the visible components within the APE are not historic in age. It no longer conveys the significance of the period of the aqueduct's initial construction, which is its period of significance. No further work is recommended for this resource.

The Second Los Angeles Aqueduct (LAA2) is also located within the APE. LAA2 has not been formally recorded independently of LAA1, although some California Historical Resources Information System (CHRIS) documentation treats LAA1 and LAA2 as a single resource. The aqueduct was put into service in 1970, which means that it is more than 45 years old and therefore should be considered under CEQA. However, LAA2 is subsurface in the APE, and no portion of LAA2 is visible. LAA2 is younger and of lesser significance than LAA1, and significantly postdates the period of significance of LAA1. LAA2 will not be impacted by the project. No further work is recommended for this resource.

The results of this analysis suggest there is a low potential that unidentified archaeological or tribal cultural resources will be encountered during ground-disturbing activities for the proposed project. If archaeological resources are encountered during ground-disturbing activities, LADWP will contact a qualified archaeologist to evaluate and determine appropriate treatment for the resource in accordance with PRC Section 21083.2(i). If any archaeological resources are encountered during ground-disturbing activities, work will be temporarily halted in the vicinity of the find and the archaeologist will be called to the project site to examine and evaluate the resource in accordance with the provisions of CEQA.

LADWP continues to consult with tribal representative, and because tribal cultural resources may be buried with no surface indications of their existence, particularly in areas of alluvial deposits, Native American tribal representatives, through the consultation process, have requested that a Native American archaeological monitor be invited to be present during ground-disturbing activities at the project site. Should any tribal cultural resources be identified during construction activities at the project site, the Native American monitor would be consulted regarding appropriate treatment and disposition of the resources. In consultation with Native American parties, LADWP will determine whether the discovery constitutes a tribal cultural resource pursuant to criteria set forth in subdivision (c) of California PRC Section 5024.1. In the extremely unlikely event that human remains are discovered, work in the immediate vicinity of the discovery will be suspended and the Los Angeles County Coroner contacted. If the remains are deemed Native American in origin, the Coroner will contact the NAHC and identify a Most Likely Descendant pursuant to PRC Section 5097.98 and California Code of Regulations Section

15064.5. Work may be resumed at the landowner's discretion but will only commence after consultation and treatment have been concluded. Work may continue on other parts of the project while consultation and treatment are conducted.

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CHAPTER 1
INTRODUCTION

INTRODUCTION

The Los Angeles Department of Water and Power (LADWP) commissioned AECOM to prepare an Initial Study/Mitigated Negative Declaration (IS/MND) in connection with the Fairmont Sedimentation Plant Project (project). This Phase I cultural resources assessment is completed in support of that IS/MND. LADWP, as the lead agency, proposes to build and operate a sedimentation plant in Los Angeles County.

PROJECT DESCRIPTION AND SETTING

LADWP proposes to address water quality concerns through the construction of a new water treatment plant using sedimentation basins with plate settlers engineered to handle the maximum design capacity of the Los Angeles Aqueduct, which is 720 cubic feet per second. This new plant will treat water coming from the Los Angeles Aqueduct, including transfers of water from the State Water Project – East Branch. Buildings and structures that will be constructed include pipelines, 20-foot-deep concrete basins, and a three-story building.

The project is located in the western Antelope Valley of the Mojave Desert. The project lies within Los Angeles County, approximately 6 miles west of Lancaster and 10 miles southeast of Neenach. The area of potential effects (APE) is roughly bounded by Fairmont Reservoir #2 and a private access road to the west; 170th Street West to the east; a line approximately 1,000 feet north of and parallel to Los Angeles City Road to the south; and West Avenue H to the north. The APE is mostly flat with approximate ranges of elevation between 3,020 to 3,045 feet above mean sea level (AMSL).

PROJECT PERSONNEL

AECOM personnel involved in the cultural resources assessment are as follows:

Marc Beherec, Ph.D., R.P.A., served as principal investigator, conducted archival research, and served as primary report author; Christy Dolan, M.A., R.P.A., contributed senior review and quality assurance; Marc Hintzman, M.S., RPA, and Linda Kry, B.A., contributed to the prehistoric and climatological background sections; Alec Stevenson, B.A., conducted field survey, prepared survey methods and results, provided figure graphics, and maintained Geographic Information Systems data; and Allison Hill, B.A., conducted field survey and prepared survey methods and results. Resumes of key personnel are included in Appendix A.

REPORT ORGANIZATION

This report is organized following the Archaeological Resource Management Reports (ARMR): Recommended Contents and Format Guidelines, (Office of Historic Preservation 1990). This provides a standardized format and suggested report content, scaled to the size of the project. Chapters of this evaluation are as follows: Chapter 1 is the introduction and describes the general project settings; Chapter 2 is the project description, including project location, proposed undertaking, and known construction details; Chapter 3 is the environmental and cultural setting; Chapter 4 discusses archival research; Chapter 5 details the survey methods and results of the effort; and Chapter 6 addresses evaluations and management recommendations for future and ongoing activities.

This report is written following the California Environmental Quality Act (CEQA) Guidelines, Public Resources Code (PRC) Section 21000 et seq. and California Code of Regulations Section 15000 et seq. to satisfy Phase I requirements of a cultural resources assessment. This evaluation includes archival research, Native American contacts, a field survey, and evaluation of cultural resources 45 years or older for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR). The potential of identifying cultural resources and mitigation measures for the course of the project and future work are provided.

CHAPTER 2
PROJECT DESCRIPTION

PROJECT LOCATION AND SETTING

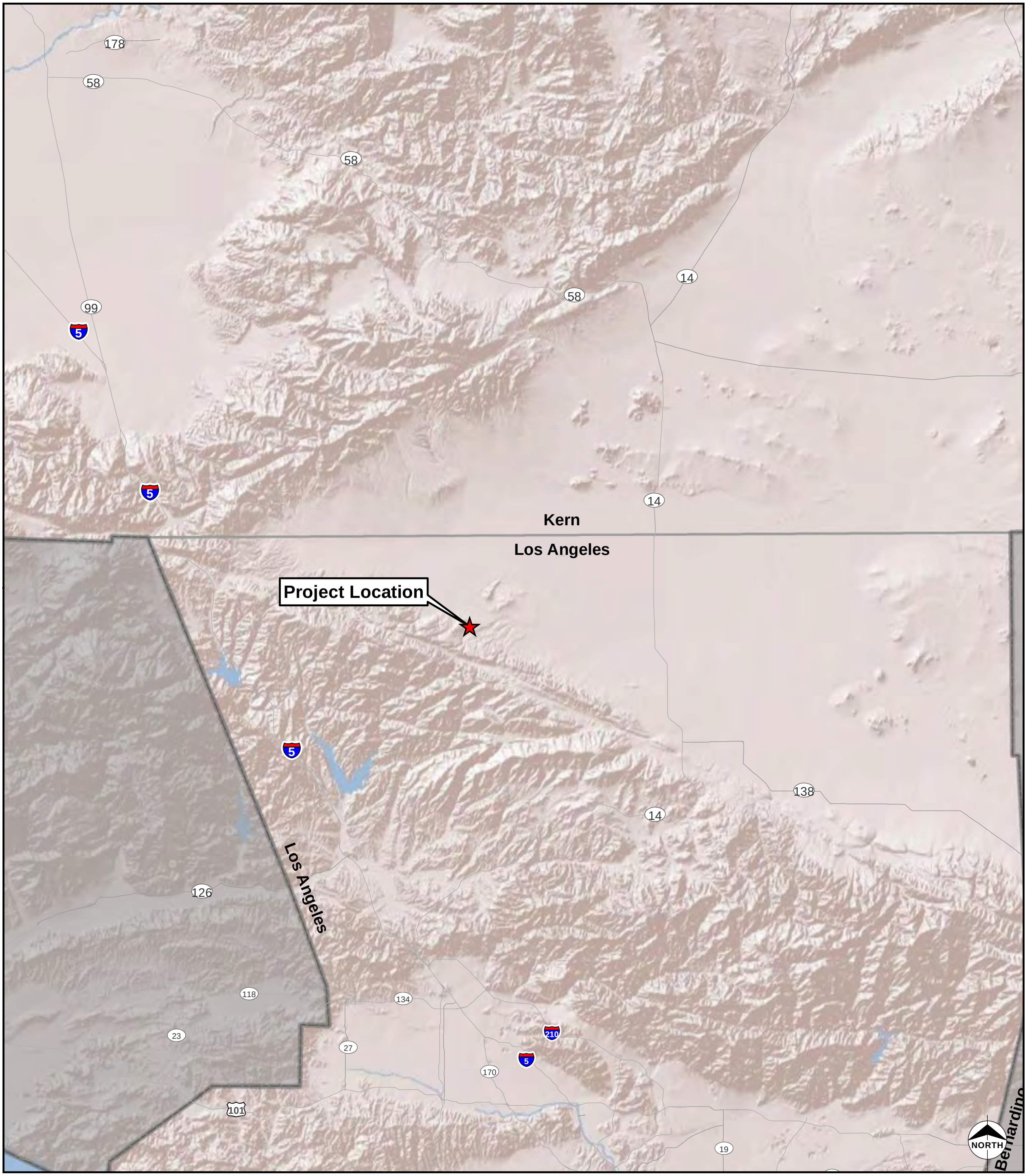
The project is located in Section 11 of Township 7 North, Range 15 West on the Lake Hughes, California, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1). The APE is located within the western Antelope Valley of the Mojave Desert. The project is located in the far south of the valley, at the edge of the Sierra Pelona Mountains (Figure 2). The project is fully contained within LADWP-owned lands. To the south is the Los Padres National Forest. To the north and east is the arid high desert, an area characterized by sparse agricultural settlements, the closest of which is the unincorporated community of Fairmont, approximately 1.5 miles northwest. The closest city is Lancaster, approximately 6 miles to the east; however, the developed portions of the City are located approximately 10 miles from the project site. The unincorporated community of Neenach lies approximately 10 miles to the northwest.

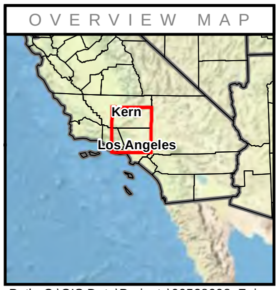
PROJECT DESCRIPTION

LADWP proposes to address water quality concerns through the construction of a new water treatment plant using sedimentation basins with plate settlers engineered to handle the maximum design capacity of the Los Angeles Aqueduct, which is 720 cubic feet per second. This new plant will treat water coming from the Los Angeles Aqueduct, including transfers of water from the State Water Project – East Branch. Several buildings and structures will be constructed to support this plant. These include a chemical tank farm, a three-story building that will serve as a dewatering sludge handling facility, and eight 20-foot-deep concrete basins measuring 100 feet by 100 feet each and one concrete basin measuring 200 feet by 250 feet. A new parking area, truck staging area, pipelines, and a concrete inlet structure to Fairmont Reservoir #2 will be also be constructed.

PROJECT AREA OF POTENTIAL EFFECTS

Typically, the APE for archaeological resources is defined by the proposed project’s three-dimensional ground disturbance area(s) (Office of Historic Preservation 1990). The horizontal limits of the project APE are roughly bounded by Fairmont Reservoir #2 and a private access road to the west; 170th Street West to the east; the facility’s planned southern boundary approximately 1,000 feet north of Los Angeles City Road to the south; and West Avenue H to the north (Figure 3). The vertical APE varies according to the project component, as shown in Table 1, and the exact depth of excavation will be finalized during design. However, the table shows the maximum possible depth for each component of the facility. The deepest floor of the APE is defined by the base of excavations for the new 20-foot-deep basins (Figure 4). This conservatively encompasses all possible locations for ground disturbance caused by the proposed project.





Legend

Highway

County Boundary

Scale1:660,000

1 inch = 10 miles

Fairmont Reservoir

Vicinity Map

Date: 11/15/2017

Project: 60528908.2

AECOM

Figure 1

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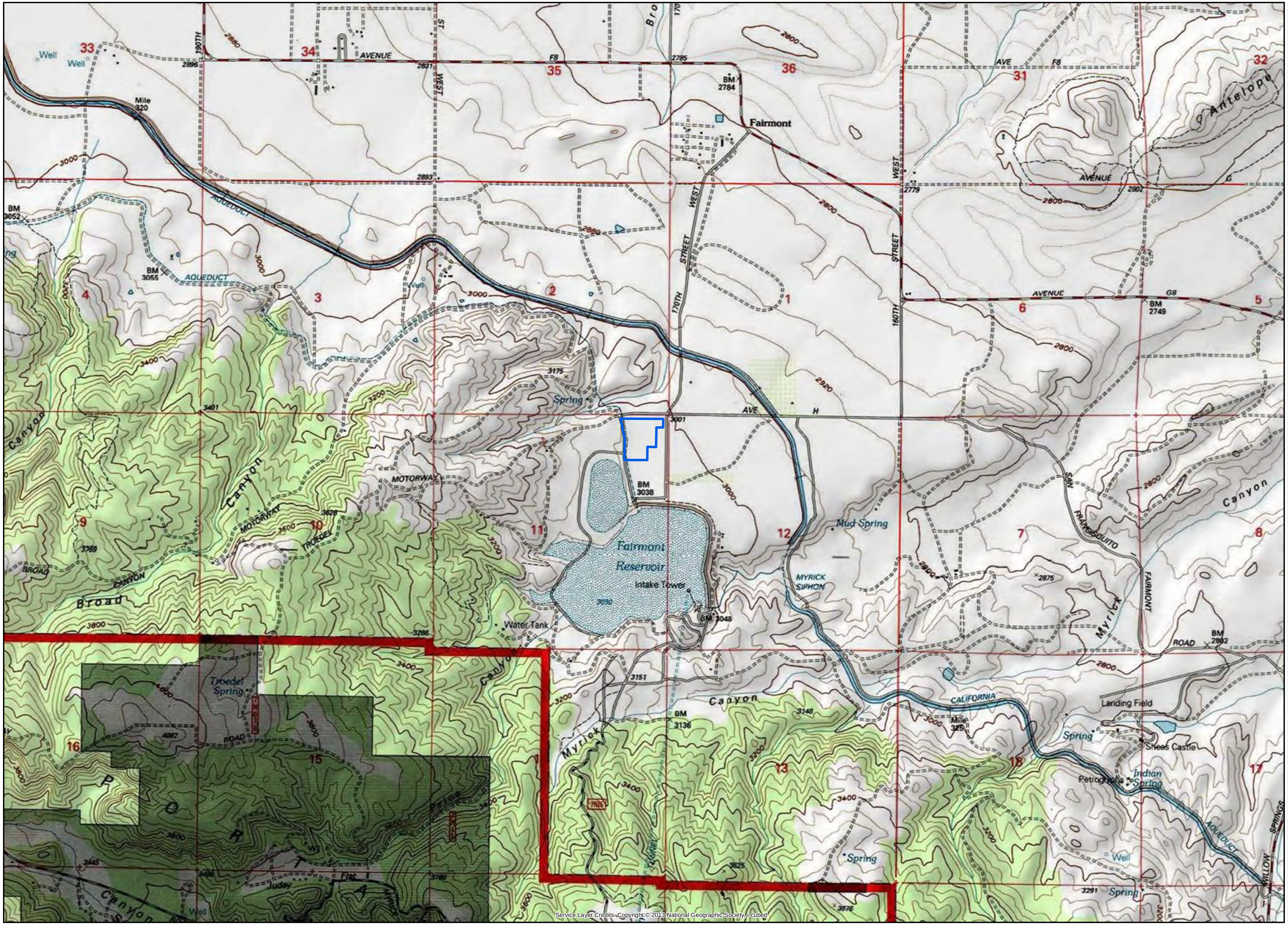

OVERVIEW MAP

Legend

Project Area

0 0.5

Miles

Scale 1:24,000

1 inch = 2,000 feet

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Fairmont Reservoir

Project Location

Date: 11/15/2017 Project: 60528908.2

AECOM

Figure 2

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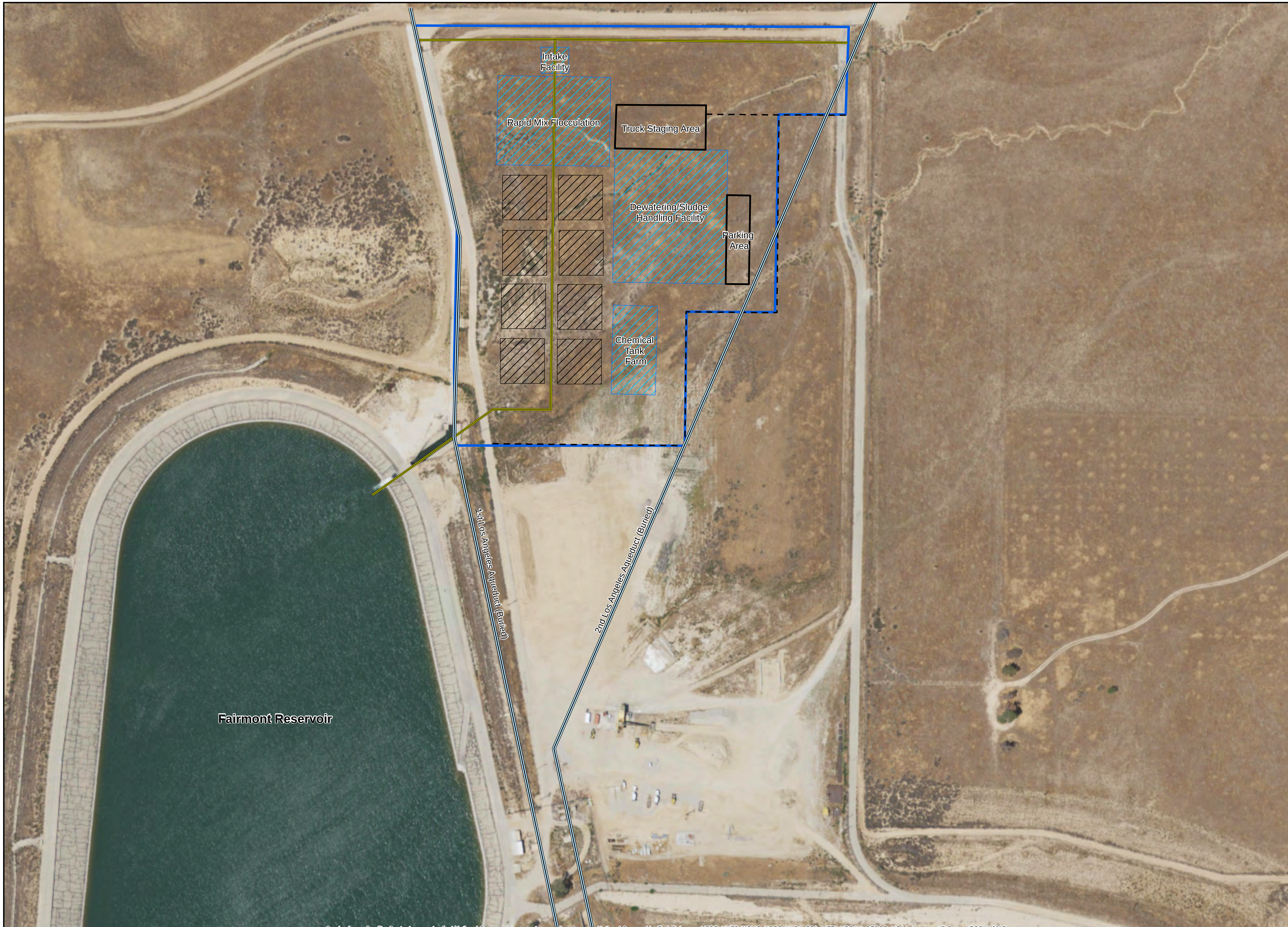
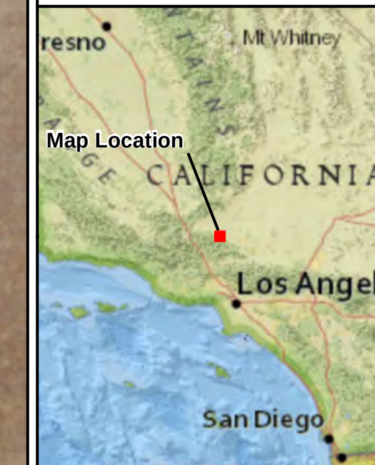


OVERVIEW MAP



Legend

- Los Angeles Aqueduct
- Project Area

Proposed Features

- Access Road
- Channel
- Facility
- Parking / Staging
- Plate Settler Sedimentation Basin

NORTH

0 300

Feet

Scale 1:2,400

1 inch = 200 feet

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Fairmont Reservoir

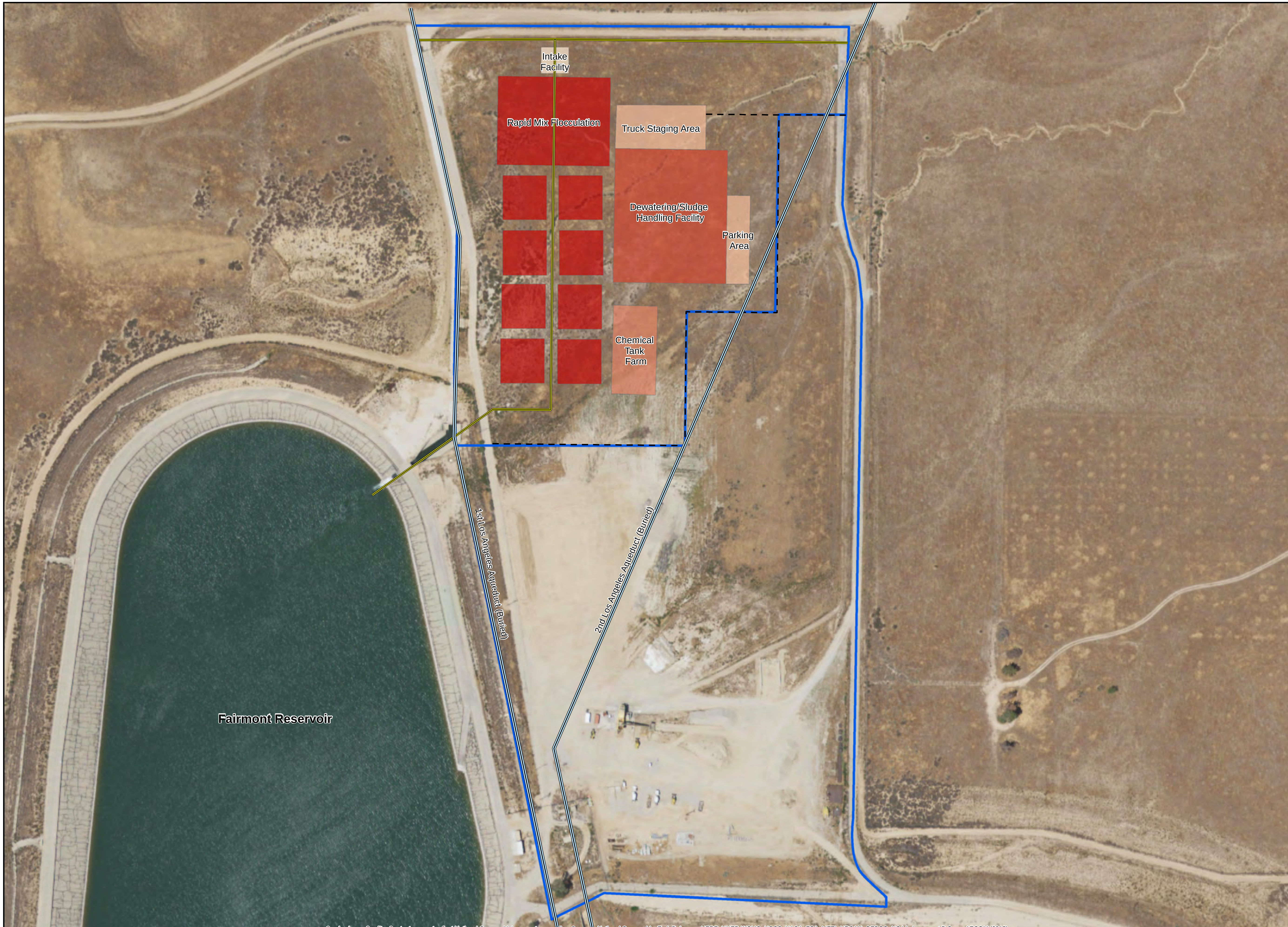
Project Facilities

Date: 11/15/2017 Project: 60528908.2

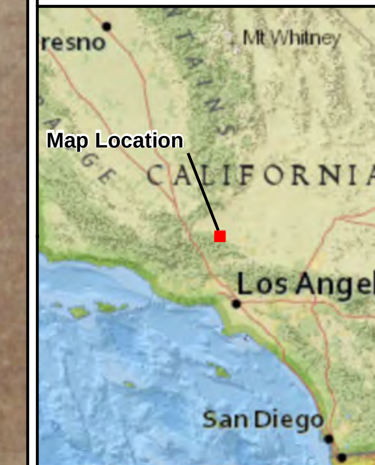
AECOM

Figure 3

Path: C:\GIS Data\Projects\60528908_Fairmont Project\GIS\MXD\Report Maps\Figure-3_Fairmont_20171115.mxd | Coordinate System: NAD 1983 UTM Zone 11N | User: stevensona1



OVERVIEW MAP



Legend

- Los Angeles Aqueduct
- Area of Potential Effect

Proposed Features

- Access Road
- Channel

Project Features (Depth)

- 0 ft
- 0.5 ft
- 3 ft
- 10 ft
- 20 ft

NORTH

0 300
Feet

Scale 1:2,400
1 inch = 200 feet

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Fairmont Reservoir

Project Facilities

Date: 12/4/2017 Project: 60528908.2

AECOM

Figure 4

Path: C:\GIS Data\Projects\60528908_Fairmont Project\GIS\MXD\Report Maps\Figure-4_Fairmont_20171204.mxd | Coordinate System: NAD 1983 UTM Zone 11N | User: stevensona1

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Table 1: Project Excavations

Project Component	Location	Square Feet	Cubic Feet	Length (Feet)	Width (Feet)	Depth of excavation (Feet)*
Chemical tank farm	Center of project area of potential effects (APE)	20,000	60,000	200	100	3
Dewatering sludge handling facility (three-story building)	North-central project APE	75,000	750,000	300	250	10
Parking area	North of dewatering facility	20,000	10,000	200	100	0.5
Truck staging area	East of dewatering facility	20,000	10,000	200	100	0.5
Eight concrete basins	West side of APE	10,000 (each)	200,000 (each)	100	100	20
Concrete basin	Northwest corner of APE	50,000	1,000,000	250	200	20

* Please note the exact depth of excavation will be finalized during project design. However, the table shows the maximum possible depth for each component of the facility.

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CHAPTER 3
PROJECT SETTING

INTRODUCTION

The project is located in the western Antelope Valley of the Mojave Desert. The project lies within Los Angeles County, approximately 6 miles west of Lancaster (the developed portions of the City are located approximately 10 miles from the project site) and 10 miles southeast of Neenach. The APE is roughly bounded by Fairmont Reservoir #2 and a private access road to the west; 170th Street West to the east; a line approximately 1,000 feet north of and parallel to Los Angeles City Road to the south; and West Avenue H to the north. The APE is mostly flat with approximate ranges of elevation between 3,020 to 3,045 feet AMSL.

GEOLOGY AND PHYSIOGRAPHY

The Mojave Desert in the Mojave physiographic province is mostly Quaternary sediments and mixed tertiary quaternary, Mesozoic granite, and older sedimentary deposits. The project in the western Mojave Desert is devoid of most of this geologic variation with a vast majority of Quaternary sediment (The National Geologic Map Database 2017).

The Sierra Nevada to the north is a massive uplift of granitic batholith (Bateman 1978), while the Transverse ranges, including Mount Pinos to the west, and Sierra Pelona and San Gabriel Mountains to the south, are part of a basement complex, possibly caused by gravitational collapse caused by the convergence of the San Andreas fault bordering the San Gabriel Mountains and the Garlock fault marking the southern edge of the Sierras. The convergence of these faults and associated mountains are complex and specifically formed the dynamic processes of the western Mojave. This is known as the basement complex (Dibblee 1967).

CLIMATE

Climatic History

The geology of the region created the structure of the Mojave Desert as a whole. Erosional processes resulted in sediment accumulation, creek channels, and Pleistocene Lake formations. The variables have been studied in detail to identify paleoclimatic and paleoenvironmental trends during the late Pleistocene and Holocene of east-central California. Regional overviews have been conducted by Wells et al. (2003), Mehringer (1977), Bettinger (1982), Elston (1982), Hall (1983), and Grayson (1993).

Researchers have drawn upon geological and biological research to construct a model of how climate has changed and how those environmental pressures have affected the distribution of biological resources in east-central California. A model presented by Reheis, Bright, Lund, Skipp, and Fleck (2012) was developed for the Mojave region using Lake Manix as a base line. It is important to note that Wells et al. (2003) points out the variability of the Mojave climate and lake formation where climactic conditions demonstrated in 1916, 1938, 1969, and 1978 are as variable as earlier stages in the Late Pleistocene and Early Holocene. It is, therefore, difficult to establish a baseline with certainty (Wells et al. 2003).

Late Pleistocene: ca. 15,000 to 10,000 years before present (B.P.)
At this time, the area was between 10 and 4 degrees cooler (degrees Centigrade) than it is today. Cooler deglaciation of the the Sierra Nevada and the White Mountains began approximately 15,000 B.P. with most areas ice free by 12,000 B.P. Around 13,000 B.P. to 11,000 B.P., the climate became much dryer. During this time, Lake Mojave Basin was seasonal and mostly dry. Lowland juniper woodlands were replaced by desert shrub communities, consisting mainly of sagebrush. After 11,000 B.P., the lake levels were relatively low even during the rainy season, and the climate became much warmer and drier. This led to well-established desert shrub environments more typical of the Holocene in this region.

Early Holocene: ca. 10,000 to 8,000 B.P.
During the Early Holocene, modern plant communities expanded into new areas; this is indicated by the transition from Late Glacial juniper woodlands to Holocene steppe and scrub communities. The pinyon pine zone moved north and upslope as a result of improved climactic conditions. Modern fauna indicative of the Mojave were established during the Early Holocene.

Middle Holocene: ca. 8000 to 3000 B.P.
During the early Middle Holocene, the climate warmed and became drier. In the late Middle Holocene, there was a short wet period marking a new growth of Lake Mojave and its surrounding basins. However, the region was still hot leading to a pinyon-juniper woodland retreat upslope, overlapping with the sub-alpine conifers. Creosote bush began to occupy the northern portions of its current range, and a variety of shrubs began to occupy the lower elevations of the basins.

Late Holocene: 3,000 to Present Day
Cooling temperatures and an increase in moisture were accompanied by a series of volcanic eruptions along the Mono Lake, Mono Craters, and Inyo Crater's axis between 2,000 and 200 years ago. The Neoglacial Period (ca. 3600–1500 B.P.) is identified by an increase in precipitation and generally lower temperatures, resulting in higher lake stands. This is followed by the Medieval Climatic Anomaly (MCA), which occurred between 1200 to 600 B.P. and is typically defined as an arid period with warmer temperatures, resulting in lower stream flow and lower lake stands. The MCA is followed by the Little Ice Age (ca. 600–100 B.P.), a period of cooler temperatures and increased precipitation; resulting in increased stream flow and higher lake stands.

FLORA AND FAUNA

Flora

The high mountain peaks surrounding the Antelope Valley create a barrier against westerly precipitation, resulting in a rain shadow. This lack of rain and associated high temperatures affect the biotic communities. Vegetation in this desert block consists of scattered sagebrush variances. Grass and flowering plants grow annually in the spring for brief periods of time (Dibblee 1967).

Studying biotic communities in the desert southwest, C. Hart Merriam identified a series of what he called “life zones” in the desert southwest. These are still useful in studying the plant and animal life that humans relied upon. These life zones are determined by elevation and dominated by particular plant and animal species. In southern California, these life zones are the Lower Sonoran, Upper Sonoran, Transitional, and Canadian or Boreal Life Zones (Jaeger and Smith 1966).

Located at elevations ranging from approximately 3,020 to 3,045 feet AMSL, the APE is located in the Lower Sonoran Life Zone, near its transition to the Upper Sonoran Life Zone. By elevation, the lowest life zone is the Lower Sonoran Life Zone. This life zone is found at elevations from approximately 100 to 3,500–4,000 feet AMSL, which includes desert and desert grasslands. Creosote and other shrubs and succulents dominate this life zone, which has a total annual precipitation of less than 10 inches. The Upper Sonoran Life Zone is dominated by chaparral communities including scrub oak, live oak, juniper, chamise, manzanita, buckthorn, and pinyon pine (Jaeger and Smith 1966).

In addition, the Mojave consists of vast numbers of intermittent streams that contain riparian vegetation communities. Perrenial or year-round streams are much rarer and contain mostly cottonwood and willow trees. Joshua trees are also common on alluvial slopes at higher altitudes between 3,000 and 4,000 feet. Mountain slopes at higher altitudes consist of mostly scrub oak, chamiso, manzanita, juniper, pinon pine, and yucca. Above 6,000 feet, forests start to take hold with mostly oak, pine, and cedar (Dibblee 1967).

Fauna

Large fauna species are rare in the Mojave Desert. Rodents, reptiles, and birds are more common and are found on the desert floor. Rodent species include various pocket mice (*Perognathus* spp.), whitetail antelope squirrel (*Ammospermophilus leucurus*), and kangaroo rats (*Dipodomys* spp.). Reptile species present include desert tortoise (*Xerobates agassizii*), desert iguana (*Dipsosaurus dorsalis*), common king snake (*Lampropeltis getulus*), and Mojave rattlesnake (*Crotalus scutulatus*). More than 300 species of birds are found in the Mojave Desert. A few species more common to the open desert are prairie falcon (*Falco mexicanus*), burrowing owl (*Athene cunicularia*), roadrunner (*Geococcyx californianus*), and horned lark (*Eremophilia alpestris*). Other species found in the Mojave include blacktail jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), and coyote (*Canis latrans*). The Antelope Valley takes its name from the pronghorn antelope (*Antilocapra americana*), which was once common in the region.

CULTURAL SETTING

Prehistory

Archaeological investigations have indicated that, although the Mojave Desert had limited prehistoric resource and surface water, the region supported a long and occasionally dense human population (Moseley and Smith 1962). Archaeological remains tend to be widely scattered and sparse and are usually located along the margins of pluvial lakes (Warren 1990). Although research in the Mojave has produced a wide array of cultural sequences, for the purpose of this report, a broad terminology is used to provide temporal context to the region. The sequence consists of the Paleoindian period, Pinto period, Gypsum period, and Protohistoric period.

Paleoindian Period (12,000 to 7000 years B.P.)

This period is the earliest documented evidence of human occupation in the Mojave Desert and has been referred to as the Western Pluvial Lakes Tradition (WPLT) (Sutton 1991). The WPLT encompasses a broad geographic region from the western Great Basin to southern California and north to Oregon. Evidence suggests that Paleoindian period population groups were highly mobile, with settlement patterns that reflect a dependency upon lacustrine resources (Sutton 1991; Sutton et al. 2007; Warren 1990). This cultural adaptation to pluvial conditions (e.g., lakes, marshes, and grasslands) flourished for several millennia around 10,500 B.P. but then disappeared during the warmer and more arid conditions of the Middle Holocene (Moratto 1984).

The Lake Mojave complex is one of the most recognized lithic complexes of the WPLT. These assemblages are typically characterized by foliated points and knives, Lake Mojave points, Silver Lake points, and flaked stone crescents. Materials dating to the Paleoindian period in the western Mojave Desert are few and confined to the dry lake beds in Antelope Valley (Sutton 1991).

Pinto Period (7000 to 4000 B.P.)

A period of dramatic environmental change has been posited for the Pinto period. The environment changed from pluvial to arid conditions; rivers and lakes dried up and animal and plant life changed. This period is seen by Warren (1984) as marking the beginnings of cultural adaptations to the desert. People either adapted to this change or relocated to areas with more favorable environmental conditions. This depopulation of the area seems evident in the small size of Pinto period sites, which are often limited to surface deposits. These ephemeral sites suggest temporary or seasonal occupations by small groups of people (Moratto 1984), focusing on a forager-like strategy (Sutton et al. 2007).

The most important distinction of Pinto period assemblages relates to an increase in the abundance of groundstone implements (Sutton et al. 2007). The appearance of significant numbers of milling stones in Pinto assemblages is attributed to the exploitation of hard seeds, which is seen by Warren (1984) as part of the process of subsistence diversification brought on by the increased aridity and decreasing game populations. A few Pinto-style projectile points have been identified in the Tehachapi area and other parts of the western Mojave (Sutton 1988).

Gypsum Period (4000 to 1500 B.P.)

The Gypsum period is marked by an increase in the number of archaeological components, and increased diversity in assemblage and site setting. Occupations in the western Mojave during this period are indicative of large permanent or seasonally occupied villages, with smaller, seasonally based, special purpose sites including rock rings, lithic scatters, and milling stations (Sutton 1980; Warren 1986). The appearance of a large village and special purpose sites in the Antelope Valley has been attributed by Warren (1986) to refined hunting methods and seed processing technologies that raised the regional carrying capacity and facilitated population growth.

Gypsum period assemblage sites are characterized by diagnostic projectile points, leaf-shaped points, rectangular-based knives, flake scrapers, T-shaped drills, large scraper-planes, choppers, and hammerstones. There is an increase in the presence of milling stones, and the mortar and pestle were introduced during this period.

Rose Spring Period (ca. 1500 to 1000 B.P.)

Archaeological evidence for the Rose Spring period indicates a major population increase, changes in artifact assemblages, and well-developed middens (Sutton 1988). The introduction of small projectile points into assemblages in the Mojave Desert and the Great Basin appears to mark the introduction of the bow and arrow and decline of the atlatl and spear weaponry (Sutton 1996).

Subsistence strategies seem to shift toward the exploitation of small to medium-sized game, including lagomorphs and rodents. The milling of plant foods was an important activity with numerous bedrock milling features at Rose Spring, including mortars and slicks (Sutton 1988).

Protohistoric Period (1000 B.P. to the time of European contact)

There is an increase in the ethnic and linguistic complexity within the Mojave Desert during this period. Desert Side-notched points and Brownware ceramics become more widely distributed throughout the Mojave Desert and the Great Basin. This development, combined with linguistic evidence, is associated with the Numic-speaking Paiute and Shoshone expansion throughout most of the area (Bettinger and Baumhoff 1982).

Characteristic artifacts of this period include Desert series projectile points (Desert Side-notched and Cottonwood Triangular), Brownware ceramics, Lower Colorado Buff Ware, unshaped hand stones and milling stones, incised stones, mortars, pestles, and shell beads (Warren and Crabtree 1986).

Ethnohistory

The APE lies within land anthropologists traditionally ascribe to the Serrano (Kroeber 1925). However, the property is located just north of what is believed to be the boundary with the Tataviam. The Antelope Valley floor is usually assigned to the Serrano, while the mountains just south of the project area are viewed as belonging to the Tataviam. It is most likely that both groups were active in the project vicinity. In fact, the notion of distinct cultural boundaries was foreign to these cultures with overlapping groups being customary (Zigmond 1986). Interaction and intertribal relations were peaceful and cooperative, with combined annual hunting expeditions for game drives being commonplace (Voegelin 1938).

Serrano and Tataviam

Serrano literally means “mountaineers” in Spanish. “This is an unfortunate name,” Kroeber notes (Kroeber 1925:611). Both the Tataviam and what are now known as the Serrano proper, in addition to other groups, were often grouped under the term Serrano. Although the term has been imprecisely applied for historical reasons, it has been adopted by both anthropologists and Native Americans themselves. The groups have been studied by anthropologists since the early twentieth century, including by such notable anthropologists as William Duncan Strong (1929), Alfred L. Kroeber (1925), and Ruth Benedict (1924).

The languages and lifeways of the Tataviam and the Serrano proper are similar, suggesting similar origins. The Serrano, and probably the Tataviam, spoke languages within the Takic group of the Uto-Aztecan (formerly known as the Shoshonean) language family. The language family, which also includes the languages of neighboring and nearby groups extending as far west as the Los Angeles Basin, is believed to have been brought to California from the Great Basin region during a mass migration centuries ago. These Uto-Aztecan speaking tribes form what is often referred to as the “Shoshonean Wedge.”

Both groups primarily inhabited desert foothills and canyons. The Tataviam lived primarily in the Lower Sonoran Life Zone (King and Blackburn 1978). Serrano villages lay primarily in the Upper Sonoran Life Zone, but villages were also found in the Lower Sonoran Life Zone near permanent water sources as well as in the Transitional Life Zone (Bean and Smith 1978).

Subsistence for both groups focused on hunting, trapping, and gathering of local plant and animal resources (Bean and Smith 1978; King and Blackburn 1978; Zigmond 1986). Stone tools and perishable fiber nets and baskets were used in food collection. Principal food sources included mesquite beans, acorns, and other seeds, in addition to roasted yucca. These plant foods were supplemented with meat from large and small game, rodents, birds, and insects (Moratto 1984; Kroeber 1925). Acorns were further used to trade for exotic obsidian and salt. Although no agriculture was practiced, there is evidence of the pruning of tobacco plants and the burning of wild seed fields to improve plant yields for the following year (Zigmond 1986). These groups exploited many other plants, and Zigmond (1986) identified over 250 taxa that were used. Acorns and mesquite beans were pounded into meal and other seeds were parched and ground before eating. Food was prepared both over open flames and baked in earth and stone ovens.

The groups lived in small villages near water sources. Villages ranged in size from as small as 10 to 20 to as large as a few hundred, with settlement sizes limited mainly by the reliability of local water. Villages tended to be organized along lineage lines. Families dwelled together in domed structures resembling a half-orange constructed of willow frames covered over by reeds or brush thatching. In addition, villages tended to include ramadas, a large ceremonial house, acorn and mesquite granaries, and sweat houses. The total population of both groups was always small, with the Tataviam having an estimated population at contact of about 1,000, compared to 2,500 to 3,500 Serrano at the time of European contact (Bean and Smith 1978; King and Blackburn 1978). Today, populations of Serrano are found on the federally recognized Morongo, San Manuel, and Soboba Reservations, and Serrano and Tataviam individuals are scattered in the towns and cities of southern California.

HISTORIC SETTING

The APE is located in a remote, dry area of the western Antelope Valley. Although nominally claimed by Spain and then Mexico before being ceded to the United States in the Treaty of Guadalupe-Hidalgo, the land lay outside any Spanish or Mexican land grant, and remained little used into the twentieth century. This changed in the first quarter of the twentieth century with the development of the Los Angeles Aqueduct under William Mulholland.

Water Development in Southern California

Water—too much, or too little—has shaped much of California's history. Rain falls unevenly and seasonally over the length of the state, and all too often California faces prolonged drought or flood cycles. The state has a generally Mediterranean climate, with little rainfall through the summer months. Although the amount of available water varies enormously from northern redwood regions of heavy rainfall to dry southern deserts, California as a whole is considered semiarid. Much of the state relies on winter snow in the mountains to provide spring and summer runoff to water the valleys below.

In the nineteenth century, as the City of Los Angeles grew, the population's water needs outstripped the supply of the irregular Los Angeles River. A number of waterworks projects were underway during the second half of the nineteenth century in an effort to increase water flow and water retention. When these measures proved insufficient, a more permanent solution to Los Angeles' water shortage was sought. By the mid-nineteenth century, city officials established a system of water use, including fees and rules, to govern the *Zanja* (Spanish: ditch), an irrigation system that would carry water from the Los Angeles River for domestic and agricultural use.

In 1868, the Los Angeles Water Company (LAWC), a private company, leased the city's water system (Nilsson 2011). In 1878, Frederick Eaton, the superintendent of the LAWC, hired a 23-year-old William Mulholland as a *Zanjero*, a maintainer of the *Zanja* irrigation system, under the newly formed LAWC (Nilsson 2011; Water and Power Associates 2017). Mulholland's hard work paid off in 1886 when, at the age of 31, he was promoted to superintendent for the LAWC, succeeding Eaton (Nilsson 2011). Mulholland's new role within the LAWC consisted of overseeing various water conveyance features. During the early stages of his career, Mulholland implemented the use of the city's first water meter. However, the city's water supply still could not meet the demands of the city's population growth and it was clear that the Los Angeles River would not be a sufficient means of water supply for the City of Los Angeles (Nilsson 2011).

In 1898, the LAWC's 30-year lease of the city's water system expired. The years that followed the expiration of the lease revolved around the ownership of the city's water supply. That same year, Mulholland's predecessor, Frederick Eaton, became the Mayor of Los Angeles. During his term as Mayor, Eaton created the Los Angeles Water Department and appointed Mulholland as the superintendent and Chief Engineer (Water and Power Associates 2017). In 1901, a bond was passed permitting the City of Los Angeles to purchase the water system and removing the control from the LAWC (Nilsson 2011; Water and Power Associates 2017). During the ensuing years, Eaton and Mulholland considered alternative sources for the city's water supply.

In 1905, Mulholland designed an aqueduct that would bring water from the Owens River to the north end of the San Fernando Valley. The construction of the 233-mile-long Los Angeles Aqueduct began in 1908 and required the labor of 5,000 men for the duration of 5 years. The project was completed in 1913 and, on November 5 of that year, 40,000 people assembled to watch the water pour down the aqueduct into the San Fernando Reservoir (Van Norman Reservoir). The sudden availability of water found a rapid shift of land use to gardens, vineyards, and orchards (Gumprecht 1999). From 1900 to 1920, Los Angeles had grown from a town of 100,000 people to a booming city of nearly 600,000. The construction of the Los Angeles Aqueduct was backed by the people of Los Angeles at a cost of over $24 million and was one of the most significant engineering achievements in Los Angeles history (Los Angeles Times 1935).

Equally important to the burgeoning population was a reliable source of power, which the aqueduct also supplied. The Fairmont Reservoir was constructed as part of Mulholland's original aqueduct system to regulate the flow of water to a series of power conduits downstream of the reservoir, in order to meet changing hourly demands for electrical power production. Below Haiwee Dam, approximately 133.5 miles of concrete-lined covered aqueduct, concrete-lined tunnels, and riveted steel inverted siphons carried the water to Fairmont Reservoir (Los Angeles Board of Public Service 1916: 300). The original Fairmont Reservoir was still under construction when the aqueduct opened. When completed, it had a capacity of 7,620 acre feet, and an earthen dam with concrete core wall measuring 115 feet high and 1,516 feet long (Los Angeles Board of Public Service 1916: 124). Water supply to the reservoir was consistent, but it was released on an as-needed basis that varied throughout the day to support varying daily hydroelectric needs (Los Angeles Board of Public Service 1916: 76). Below the reservoir, the aqueduct entered the Elizabeth Tunnel, through which water was carried beneath the mountains.

Work on the tunnel, which unlike the reservoir was essential to the water system, was conducted first, and the same crew was then responsible for construction of the reservoir. This segment of the aqueduct was known as Division 10 or Elizabeth Division. The northern part of the tunnel was dug by hand through decomposing granite, and teams of men then shored the tunnel, which sometimes had to be retimbered two or three times (Plate 1). Praising his men, Mulholland noted, "The excavation of this portion of the tunnel was most difficult, and called for courage, skill and persistence" (Mulholland 1911: 663). The army of men who fulfilled this work lived in dozens of temporary buildings constructed near the reservoir over the space of the several years of construction (Plate 2).

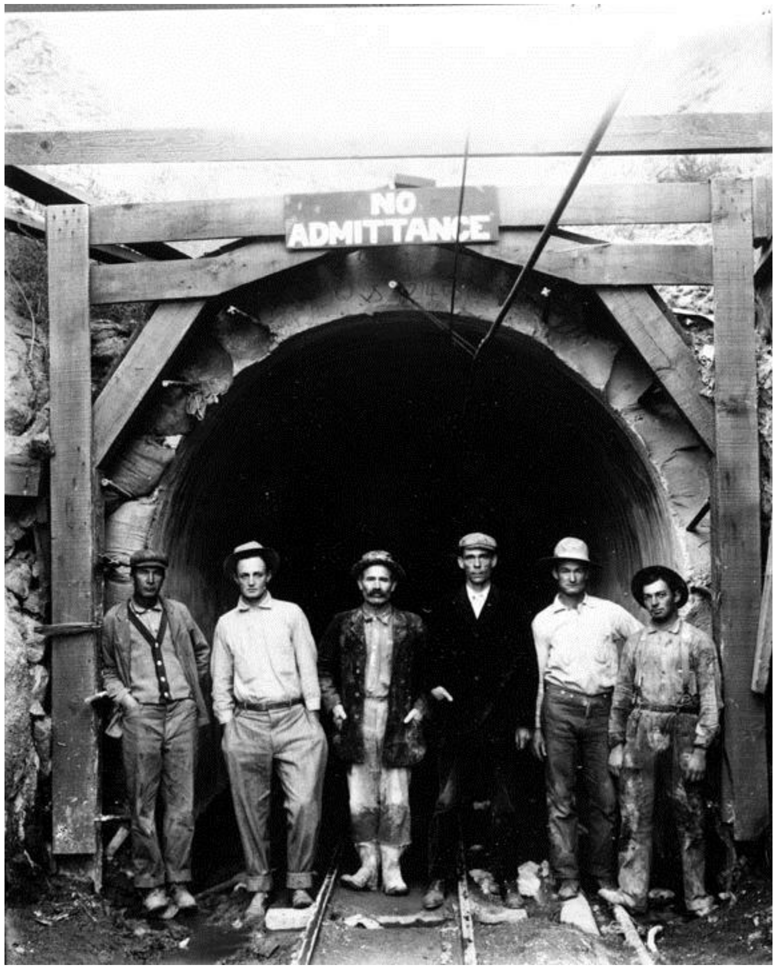


Plate 1: Workers at the North Portal of the Elizabeth Tunnel (Bledsoe n.d.a).

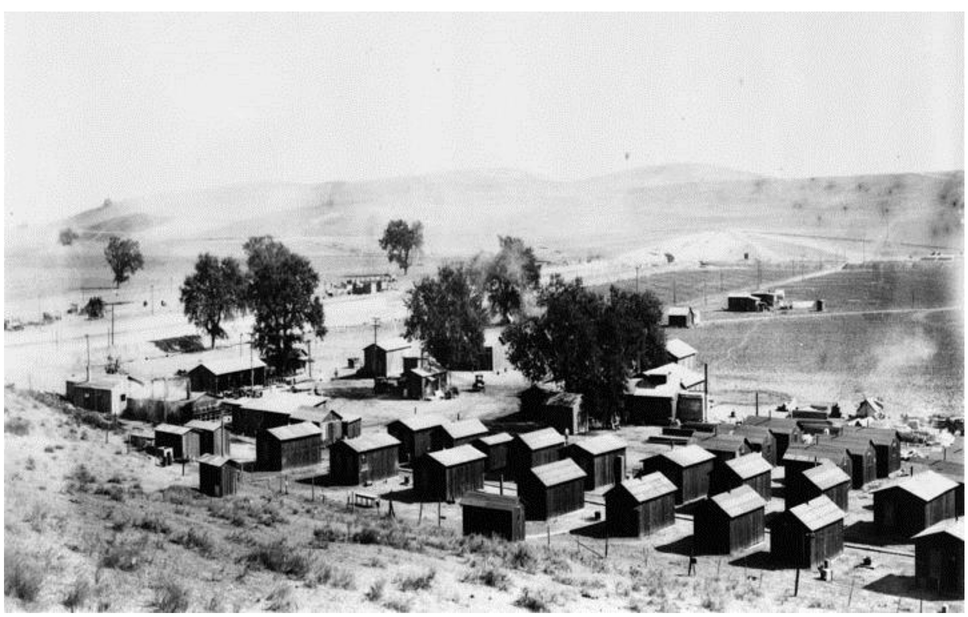


Plate 2: Temporary Housing near Fairmont Reservoir (Bledsoe n.d.b).

In 1971, a 6.6 magnitude earthquake struck in the San Gabriel Mountains. The Sylmar-San Fernando Earthquake killed 64 people and caused more than $550 million in damage (Bartholomew 2016). The epicenter was near Van Norman Dam, and fears that the dam would fail led to the evacuation of 30,000 people. The disaster led the state not only to examine local dams for potentially dangerous earthquake damage, but led to a state-wide reassessment of how dams should be built and tougher dam laws and regulations (Shaw 1977). Fairmont Reservoir was determined as unsafe and decommissioned. A new reservoir, Fairmont Reservoir #2, with a capacity of only 491 acre feet, was opened in 1983. This new reservoir was constructed in such a fashion that, should its dam fail, the water would be stopped by the massive earthen dam of Fairmont Reservoir #1 (MLC & Associates 2013: 10-3).

CHAPTER 4
ARCHIVAL RESEARCH

INTRODUCTION

As part of this cultural resources assessment, an archival research program was conducted. The purpose of this research is to identify known cultural resources in the APE, provide context for the evaluation of cultural resources within this area that are 45 years or older, and to inform interpretations regarding the potential to encounter previously unidentified cultural resources in the course of ground-disturbing work associated with the project.

Archival research included a records search at the South Central Coastal Information Center (SCCIC), a review of local cultural resource registers, and review of local and regional historic maps. Supplemental research in published and unpublished sources was also conducted to provide prehistoric and historic contexts for the APE. Finally, the Native American Heritage Commission (NAHC) was contacted in order to request a Sacred Lands File (SLF) search of the APE.

ARCHIVAL RESEARCH

An archival records search of the project area was conducted by Marc A. Beherec, Ph.D., RPA, on April 27, 2017, at the SCCIC at California State University, Fullerton. Previously conducted cultural resources investigations and previously identified cultural resources were reviewed as part of this investigation. A 0.5-mile radius around the APE was examined and is referenced as the Study Area in this document. Information was obtained from the SCCIC, local historical resource inventories, and listings for the California Office of Historic Preservation's Historic Resources Inventory, which includes resources in the NRHP database, the CRHR, and California State Points of Historical Interest. USGS modern and historical topographic maps were also reviewed.

PREVIOUS CULTURAL RESOURCES INVESTIGATION REPORTS

The records search at the SCCIC revealed a total of seven cultural resources investigations previously conducted within a 0.5-mile radius of the APE (Table 2). Four of these are pole replacement projects, one is a survey in preparation for a solar and wind energy farm, one is a 98-linear-mile survey preparatory to an aqueduct construction, and one is an inventory of the First Los Angeles Aqueduct (LAA1) and Second Los Angeles Aqueduct (LAA2) and certain associated roads. The previous cultural resources investigation reports are reproduced in confidential Appendix B. In total, approximately 10% of the APE and 5% of the Study Area have been previously surveyed (Figure 5).

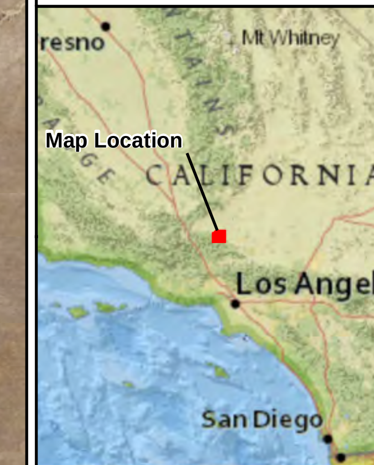
Table 2. Previous Investigations Conducted within the Study Area (0.5-mile buffer)

Author	Report (LA-)	Description	Date
Nilsson, Elena, Russell Bevill, and Michael S. Kelly	08169	Archaeological Inventory of the First and Second Los Angeles Aqueducts and Selected Access Roads, Kern, Inyo, and Los Angeles Counties, California	2006
Schmidt, June	08386	DWO 6036-4800; J.I. No. 6-4827: Bledsoe 12 kV and Hughes Lake 12 kV Deteriorated Pole Replacement, Los Angeles County	2006
Pollock, Katherine H., and Michael K. Lerch	09694	Deteriorated Pole Replacement Project Archaeological Survey of Ten Pole Locations on the Kinsley 12kV, Whirlwind 12 kV, Rayburn 12kV, Pick 12 kV, Lake Hughes 12 kV, and Big Pines 12 kV Transmission Lines, Los Angeles County, California, and the Willowsprings 12 kV Transmission Line, Kern County, California	2005
Schmidt, James	10143	WO 6036-4800, No. A-4809 and 7-4816: Hughes Lake 12 kV and Whirlwind 12 kV Deteriorated Pole Replacement Project, Los Angeles County, California	2008
Jordan, Stacey C., and Andrea M. Craft	10550	Archaeological Survey Report for the Southern California Edison Company Replacement of One Deteriorated Pole on the Pick 12 kV Circuit and Two Deteriorated Poles on the Hughes Lake 12 kV Circuit State Land and Private Inholdings, Los Angeles County, CA	2006
Bray, Madeleine	10634	Preliminary Archaeological Survey Report for 98 Linear Miles of the East Branch Extension of the California Aqueduct for the DWR East Branch Enlargement Project, Los Angeles and San Bernardino Counties	2010
Anonymous	11230	Wildflower Green Energy Farm County Project, 16700 Lancaster Road, Antelope Valley, CA 93536	2011

Previously Recorded Cultural Resource Sites

The SCCIC records search identified eight previously recorded cultural resources within the Study Area (Table 3). The DPR forms documenting these resources are reproduced in confidential Appendix C. A map showing the locations of the resources is included as confidential Appendix D. One of the resources enters into the APE itself.

OVERVIEW MAP



Legend

- Project Area
- 0.5 Mile Records Search Buffer
- Previous Investigations

NORTH

0 — 1,000 Feet

Scale 1:9,196
1 inch = 766 feet

Fairmont
Reservoir

Previous Investigations

Date: 11/16/2017 Project: 60528908.2

AECOM **Figure 5**

Path: C:\GIS Data\Projects\60528908_Fairmont Project\GIS\MXD\Report Maps\Figure-5_Fairmont_20171116.mxd | Coordinate System: NAD 1983 UTM Zone 11N | User: stevensona1

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Table 3. Previously Recorded Cultural Resource Sites within the Study Area (0.5-mile buffer)

Primary Number (P-19-)	Description	Time Period	Eligibility Evaluation	Location in APE
001677	Old Orchard Homesite	Historic (ca. 1915)	Not evaluated for either NRHP or CRHR	Not in APE
002105H	Los Angeles Aqueduct	Historic (1908-1913)	Appears eligible for CRHR under Criteria 1 and 2	West edge of APE
004154	East Branch of the California Aqueduct	Historic (1966-1973)	Appears eligible for NRHP under Criteria A and C; appears eligible for CRHR under Criteria 1 and 3	Not in APE
004233H	Abandoned homestead	Historic (early-mid 20th Century)	Not eligible for NRHP; not evaluated for CRHR	Not in APE
004238	Refuse deposit	Historic (ca. 1914-1945)	Not evaluated for either NRHP or CRHR	Not in APE
004246	170th Street West	Historic (pre-1915)	Not evaluated for either NRHP or CRHR	Borders APE
004248	San Francisquito Road	Historic (pre-1915)	Not evaluated for either NRHP or CRHR	Borders APE
004473H	Refuse deposit	Historic (ca.1915-1950s)	Not evaluated for either NRHP or CRHR	Not in APE

P-19-001677 / Old Orchard Homesite

The Old Orchard Homesite is the remnants of a homestead and associated orchard that first appears on historic maps in 1915. The site includes a fence, a 22-inch steel pipe and possibly an associated well, building debris, and scant artifacts. When the site was recorded in 1989 it had been mostly destroyed by the construction of the Los Angeles Aqueduct; it was in much the same state when the site was revisited in 2009. This site has not been evaluated for inclusion on either the NRHP or the CRHR.

P-19-002105H / Los Angeles Aqueduct

This resource consists of the Los Angeles Aqueduct. The Los Angeles Aqueduct channels water from Owens Lake to the San Fernando Valley. Construction began in 1908 and the aqueduct was opened in 1913. The aqueduct was considered an engineering marvel at the time of construction, and its completion gave a reliable water source to the expanding City of Los Angeles and resulted in the annexation of the San Fernando Valley to the City. Segments of the Los Angeles Aqueduct in Los Angeles County have been found eligible for the CRHR under Criteria 1 and 2, and in other counties the aqueduct has been recommended eligible also under Criterion 3. The period of significance for the Los Angeles Aqueduct is its initial construction, 1908–1913.

P-19-004154 / East Branch of the California Aqueduct

The East Branch of the California Aqueduct is a historic aqueduct still in use. It was constructed between 1966 and 1973 spanning 98 miles of the total 444 miles, delivering water from northern

California to southern California. The northern section begins just below Tehachapi where the main California Aqueduct splits in an east-to-west direction. The East Branch runs east at this split along the border of the San Gabriel Mountains.

The California Aqueduct has been determined eligible for listing in the NRHP under Criteria A and C and for the CRHR under Criteria 1 and 3.

P-19-004233H / Abandoned Homestead

This resource consists of an abandoned homestead. The site consists of a collapsed building, two concrete pads, and structural debris. The collapsed building is visible on a 1959 aerial photograph and is believed to date to the early to middle twentieth century. The site does not appear eligible for the NRHP, but was not evaluated for inclusion in the CRHR.

P-19-004238 / Refuse Deposit

This resource consists of a historic refuse scatter dumped in a deep ravine. The refuse consists of the remains of two mattresses, barbed wire, a car body, the body of an unidentified piece of machinery, a refrigerator, and window pane fragments. The site was estimated to date ca. 1914–1945. The site has not been evaluated for inclusion in the CRHR or the NRHP.

P-19-004246 / 170th Street West

This resource consists of a north-south–oriented road. The road is roughly 20 feet wide and consists mostly of a graded dirt surface, though in places it is improved with asphalt or macadamized. The road appears on maps going at least as far back as 1915. This resource has not been evaluated for inclusion in the CRHR or the NRHP.

P-19-004248 / San Francisquito Road

This resource consists of an east-west–oriented road. The road is on average 23 feet wide and consists mostly of a graded dirt surface, though in places it is improved with asphalt or macadamized. The road appears on maps going at least as far back as 1915. Historically, the road is known as San Francisquito Road, but today is incorporated into Avenue H, forming the western end of Avenue H. This resource has not been evaluated for inclusion in the CRHR or the NRHP.

P-19-004473H / Refuse Deposit

This resource consists of a sparse but spatially large refuse scatter located on the east side of Fairmont Reservoir. The refuse includes food and beverage cans, bricks, glazed ceramics, car parts, metal hardware, and a California license plate, and includes material dating from 1917 to 1957. The refuse is believed to be associated with a structure associated with a small agricultural operation that stood approximately 20 meters north of the site and appears on a 1915 topographic map and a 1959 aerial photograph but which was demolished by the time of a 1965 aerial photograph. This resource has not been evaluated for inclusion in the CRHR or the NRHP.

Other Archival Research

In addition to the SCCIC records search, historical maps and aerial photos were consulted to identify any potential cultural resources and to compile information pertinent to the significance of any identified resources.

Historical Maps Database

Historical maps on file at the SCCIC and USGS databases were reviewed. USGS records are useful but limited due to scale.

The USGS maintains a database of modern and historical topographic maps that are accessible to the public on the USGS website (store.usgs.gov). All available historical maps of the project vicinity were reviewed to identify any historical information of land use or structures that may not currently be visible within the project area but were present in the past (Table 4). The earliest available USGS maps are the 1915 1:96000 and 1:125000 Lake Elizabeth maps. These maps show a building in the approximate southeast corner of the project area. The 1:96000 scale map shows Fairmont Reservoir, but the 1:125000 map does not, because the reservoir was under construction as these maps were being prepared. The building still stands in the 1917 map. None of these early maps show the private or service roads which today mark the south or west sides of the project area, but both maps show the roads following the east and north sides (Avenue H and 170th Street).

Table 4. Historic Maps Reviewed

Map Name	Scale	Date
USGS Lake Elizabeth	1:96000	1915
USGS Lake Elizabeth	1:125000	1917
USGS Fairmont	1:24000	1932
USGS Fairmont	1:24000	1937
USGS Fairmont	1:24000	1950
USGS Lake Hughes	1:24000	1957
USGS Bouquet Reservoir	1:62500	1958
USGS Bouquet Reservoir	1:62500	1987
USGS Lake Hughes	1:24000	1995
USGS Lake Hughes	1:24000	2015

By the time of the 1932 Fairmont map, the building is gone. A depression, probably a borrow pit, is visible in the south end of the project area, near or possibly in the location where the building once stood. This depression is also visible in the 1937 and 1950 maps, but not in later maps. This depression forms a visible scar upon the landscape in historic aerial photographs dated 1948, 1952, 1959, 1963, 1965, 1971, and 1974, but the depression appears shallow. The scar softens over time, and is no longer visible in a 1994 aerial photograph (Nationwide Environmental Title Research 2017).

The private roads on the east and south of the project area are visible in the 1932 and all subsequent maps.

LAA1 is shown in all the available maps. In the 1915 and 1917 maps it appears as a solid blue line, while in later maps it is indicated as a broken blue line, probably because it is underground. LAA2 does not appear in any of these maps, although the buried aqueduct is shown cutting northeast-southwest across the APE in project documents.

Fairmont Reservoir #2 does not appear in maps dating from 1958 and earlier. The earliest available map after 1958 is 1987. Fairmont Reservoir #2 appears in the 1987 and later maps.

SACRED LANDS FILE AND NATIVE AMERICAN CONTACT

A letter was emailed to the NAHC on May 3, 2017. The letter requested that an SLF search be conducted for the proposed project. The NAHC responded in a letter sent via email dated May 15, 2017, stating "A search of the SLF was completed for the project with negative results." The NAHC response is included in confidential Appendix E.

A list of relevant Native American groups or individuals that might potentially have additional information or concerns relevant to the APE was provided to LADWP. All Native American contact and consultation for this project is being conducted by LADWP.

On August 2, 2017, LADWP mailed letters to representatives of 10 tribes, including all 6 tribes on the tribal consultation list provided by the NAHC, as well as four other tribes with whom LADWP has had past contact. The letters described the planned project and provided the results of the cultural resources records search and survey. The letters also described the regulatory context and requested input on tribal concerns in accordance with Assembly Bill 52 (AB 52). A map illustrating the project location and a contact response form were included with the letters.

Four tribes indicated interest in the project. None of the tribes contacted provided information documenting the existence of tribal cultural resources within the project site. One tribe, the Gabrieleño Band of Mission Indians-Kizh Nation, initially requested consultation and then reversed its decision and declined consultation after deciding the project is outside their tribal territory. Another group, the Colorado River Indian Tribes (CRIT), expressed general concern about the removal of artifacts from the area; however, the CRIT stated that it did not have specific concerns about the project and wished to defer to other tribes. The San Manuel Band of Mission Indians indicated that they do not have concerns with the project implementation plans, and recommended mitigation measures be implemented to protect unanticipated discoveries including the opportunity for tribal representatives to be present during the evaluation of such discoveries. Finally, the Fernandeño Tataviam Band of Mission Indians requested consultation and expressed concern that unknown resources may exist within the project area. The Fernandeño Tataviam Band of Mission Indians also requested that a qualified tribal representative be present during all ground-disturbing activities.

SUMMARY

Archival research indicates that approximately 5% of the Study Area has been previously studied. Within the Study Area, approximately 10% of the APE was previously studied. Eight resources were identified within the Study Area. One cultural resource, the Los Angeles Aqueduct, P-19-002105H, was identified within the APE. It has previously been determined eligible for listing in the CRHR. No tribal cultural resources or resources of Native American origin were identified within the project site during the archival research and Native American contact.

CHAPTER 5
SURVEY METHODS AND RESULTS

SURVEY METHODS

To determine project impacts to cultural resources, a Phase I intensive pedestrian survey was conducted to determine the location of unknown cultural resources and evaluate the present condition of the known historic resource, the Los Angeles Aqueduct. The majority of the APE has never been subjected to such a systematic pedestrian survey.

On May 18, 2017, Alec Stevenson, B.A., and Allison Hill, B.A., surveyed the APE. The land south of the APE extending as far as Los Angeles City Road was also surveyed, because segments of the project, now removed, were located in that area. The survey consisted of east-to-west transects that did not exceed 15-meter intervals per crew member. When a resource was identified, its location was recorded using a handheld global positioning system (GPS) device (DUAL XGPS), photographs were taken, the appropriate field forms were completed, and detailed descriptions and notes were compiled.

On the date of the survey, the weather was sunny with temperatures ranging between 70 degrees Fahrenheit (°F) and 80°F. Ground visibility varied tremendously depending on vegetation and disturbance. The northern portion of the APE is less disturbed than the southern half. Visibility ranged between 95% and 15% and was much higher in the southern half. The southern portion of the APE contains gravel associated with rock crushing machinery and non-native grass. The remaining APE contains dispersed asphalt with some modern trash as well as non-native grass and other herbaceous weeds.

Resources identified during the survey were documented in detail to allow for the completion of all appropriate Department of Parks and Recreation (DPR) 523 forms. Minimally, these include primary forms (Form 523A) and location maps overlaid on a USGS topographic map (Form 523J). More complex resources potentially require an Archaeological Site Record (Form 523C), Linear Feature Form (Form 523E), and/or a Sketch Map (Form 523K). Sketch maps included a site datum, features, artifacts concentrations, and other cultural elements. In addition to the information required for DPR site forms, detailed field notes were produced for each site. Field notes described site impacts, geology, and vegetation, and contained diagnostic information about cultural materials at each site.

The DPR site forms are presented in Appendix C. All updated DPR site forms will be sent to the CHRIS for inclusion in the state inventory system. The survey conducted within the APE identified one cultural resource; an extension of the Los Angeles Aqueduct previously recorded as P-19-002105H. This resource is described in the following section.

SURVEY RESULTS

The survey conducted within the APE found an extension of one previously recorded site.

P-19-002105H

P-19-002105H was initially recorded by Science Applications International Corporation in 1992. The resource consists of the entirety of the Los Angeles Aqueduct, beginning at the Owens River and ending in San Fernando. The Los Angeles Aqueduct was constructed in two main phases: the first between 1907 and 1913 and the second between 1965 and 1970. A sub-extension was built in the Mono Basin between 1930 and 1940.

The original aqueduct was conceived by engineer William Mulholland and built with the help of Mayor Frederick Eaton. The placement of this aqueduct was a necessity and contributing factor to the physical and economic growth of Los Angeles. The Mono Basin extension, east of Mono Lake, took advantage of local streams in order to comply with a growing need for more water after Los Angeles grew in the 1920s. This additional section of the aqueduct carries more water at more efficient rates than the original.

A portion of the main Los Angeles Aqueduct is visible within the APE. This portion of the Los Angeles Aqueduct enters from the northwest and connects with Fairmont Reservoir #2. The aqueduct was recorded as two connected features. These are the aqueduct channel itself (Feature 1) and a water diversion structure that passes over the aqueduct and then below a service road (Feature 2).

Feature 1 consists of the Los Angeles aqueduct channel. The visible portion is 1,100 feet long and 15 feet wide. Only the top is visible at the surface; the majority is underground. In its present state it connects to Fairmont Reservoir #2, although it originally connected to the now-decommissioned Fairmont Reservoir #1.

Feature 2 is a spillway and culvert constructed atop and adjacent to the Los Angeles Aqueduct. The spillway diverts water from a slope west of the aqueduct over the aqueduct and beneath an access road. Historic plans provided by LADWP indicate that the Feature 2 structure was probably initially constructed about 1929 (LADWP n.d.). The feature has been substantially modified since that date.

The spillway is an amalgamation of historic structures with non-historic additions. The portion of the feature that appears to be historic consists of two east/west running rock walls 20 feet apart, 15 feet long, 2 feet tall, and 15 inches wide. The walls are approximately 4 to 5 courses high and 1 stone wide. The stones each measure approximately 6 inches in diameter. This part of the structure is built of local granite or volcanic rock that is now covered in green and teal lichen. A coarse-grained homogenous concrete binds the stones together.

The more recent, west side of the structure consists of concrete walls marked with a contractor's stamp. The contractor's stamp bears the legend "L.A.D.W.P. / MOJAVE / 2010 / CONSTRUCTION." This stamp indicates that this portion of the feature was built in 2010, probably by a firm named Mojave Construction (Plate 5). These walls overlap the rock walls by 16 inches and are 2 feet tall and 6 inches wide. They continue west 5 feet 10 inches before angling 45 degrees northwest an additional 5 feet 10 inches. This northwestern part of the wall overlaps with the Los Angeles Aqueduct concrete surface segment (Feature 1).

After crossing over the aqueduct, the structure takes the form of a floor sloping downward to the east at a slope of approximately 35 degrees. This segment is again constructed of local rock set in concrete and appears to be part of the historic structure. This channel is roofed in concrete for all but the eastern 2 feet of the structure (Plates 6 and 7). At the bottom of this slope, water is diverted into a 21-inch-wide culvert pipe that connects to a seasonal drainage on the opposite side of a dirt access road (Plate 8).

Plate 3. Overview of P-19-002105H, Los Angeles Aqueduct, Feature 1

Plate 4. Overview of P-19-002105H, Los Angeles Aqueduct, Feature 1

The slope on the east, downriver side of the access road is covered with a debris and poured concrete intended to reinforce the hillside. It is likely that this structural debris was once part of Feature 2 but was disturbed during a later building phase. Historic plans and the general appearance of the culvert suggest that it was originally up to twice as long as it is today.

No sign of LAA2 was visible on the surface at the time of visit, although it is known to exist subsurface in the project footprint.

Plate 5. P-19-002105H, Feature 2 Concrete Wall Contractor's Stamp

Plate 6. Overview of P-19-002105H, Feature 2, Los Angeles Aqueduct Spillway

Plate 7. Overview of P-19-002105H, Feature 2, Los Angeles Aqueduct Spillway

Plate 8. Overview of P-19-002105H, Feature 2, Los Angeles Aqueduct Spillway Drainage

SUMMARY

Archival and field survey investigations identified one previously recorded site within the current APE. P-19-002105H is the Los Angeles Aqueduct. A 1,100-foot-long segment of the aqueduct lies within the APE. Two features were observed in connection with the aqueduct. Feature 1 is the concrete top of the aqueduct, which dates to approximately 2010. Feature 2 is a stone and concrete spillway and culvert, originally dating to at least 1929 but with substantial modifications dating to 2010. LAA2 is known to exist in the APE but was not visible. No other resources were identified as a result of the survey.

The exposed portion of the Los Angeles Aqueduct observed during the survey was documented on appropriate DPR forms, which are included in confidential Appendix F.

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CHAPTER 6
EVALUATIONS AND RECOMMENDATIONS

SUMMARY

Archival research and a cultural resources survey identified one cultural resource within the APE. Tribal cultural resources can only be designated with Native American consultation, but no probable tribal cultural resources were identified during the archival research or field survey. The following discussion evaluates these resources for eligibility for listing in the NRHP and CRHR, and provides management recommendations for these resources and potential unanticipated discoveries.

REGULATORY SETTING

Cultural resources in California are protected by a number of federal, state, and local regulations, statutes, and ordinances. Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. State and federal laws use different terms for cultural resources. California state law discusses significant cultural resources as “historical resources,” whereas federal law uses the terms “historic properties” and “historic resources.” In all instances where the term “resource” or “resources” is used, it is intended to convey the sense of both state and federal law.

The purpose of this evaluation is to identify potential impacts to cultural resources, in compliance with CEQA, PRC Section 21000 et seq. and the State CEQA Guidelines, California Code of Regulations Section 15000 et seq. In addition, LADWP seeks assistance for the project from the CWSRF Program of the California State Water Resources Control Board. The CWSRF is awarded capitalization grants by the EPA. Projects carried out with EPA federal assistance are subject to EPA State Revolving Fund Program Implementation Regulations (40 CFR Part 35) and Section 106 of the NHPA (36 CFR Part 800). The CWSRF Program is governed by a *Programmatic Agreement on Historic Preservation for the State Revolving Fund*. These regulations and guidelines require that resources that are historic in age and may be impacted by the project be evaluated for inclusion on the NRHP and the CRHR.

National Register of Historic Places

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important in prehistory or history.

A resource meeting one or more of the NRHP criteria must also retain the essential physical features that enable it to convey its historic identity. The quality of significance is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association. To retain historic integrity a property will always possess several, and usually most, of the aspects.

California Register of Historical Resources

The CRHR was created to identify resources deemed worthy of preservation on a state level and was modeled closely after the NRHP. The criteria are nearly identical to those of the NRHP but focus on resources of statewide, rather than national, significance. The CRHR consists of properties that are listed automatically as well as those that must be nominated through an application and public hearing process.

The criteria for eligibility of listing in the CRHR are based on NRHP criteria but are identified as 1 through 4 instead of A through D. To be eligible for listing in the CRHR, a property must be at least 50 years of age and possess significance at the local, state, or national level, under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or
3. It embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important in the prehistory or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, historical resources eligible for listing in the CRHR must retain enough of their historic character or appearance to be able to convey the reasons for their significance. Such integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association.

Tribal Cultural Resources

The recent addition of AB 52 to CEQA legislation creates a new resource category, tribal cultural resources, and requires that a lead agency must consult with interested California Native American tribes who request formal consultation regarding impacts to tribal cultural resources. As defined by AB 52, Tribal cultural resources are either of the following:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

  (A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.

  (B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

- 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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

AB 52 also creates a consultation process between lead agencies and California Native American tribes to identify and protect tribal cultural resources. In accordance with AB 52, Native American groups who wish to be consulted on projects within their traditional geographic area are required to request in writing that lead agencies notify them of upcoming projects within their geographic areas.

NRHP AND CRHR EVALUATION

The Los Angeles Aqueduct, P-19-002105H, has been documented several times and given different Primary and Site numbers in the different counties in which it was encountered. In Los Angeles County, the aqueduct was evaluated and found eligible for inclusion in the CRHR. In 2011, a conduit extension in the Mojave Division was evaluated as eligible for listing in the CRHR under Criteria 1 and 2 by CH2M HILL archaeologist N. Lawson. Lawson found the segment analyzed, as well as the aqueduct as a whole, to be eligible based on its importance as a water carrying resource that contributed to the success of Los Angeles in its infancy (Criterion 1) and its association with famous engineer William Mulholland, who was associated with other major projects in the region (Criterion 2). Moreover, the aqueduct has also been recommended eligible as the work of a master engineer (Criterion 3). For these reasons, the aqueduct might also be considered eligible for inclusion in the NRHP under Criteria A, B, and C.

However, the segment in the APE has been heavily modified since the period of significance. The Los Angeles Aqueduct formerly exited the Elizabeth Tunnel at Fairmont Reservoir. The reservoir was decommissioned after the San Fernando Earthquake in 1974 because it was considered unsound. Fairmont Reservoir No. 2 took its place in 1983. The new reservoir required major modifications to this portion of the aqueduct, which was diverted into the new reservoir.

Moreover, the visible portions of the aqueduct all date to an even later building phase. The Feature 1 concrete surface does not appear in a Google Earth aerial photograph dated June 2009 or any aerial photographs before that date. It does appear in an aerial photograph dated July 2011 and all subsequent aerial photographs. The Feature 2 drain incorporates historic elements, but much of what is today visible is known to date from 2010. Therefore, the design and materials of the visible portion of Feature 1 and much of Feature 2 all date to 2010. This segment of the aqueduct has been modified to the extent that it no longer conveys the historic significance of the engineering marvel constructed in the first quarter of the twentieth century by William Mulholland. This segment of the aqueduct has lost its integrity due to substantial modification, and is not eligible for inclusion in the NRHP or the CRHR.

LAA2 has not been formally recorded independently of LAA1. LAA2 is much later in date than LAA1, having been constructed between 1965 and 1970. LAA2 will not be impacted by the current project.

MANAGEMENT RECOMMENDATIONS

Built Environment Recommendations

Although the Los Angeles Aqueduct, P-19-002105H, has been recommended as eligible for inclusion in the CRHR and may be eligible for inclusion in the NRHP, the segment within the APE does not contribute to the resource's significance. The aqueduct within the APE may be modified without impacting the overall significance of the Los Angeles Aqueduct, and therefore, its eligibility for inclusion in the CRHR and NRHP. No further work is recommended for this segment of the resource.

Archaeological Recommendations

Based on the results of the archival research and survey, there is low potential that archaeological resources will be encountered during ground-disturbing activities for the proposed project. Nonetheless, archaeological deposits can be buried with no surface indications of their presence, particularly in area of alluvial deposits. Therefore, it is possible that archaeological resources could be buried beneath the ground surface, especially in areas where previous development has included only minimal ground disturbance.

Because the potential to encounter archaeological resources exists during construction of the proposed project, the following mitigation measures are recommended:

1. Before the start of ground-disturbing activities at the project site, a training program for construction personnel shall be developed and implemented to familiarize construction personnel with the relevant legal context for potential cultural resources at the project site and with the types of cultural sites, features, and artifacts that could be uncovered during construction activities. In addition, this training is to prevent unauthorized collection of archaeological materials or vandalism to known archaeological sites. These training sessions will be conducted before beginning construction and will be repeated as needed as construction crews and supervisors change.

2. Pursuant to California Resources Code Section 21083.2(i) regarding provisions related to accidental discovery of archaeological resources, the following procedures shall be followed if such resources are accidentally encountered during ground-disturbing activities. Work shall immediately be halted in the vicinity (within a 60-foot buffer of the find), LADWP shall be notified, and LADWP shall contact a qualified archaeologist meeting U.S. Secretary of Interior standards to evaluate the significance of and determine

appropriate treatment for the resource in accordance with the provisions of CEQA Guidelines Section 15064.5 and the National Historic Preservation Act. Work in the area may not resume until evaluation and treatment of the resource is completed or the resource is recovered and removed from the site. Construction activities may continue on other parts of the construction site while evaluation and treatment at the site take place. A trained Native American monitor shall be invited to be present during all ground-disturbing activities and as the archaeologist conducts the assessment of any discovered resources believed to be of Native American origin. In consultation with LADWP, the Native American monitor may make recommendations for the treatment and disposition of any such resources.

If human remains are discovered, work in the immediate vicinity of the discovery will be suspended and the Los Angeles County Coroner contacted. If the remains are deemed Native American in origin, the Coroner will contact the NAHC and identify a Most Likely Descendant pursuant to PRC Section 5097.98 and California Code of Regulations Section 15064.5. Work may be resumed at the landowner's discretion but will only commence after consultation and treatment have been concluded. Work may continue on other parts of the project while consultation and treatment are conducted.

Tribal Cultural Resources Recommendations

Based on the results of the archival research and survey, there is low potential that archaeological resources will be encountered during ground-disturbing activities for the proposed project. No sites or objects of Native American origin were identified during the archival research, which included a complete CHRIS search conducted by AECOM and an SLF search conducted by the NAHC. In addition, no published or unpublished material was found that indicated the possible existence of tribal cultural resources (which may include geographic features) within the project APE. Finally, although Native Americans contacted in the course of AB 52 consultation expressed concern that unknown cultural resources may exist within the project area, they did not relay knowledge of any tribal cultural resources known to exist within the APE, as of the date of this report. The Fernandeño Tataviam Band of Mission Indians requested consultation and expressed concern that unknown resources may exist within the project area, and provided information on tribal cultural resources identified in the greater area but not specifically within the project APE. The Fernandeño Tataviam Band of Mission Indians requested that a qualified tribal representative be present during all ground-disturbing activities. The San Manuel Band of Mission Indians indicated that they do not have specific concerns with the project implementation plans and did not identify any known tribal cultural resources in the project APE, but recommended mitigation measures be implemented to protect unanticipated discoveries, including the opportunity for tribal representatives to be present during the evaluation of such discoveries.

Consultation is ongoing between LADWP and interested tribal representatives. Because tribal cultural resources may be buried with no surface indications of their existence, particularly in areas of alluvial deposits, the Fernandeño Tataviam Band of Mission Indians Native American tribal representatives have requested that a qualified tribal representative be invited to be present during ground-disturbing activities at the project site; and LADWP has indicated that the Fernandeño Tataviam Band of Mission Indians will be invited to observe ground disturbing activities at the project site. Should any tribal cultural resources be identified during construction activities at the project site, the Native American monitor would be consulted regarding appropriate treatment and disposition of the resources. In consultation with the Native American representative(s) from the Fernandeño Tataviam Band of Mission Indians and the San Manuel Band of Mission Indians, LADWP would determine whether the resource is significant pursuant to criteria set forth in Section 5024.1 of the Public Resources Code.

Because the potential to encounter tribal cultural resources exists during construction of the proposed project, the following mitigation measure is recommended:

1. Before ground-disturbing construction, LADWP will include a monitoring plan in their work plan or in the contract conditions of the construction contractor, identifying the following steps to be taken in the event of the inadvertent discovery of previously unknown tribal cultural resources: A trained Native American monitor from the appropriate tribe shall be invited to be present to observe ground-disturbing activities at the project site. In the event of the discovery of a tribal cultural resource, work shall cease in the immediate vicinity (within a 60-foot buffer of the find), LADWP shall be notified, and LADWP shall contact a qualified professional archaeologist who meets the Secretary of the Interior's standards to evaluate the significance of and determine appropriate treatment for the resource. This shall include a determination of eligibility for listing in the California Register of Historic Resources pursuant to criteria set forth in Section 5024.1 of the California Public Resources Code. Work in the area of the discovery may not resume until evaluation and treatment of the resource is completed and/or the resource is recovered and removed from the site. Construction activities may continue on other parts of the construction site while evaluation and treatment of resource takes place. The Native American monitor shall be consulted regarding the evaluation and treatment of the resource, and the archaeologist shall make recommendations for further evaluation and treatment as necessary in consultation with the Native American monitor.

REFERENCES

Advisory Council on Historic Preservation

1990 *Programmatic Agreement on Historic Preservation for the State Revolving Fund.* Washington, D.C.: United States Environmental Protection Agency.

Bartholomew, Dana

2016 Sylmar-San Fernando Earthquake: 45 Years Ago Tuesday, 64 Killed. Los Angeles Daily News 8 February. Online at http://www.dailynews.com/general-news/20160208/sylmar-san-fernando-earthquake-45-years-ago-tuesday-64-killed. Accessed July 10, 2017.

Bateman, P.

1978 *In Deepest Valley: A Guide to Owens Valley, Its Roadsides and Mountain Trails*, edited by G. S. Smith, pp. 47–76. University of New Mexico Press. Albuquerque.

Bean, Lowell John, and Charles R. Smith

1978 Serrano. In *California*, edited by Robert F. Heizer, pp. 570–574. Handbook of North American Indians, Vol. 8. Washington, D.C.: Smithsonian Institution.

Benedict, Ruth

1924 A Brief Sketch of Serrano Culture. *American Anthropologist* 26(3): 366–392.

Bettinger, Robert L., and Martin A. Baumhoff

1982 The Numic Spread: Great Basin Cultures in Competition. *American Antiquity* 47 (3): 485–503.

Bledsoe, James

n.d.a Tunnel Construction. Online at http://dbase1.lapl.org/dbtw-wpd/exec/dbtwpub.dll Barcode 1000231.

n.d.b Fairmont Reservoir. Online at http://dbase1.lapl.org/dbtw-wpd/exec/dbtwpub.dll Barcode 1000289.

Dibblee, Thomas. W.

1967 *Areal Geology of the Western Mojave Desert California*. United States Government Printing Office, Washington.

Elston, R. G.

1982 Good Times, Hard Times: Prehistoric Culture Change in the Western Great Basin. In *Man and Environment in the Great Basin*, edited by D. B. Madsen and J. F. O'Connell, pp. 186–206. SAA Papers No. 2. Society for American Archaeology, Washington, D.C.

Grayson, Donald K.
1993 *The Desert's Past: A Natural Prehistory of the Great Basin*. Smithsonian Institution Press, Washington.

Gumprecht, Blake
1999 *The Los Angeles River: Its Life, Death, and Possible Rebirth.* Baltimore: Johns Hopkins University Press.

Hall, M. C.
1983 *Late Holocene Hunter-Gatherers and Volcanism in the Long Valley-Mono Basin Region: Prehistoric Culture Change in the Eastern Sierra Nevada*. Ph.D. dissertation, University of California, Riverside.

Jaeger, Edmund C., and Arthur C. Smith
1966 *Introduction to the Natural History of Southern California.* Berkeley: University of California Press.

King, Chester, and Thomas C. Blackburn
1978 Tataviam. In *California*, edited by Robert F. Heizer, pp. 535–537. Handbook of North American Indians, Vol. 8. Washington, D.C.: Smithsonian Institution.

Kroeber, A. L.
1925 *Handbook of the Indians of California*. Bulletin 78. Washington, D.C.: Government Printing Office.

Los Angeles Board of Public Service
1916 *Complete Report on Construction of the Los Angeles Aqueduct.* Los Angeles: City of Los Angeles Department of Public Service.

Los Angeles Department of Water and Power (LADWP)
n.d. Los Angeles Aqueduct: Dr Apron and Cvt Over Aqd. Plan F-10954. Document on file, LADWP.

Los Angeles Times
1935 Death Calls Aqueduct Builder: Mulholland of Aqueduct Fame Dies. 23 July: 1, 2. Los Angeles, California.

Mehringer, P. J., Jr.
1977 Great Basin Late Quaternary Environments and Chronology. *In* Models and Great Basin Prehistory: A Symposium, edited by D. D. Fowler, pp. 113–167. *Desert Research Institute Publications in the Social Sciences* 12. Reno.

1986 Prehistoric Environments. In *Great Basin*, edited by Warren d'Azevedo, pp. 31–50. Handbook of North American Indians, Vol. 11, W. G. Sturtevant, general editor. Smithsonian Institution, Washington D.C.

MLC & Associates

2013 2013 City of Lancaster Hazard Mitigation Plan. Online at http://www.cityoflancasterca.org/home/showdocument?id=21798. Accessed July 10, 2017.

Moratto, M. J.
1984 *California Archaeology*. Academic Press, Inc., Orlando.

Moseley, M., and G.A. Smith
1962 Archaeological Investigations of the Mojave River Drainage. San Bernardino County Museum Association Quarterly 9:3.

Mulholland, William
1911 *Sixth Annual Report of the Bureau of the Los Angeles Aqueduct to the Board of Public Works.* Los Angeles: City of Los Angeles Board of Public Works.

The National Geologic Map Database
2017 Online at https://ngmdb.usgs.gov/ngmdb/ngmdb_home.html. Accessed April 2, 2017.

Nilsson, Elena
2011 *Cultural Resources Inventory of the Division Creek Power Plant Unit One Replacement Project: Downstream Flowline Component, Inyo County, California*. Submitted to Los Angeles Department of Water and Power. URS Corporation.

Office of Historic Preservation
1990 *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format*. California Department of Parks and Recreation. Office of Historic Preservation, Sacramento, CA.

Reheis, Marith C., Jordon Bright, Steve P. Lund, David M. Miller, Gary Skipp, and Robert J. Fleck
2012 A half-million-year record of paleoclimate from the Lake Manix Core, Mojave Desert, California. *Palaeogeography, Palaeoclimatology, Paleoecology* 365-366: 11-37.

Shaw, Gaylord
1977 State Learns Lesson, Has Best Dam Safety Program. *Los Angeles Times* 14 March: 1, 22. Los Angeles, California.

Strong, William Duncan
1929 *Aboriginal Society in Southern California.* University of California Publications in American Archaeology and Ethnology No. 26.

Sutton, M. Q.
1980 Some Aspects of Kitanemuk Prehistory. *The Journal of California and Great Basin Anthropology* 2(2).

1988 *An Introduction to the Archaeology of the Western Mojave Desert, California*. Coyote Press Archives of California Prehistory No. 14.

1991 *Archaeological Investigations at Cantil, Fremont Valley, Western Mojave Desert, California*. Museum of Anthropology, California State University, Bakersfield, Occasional Papers in Anthropology 1.

1996 The Current Status of Archaeological Research in the Mojave Desert. *Journal of California and Great Basin Anthropology* 18(2): 221–257.

Sutton, Mark Q., Mark E. Basgall, Jill K. Gardner, and Mark W. Allen

2007 Advances in the Understanding of Mojave Desert Prehistory. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar. Altamira Press, Lanham, Maryland.

United States Geologic Survey (USGS)

1995 Lake Hughes 1:24000 Quadrangle. Reston, VA: U.S. Department of the Interior.

Voegelin, E. W.

1938 Tubatulabal Ethnography. *University of California Anthropological Records* 2(1): 1–84. Berkeley.

Water and Power Associates

2017 Online at http://waterandpower.org/. Accessed April 10, 2017.

Warren, C. N.

1984 The Desert Region. In *California Archaeology*, edited by Michael J. Moratto, pp. 339–430. Academic Press, New York.

1986 Early Holocene Cultural Adaptation in the Mojave Desert. In *The Pleistocene Perspective, Volume 2*, pp. 1–27. Allen and Unwin, London.

1990 *Archaeological Investigations at Nelson Wash, Fort Irwin, California.* Fort Irwin. Archaeological Project Research Report Number 23, Volumes I and II Interagency Archaeological Services, National Park Service Western Region. San Francisco, California.

Warren, C. N., and R. H. Crabtree

1986 Prehistory of the Southwestern Area. In *Great Basin*, edited by Warren d'Azevedo, pp. 183–193. Handbook of North American Indians, Vol. 11, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Wells, G. L., E. Olson, and S. Charman

2003 Distorted Retrospective Eyewitness Reports as Functions of Feedback and Delay. *Journal of Experimental Psychology: Applied* 9: 42–52.

Zigmond, M. L.

1986 Kawaiisu. In *Great Basin*, edited by Warren d'Azevedo pp. 398–411. Handbook of North American Indians, Vol. 11, W. G. Sturtevant, general editor. Smithsonian Institution, Washington D.C.

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APPENDIX A

RESUMES

Marc A. Beherec, PhD, RPA
Archaeologist

Education
PhD, Anthropology, University of California, San Diego, La Jolla, CA, 2011
MA, Anthropology, University of California, San Diego, La Jolla, CA, 2004
BA, Anthropology (Geology minor), University of Texas, Austin, Austin, TX, 2000

Professional Registrations and Certifications
Register of Professional Archaeologists (RPA)
40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) certified

Professional Affiliations
Member, Society for American Archaeology
Member, Society for California Archaeology

Dr. Marc Beherec is an archaeologist who has been involved in the field of cultural resources management for more than fifteen years. He has worked throughout the southwest on projects within Federal and State regulatory framework, and is experienced in the identification and analysis of both prehistoric and historic era artifacts. Dr. Beherec has also taken part in large-scale excavations in Jordan. Over the past five years, he has served as Lead Monitor for the NextEra Genesis Solar Energy Project and as Project Manager and Project Archaeologist for the Los Angeles Metropolitan Transportation Authority's large Regional Connector and Crenshaw rail projects. He manages a team of four full-time archaeologists and numerous project-specific part-time employees and subcontractors conducting work across the Greater Los Angeles area. At the same time, he has written cultural resources assessments for several clients, satisfying the requirements of both the California Environmental Quality Act and Section 106 of the National Historic Preservation Act.

Selected Project Experience

Los Angeles World Airports Worker Training and Construction Monitoring

Served as back-up coordinator and archaeological/paleontological monitor for construction for Qantas and West Aircraft Maintenance Area (WAMA) Projects, LAX, during years 2014-2015. Delivered workers' trainings, liased with construction leads regarding schedules, and monitored when regular Project Archaeologist and archaeological/paleontological monitor were not available.

County of Los Angeles Department of Public Works Topanga Underground Utilities District Archaeological Mitigation

Field director of archaeological mitigation at CA-LAN-8, a prehistoric site in the Santa Monica Mountains. Oversaw a team of up to 8 in hand-excavation of Tasks include coordinating archaeologists and Native American monitors; compilation and QA/QC of field documents; preparing reserving as a liason between the Most Likely Descendant and other Native American groups, construction crew, and client representatives.

Los Angeles Metropolitan Transportation Authority Compliance Monitoring
Project Archaeologist and Project Manager for the cultural resources compliance monitoring of multiple multi-year projects within the greater Los Angeles area, including the 8.5-mile Crenshaw rail transit corridor and associated stations and the 1.9-mile Regional Connector subway corridor and associated stations. Tasks involve instructing construction team in cultural resources compliance; the scheduling and coordination of multiple concurrent Native American and archaeological monitors on diverse construction efforts throughout the metropolitan area; testing and evaluating finds; compilation, QA/QC, and delivery of daily monitoring logs and other documentation for all on-site monitors; serving as a liaison between archaeological monitors, construction crew, and client project team; preparing weekly and monthly reports of activities and findings; and ensuring overall cultural resources compliance within the permitted conditions of the project.

Los Angeles Metropolitan Transportation Authority Zanja Discovery Program
Conducted archival research and assembled historical data to determine the location and construction history of the Los Angeles Zanja System; the city's first irrigation system. Included research within city archives and published records to determine the probable locations of underground portions of this miles-long system, which is treated as an eligible resource for the National Register of Historic Places. Information was used to guide cultural resources compliance during construction of the Regional Connector subway corridor.

Los Angeles Department of Water and Power; City of Los Angeles Bureau of Engineering; Water Replenishment District of Southern California; Los Angeles Metropolitan Transportation Authority; City of Orange; City of Santa Ana; Port of Los Angeles
Cultural Resources Assessments
Assessed sites for pumping stations, pipelines, and other infrastructure improvements in compliance with CEQA and CEQA Plus. Tasks included archival research including researching known sites at the South Central Coastal Information Center at California State University, Fullerton; conducting archaeological and built environment surveys; assessing finds for inclusion on the California Register of Historic Places; writing reports of findings.

NextEra Genesis Solar Energy Project Cultural Resources Compliance Monitoring
Lead Monitor for the cultural resources compliance monitoring of a 2000-acre solar power project under the jurisdiction of the California Energy Commission and Bureau of Land Management (BLM) on BLM land in the western Mojave Desert. Tasks involve the coordination of between 5 and 20 concurrent archaeological monitors on diverse construction efforts throughout the project site; compilation, QA/QC, and delivery of daily monitoring logs for all on-site monitors; attending project construction scheduling and Health and Safety meetings; conducting and documenting daily monitoring crew Health and Safety meetings; serving as liaison between archaeological monitors, construction crew and client project team; ensuring overall cultural resources compliance with the permitted conditions of the project.

San Bernardino National Forest San Jacinto District Archaeologist, Idyllwild, CA
Archaeologist assigned to Idyllwild Ranger Station, San Jacinto District, San Bernardino National Forest, Riverside County, California. Over the course of one year, assisted District Archaeologist in cultural resources efforts, including supervision of crews conducting cultural resources inventories of mountainous terrain, GPS documentation of resources, preparation of DPR 523 forms, research of prehistoric and historic artifact parallels, including projectile point typologies, makers' marks, and tin can typologies, and authoring technical reports. Work was performed before joining this firm.

Border Field State Park, San Diego County, CA
Excavated coastal Early Archaic sites in and adjacent to Border Field State Park in conjunction with the construction of the Mexico-United States Border Barrier. Work was performed before joining this firm.

Lake Meredith National Recreational Area Cultural Resources Surveys, Amarillo, TX
Archaeologist for intensive pedestrian surveys of the Lake Meredith National Recreational Area, an area along the Canadian River with documented human occupation for over 12,000 years. Relocated previously documented archaeological sites and documented newly identified sites. Work was performed before joining this firm.

East Texas Pipeline Survey, Rural East Texas
Crew Chief for intensive pedestrian survey of a new east Texas pipeline corridor. Efforts included field survey, shovel testing, site recordation, and GPS operation. Work was performed before joining this firm.

Camp Swift Archaeological Project, Bastrop, TX
Archaeologist for test excavations at Camp Swift Army National Guard Base. Excavated test units at eighteen sites, documented excavations, and drilled rock cores for archaeomagnetic dating research. Work was performed before joining this firm.

Gault Site Archaeological Project, Bell County, TX
Excavated at the Gault Paleoindian site (41BL323), completed documents (unit forms and maps, profile maps, Munsell notations, artifact catalogs), conducted preliminary lithic analysis, measured lithic blades for statistical studies, and supervised student volunteers in washing lithics. Work was performed before joining this firm.

APPENDIX B

PREVIOUS CULTURAL RESOURCES INVESTIGATION REPORTS

(CONFIDENTIAL)

APPENDIX C

PREVIOUSLY DOCUMENTED CULTURAL RESOURCES DPR FORMS

(CONFIDENTIAL)

APPENDIX D

MAP: CULTURAL RESOURCES WITHIN 0.5 MILE OF THE PROJECT AREA

(CONFIDENTIAL)

APPENDIX E

SACRED LANDS FILE SEARCH RESULTS AND NATIVE AMERICAN CONTACT

(CONFIDENTIAL)

APPENDIX F

P-19-002105 DPR FORM UPDATE

(CONFIDENTIAL)

LADWP FAIRMONT SEDIMENTATION PLANT PROJECT

GREENHOUSE GAS EMISSIONS IMPACT STUDY

Prepared for

AECOM

Prepared by

TERRY A. HAYES ASSOCIATES INC.

APRIL 2018

taha 2017-031

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1.0 SUMMARY OF FINDINGS

Terry A. Hayes Associates Inc. (TAHA) completed a greenhouse gas (GHG) emissions impact assessment for the proposed Los Angeles Department of Water and Power (LADWP) Fairmont Sedimentation Plant Project (proposed project). The proposed project would be located on LADWP property adjacent to the existing Fairmont Reservoir in unincorporated Los Angeles County approximately six miles west of the City of Lancaster, CA. The analyses examined potential environmental impacts related to GHG emissions resulting from construction and operation of the proposed project. The GHG emissions impact assessment considers the magnitude of GHG emissions in the context of consistency with federal, state, and regional GHG emissions reduction plans in determining the potential significance in accordance with applicable Antelope Valley Air Quality Management District (AVAQMD) methodologies. Conclusions that address significance determinations under the California Environmental Quality Act (CEQA) Environmental Checklist criteria are shown in **Table 1-1**.

TABLE 1-1: SUMMARY OF IMPACT STATEMENTS

Impact Statement	Proposed Project Level of Significance	Applicable Mitigation Measures	Level of Significance After Mitigation
Would the proposed project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Less-than-Significant Impact	None	Less-than-Significant Impact
Would the proposed project conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Less-than-Significant Impact	None	Less-than-Significant Impact

SOURCE: TAHA, 2017.

2.0 INTRODUCTION

2.1 PURPOSE OF REPORT

The purpose of this report is to evaluate the potential significance of environmental impacts related to GHG emissions and climate change associated with construction and operation of the proposed project.

2.2 PROJECT DESCRIPTION

Background

To maintain the quality and reliability of the City of Los Angeles' potable water supply, LADWP is proposing to implement the proposed project to improve raw water quality through a reduction in sediment in the water delivered by the First and Second Los Angeles Aqueducts (LAA1 and LAA2) to the Los Angeles Aqueduct Filtration Plant (LAAFP), where the water receives additional treatment and disinfection before entering the City's potable water distribution system. The proposed sedimentation plant would utilize plate settler technology to increase the efficiency and effectiveness of the sediment removal process and minimize the new plant's required footprint.

Project Location

The project site is located on LADWP-owned property adjacent to LADWP Fairmont Reservoir #2. The Fairmont Reservoir property is located at West Avenue H and 170th Street West, approximately 6 miles west of the City of Lancaster, in the Antelope Valley in northwest Los Angeles County (see **Figure 2-1**). Regional access to the site is provided by State Highway 138, an east-west thoroughfare that is located approximately 4 miles north of the property and provides linkage between State Highway 14 (about 15 miles east of the project site) and Interstate Route 5 (about 20 miles west of the project site). The nearest paved road to the project site is Lancaster Road, which is approximately 1 mile to the northeast at its closest point. Immediate access to the project site is provided by unpaved roads.

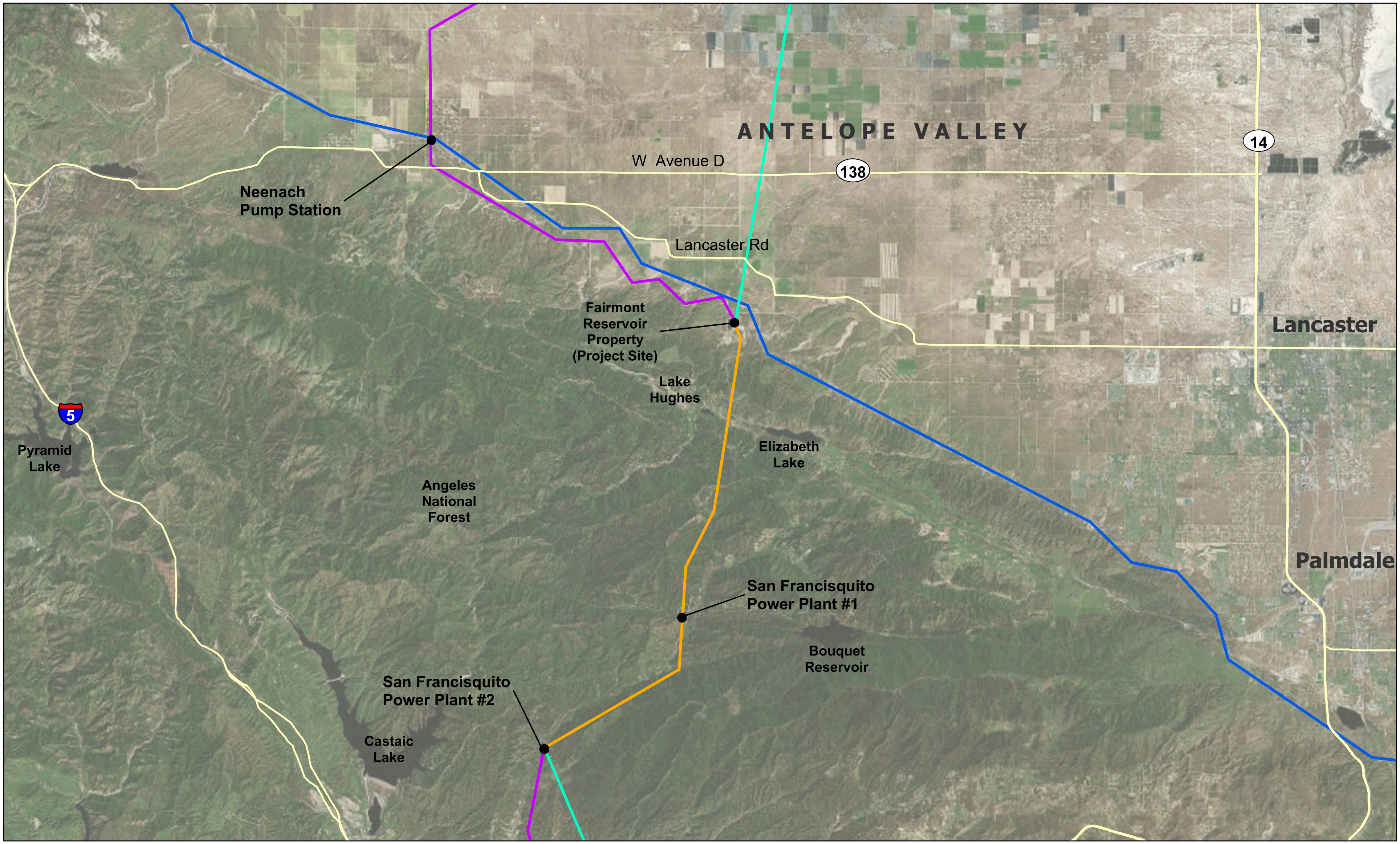
The proposed project site consists of an approximately 20-acre vacant parcel located just northeast of Fairmont Reservoir #2. The parcel is relatively flat, sparsely vegetated, and maintained by tilling. An ephemeral drainage course, which contains some vegetation, crosses the site generally from southwest to northeast. Along its northern and eastern edges, the site is bounded by a chain-link fence, which is part of the LADWP Fairmont Reservoir property perimeter security fence (see **Figure 2-2**).

Proposed Project

In addition to the key characteristics described above, in order to achieve the project objectives, the sedimentation plant would include the following primary facilities and components (see **Figure 2-3**).

LAA Realignment

LAA1 and LAA2 converge at the Fairmont Reservoir property. However, the actual convergence occurs downstream of the Fairmont Reservoir #2, at the outlet pipeline of the reservoir, and downstream of the proposed sedimentation plant site. Currently, only LAA1 water passes through the Fairmont Reservoir #2, while LAA2 is routed directly to the outlet pipeline. In order to allow both LAA1 and LAA2 to flow to the proposed sedimentation plant, they would be diverted into a new buried pipeline located upstream of the reservoir and connected to the plant intake facility. The existing buried aqueduct pipelines would remain in place with new isolation valves to allow for bypassing the sedimentation plant if necessary.



LEGEND

- LAA1
- LAA2
- Combined LAA1 and LAA2 Flow
- State Water Project - East Branch

0 100 200 Miles

SOURCE: AECOM, 2018.

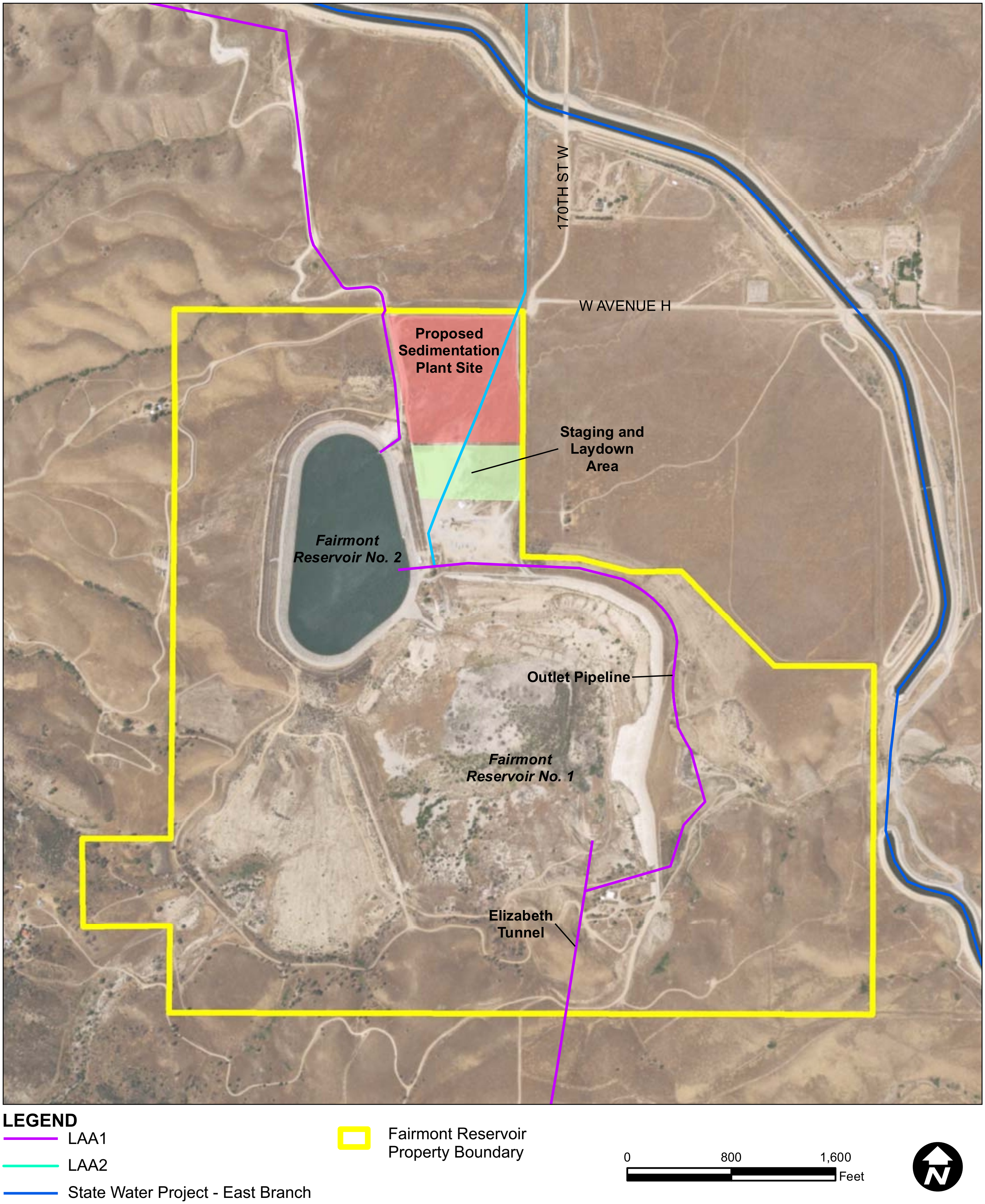
Fairmont Sedimentation Plant Project
Greenhouse Gas Emissions Impact Study

FIGURE 2-1

REGIONAL LOCATION MAP

TAHA 2017-031

LADWP



SOURCE: LADWP, 2017; AECOM, 2017.

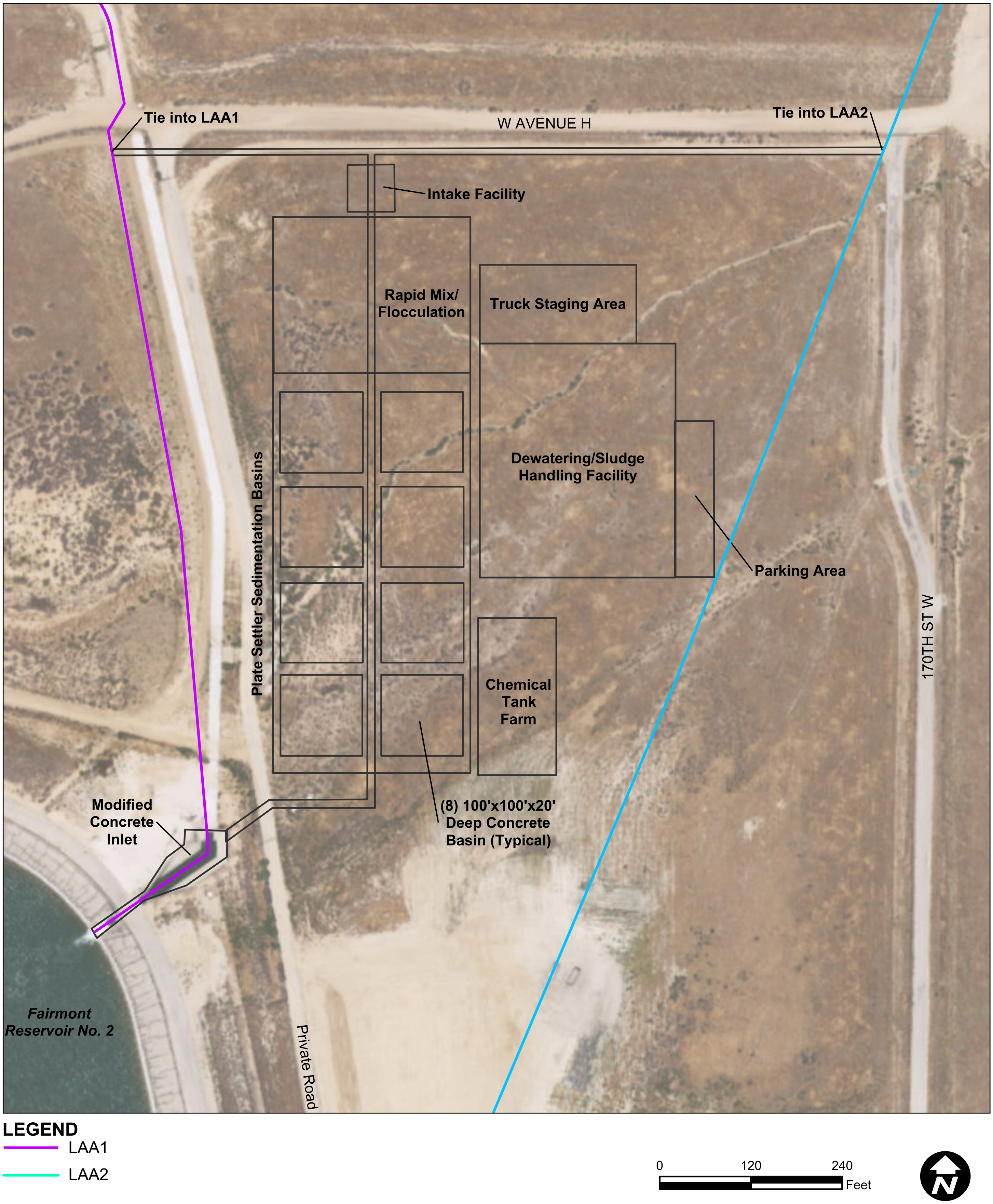
Fairmont Sedimentation Plant Project
Greenhouse Gas Emissions Impact Study

LADWP

TAHA 2017-031

FIGURE 2-2

FAIRMONT RESERVOIR PROPERTY



SOURCE: LADWP, 2017; AECOM, 2017.

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Fairmont Sedimentation Plant Project
Greenhouse Gas Emissions Impact Study

LADWP

FIGURE 2-3

CONCEPTUAL SITE PLAN

Intake Facility

An intake facility would meter total flow into the plant from the LAAs to determine the hydraulic conditions for plant operations. The intake facility would also include coarse screens to capture algae and larger debris.

Rapid Mix Coagulation/Flocculation

Following the intake facility but prior to the sedimentation basins, the water would pass through rapid mix coagulation/flocculation tanks. The application of coagulants/flocculants would improve the settling rate of sediment, resulting in more effective and efficient treatment and allowing for increased flow velocities through the sedimentation basins. Chemical storage tanks, with appropriate safety measures, including spill containment, would be required to store the coagulants/flocculants.

Plate Settler Sedimentation Basins

The sedimentation plant would include a series of basins sized to accommodate the maximum and operable minimum flow conditions at Fairmont. Each individual basin would contain plate settlers and could be operated independently of the other basins, as required.

Sludge Processing Facility

The plate settler treatment process would result in the accumulation of sediment on the bottom of the sedimentation basins. The accumulated sediment would be removed from the basins by means of a mechanical system to a collection pit. The sediment would then be conveyed to a sludge thickening facility consisting of rapid mix coagulation settling tanks and equalization basins. The thickened sludge would then be conveyed to a mechanical dewatering facility where additional coagulants may be added and mechanical dewatering equipment would separate solid material from the water in the sludge. The resulting residual sludge would be temporarily stored in a hopper or loaded directly into trucks at an on-site staging facility to be transported to a suitable off-site landfill.

Administration and Support Facilities

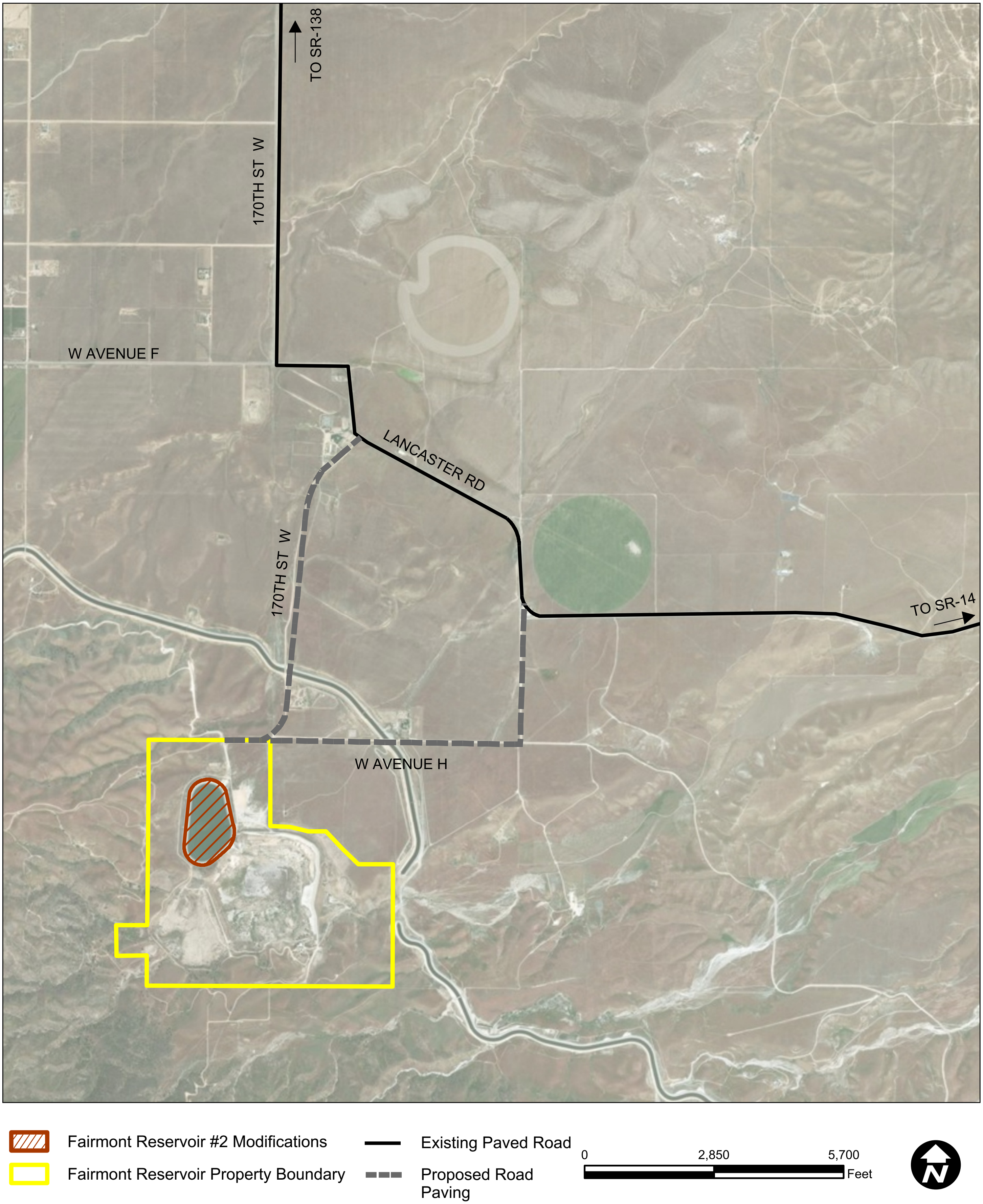
To operate the sedimentation plant, support facilities including, but not limited to, offices and other administrative spaces, a control room, laboratory, and necessary shop and materials storage areas would be provided.

Sanitary Waste and Water Treatment

Given the location of the proposed project, a septic system would be required to handle sanitary waste. Since the effluent from the sedimentation plant would not be considered potable, a small on-site potable water treatment system and storage tank would be required to provide for personnel and operational needs.

Access Road Paving

Immediate access to the project site is currently provided via unpaved roads. To provide a stable and durable road surface for trucks and to minimize the creation of dust from vehicle travel on the unpaved road surfaces, approximately 3 miles of existing access roads would be paved prior to the outset of construction activities at the project site. This would entail paving Avenue H east of the project site to 160th Street and 160th Street north of Avenue H to its intersection with Lancaster Road, which is a paved roadway. In addition, 170th Street would be paved north of the project site to its intersection with Lancaster Road. This would provide two paved ingress/egress routes to the site (see **Figure 2-4**).



SOURCE: LADWP, 2017; AECOM, 2018.

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Fairmont Sedimentation Plant Project
Greenhouse Gas Emissions Impact Study

LADWP

FIGURE 2-4

PROPOSED ROAD PAVING

Fairmont Reservoir #2 Modifications

Reservoir Inlet Structure. LAA1 currently empties into Fairmont Reservoir #2, and LAA2 intercepts the outflow from the Fairmont Reservoir #2 at the outlet pipeline directly downstream of the reservoir. However, under the proposed project, both LAA1 and LAA2 would flow into the sedimentation plant, and after treatment, the effluent from the plant, which would consist of the combined flows of both aqueducts, would be directed to Fairmont Reservoir #2. Modification of the open-channel concrete inlet structure for the reservoir would be required to accommodate the combined flow from the plant.

Reservoir Relining. Fairmont Reservoir #2 is fully lined with asphalt. However, this lining has not been replaced since the reservoir was first constructed in 1982, and it has deteriorated to the extent that maintenance of the reservoir is difficult. Since LAA1 would be out of service for a period of time during project (and therefore not flow into Fairmont Reservoir #2), the opportunity to reline the reservoir would be available. This relining would include asphalt sidewalls and a concrete bottom for durability and maintenance.

Electrical Power

Electrical power for the project would be drawn from the existing Southern California Edison power feed to the Fairmont Reservoir property, which currently enters the property near the northwest corner of the sedimentation plant site. A diesel-powered backup power generator would also be installed to support minimal critical treatment processes as well as communications, human-machine interface, and alarm systems in the event of an outage on the Southern California Edison feed.

Project Construction

Construction of the proposed project is scheduled to begin in early 2020. As shown in **Figure 2-5**, construction would consist of several tasks, including access road paving; LAA1 and LAA2 realignment; Fairmont Reservoir #2 modifications; excavation and grading for the sedimentation plant; construction of the structural elements of the plant (e.g., concrete foundations, basins, and tanks); and installation of the plant equipment and support facility construction. The general work that would occur in each of these phases is described below. While these phases are distinct and generally must precede or be preceded by others, some work associated with various phases could occur concurrently at different locations within the project site as construction of the plant proceeds. The exact sequencing of various tasks would be determined prior to the start of construction, but the total construction period, from mobilization to completion of the plant is anticipated to last approximately 3.5 years, including a plant commissioning period of several months.

Construction activities would normally occur Mondays through Fridays during the daytime hours, generally beginning no earlier than 7:00 a.m. and ending by late afternoon/early evening. Contractors and LADWP would require temporary trailers for construction management activities and temporary laydown areas and storage facilities for construction materials and equipment. All required administrative, staging, storage, and laydown areas related to project construction would be located within the existing Fairmont Reservoir property boundaries. Direct vehicular access to the site during construction would be provided along 170th Street West and West Avenue H, which, as discussed below, would be paved in the first phase of the project.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Access Road Paving	■	■	■																																							
Site Mobilization				■	■																																					
LAA1 & LAA2 Realignment						■	■	■	■	■	■	■	■	■	■	■	■																									
Reservoir #2 Modifications											■	■	■	■	■	■	■																									
Plant Excavation & Grading																		■	■	■	■																					
Plant Structures																						■	■	■	■	■																
Plant Equip. & Support Facilities																											■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Demobilization																																										■
Average Daily Equipment	9	9	9	6	6	22	22	22	22	22	32	32	32	29	29	29	29	30	30	30	30	7	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6
Average Daily Truck Roundtrips	13	13	13	2	2	16	16	16	16	16	59	59	59	48	48	48	48	6	6	6	6	10	48	48	48	48	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	2
Average Daily Workers	15	15	15	10	10	25	25	25	25	25	45	45	45	75	75	75	75	25	25	25	25	25	25	25	25	25	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10

SOURCE: AECOM, 2017.

FIGURE 2-5

PROJECT SCHEDULE

Construction of the plant and modification of the reservoir would require the operation of various pieces of heavy equipment on site, including excavators, front end loaders, bulldozers, motor graders, cranes, and concrete pump trucks. The type and level of use of this equipment would vary across the phases of work, with an estimated daily peak of about 32 pieces of equipment occurring during a few months of the project when the realignment of the LAAs and modifications of the reservoir would overlap.

The peak number of daily off-site truck roundtrips would be about 59, also occurring when the realignment of the LAAs and modifications of the reservoir would overlap. Secondary peaks of about 48 daily truck roundtrips would occur for several months in association with concrete deliveries for the reservoir relining and the plant structural elements. During the balance of the project, the average number of daily truck roundtrips would be substantially lower, at no greater than 16 and often less than 10 per day. These truck trips would generally be distributed throughout the work day, rather than concentrated during a particular portion of the day.

The number of daily on-site workers would range from a low of 15 to a high of 75, which would occur during the overlap of the LAA realignment and reservoir relining (i.e., asphalt and concrete work). It was assumed that each individual worker would generate a vehicle trip inbound to the project site in the morning and a vehicle trip outbound from the project site in the afternoon (i.e., no reduction in the number of worker trips associated with carpooling has been considered).

Access Road Paving

As discussed above, the roads that provide direct access to the Fairmont Reservoir property are currently unpaved. Because construction and operation of the plant would involve the delivery of heavy loads to the site (during construction) and the hauling of heavy loads from the site (during both construction and operation), access roads would be paved to provide a stable and durable surface and minimize dust that would be generated by travel on the unpaved roads. The road paving would occur before work at the reservoir property would begin.

The paving would involve portions of 170th Street West, West Avenue H, and 160th Street West to link the project site to Lancaster Road in two different locations. The total length of road included in the paving would be approximately 15,000 feet, and the width of the paved surface would be 24 feet. The road would consist of 4 inches of structural base material and 2 inches of asphalt paving. Some grading of the existing unpaved road surface may be required prior to paving. The road paving would involve several pieces of equipment, including an excavator, dump truck, front end loader, asphalt paving machine, and compaction roller. It is estimated that approximately eight truckloads of base material and four truckloads of hot mix asphalt would be delivered each day. Approximately 15 construction personnel would be required throughout the paving phase, which is anticipated to take approximately 3 months to complete.

LAA1 and LAA2 Realignment

As discussed above, LAA1 and LAA2 physically converge at the Fairmont Reservoir property downstream of the Fairmont Reservoir #2 outlet. To feed into the proposed sedimentation plant, they would need to be realigned, so that they converge upstream of Fairmont Reservoir #2. The 120-inch diameter LAA1 crosses into the property at the northwest corner of the project site, and the 90-inch diameter LAA2 crosses into the property at the northeast corner of the site. New supply lines of similar size would be installed below grade across the northern end of the site to connect each aqueduct to the sedimentation plant intake facility (see **Figure 2-3**). Isolation valves would be installed at the existing LAA connection points to allow for the temporary shutoff of flows to the plant from one or both LAAs. In addition, double block and bleed bypass valves would be installed on the existing LAA1 and LAA2 (both of which would remain in place) downstream of each new connection point. This would completely isolate the existing lines during normal operating conditions at the plant but also allow for flows to be temporarily diverted around the plant through the lines if necessary. The flow in each LAA would be discontinued non-concurrently while these valves were installed. After the installation of the valves, flows would continue through the existing LAA lines during the duration of plant construction.

The installation of the new line, which would be approximately 1,000 feet in length, would entail the excavation of a trench, with the excavated material stockpiled adjacent to the trench to be used as backfill once the line was installed. Because of the width and depth of the trench, shoring would be required. Energy dissipaters or other controls may also be installed to ensure proper inlet velocities at the plant intake facility from the combined flows of the two LAAs. Pipe sections and other material would be delivered to the site, and some demolition material and debris would be hauled from the site. This would involve an average of 16 daily truck roundtrips throughout the phase.

Numerous pieces of equipment would be needed to install the realigned LAA pipeline, including excavators, dump trucks, front end loaders, bulldozers, and a crawler crane. An average of about 22 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Approximately 25 construction personnel would be required throughout the pipeline installation, which is anticipated to take approximately 12 months to complete.

Fairmont Reservoir #2 Modifications

The current concrete inlet structure for Fairmont Reservoir #2 was constructed to accommodate the flows from only LAA1. As discussed above, LAA2 currently bypasses Fairmont Reservoir #2 and connects to the outlet pipeline immediately downstream of the reservoir. However, after completion of the sedimentation plant, the reservoir would accept the combined flows of LAA1 and LAA2 discharged from the plant. Therefore, the existing inlet structure would be enlarged to accommodate this combined flow. This would require the demolition and reconstruction of at least a portion of the existing inlet structure.

In addition, because Fairmont Reservoir #2 was constructed 35 years ago, the original asphalt lining has deteriorated. Since the enlargement of the inlet structure, as well as the realignment of LAA1, would mean that discharges to the reservoir would be paused for a period of time, an opportunity would be provided to replace the existing liner when the reservoir could be emptied. This replacement would involve the demolition of the liner and the repaving of the reservoir side walls with asphalt and the reservoir bottom with unreinforced concrete.

The demolition of the existing reservoir liner would involve the removal of approximately 18,000 cubic yards (CY) of asphalt, which would be hauled off site. This would result in approximately 43 haul truck roundtrips per day for about three months. The relining of the reservoir bottom would require approximately 3,000 CY of asphalt and 22,000 CY of concrete, which would result in approximately 32 delivery truck roundtrips per day for about 4 months.

The demolition and relining of the reservoir would require numerous pieces of equipment, including dump trucks, front end loaders, concrete pump trucks, a bulldozer, an asphalt paver, and a compaction roller. A peak of 10 pieces of equipment (including pickup trucks and water trucks) would be in operation daily for about 3 months, during demolition. A peak of approximately 50 daily construction personnel would be required during the relining operation. The entire reservoir modification phase is anticipated to take about 7 months to complete.

The number of daily truck trips, construction equipment, and personnel described above relate to the reservoir modification work only. However, as discussed above, this work would occur concurrently with the LAA realignment phase because discharges to the reservoir would temporarily cease during the aqueduct realignment. Because these two phases of work would overlap, the actual daily peak of construction activity at the Fairmont Reservoir property during the 7-month reservoir modification would be higher. The combined work under these two phases would result in a peak of approximately 59 truck roundtrips and 32 pieces of operating equipment per day during the 3-month demolition task and 75 construction personnel per day during the 4-month repaving task.

Sedimentation Plant Excavation and Grading

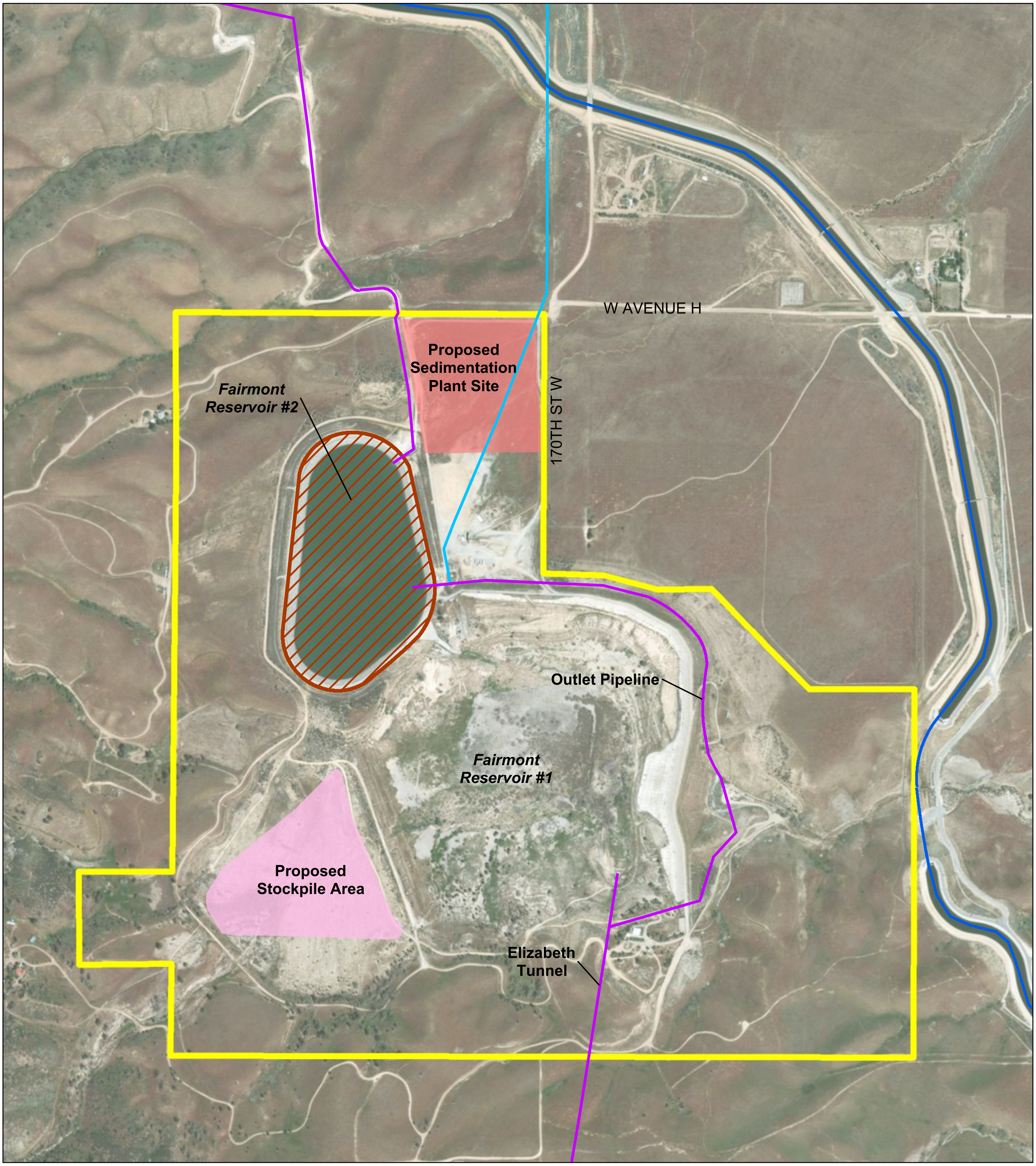
The LAAs operate via gravity flow, and in order to maintain this gravity flow, the various plant components must be situated at the appropriate elevation so that water would continue to flow through the plant and discharge into Fairmont Reservoir #2 without pumping. This would require excavation and grading for the proposed sedimentation basins and the rapid mix coagulation/flocculation tanks, which would each need to be about 20 feet deep, and the sludge processing facility, which would need to be about 10 feet deep. Because of the depth of excavation, shoring may be required in locations stable slopes cannot be built. Suitable excavated material would be used as necessary as fill to achieve the proper elevation across the entire plant. However, it is estimated that over 200,000 CY of excess material may be generated during the excavation and grading for the plant. This excess material would be disposed of in the empty Fairmont Reservoir #1, as indicated in **Figure 2-6**. To stabilize the material placed in Reservoir #1 to reduce erosion and windborne dust, it would be seeded with locally adapted native species and temporarily irrigated as appropriate to facilitate germination and growth. During the grading phase, runoff currently carried in the open drainage channel that crosses the proposed project site would be intercepted and redirected. The final drainage plan would be designed and permitted in consultation with the appropriate regulatory agencies (i.e. CDFW, RWQCB).

The excavation and grading phase would require numerous pieces of equipment, including dump trucks, excavators, front end loaders, bulldozers, and motor graders, and compaction rollers. An average of about 30 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Although most excavated material would remain on site, about six off-site haul truck round trips per day would be required to remove general debris during this phase. Approximately 25 construction personnel would be required throughout the excavation and grading phase, which is anticipated to take approximately 4 months to complete.

Sedimentation Plant Structures

The foundations for the sedimentation plant and ancillary facilities, as well as the walls for the plate settler sedimentation basins, the rapid mix coagulation/flocculation tanks, and the sludge processing facility would require substantial quantities of concrete. The total volume of concrete for the structures is estimated at approximately 30,000 CY, which would require a total of 3,000 concrete truck roundtrips over the 4 to 5 months of this phase of work. Along with the delivery of materials, such as reinforcing steel and form material, and the hauling of construction debris from the site, the peak number of daily off-site truck roundtrips would be about 48.

The primary pieces of on-site equipment required to complete the structures would be concrete pump trucks and a crawler crane. A peak of 9 pieces of equipment (including pickup trucks and water trucks) would be in operation daily for about 4 months. Approximately 25 construction personnel would be required throughout the structures phase, which is anticipated to take approximately 5 months to complete.



LEGEND

- LAA1
- LAA2
- State Water Project - East Branch
- Fairmont Reservoir Property Boundary
- Fairmont Reservoir #2 Modifications

0 800 1,600 Feet

SOURCE: LADWP, 2017; AECOM, 2018.

taha environmental planners

Fairmont Sedimentation Plant Project
Greenhouse Gas Emissions Impact Study

TAHA 2017-031

LADWP

FIGURE 2-6

PROPOSED STOCKPILE AREAS

Plant Equipment and Support Facilities

The final phase of the sedimentation plant construction involves the installation of the plant equipment and the construction and finishing of the support facilities. The equipment includes: flow meters, regulators, and screens at the intake facility; mechanical mixers and chemical feed apparatus at the rapid mix coagulation/flocculation tanks; plate settlers and mechanical sediment removal systems in the sedimentation basins; chemical feed apparatus, mechanical mixers, and centrifuge dewatering systems at the sludge processing facility; conveyance systems to transfer processed sludge to trucks at the truck staging area; and chemical storage tanks for coagulants and flocculants. Support facility construction would involve structural and architectural elements and exterior and interior finishing, including plant control rooms, laboratories, administrative space, security systems, and personnel support facilities. In addition, septic and potable water treatment systems would be constructed during this phase.

The delivery of materials and the hauling of construction debris would result in about 8 truck roundtrips through the plant equipment and support facilities phase. Equipment required would include a front end loader, crawler crane, backhoe, and forklifts. An average of about 12 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Approximately 20 construction personnel would be required throughout the phase, which is anticipated to take approximately 15 months to complete.

Project Operation

The proposed sedimentation plant would be sized to operate at a peak inflow of 720 cfs, which is the maximum combined flow of LAA1 and LAA2 based on the physical characteristics of the aqueducts. The plant would be designed to treat LAA influent water with sediment load derived from the last 10 years of available data. The addition of SWP East Branch water to LAA1 would not increase these concentration levels because the maximum anticipated concentration of sediment in the SWP East Branch is lower than that of the LAAs. The sedimentation plant as proposed would achieve a higher treatment standard than is currently achieved at CTP, even under the highly conservative design assumptions for influent quantity and quality.

Treatment Process

Water from LAA1 and LAA2, as well as water recycled from the sludge processing facility (see below), would enter the intake facility, where it would be metered to determine the hydraulic conditions and chemical dosing requirements for plant operations. The water would also pass through a coarse screen at the intake to remove algae and larger debris. From the intake facility, water would flow into the coagulation/flocculation tanks, where chemicals would be injected and mixed into the water by means of mechanical rapid mixers. This process would induce suspended particles to clump together into molecularly destabilized charged particles so they will more readily settle out in the sedimentation basins.

The water would then enter the sedimentation basins through inlet structures that could be independently opened or closed for each of the sedimentation basins. The number of basins that would be operated at a given time would be based on the quantity and quality of the influent raw water. The influent water would flow upward between the inclined settler plates, and based on the design velocity of the flow, the sediment would move downward on the surface of the plates and settle on the bottom of the basins, while the clarified water would continue to flow upward to collection channels. The effluent from the sedimentation basins would be discharged to a pipe and conveyed to the Fairmont Reservoir #2 inlet structure. The sediment that has accumulated on the bottom of the basins would be collected by means of a mechanical system and conveyed to the sludge processing facility.

The sludge collected from the basins would include a substantial mixture of sediment and water that must be further dewatered before the sludge could be transported off-site for disposal. The sludge would first flow to settling tanks, where coagulants would be injected and mixed with the sludge. The stabilized particles would settle to the bottom of the tank as thickened sludge, while the clear water lying above the solids layer would be recycled to the sedimentation plant intake facility. The thickened sludge would then enter a flow equalization basin(s) that would provide storage capacity to temporarily retain, as necessary, the sludge, which could then be released into the dewatering facility system at a controlled rate to help maintain a more uniform volume of influent. From the equalization basins, the thickened sludge would then be conveyed to a mechanical dewatering facility, where additional coagulants may be added to the solids and water would be separated from solids by mechanical means. The water would be recycled to the plant intake facility, and the residual sludge would be temporarily stored in a sludge hopper, from which it would be loaded onto trucks for transport offsite.

Plant Operation and Maintenance

The sedimentation plant would generally be in operations 24 hours per day, seven days per week, whenever the LAAs are flowing. The plant would require up to 10 personnel, who would be distributed between two to three shifts during a day. After commissioning of the sedimentation plant, CTP would be taken out of operation. However, the existing equipment would remain in place, and if circumstances required, it could be used to add coagulants and flocculants to LAA1 at CTP, as is currently done. Although both LAA1 and LAA2 would flow through Fairmont Reservoir #2 after completion of the sedimentation pant, the reservoir would continue to operate with approximately the same freeboard elevation as it currently does, providing storage and regulating flows to Power Plants #1 and #2.

Based on a flow of 320 cfs and turbidity of 14 Nephelometric Turbidity Units (NTU) averaged across the last 10 years of available LAA water quality data, approximately 144 wet tons of residual sludge would be processed on average each day. However, at peak flow and sediment concentration levels for the LAAs, approximately 346 wet tons of residual sludge would be processed in one day. Because arsenic, a naturally occurring trace element in LAA water, would be present in the sludge, it would be treated as California hazardous waste and disposed of at an approved hazardous waste landfill. Based on the average sludge production rate, it would require about 10 truck trips a day, Monday through Friday (typical landfill operating days), to transport about 200 tons of sludge. The sludge hopper at the plant would be sized to accommodate a minimum of 1 week of processed sludge to help maintain uniformity in the number of daily haul trucks trips.

Under emergency conditions when the Fairmont Sedimentation Plant must be shut down, the LAA1 and LAA2 isolation valves would be closed to shut off flow to the plant, and the double block and bleed bypass valves on the original aqueduct lines would be opened to allow water to flow through. As currently happens, LAA1 water would flow through Fairmont Reservoir #2, and LAA2 water would flow into the reservoir outlet pipeline downstream of the reservoir. If during the emergency shutdown it is determined, based on the concentrations of sediment in the LAA water or on the length of the shutdown, that the LAAFP cannot adequately treat the water, coagulants and flocculants would be added to LAA1 at CTP as described above, inducing sediment to settle out in North Haiwee Reservoir.

Scheduled maintenance of the plant would occur during lower-flow periods of the LAAs, generally between October 1 and March 31. During maintenance normal precipitation years, the LAA1 and LAA2 isolation valves would be closed to shut off flow to the plant, and the double block and bleed bypass valves on LAA1 and/or LAA2 would be opened to allow flows through to Elizabeth Tunnel and the LAAFP, which would have the capability to temporarily treat the relatively low volumes of water without pretreatment at the Fairmont Sedimentation Plant. During high precipitation years, the plant shutdown during maintenance would be similar, but greater control of flows from the various sources (i.e., LAA1, LAA2, and SWP East Branch) may be necessary, depending on the sediment load in each source.

3.0 GREENHOUSE GAS EMISSIONS

The purpose of this section is to discuss how the proposed project would affect regional GHG emissions. GHG emissions refer to airborne pollutants that are generally believed to affect global climate conditions. These pollutants have the effect of trapping heat in the atmosphere, thereby altering weather patterns and climatic conditions. This section of the report assesses the GHG emissions that would be generated by construction and future operation of the proposed project.

3.1 GREENHOUSE GASES CHARACTERISTICS AND EFFECTS

The standard definition of GHG includes six substances: carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulfur hexafluoride (SF_6).[1] Tropospheric O_3, a short-lived, not-well-mixed gas, and black carbon are also important climate pollutants. CO_2 is the most abundant GHG, and collectively CO_2, CH_4, and N_2O amount to 80 percent GHG effects.

CO_2, CH_4, and N_2O concentrations have increased in the atmosphere since pre-industrial times, and this increase is the main driver of climate change. Globally, CO_2 increased by 40 percent from 278 ppm circa 1750 to 390.5 ppm in 2011.[2] During the same time interval, CH_4 increased by 150 percent, from 722 parts per billion (ppb) to 1,803 ppb, and N_2O by 20 percent, from 271 ppb to 324.2 ppb in 2011. The increase of CO_2, CH_4, and N_2O is caused by anthropogenic emissions from the use of fossil fuel as a source of energy, fertilizer usage, and from land use and land use change—in particular, agriculture.

For each GHG, a global warming potential (GWP) has been calculated to reflect how long emissions remain in the atmosphere and how strongly energy is absorbed on a per-kilogram basis relative to CO_2. GWP is a metric that indicates the relative climate forcing of a kilogram of emissions when averaged over the period of interest (both 20-year and 100-year horizons are used for the GWPs shown in **Table 3-1**. To account for this higher potential, emissions of other GHGs are frequently expressed in the equivalent of CO_2, denoted as CO_2e. CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect.

TABLE 3-1: GLOBAL WARMING POTENTIAL FOR SELECTED GREENHOUSE GASES

Pollutant	Lifetime (Years)	Global Warming Potential (20-Year)	Global Warming Potential (100-Year)
Carbon Dioxide	100	1	1
Nitrous Oxide	121	264	265
Nitrogen Trifluoride	500	12,800	16,100
Sulfur Hexafluoride	3,200	17,500	23,500
Perfluorocarbons	3,000-50,000	5,000-8,000	7,000-11,000
Black Carbon	days to weeks	270-6,200	100-1,700
Methane	12	84	28
Hydrofluorocarbons	Uncertain	100-11,000	100-12,000

SOURCE: CARB, *First Update to the Climate Change Scoping Plan*, 2014.

[1] CARB, *First Update to the Climate Change Scoping Plan*, 2014.
[2] *Ibid*.

The primary effect of rising global concentrations of atmospheric GHG is a rise in the average global temperature of approximately 0.2 degrees Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling using emission rates shows that further warming is likely to occur given the expected rise in global atmospheric GHG concentrations from innumerable sources of GHG emissions worldwide, which would induce further changes in the global climate system during the current century.[3] Adverse impacts from global climate change worldwide and in California include:

- Declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in atmospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;[4]
- Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets;[5]
- Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;[6]
- Declining Sierra Mountains snowpack levels, which account for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years;[7]
- Increasing the number of days conducive to O_3 formation (e.g., clear days with intense sun light) by 25 to 85 percent (depending on the future temperature scenario) in high O_3 areas located in the Southern California area and the San Joaquin Valley by the end of the 21st Century;[8] and
- Increasing the potential for erosion of California's coastlines and seawater intrusion into the Sacramento Delta and associated levee systems due to the rise in sea level.[9]

Scientific understanding of the fundamental processes responsible for global climate change has improved over the past decade. However, there remain significant scientific uncertainties. For example, uncertainties exist in predictions of local effects of climate change, occurrence of extreme weather events, and effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the climate system, the uncertainty surrounding the implications of climate change may never be completely eliminated. Because of these uncertainties, there continues to be significant debate as to the extent to which increased concentrations of GHGs have caused or will cause climate change, and with respect to the appropriate actions to limit and/or respond to climate change. In addition, it may not be possible to link specific development projects to future specific climate change impacts, though estimating project-specific impacts is possible.

[3] USEPA, Draft Endangerment Finding, 74 Fed. Reg. 18886, 18904, April 24, 2009.
[4] *Ibid*.
[5] Intergovernmental Panel on Climate Change, *Climate Change,* 2007.
[6] *Ibid*.
[7] Cal/EPA, Climate Action Team, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.
[8] *Ibid*.
[9] *Ibid*.

3.2 REGULATORY SETTING

GHG emissions refer to a group of emissions that are generally believed to affect global climate conditions. Consequently, regulatory efforts have been implemented at the international, national, State, regional, and local levels to address the effects of GHG emissions, as discussed below.

International

U.S.–China Climate Agreement. In November 2014, the United States and China made a joint announcement to cooperate on combating climate change and promoting clean energy. In the United States, President Barack Obama announced a climate target to reduce GHG emissions by 26 to 28 percent below 2005 levels by 2025. In China, President Xi Jinping announced a climate target to reduce peak CO_2 emissions by 2030 and to increase the renewable energy share across all sectors to 20 percent by 2030. China will need to build an additional 800 to 1,000 gigawatts of nuclear, wind, solar, and other zero emission generation capacity by 2030 to reach this target. Together, the United States and China have agreed to: expand joint clean energy research and development at the U.S.-China Clean Energy Research Center (CERC), advance major carbon capture, use and storage demonstrations, enhance cooperation on HFCs, launch a climate-smart/low-carbon cities initiative, promote trade in green goods, and demonstrate clean energy on the ground.[10]

Paris United Nations Framework Convention on Climate Change. A new international climate change agreement was adopted at the Paris United Nations Framework Convention on Climate Change climate conference in December 2015. The last two climate conferences in Warsaw (2013) and Lima (2014) decided that countries were to submit their proposed emissions reduction targets for the 2015 conference as "intended nationally determined contributions" prior to the Paris conference. The European Union has committed to an economy-wide, domestic GHG reduction target of 40 percent below 1990 levels by 2030. The United States has set its intended nationally determined contribution to reduce its GHG emissions by 26 to 28 percent below its 2005 level in 2025 and to make best efforts to reduce its emissions by 28 percent. These targets are set with the goal of limiting global temperature rise to well below 2 degrees Celsius and getting to the 80 percent emission reduction by 2050.

North American Climate, Clean Energy, and Environment Partnership Action Plan. The North American Climate, Clean Energy, and Environment Partnership Action Plan were announced by Prime Minister Justin Trudeau, President Barack Obama, and President Enrique Peña Nieto on June 29, 2016, at the North American Leaders Summit in Ottawa, Canada.[11] This Action Plan identifies the deliverables to be achieved and activities to be pursued by the three countries as part of this enduring Partnership. The three leaders declared their common vision in a historic North American Climate, Clean Energy, and Environment Partnership, described in a Leaders' Statement and Action Plan that details the actions our leaders will pursue. These actions include:

- Setting a target to increase clean power to 50 percent of the electricity generated across North America by 2025.
- Reducing methane emissions from the oil and gas sector by 40 to 45 percent by 2025.

[10]The White House, *Fact Sheet: U.S.-China Joint Announcement on Climate Change and Clean Energy Cooperation*, November 11, 2014.
[11]The White House, *Fact Sheet: United States Key Deliverables for the 2016 North American Leaders' Summit*, June 29, 2016.

- Strengthening standards for energy efficiency and vehicle emissions, including aligning energy efficiency standards that will amount to over $4 billion per year in annual savings for United States businesses and consumers by 2025.
- Strengthening vehicle efficiency, improving fuel quality, and reducing tailpipe pollutants.
- Affirming their support for joining and implementing the Paris Agreement this year and committing to work together to address climate issues through the Montreal Protocol, International Civil Aviation Organization, G-20, and other forums.
- Celebrating our strong environmental cooperation, including expanding cooperation on early warning systems for natural disasters, supporting habitat for migratory species including Monarchs and birds, and developing action plans to combat wildlife trafficking.

Federal

In response to growing scientific and political concern regarding the environmental consequences of global climate change, a series of federal actions have been implemented to address GHG emissions at the national level. Several of the most pertinent regulatory efforts are discussed below.

Supreme Court Rulings*.* The U.S. Supreme Court ruled in *Massachusetts v. Environmental Protection Agency, 127 S. Ct. 1438* (2007) that CO_2 and other GHGs are pollutants under the CAA, which the USEPA must regulate if it determines they pose an endangerment to public health or welfare. On December 7, 2009, the USEPA Administrator made two distinct findings: 1) the current and projected concentrations of the six key GHGs in the atmosphere (i.e., CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threaten the public health and welfare of current and future generations; and 2) the combined emissions of these GHGs from motor vehicle engines contribute to GHG pollution which threatens public health and welfare.

On June 23, 2014, the U.S. Supreme Court ruled in *Utility Air Regulatory Group v. EPA* that the USEPA exceeded its statutory authority under the CAA when it determined that stationary source emissions of GHGs would trigger permitting obligations under the Prevention of Significant Deterioration (PSD) program and Title V of the CAA. The Court, however, upheld those portions of USEPA's rulemaking that require a source to apply best available control technology (BACT) to GHG emissions where the source would otherwise trigger PSD permitting on account of its emissions of other pollutants. The Supreme Court's decision was limited to USEPA's regulation of GHG emissions under the PSD and Title V provisions of the CAA, and it left unanswered other questions regarding USEPA's permitting and BACT authority under the PSD program, and the USEPA's efforts to regulate GHG emissions from stationary sources.

Federal Climate Action Plan. On June 25, 2013, President Barack Obama issued a Climate Action Plan. The three main goals are to cut carbon pollution, prepare the United States for the impacts of climate change, and lead international efforts to combat global climate change and prepare for its impacts. President Barack Obama plans to cut carbon pollution by directing the USEPA to complete carbon pollution standards in the power sector. This will reduce emissions from power plants and encourage renewable energy development. Other strategies to combat climate change are increasing energy efficiency, stricter vehicle and fuel standards, preserving forests to absorb carbon dioxide, reducing energy waste, combating short-lived climate pollutants, mobilizing climate finance, and leading international negotiations on climate change.

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 includes several key provisions that will increase energy efficiency and the availability of renewable energy, which will collectively reduce GHG emissions as a result. First, this act sets a Renewable

Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel by 2022.[12] Second, this act increases Corporate Average Fuel Economy Standards to require a minimum average fuel economy of 35 miles per gallon for the combined fleet of cars and light trucks by 2020. Third, this act includes a variety of new standards for lighting and for residential and commercial appliance equipment. The equipment includes residential refrigerators, freezers, refrigerator-freezers, metal halide lamps, and commercial walk-in coolers and freezers.

National Fuel Efficiency Policy. On May 19, 2009, President Barack Obama announced a new National Fuel Efficiency Policy aimed at increasing fuel economy and reducing GHG pollution.[13] This policy is expected to increase fuel economy by more than five percent by requiring a fleet-wide average of 35.5 miles per gallon by 2016 starting with model year 2012.

Fuel Economy Standards. On September 15, 2009, the USEPA and the Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA) issued a joint proposal to establish a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles that will reduce GHG emissions and improve fuel economy. The proposed standards would be phased in and would require passenger cars and light-duty trucks to comply with a declining emissions standard. In 2012, passenger cars and light-duty trucks would have to meet an average emissions standard of 295 grams of CO_2 per mile and 30.1 miles per gallon. By 2016, the vehicles would have to meet an average standard of 250 grams of CO_2 per mile and 35.5 miles per gallon.[14] The final standards were adopted by USEPA and DOT on April 1, 2010.

On December 7, 2009, the USEPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA (42 United States Code Section 7521):

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

While these findings do not impose additional requirements on industry or other entities, this action is a prerequisite to finalizing USEPA's proposed GHG emissions standards for light-duty vehicles, which were jointly proposed by USEPA and NHTSA.

Heavy-Duty Vehicle Program. The Heavy-Duty Vehicle Program was adopted on August 9, 2011 to establish the first fuel efficiency requirements for medium- and heavy-duty vehicles beginning with the model year 2014.

State

In response to growing scientific and political concern regarding the environmental consequences of global climate change, California has adopted a series of laws to reduce emissions of GHGs into the atmosphere. A brief discussion of applicable State regulations is provided below.

State CEQA Guidelines Section 15064.4. Requires that, in performing environmental review under CEQA, an agency should make a good-faith effort, based to the extent possible on scientific

[12] According to the United States Energy Information Administration, 36 billion gallons of fuel represents approximately 26 percent of current gasoline consumption.
[13] The White House, *Office of the Press Secretary*, http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/, May 19, 2009.
[14] USEPA, *EPA and NHTSA Propose Historic Nation Program*, 2009.

and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a project. The lead agency has discretion to determine whether to use a model or methodology to quantify GHG emissions, and which model or methodology to use, or rely on a qualitative analysis or performance-based standards. The lead agency should consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment.

- The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting.
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

Assembly Bill 1493 (Pavley I). AB 1493 (referred to as Pavley I), adopted in 2002, required the CARB to develop and adopt standards for vehicle manufacturers to reduce GHG emissions coming from passenger vehicles and light-duty trucks at a "maximum feasible and cost effective reduction" by January 1, 2005. Pavley I took effect for model years starting in 2009 and extending to 2016 and the Low Emission Vehicle (LEV) III GHG will cover 2017 to 2025. It is estimated that the standard will reduce climate change emissions from the vehicle fleet by 30 percent in 2016 compared to the emissions in the same year without the standards.[15]

Senate Bill 1078 (SB 1078), Senate Bill 107 (SB 107), and Executive Order (E.O.) S-14-08 (Renewables Portfolio Standard). Signed on September 12, 2002, SB 1078 required California to generate 20 percent of its electricity from renewable energy by 2017. SB 107, signed on September 26, 2006 changed the due date for this goal from 2017 to 2010, which was achieved by the State. On November 17, 2008, E.O. S-14-08, which established a Renewables Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. Increased use of renewable energy sources will decrease California's reliance on fossil fuels, reducing emissions of GHG from the energy sector.

Executive Order (E.O.) S-3-05. On June 1, 2005, E.O. S-3-05 set the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

E.O. S-3-05 calls for the Secretary of California Environmental Protection Agency (Cal-EPA) to be responsible for coordination of state agencies and progress reporting. A recent California Energy Commission report concludes, however, that the primary strategies to achieve this target should be major "decarbonization" of electricity supplies and fuels, and major improvements in energy efficiency.[16]

In response to the E.O. S-3-05, the Secretary of the Cal-EPA created the Climate Action Team (CAT). California's CAT originated as a coordinating council and included the Secretaries of the Natural Resources Agency, and the Department of Food and Agriculture, and the Chairs of the CARB, Energy Commission, and Public Utilities Commission. The original council was an informal

[15]CARB, *Clean Air Standards - Pavley, Assembly Bill 1493*, May 6, 2013.
[16]California Energy Commission, *California's Energy Future – The View to 2050*, May 2011.

collaboration between the agencies to develop potential mechanisms for reductions in GHG emissions in the State of California.

The original mandate for the CAT was to develop proposed measures to meet the emission reduction targets set forth in E.O. S-3-05. The CAT has since expanded and currently has members from 18 state agencies and departments. The CAT also has ten working groups which coordinate policies among their members. The working groups and their major areas of focus are:

- Agriculture: Focusing on opportunities for agriculture to reduce GHG emissions through efficiency improvements and alternative energy projects, while adapting agricultural systems to climate change;
- Biodiversity: Designing policies to protect species and natural habitats from the effects of climate change;
- Energy: Reducing GHG emissions through extensive energy efficiency policies and renewable energy generation;
- Forestry: Coupling GHG mitigation efforts with climate change adaptation related to forest preservation and resilience, waste to energy programs and forest offset protocols;
- Land Use and Infrastructure: Linking land use and infrastructure planning to efforts to reduce GHG from vehicles and adaptation to changing climatic conditions;
- Oceans and Coastal: Evaluating the effects of sea level rise and changes in coastal storm patterns on human and natural systems in California;
- Public Health: Evaluating the effects of GHG mitigation policies on public health and adapting public health systems to cope with changing climatic conditions;
- Research: Coordinating research concerning impacts of and responses to climate change in California;
- State Government: Evaluating and implementing strategies to reduce GHG emissions resulting from State government operations; and
- Water: Reducing GHG impacts associated with the State's water systems and exploring strategies to protect water distribution and flood protection infrastructure.

The CAT is responsible for preparing reports that summarize the State's progress in reducing GHG emissions. The most recent CAT Report was published in December 2010. The CAT Report discusses mitigation and adaptation strategies, State research programs, policy development, and future efforts.

Assembly Bill 32 (AB 32). In September 2006, the California Global Warming Solutions Act of 2006, also known as AB 32, was signed into law. AB 32 focuses on reducing GHG emissions in California, and requires CARB to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020. CARB initially determined that the total statewide aggregated GHG 1990 emissions level and 2020 emissions limit was 427 million metric tons of CO_2e. The 2020 target reduction was estimated to be 174 million metric tons of CO_2e.

To achieve the goal, AB 32 mandates that CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce statewide GHG emissions from stationary sources, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved. Because the intent of AB 32 is to limit 2020 emissions to the equivalent of 1990, it is expected that the regulations would affect many existing sources of GHG emissions and not just new general development projects. SB 1368, a companion bill to AB 32, requires the

California Public Utilities Commission (CPUC) and the CEC to establish GHG emission performance standards for the generation of electricity. These standards will also apply to power that is generated outside of California and imported into the State.

AB 32 charges CARB with the responsibility to monitor and regulate sources of GHG emissions in order to reduce those emissions. On June 1, 2007, CARB adopted three discrete early action measures to reduce GHG emissions. These measures involved complying with a low carbon fuel standard, reducing refrigerant loss from motor vehicle air conditioning maintenance, and increasing methane capture from landfills.[17] On October 25, 2007, CARB tripled the set of previously approved early action measures. The approved measures include improving truck efficiency (i.e., reducing aerodynamic drag), electrifying port equipment, reducing PFCs emissions from the semiconductor industry, reducing propellants in consumer products, promoting proper tire inflation in vehicles, and reducing SF_6 emissions from the non-electricity sector.

The CARB AB 32 Scoping Plan (Scoping Plan) contains the main strategies to achieve the 2020 emissions cap. The Scoping Plan was developed by CARB with input from CAT and proposes a comprehensive set of actions designed to reduce overall carbon emissions in California, improve the environment, reduce oil dependency, diversify energy sources, and enhance public health while creating new jobs and improving the State economy. The GHG reduction strategies contained in the Scoping Plan include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. Key approaches for reducing GHG emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewable electricity standard of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout the State, and pursuing policies and incentives to achieve those targets; and
- Adopting and implementing measures to reduce transportation sector emissions.

The CARB has adopted the First Update to the AB 32 Scoping Plan.[18] This Update identifies the next steps for California's leadership on climate change. The First Update to the initial AB 32 Scoping Plan describes progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities for the next several years. It also frames activities and issues facing the State as it develops an integrated framework for achieving both air quality and climate goals in California beyond 2020. Specifically, the Update covers a range of topics:

- An update of the latest scientific findings related to climate change and its impacts, including short-lived climate pollutants.
- A review of progress-to-date, including an update of Scoping Plan measures and other State, federal, and local efforts to reduce GHG emissions in California.
- Potential technologically feasible and cost-effective actions to further reduce GHG emissions by 2020.

[17] CARB, *Proposed Early Action Measures to Mitigate Climate Change in California*, April 20, 2007.
[18] CARB, *First Update to the Climate Change Scoping Plan*, May 2014.

- Recommendations for establishing a mid-term emission limit that aligns with the State's long-term goal of emissions reaching 80 percent below 1990 levels by 2050.
- Sector-specific discussions covering issues, technologies, needs, and ongoing State activities to significantly reduce emissions throughout California's economy through 2050.

As discussed above, in December 2007, CARB approved a total statewide GHG 1990 emissions level and 2020 emissions limit of 427 million metric tons of CO_2e. As part of the Update, CARB revised the 2020 statewide limit to 431 million metric tons of CO_2e, an approximately one percent increase from the original estimate. The revised estimate includes incorporation of the Pavley standards in the business-as-usual (BAU) forecast. The 2020 BAU forecast in the Update is 509 million metric tons of CO_2e. The State would need to reduce those emissions by 15 percent to meet the 431 million metric tons of CO_2e 2020 limit.

Executive Order (E.O.) S-1-07, the Low Carbon Fuel Standard. On January 18, 2007, E.O. S-1-07 was issued requiring a reduction of at least ten percent in the carbon intensity of California's transportation fuels by 2020. Regulatory proceedings and implementation of the Low Carbon Fuel Standard are CARB's responsibility. The Low Carbon Fuel Standard has been identified by CARB as a discrete early action item in the CARB Scoping Plan. CARB expects the Low Carbon Fuel Standard to achieve the minimum ten percent reduction goal; however, many of the early action items outlined in the Scoping Plan work in tandem with one another. To avoid the potential for double-counting emission reductions associated with AB 1493 (see previous discussion), the Scoping Plan has modified the aggregate reduction expected from the Low Carbon Fuel Standard to 9.1 percent.

Senate Bill 375 (SB 375). SB 375, adopted in September 30, 2008, provides a means for achieving AB 32 goals through the reduction in emissions by cars and light trucks. SB 375 requires Regional Transportation Plans (RTPs) prepared by Metropolitan Planning Organizations (MPOs) to include Sustainable Communities Strategies (SCSs). In adopting SB 375, the Legislature found that improved coordination between land use planning and transportation planning is needed in order to achieve the GHG emissions reduction target of AB 32. Further, the staff analysis for the bill prepared for the Senate Transportation and Housing Committee's August 29, 2008 hearing on SB 375 began with the following statement: "According to the author, this bill will help implement AB 32 by aligning planning for housing, land use, transportation and greenhouse gas emissions for the 17 MPOs in the State." Under the Sustainable Communities Act, CARB sets regional targets for GHG emissions reductions from passenger vehicle use. CARB has set the following reduction targets for SCAG: reduce per capita 8 percent of GHG emissions below 2005 levels by 2020 and 13 percent below 2005 levels by 2035.

Senate Bill 743 (SB 743). SB 743, adopted September 27, 2013, encourages land use and transportation planning decisions and investments that reduce vehicle miles traveled (VMT), which contribute to GHG emissions, as required by AB 32. Key provisions of SB 743 include reforming aesthetics and parking CEQA analysis for certain urban infill projects and eliminating the measurement of auto delay, including Level of Service (LOS), as a metric that can be used for measuring traffic impacts in transit priority areas. SB 743 requires the Governor's Office of Planning and Research (OPR) to develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects within transit priority areas that promote the "…reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." It also allows OPR to develop alternative metrics outside of transit priority areas.

Executive Order (E.O.) B-30-15. On April 29, 2015, Governor Brown issued E.O. B-30-15, stating a new statewide policy goal to reduce GHG emissions 40 percent below their 1990 levels by 2030.

The E.O. establishes GHG emissions reduction targets to reduce emissions to 80 percent below 1990 levels by 2050 and sets an interim target of emissions reductions for 2030 as being necessary to guide regulatory policy and investments in California and put California on the most cost-effective path for long-term emissions reductions. The E.O. orders "all State agencies with jurisdiction over sources of [GHG] emissions [to] ... implement measures, pursuant to statutory authority, to achieve reductions of [GHG] emissions to meet the 2030 and 2050 [GHG] emissions reductions targets." It directs CARB to "update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent."

It also directs the Natural Resources Agency to update "Safeguarding California" (the State's climate adaptation strategy) every three years, as specified; directs State agencies to "take climate change into account in their planning and investment decisions, and employ full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives;" and orders the "State's Five-Year Infrastructure Plan [to] take current and future climate change impacts into account in all infrastructure projects." Among its other directives, the E.O. states that "State agencies' planning and investment shall be guided by the... principle that priority should be given to actions that both build climate preparedness and reduce GHG emissions."

Senate Bill 32 (SB 32). On September 8, 2016, California signed into law SB 32, which adds Section 38566 to the Health and Safety Code and requires a commitment to reducing statewide GHG emissions by 2020 to 1990 levels and by 2030 to 40 percent less than 1990 levels. SB 32 was passed with companion legislation AB 197, which provides additional direction for developing the Scoping Plan. Recently, CARB released the proposed 2017 Climate Change Scoping Plan Update (proposed 2017 Update), which outlines the proposed framework of action for achieving California's new SB 32 2030 GHG target: a 40 percent reduction in GHG emissions by 2030 relative to 1990 levels.[19] The 2030 target is intended to ensure that California remains on track to achieve the goal set forth by E.O. B-30-15 to reduce statewide GHG emissions by 2050 to 80 percent below 1990 levels. The proposed 2017 Update identifies key sectors of the implementation strategy, which includes improvements in low carbon energy, industry, transportation sustainability, natural and working lands, waste management, and water.

Through a combination of data synthesis and modeling, CARB determined that the target statewide 2030 emissions limit is 260 MMTCO2e, and that further commitments will need to be made to achieve an additional reduction of 50 MMTCO2e beyond current policies and programs. Key elements of the proposed 2017 Update include a proposed 20 percent reduction in GHG emissions from refineries and an expansion of the Cap-and-Trade program to meet the aggressive 2030 GHG emissions goal and ensure achievement of the 2050 limit set forth by E.O. B-30-15. The proposed 2017 Update indicates that stronger SB 375 reduction targets are needed to meet the State's 2030 and 2050 goals and that, "[m]ore needs to be done to fully exploit synergies with emerging mobility solutions like ridesourcing and more effective infrastructure planning to anticipate and guide the necessary changes in travel behavior, especially among millennials. Stronger SB 375 reduction targets will likely encourage further densification around transit infrastructure.

Regional

In addition to federal and statewide efforts to minimize the environmental consequences of climate change by reducing GHG emissions, regional strategies have also been adopted to expand upon the greater regulatory framework and assess opportunities for reducing emissions on a smaller scale.

[19] CARB, *The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target*, January 20, 2017.

Southern California Association of Governments (SCAG) *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)*. While Southern California is a leader in reducing emissions—and ambient levels of air pollutants are improving—the SCAG region continues to have the worst air quality in the nation. SCAG is the MPO for the six-county region that includes Los Angeles, Orange, Riverside, Ventura, San Bernardino and Imperial counties. The 2016–2040 RTP/SCS includes commitments to reduce emissions from transportation sources to comply with SB 375. Goals and policies included in the 2016–2040 RTP/SCS to reduce air pollution consist of adding density in proximity to transit stations, mixed-use development and encouraging active transportation (i.e., non-motorized transportation such as bicycling).

SB 375 requires CARB to develop regional CO_2 emission reduction targets, compared to 2005 emissions, for cars and light trucks only for 2020 and 2035 for each MPO. Each MPO is to prepare an SCS as part of the RTP in order to reduce CO_2 by better aligning transportation, land use, and housing. For SCAG, the targets are to reduce per capita emissions 8 percent below 2005 levels by 2020 and 13 percent below 2005 levels by 2035.[20] The 2016–2040 RTP/SCS states that the region will meet or exceed the SB 375 per capita targets, lowering regional per capita GHG emissions (below 2005 levels) by eight percent by 2020 and 18 percent by 2035. The 2016–2040 RTP/SCS also states that regional 2040 per capita emissions would be reduced by 22 percent, although CARB has not established a 2040 per capita emissions target.

California Air Pollution Control Officers Association (CAPCOA) *CEQA & Climate Change*. CAPCOA is a non-profit association of the air pollution control officers from all 35 local air quality agencies throughout California. CAPCOA promotes unity and efficiency in state air quality issues, and strives to encourage consistency in methods and practices of air pollution control. In 2008, CAPCOA published the CEQA & Climate Change white paper.[21] This paper is intended to serve as a resource for reviewing GHG emissions from projects under CEQA. It considers the application of thresholds and offers approaches toward determining whether GHG emissions are significant. The paper also evaluates tools and methodologies for estimating impacts, and summarizes mitigation measures.

***AVAQMD CEQA and Federal Conformity Guidelines*.** The AVAQMD Planning, Rule-making and Grants Section published its *CEQA and Federal Conformity Guidelines* to assist preparation of environmental analysis and review documents for individual projects within the AVAQMD jurisdiction, which spans the Antelope Valley region of the Mojave Desert Air Basin (MDAB).[22] Due to the regionally cumulative nature of GHG emissions and their effects on climate change, regulatory agencies in California have implemented and adopted various methods for assessing the potential significance of GHG emissions under CEQA based on regional- and municipality-scale GHG emission inventories and feasibly available control strategies. The AVAQMD officially promulgated quantitative CEQA significance thresholds for GHG emissions.

3.3 EXISTING ENVIRONMENTAL CONDITIONS

The CARB has prepared a statewide emissions inventory covering 2000 to 2014, which concluded that GHG emissions have decreased by 7.9 percent over that period.[23] Emissions in 2014 from the transportation sector, which represents California's largest source of GHG emissions and contributed 37 percent of total annual emissions, declined marginally relative to 2011 even while

[20] SCAG, *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy*, April 2016.
[21] CAPCOA, *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*, January 2008.
[22] AVAQMD, *CEQA and Federal Conformity Guidelines*, August 2016.
[23] CARB, *California Greenhouse Gas Inventory 2000-2014*, March 30, 2016.

the economy and population continued to grow over that three year time period.[24] The long term direction of transportation-related GHG emissions is another clear trend, with a 13 percent drop over the past ten years.

Table 3-2 shows GHG emissions from 2005 to 2014 in California. Statewide, mobile vehicular sources account for approximately 36 percent of GHG emissions as of 2014. Direct stationary sources of emissions include solid waste decomposition, haul trucks, and the use of refrigerant compounds. The emissions in 2011 are the lowest of the 12-year period between 2000 and 2011, while 2004 had the highest emissions with 495 MMTCO$_2$e. Between 2000 and 2011, California's population grew by 10.5 percent. As a result, California's per capita GHG emissions decreased by 11.9 percent over that same period. Emissions in 2014 were of similar magnitude to those in 2011.[25]

TABLE 3-2: CALIFORNIA GREENHOUSE GAS EMISSIONS INVENTORY

	CO_2e Emissions (Million Metric Tons)									
Sector	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Transportation	184	184	184	173	166	163	159	159	158	160
Industrial	95	93	90	90	88	91	91	91	93	93
Electric Power	108	105	114	120	101	90	88	95	90	88
Commercial and Residential	42	43	43	43	44	45	45	43	43	38
Agriculture	34	36	36	36	34	35	36	37	35	36
High Global Warming Potential	8	8	9	10	11	12	14	15	16	17
Recycling and Waste	8	8	8	8	8	9	9	9	9	9
Emissions Total	**479**	**477**	**484**	**480**	**452**	**445**	**442**	**449**	**444**	**441**

SOURCE: CARB, *California Greenhouse Gas Inventory 2000-2014*, October 18, 2016.

3.4 METHODOLOGY AND SIGNIFICANCE CRITERIA

3.4.1 Methodology

This subsection of the report describes the methodology employed to calculate GHG emissions that would result from construction activity and future operation of the proposed project.

Construction*.* During construction activities, GHG emissions would be generated by the use of heavy duty off-road construction equipment and vehicle trips to and from the project site (i.e., construction workers and material transport trucks). GHG emissions that will be generated by construction of the proposed project were estimated using OFFROAD2011 emission factors for construction equipment exhaust and EMFAC2014 emission factors for vehicle trip emissions in accordance with statewide guidance promulgated by the CARB. Sources of GHG emissions during project construction will include heavy-duty off-road diesel equipment and vehicular travel to and from the project site. Emissions were quantified for each unique combination of anticipated equipment and vehicle trips throughout the duration of proposed project construction.

As discussed in Section 2.0, construction of the proposed project is anticipated to begin in early 2020 and last for approximately 42 months. Construction will involve a total of eight individual activities—as outlined in detail in Section 2.0—each requiring a specific equipment inventory, number of workers, and number of daily haul truck trips for transporting materials.

[24]CARB, *California Greenhouse Gas Inventory 2000-2014*, March 30, 2016.
[25]CARB, *First Update to the Climate Change Scoping Plan*, 2014.

Table 3-3 presents a summary of the schedule of activities. As shown in **Table 3-3**, some activities overlap (LAAs Realignment and Reservoir Demolition) and other activities span multiple years. In order to most effectively characterize emissions that would be generated by construction of the proposed project, the schedule was divided into 11 scenarios that represent unique combinations of equipment inventories, workers, and haul trips that are specific to a given year. The scenario numbers can be found in the first column of **Table 3-3**. Detailed equipment, worker, and haul trip inventories can be found in the technical Appendix.

TABLE 3-3: PROJECT CONSTRUCTION SCHEDULE SUMMARY

Phase	Year	Activity Description	Duration (Days)	Pieces of Equipment	Number of Workers	Daily Haul Truck Trips
1	2020	Access Road Paving	60	9	15	26
2	2020	Site Mobilization	40	6	10	4
3	2020	LAAs Realignment	100	22	25	32
4	2021	LAAs Realignment + Reservoir Demo	60	32	45	118
5	2021	LAAs Realignment + Reservoir Demo	80	29	75	96
6	2021	Plant Excavation & Grading	80	30	25	12
7	2021	Plant Structural	20	7	25	20
8	2022	Plant Structural	80	9	25	96
9	2022	Plant Construction & Finishing	160	12	20	16
10	2023	Plant Construction & Finishing	140	12	20	16
11	2023	Demobilization	20	6	10	4

SOURCE: TAHA, 2017.

The OFFROAD2011 diesel equipment emissions model contains emission factors for CO_2 and CH_4 that are expressed in terms of grams of GHG emitted per brake-horsepower per hour of use (g/bhp-hr). Conservatively assuming that each piece of heavy duty equipment would be operated for the maximum eight hours per day, daily GHG emissions expressed in metric tons of CO_2e per day ($MTCO_2e$/day) from construction equipment exhaust were estimated using the following equation; where GWP is the global warming potential, HP is the average horsepower of the type of equipment and LF is the load factor (ratio of actual output to the maximum output of a piece of equipment), default values were obtained from CARB OFFROAD2011:

$$E\left(\frac{lb\ CO_2e}{day}\right) = EF\left(\frac{g}{bhp-hr}\right) \times HP \times Usage\left(\frac{hr}{day}\right) \times LF \times \left(\frac{1\ lb}{453.592\ g}\right) \times GWP$$

The CalEEMod technical appendix included average horsepower and load factors for each type of equipment identified by the project team. Detailed construction equipment inventory information, OFFROAD2011 emission rates, and emission calculations can be found in the Appendix.

In addition to equipment exhaust, vehicle trips to and from the project site would constitute mobile sources of GHG emissions. Daily vehicle trips for construction workers, material delivery, and hauling of displaced material to a disposal site were provided by the project team for each phase of construction. Emissions were quantified using vehicle trip data provided by the project team, regionally-specific trip length data extracted from CalEEMod, and emission rates obtained from the CARB EMFAC2014 mobile source emissions model. The EMFAC2014 model database contains emission rates for various processes associated with on-road vehicle operations.

Emission rates for running exhaust (CO_2, CH_4) and were obtained from the EMFAC2014 model to estimate daily emissions from vehicle travel associated with construction of the proposed project.

The EMFAC2014 emission rates are expressed in terms of grams of pollutant emitted per vehicle mile traveled (VMT). The following equation was used to calculate daily GHG emissions (pounds CO_2e/day) associated with exhaust from vehicle trips, where GWP is the global warming potential:

$$E\left(\frac{lb\ CO_2e}{day}\right) = EF\left(\frac{g}{mile}\right) \times \left(\frac{miles}{trip}\right) \times \left(\frac{trips}{day}\right) \times \left(\frac{1\ lb}{453.592\ g}\right) \times GWP$$

For each phase of construction activity, daily air pollutant emissions were quantified by the sum of emissions from equipment exhaust and vehicle trips. Detailed emissions calculations can be found in the Appendix.

Operation. Operation of the proposed project would generate direct GHG emissions through haul truck trips transporting sludge effluent from the sedimentation plant to an offsite disposal facility and indirect GHG emissions through electricity generation to power the centrifuge and conveyor components of the plant. Mobile source GHG emissions resulting from operational haul truck trips were estimated using EMFAC2014 emission factors for heavy duty trucks and the equation presented above. It was determined that approximately 10 truck trips worth of sludge would be transported daily, and as a conservative approach it was assumed that all haul trips would terminate at the hazardous waste disposal facility near Beatty, Nevada approximately 230 miles from the project site. Detailed operational mobile source emissions calculations can be found in the Appendix.

Indirect GHG emissions resulting from electricity generation were quantified using methodologies described in the CalEEMod technical appendix and energy demand data for the proposed project provided by LADWP.[26] Electricity generation at power plants results in GHG emissions that, although not directly associated with operations at the site of proposed project, are released to the atmosphere in order to deliver electricity to the proposed project. Through a statewide survey of power generation sources, CAPCOA assembled an inventory of GHG emission factors based on utility provider. The proposed project would be provided electricity by Southern California Edison. GHG emissions that would result from electricity generation to power the proposed project were estimated using the following equation, where the *EF* for Southern California Edison is 0.705 pounds CO_2e per kilowatt-hour (kWh):

$$E\left(\frac{lb\ CO_2e}{day}\right) = EF\left(\frac{lb\ CO_2e}{kWh}\right) \times \left(\frac{kWh}{day}\right)$$

Detailed GHG emissions calculations can be found in the technical Appendix.

3.4.2 CEQA Significance Criteria

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would have a significant impact related to GHG if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; and/or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

The CEQA Guidelines require lead agencies to adopt thresholds of significance for GHG emissions. When adopting these thresholds, the amended Guideline allows lead agencies to

[26] CAPCOA, *CalEEMod User's Guide Appendix A Calculation Details*, September 2016.

consider thresholds of significance adopted or recommended by other public agencies, or recommended by experts, provided that the thresholds are supported by substantial evidence, and/or to develop their own significance threshold.

The AVAQMD has promulgated its own quantitative CEQA significance thresholds for GHG emissions generated by projects within its jurisdiction. The proposed project could potentially result in a significant environmental impact related to GHG emissions if construction or operation of the proposed project resulted in daily GHG emissions equal to or exceeding 548,000 pounds CO_2e or annual GHG emissions equal to or exceeding 100,000 tons CO_2e. If daily or annual emissions exceed respective thresholds of significance, further demonstration of consistency with State and regional GHG emissions reduction plans would be warranted to determine the severity of impacts.

3.5 ENVIRONMENTAL IMPACTS

3.5.1 Would the proposed project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment? (*Less-than-Significant Impact*)

Construction. The AVAQMD *CEQA and Federal Conformity Guidelines* include daily and annual quantitative thresholds of significance for GHG emissions generated by individual projects within Antelope Valley. The quantitative thresholds were derived to ensure that individual projects generating less than the daily and annual mass values would not have a directly or indirectly significant influence on the regional GHG emissions inventory and would not interfere with plans and policies aimed at reducing GHG emissions. It is very unlikely that any individual development project would generate GHG emissions of a sufficient magnitude to directly impact regional climate change unless it were an industrial use of large scale or a land use that would generate a disproportionately high number of vehicle trips; therefore there would be no direct GHG emissions impact resulting from implementation of the proposed sedimentation plant project and any impact would be considered on an indirect or cumulative basis.

Table 3-4 displays the results of the GHG emissions analysis for heavy duty construction equipment and vehicle trips. Daily emissions modeling conservatively assumed that all construction equipment would operate for the entire eight-hour workday. Annual emissions were estimated by multiplying the daily emissions for each phase described in **Table 3-3** by the phase length in days, and then summing across phases which were anticipated to occur within the same year.

TABLE 3-4: ESTIMATED GREENHOUSE GAS EMISSIONS – PROPOSED PROJECT CONSTRUCTION

Source Category	Maximum Daily Emissions (pounds CO_2e per day)	Maximum Annual Emissions (tons CO_2e per year)
Construction Equipment (2021)	7,860	817
Vehicle Trips (2021)	11,116	916
Total	**18,976**	**1,733**
AVAQMD Threshold Value	548,000	100,000
Exceeds AVAQMD Threshold Value?	**No**	**No**

SOURCE: TAHA, 2017.

As shown in **Table 3-4**, maximum daily and annual GHG emissions resulting from construction of the proposed project would remain substantially below the respective applicable AVAQMD significance threshold values, representing only 3.5 percent of the AVAQMD allowable limits. Furthermore, all heavy duty construction equipment and diesel haul trucks would be operated in accordance with existing CARB and AVAQMD Rules and Regulations. Construction of the proposed project would not generate GHG emissions of sufficient magnitude to have a significant impact on the environment. The impact would be less than significant and no mitigation is required.

Operation. Sources of GHG emissions that would be associated with operation of the proposed project include approximately 20 daily one-way haul truck trips disposing of sludge effluent from the sedimentation plant and the provision of electricity by Southern California Edison. It was conservatively assumed that all haul truck trips would originate at the project site and terminate at the hazardous waste disposal facility near Beatty, Nevada, located approximately 230 miles from the project site. As stated previously, the GHG emission intensity factor for provision of electricity by Southern California Edison is 0.705 lb CO_2e per kilowatt-hour (kWh). The LADWP determined that the proposed project would require approximately 9,377,471 kWh annually, or approximately 25,692 kWh daily. **Table 3-5** presents the results of the operational GHG emissions analysis.

TABLE 3-5: ESTIMATED GREENHOUSE GAS EMISSIONS – PROPOSED PROJECT OPERATION		
Source Category	**Daily Emissions (pounds CO_2e per day)**	**Annual Emissions (tons CO_2e per year)**
Vehicle Trips	15,065	1,883
Electricity Provision	18,113	3,306
Total	**33,178**	**5,189**
AVAQMD Threshold Value	548,000	100,000
Exceeds AVAQMD Threshold Value?	**No**	**No**
SOURCE: TAHA, 2017.		

As shown in **Table 3-5**, maximum daily and annual GHG emissions that would be generated by operation of the proposed project would be substantially below the applicable AVAQMD significance thresholds, representing only6 percent of the allowable daily limit and only 5 percent of the annual limit. Based on the results of the operational GHG emissions analysis, the proposed project would not generate direct or indirect GHG emissions that would have a significant impact on the environment; impacts would be less than significant under this criterion and no mitigation is required.

3.5.2 Would the proposed project or its alternatives conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs? (*Less-than-Significant Impact*)

Construction. As discussed previously, GHG emissions are regionally cumulative in nature and it is highly unlikely construction of any individual project would generate GHG emissions of sufficient quantity to conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Standard construction procedures would be undertaken in accordance with AVAQMD and CARB regulations applicable to heavy duty construction equipment and diesel haul trucks. Adhering to requirements pertinent to construction equipment maintenance and inspections and emissions standards, as well as diesel fleet requirements including idling time restrictions and maintenance, would ensure that construction of the proposed project would not conflict with GHG emissions reductions efforts. Furthermore, maximum daily and annual GHG emissions would remain substantially below the allowable limits set forth by the AVAQMD. Impacts would be less than significant and no mitigation is required.

Operation. As discussed previously, GHG emissions are regionally cumulative in nature and it is highly unlikely that any individual project would generate GHG emissions of sufficient quantity to conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions unless it resulted in disproportionate growth or vehicle trips beyond the assumptions incorporated into the regional transportation and sustainability planning efforts. Adhering to requirements pertinent to haul truck and facility maintenance and inspections and emissions standards, as well as diesel fleet requirements including idling time restrictions and maintenance, would ensure that operation of the proposed project would not conflict with GHG emissions reductions efforts. Furthermore, maximum daily and annual GHG emissions would remain substantially below the allowable limits set forth by the AVAQMD. Impacts would be less than significant and no mitigation is required.

3.6 ASSESSMENT OF CUMULATIVE IMPACTS

Refer to **Criterion 3.5-2**, above, for a discussion of the cumulative impacts. GHG emissions are regionally cumulative in nature, and it is highly unlikely that any individual development project would result in cumulatively considerable increases in GHG emissions. There would be minimal long-term sources of direct GHG emissions associated with implementation of the proposed project, as haul truck trips would be limited to approximately 10 round trips per day to dispose of sedimentation plant sludge effluent. Compliance with requirements set forth by the AVAQMD and the CARB would ensure that off-road equipment and on-road diesel trucks are consistent with efforts to reduce GHG emissions in the long run from heavy duty equipment and diesel trucks. The State of California has taken aggressive measures to reduce the statewide GHG emissions inventory by implementing programs and policies that address a wide variety of emissions sectors, and GHG emissions resulting from haul truck activity and electricity provision associated with the proposed project are likely to decrease in the future as cleaner technologies become more feasibly employed.

4.0 REFERENCES

Antelope Valley Air Quality Management District, *CEQA and Federal Conformity Guidelines*, August 2016.

California Air Pollution Control Officers Association, *California Emissions Estimator Model (CalEEMod v2016.3.1) User's Guide*, September 2016.

California Air Pollution Control Officers Association, *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions Subject to the California Environmental Quality Act*, January 2008.

California Air Resources Board, *California Greenhouse Gas Inventory 2000-2014*, March 30, 2016.

California Air Resources Board, *Clean Air Standards - Pavley, Assembly Bill 1493,* May 6, 2013.

California Air Resources Board, *First Update to the Climate Change Scoping Plan*, May 2014.

California Air Resources Board, *Proposed Early Action Measures to Mitigate Climate Change in California*, April 20, 2007.

California Air Resources Board, *The 2017 Climate Change Scoping Plan Update: The proposed Strategy for Achieving California's 2030 Greenhouse Gas Target*, January 20, 2017.

California Energy Commission, *California's Energy Efficiency Standards for Residential and Nonresidential Buildings, Title 24, Part 6, of the California Code of Regulations*, June 2015.

California Energy Commission, *California's Energy Future – The View to 2050*, May 2011.

California Environmental Protection Agency, *Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature*, 2006.

Southern California Association of Governments, *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy*, April 2016.

The White House, *Fact Sheet: U.S.-China Joint Announcement on Climate Change and Clean Energy Cooperation*, November 11, 2014.

The White House, *Fact Sheet: United States Key Deliverables for the 2016 North American Leaders' Summit*, June 29, 2016.

The White House, Office of the Press Secretary, http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/, May 19, 2009.

United States Environmental Protection Agency, *Draft Endangerment Finding, 74 Fed. Reg. 18886, 18904*, April 24, 2009.

United States Environmental Protection Agency, *EPA and NHTSA Propose Historic Nation Program*, 2009.

APPENDIX

Greenhouse Gas Emissions Calculations

GHG Emissions Calculations

Construction

Equipment			Emissions (lb/day)			Emissions (ton CO2e/phase)		
SCEN	Year	CO2	CH4	CO2e (lb/day)	CO2	CH4	Sum	
1	2020	2014.787	0.652	2033.049	60.444	0.548	60.991	
2	2020	1105.279	0.358	1115.301	22.106	0.200	22.306	
3	2020	5251.378	1.702	5299.025	262.569	2.382	264.951	
	2020 Total						348.249	
4	2021	7789.635	2.524	7860.304	233.689	2.120	235.809	
5	2021	7080.141	2.294	7144.365	283.206	2.569	285.775	
6	2021	7188.004	2.326	7253.141	287.520	2.605	290.126	
7	2021	558.739	0.181	563.801	5.587	0.051	5.638	
	2021 Total						817.347	
8	2022	1755.494	0.568	1771.401	70.220	0.636	70.856	
9	2022	2133.244	0.690	2152.565	170.660	1.546	172.205	
	2022 Total						243.061	
10	2023	2133.565	0.690	2152.887	149.350	1.352	150.702	
11	2023	1105.668	0.358	1115.690	11.057	0.100	11.157	
	2023 Total						161.859	

GHG Emissions Calculations

Mobile

		Pounds/Day			ton CO2e/phase		
SCEN	Year	CO2	CH4	CO2e (lb/day)	CO2	CH4	
1	2020	2528.069	0.029	2528.887	75.842	0.025	75.867
2	2020	918.582	0.015	918.992	18.372	0.008	18.380
3	2020	4276.084	0.056	4277.639	213.804	0.078	213.882
	2020 Total						308.128
4	2021	11113.035	0.103	11115.927	333.391	0.087	333.478
5	2021	9798.140	0.104	9801.040	391.926	0.116	392.042
6	2021	4150.160	0.057	4151.764	166.006	0.064	166.071
7	2021	2485.885	0.029	2486.693	24.859	0.008	24.867
	2021 Total						916.457
8	2022	7562.887	0.062	7564.629	302.515	0.070	302.585
9	2022	2208.820	0.023	2209.467	176.706	0.052	176.757
	2022 Total						479.343
10	2023	2158.068	0.020	2158.629	151.065	0.039	151.104
11	2023	924.219	0.012	924.556	9.242	0.003	9.246
	2023 Total						160.350

GHG Emissions Calculations

Total

SCEN	Year	CO2	CH4	CO2e (lb/day)	CO2 CO2e (tons)	CH4 tons CO2e)	Total (tons CO2e)
1	2020	4,542.856	0.681	4561.935	136.286	0.572	136.858
2	2020	2,023.862	0.373	2034.293	40.477	0.209	40.686
3	2020	9,527.462	1.757	9576.664	476.373	2.460	478.833
	2020 Total						656.377
4	2021	18,902.670	2.627	18976.231	567.080	2.207	569.287
5	2021	16,878.281	2.397	16945.405	675.131	2.685	677.816
6	2021	11,338.164	2.384	11404.904	453.527	2.670	456.196
7	2021	3,044.624	0.210	3050.493	30.446	0.059	30.505
	2021 Total						1733.804
8	2022	9,318.381	0.630	9336.030	372.735	0.706	373.441
9	2022	4,342.064	0.713	4362.033	347.365	1.598	348.963
	2022 Total						722.404
10	2023	4,291.633	0.710	4311.516	300.414	1.392	301.806
11	2023	2,029.886	0.370	2040.245	20.299	0.104	20.402
	2023 Total						322.209

Construction Equipment Emissions Calculations

SCEN	Year	Description	Length (months)	Length (days)
1	2020	Access Road Paving	3	60
1	2020	Access Road Paving	3	60
1	2020	Access Road Paving	3	60
1	2020	Access Road Paving	3	60
1	2020	Access Road Paving	3	60
1 Total				
2	2020	Site Mobilization	2	40
2	2020	Site Mobilization	2	40
2 Total				
3	2020	LAAS REALIGNMENT	5	100
3	2020	LAAS REALIGNMENT	5	100
3	2020	LAAS REALIGNMENT	5	100
3	2020	LAAS REALIGNMENT	5	100
3 Total				
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
4 Total				
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
5 Total				
6	2021	Plant Excavation & Grading	4	80
6	2021	Plant Excavation & Grading	4	80
6	2021	Plant Excavation & Grading	4	80
6	2021	Plant Excavation & Grading	4	80
6	2021	Plant Excavation & Grading	4	80
6	2021	Plant Excavation & Grading	4	80
6 Total				
7	2021	Plant Structural	1	20
7 Total				

Construction Equipment Emissions Calculations

SCEN	Year	Equipment	Count	Usage (hours/day)	HP	Load Factor
1	2020	Excavators	1	8	158	0.38
1	2020	RubberTiredLoaders	1	8	203	0.36
1	2020	Pavers	1	8	130	0.42
1	2020	Rollers	1	8	80	0.38
1	2020	SkidSteerLoaders	1	8	65	0.37
1 Total						
2	2020	Excavators	1	8	158	0.38
2	2020	RubberTiredLoaders	1	8	203	0.36
2 Total						
3	2020	Excavators	2	8	158	0.38
3	2020	RubberTiredLoaders	2	8	203	0.36
3	2020	RubberTiredDozers	3	8	247	0.4
3	2020	Cranes	1	8	231	0.29
3 Total						
4	2021	Excavators	3	8	158	0.38
4	2021	RubberTiredLoaders	4	8	203	0.36
4	2021	RubberTiredDozers	4	8	247	0.4
4	2021	Cranes	1	8	231	0.29
4 Total						
5	2021	Excavators	2	8	158	0.38
5	2021	RubberTiredLoaders	2	8	203	0.36
5	2021	RubberTiredDozers	3	8	247	0.4
5	2021	Rollers	1	8	80	0.38
5	2021	Pavers	1	8	130	0.42
5	2021	Cranes	1	8	231	0.29
5	2021	OtherMaterialHandlingEquipment	2	8	168	0.4
5 Total						
6	2021	RubberTiredLoaders	3	8	203	0.36
6	2021	Rollers	2	8	80	0.38
6	2021	Excavators	1	8	158	0.38
6	2021	RubberTiredDozers	3	8	247	0.4
6	2021	OtherConstructionEquipment	1	8	172	0.42
6	2021	Graders	2	8	187	0.41
6 Total						
7	2021	Cranes	1	8	231	0.29
7 Total						

Construction Equipment Emissions Calculations

		Emission Factors (g/bhp-hr)		Emissions (lb/day)		Emissions (ton CO2e/phase)	
SCEN	Year	CO2	CH4	CO2	CH4	CO2	CH4
1	2020	472.29	0.15	500.12	0.16	15.00	0.14
1	2020	469.51	0.15	605.16	0.20	18.15	0.16
1	2020	472.77	0.15	455.27	0.15	13.66	0.12
1	2020	473.86	0.15	254.07	0.08	7.62	0.07
1	2020	471.91	0.15	200.17	0.06	6.01	0.05
1 Total				2014.79	0.65	60.44	0.55
2	2020	472.29	0.15	500.12	0.16	10.00	0.09
2	2020	469.51	0.15	605.16	0.20	12.10	0.11
2 Total				1105.28	0.36	22.11	0.20
3	2020	472.29	0.15	1000.24	0.32	50.01	0.45
3	2020	469.51	0.15	1210.32	0.39	60.52	0.55
3	2020	474.79	0.15	2482.03	0.81	124.10	1.13
3	2020	472.95	0.15	558.79	0.18	27.94	0.25
3 Total				5251.38	1.70	262.57	2.38
4	2021	472.36	0.15	1500.58	0.49	45.02	0.41
4	2021	469.56	0.15	2420.91	0.78	72.63	0.66
4	2021	474.80	0.15	3309.41	1.07	99.28	0.90
4	2021	472.91	0.15	558.74	0.18	16.76	0.15
4 Total				7789.64	2.52	233.69	2.12
5	2021	472.36	0.15	1000.38	0.32	40.02	0.36
5	2021	469.56	0.15	1210.45	0.39	48.42	0.44
5	2021	474.80	0.15	2482.06	0.81	99.28	0.90
5	2021	473.90	0.15	254.09	0.08	10.16	0.09
5	2021	472.56	0.15	455.06	0.15	18.20	0.17
5	2021	472.91	0.15	558.74	0.18	22.35	0.20
5	2021	472.22	0.15	1119.35	0.36	44.77	0.41
5 Total				7080.14	2.29	283.21	2.57
6	2021	469.56	0.15	1815.68	0.59	72.63	0.66
6	2021	473.90	0.15	508.18	0.16	20.33	0.18
6	2021	472.36	0.15	500.19	0.16	20.01	0.18
6	2021	474.80	0.15	2482.06	0.81	99.28	0.90
6	2021	469.76	0.15	598.52	0.19	23.94	0.22
6	2021	474.54	0.15	1283.37	0.41	51.33	0.46
6 Total				7188.00	2.33	287.52	2.61
7	2021	472.91	0.15	558.74	0.18	5.59	0.05
7 Total				558.74	0.18	5.59	0.05

Construction Equipment Emissions Calculations

SCEN	Year	Description	Length (months)	Length (days)
8	2022	Plant Structural	4	80
8	2022	Plant Structural	4	80
8 Total				
9	2022	Plant Construction & Finishing	8	160
9	2022	Plant Construction & Finishing	8	160
9	2022	Plant Construction & Finishing	8	160
9	2022	Plant Construction & Finishing	8	160
9 Total				
10	2023	Plant Construction & Finishing	7	140
10	2023	Plant Construction & Finishing	7	140
10	2023	Plant Construction & Finishing	7	140
10	2023	Plant Construction & Finishing	7	140
10 Total				
11	2023	Demobilization	1	20
11	2023	Demobilization	1	20
11 Total				

Construction Equipment Emissions Calculations

SCEN	Year	Equipment	Count	Usage (hours/day)	HP	Load Factor
8	2022	Cranes	1	8	231	0.29
8	2022	OtherConstructionEquipment	2	8	172	0.42
8 Total						
9	2022	RubberTiredLoaders	1	8	203	0.36
9	2022	Cranes	1	8	231	0.29
9	2022	Tractors/Loaders/Backhoes	1	8	97	0.37
9	2022	RoughTerrainForklifts	2	8	100	0.4
9 Total						
10	2023	RubberTiredLoaders	1	8	203	0.36
10	2023	Cranes	1	8	231	0.29
10	2023	Tractors/Loaders/Backhoes	1	8	97	0.37
10	2023	RoughTerrainForklifts	2	8	100	0.4
10 Total						
11	2023	Excavators	1	8	158	0.38
11	2023	RubberTiredLoaders	1	8	203	0.36
11 Total						

Construction Equipment Emissions Calculations

		Emission Factors (g/bhp-hr)		Emissions (lb/day)		Emissions (ton CO2e/phase)	
SCEN	Year	CO2	CH4	CO2	CH4	CO2	CH4
8	2022	472.98	0.15	558.83	0.18	22.35	0.20
8	2022	469.61	0.15	1196.66	0.39	47.87	0.43
8 Total				1755.49	0.57	70.22	0.64
9	2022	469.90	0.15	605.66	0.20	48.45	0.44
9	2022	472.98	0.15	558.83	0.18	44.71	0.40
9	2022	475.90	0.15	301.24	0.10	24.10	0.22
9	2022	473.09	0.15	667.51	0.22	53.40	0.48
9 Total				2133.24	0.69	170.66	1.55
10	2023	469.82	0.15	605.56	0.20	42.39	0.38
10	2023	472.97	0.15	558.82	0.18	39.12	0.35
10	2023	476.43	0.15	301.58	0.10	21.11	0.19
10	2023	473.16	0.15	667.61	0.22	46.73	0.42
10 Total				2133.57	0.69	149.35	1.35
11	2023	472.28	0.15	500.11	0.16	5.00	0.05
11	2023	469.82	0.15	605.56	0.20	6.06	0.05
11 Total				1105.67	0.36	11.06	0.10

OFFRAOD Default Horsepower Load Factor

OFFROAD Equipment Type	Horsepower	Load Factor
AerialLifts	63	0.31
AirCompressors	78	0.48
Bore/DrillRigs	221	0.5
CementandMortarMixers	9	0.56
Concrete/IndustrialSaws	81	0.73
Cranes	231	0.29
CrawlerTractors	212	0.43
Crushing/Proc.Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	158	0.38
Forklifts	89	0.2
GeneratorSets	84	0.74
Graders	187	0.41
Off-HighwayTractors	124	0.44
Off-HighwayTrucks	402	0.38
OtherConstructionEquipment	172	0.42
OtherGeneralIndustrialEquipment	88	0.34
OtherMaterialHandlingEquipment	168	0.4
Pavers	130	0.42
PavingEquipment	132	0.36
PlateCompactors	8	0.43
PressureWashers	13	0.3
Pumps	84	0.74
Rollers	80	0.38
RoughTerrainForklifts	100	0.4
RubberTiredDozers	247	0.4
RubberTiredLoaders	203	0.36
Scrapers	367	0.48
SignalBoards	6	0.82
SkidSteerLoaders	65	0.37
SurfacingEquipment	263	0.3
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	97	0.37
Trenchers	78	0.5
Welders	46	0.45

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
AerialLifts	2020	6	15	525.0743	0.17
AerialLifts	2020	16	25	525.0743	0.17
AerialLifts	2020	26	50	525.0743	0.17
AerialLifts	2020	51	120	472.1142	0.153
AerialLifts	2020	251	500	472.0545	0.153
AerialLifts	2020	501	750	568.299	0.018
AerialLifts	2021	6	15	525.0743	0.17
AerialLifts	2021	16	25	525.0743	0.17
AerialLifts	2021	26	50	525.0743	0.17
AerialLifts	2021	51	120	472.1142	0.153
AerialLifts	2021	251	500	472.0545	0.153
AerialLifts	2021	501	750	568.299	0.016
AerialLifts	2022	6	15	525.0743	0.17
AerialLifts	2022	16	25	525.0743	0.17
AerialLifts	2022	26	50	525.0743	0.17
AerialLifts	2022	51	120	472.1142	0.153
AerialLifts	2022	251	500	472.0545	0.153
AerialLifts	2022	501	750	568.299	0.016
AerialLifts	2023	6	15	525.0743	0.17
AerialLifts	2023	16	25	525.0743	0.17
AerialLifts	2023	26	50	525.0743	0.17
AerialLifts	2023	51	120	472.1142	0.153
AerialLifts	2023	251	500	472.0545	0.153
AerialLifts	2023	501	750	568.299	0.015
AirCompressors	2020	6	15	568.299	0.066
AirCompressors	2020	16	25	568.3	0.069
AirCompressors	2020	26	50	568.299	0.09
AirCompressors	2020	51	120	568.299	0.044
AirCompressors	2020	121	175	568.299	0.033
AirCompressors	2020	176	250	568.299	0.026
AirCompressors	2020	251	500	568.299	0.025
AirCompressors	2020	501	750	568.299	0.025
AirCompressors	2020	751	1000	568.3	0.027
AirCompressors	2021	6	15	568.299	0.064
AirCompressors	2021	16	25	568.299	0.067
AirCompressors	2021	26	50	568.299	0.08
AirCompressors	2021	51	120	568.299	0.039
AirCompressors	2021	121	175	568.299	0.03
AirCompressors	2021	176	250	568.299	0.024
AirCompressors	2021	251	500	568.299	0.023
AirCompressors	2021	501	750	568.299	0.023
AirCompressors	2021	751	1000	568.3	0.025
AirCompressors	2021	751	1000	568.3	0.025
AirCompressors	2022	6	15	568.299	0.063
AirCompressors	2022	16	25	568.299	0.066
AirCompressors	2022	26	50	568.299	0.073
AirCompressors	2022	51	120	568.299	0.037
AirCompressors	2022	121	175	568.299	0.029
AirCompressors	2022	176	250	568.3	0.023
AirCompressors	2022	251	500	568.299	0.022
AirCompressors	2022	501	750	568.299	0.022
AirCompressors	2022	751	1000	568.3	0.024
AirCompressors	2023	6	15	568.299	0.063
AirCompressors	2023	16	25	568.299	0.065

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
AirCompressors	2023	26	50	568.299	0.067
AirCompressors	2023	51	120	568.299	0.034
AirCompressors	2023	121	175	568.299	0.027
AirCompressors	2023	176	250	568.299	0.021
AirCompressors	2023	251	500	568.299	0.021
AirCompressors	2023	501	750	568.299	0.021
AirCompressors	2023	751	1000	568.299	0.023
Bore/DrillRigs	2020	6	15	535.2948	0.173
Bore/DrillRigs	2020	16	25	535.2948	0.173
Bore/DrillRigs	2020	26	50	535.2948	0.173
Bore/DrillRigs	2020	51	120	463.5827	0.15
Bore/DrillRigs	2020	121	175	477.722	0.155
Bore/DrillRigs	2020	176	250	466.8342	0.151
Bore/DrillRigs	2020	251	500	466.8219	0.151
Bore/DrillRigs	2020	501	750	473.6679	0.153
Bore/DrillRigs	2020	751	1000	471.8492	0.153
Bore/DrillRigs	2021	6	15	535.3782	0.173
Bore/DrillRigs	2021	16	25	535.3782	0.173
Bore/DrillRigs	2021	26	50	535.3782	0.173
Bore/DrillRigs	2021	51	120	464.9725	0.15
Bore/DrillRigs	2021	121	175	477.0482	0.154
Bore/DrillRigs	2021	176	250	467.9916	0.151
Bore/DrillRigs	2021	251	500	469.8158	0.152
Bore/DrillRigs	2021	501	750	474.079	0.153
Bore/DrillRigs	2021	751	1000	471.8158	0.153
Bore/DrillRigs	2022	6	15	529.8703	0.171
Bore/DrillRigs	2022	16	25	529.8703	0.171
Bore/DrillRigs	2022	26	50	529.8703	0.171
Bore/DrillRigs	2022	51	120	462.2674	0.15
Bore/DrillRigs	2022	121	175	477.3719	0.154
Bore/DrillRigs	2022	176	250	468.7604	0.152
Bore/DrillRigs	2022	251	500	467.1923	0.151
Bore/DrillRigs	2022	501	750	477.141	0.154
Bore/DrillRigs	2022	751	1000	472.9214	0.153
Bore/DrillRigs	2023	6	15	531.9856	0.172
Bore/DrillRigs	2023	16	25	531.9856	0.172
Bore/DrillRigs	2023	26	50	531.9856	0.172
Bore/DrillRigs	2023	51	120	461.214	0.149
Bore/DrillRigs	2023	121	175	479.6465	0.155
Bore/DrillRigs	2023	176	250	469.7058	0.152
Bore/DrillRigs	2023	251	500	464.0407	0.15
Bore/DrillRigs	2023	501	750	479.2199	0.155
Bore/DrillRigs	2023	751	1000	472.0201	0.153
CementandMortarMixers	2020	6	15	568.299	0.059
CementandMortarMixers	2020	16	25	568.299	0.065
CementandMortarMixers	2021	6	15	568.299	0.059
CementandMortarMixers	2021	16	25	568.299	0.064
CementandMortarMixers	2023	6	15	568.299	0.059
CementandMortarMixers	2023	16	25	568.299	0.062
CementandMortarMixers	2024	6	15	568.299	0.059
CementandMortarMixers	2024	16	25	568.299	0.062
Concrete/IndustrialSaws	2020	16	25	568.299	0.061
Concrete/IndustrialSaws	2020	26	50	568.299	0.072
Concrete/IndustrialSaws	2020	51	120	568.299	0.036

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
Concrete/IndustrialSaws	2020	121	175	568.299	0.027
Concrete/IndustrialSaws	2021	16	25	568.299	0.061
Concrete/IndustrialSaws	2021	26	50	568.3	0.065
Concrete/IndustrialSaws	2021	51	120	568.299	0.033
Concrete/IndustrialSaws	2021	121	175	568.299	0.025
Concrete/IndustrialSaws	2022	16	25	568.299	0.061
Concrete/IndustrialSaws	2022	26	50	568.3	0.059
Concrete/IndustrialSaws	2022	51	120	568.299	0.031
Concrete/IndustrialSaws	2022	121	175	568.3	0.024
Concrete/IndustrialSaws	2023	16	25	568.299	0.061
Concrete/IndustrialSaws	2023	26	50	568.299	0.054
Concrete/IndustrialSaws	2023	51	120	568.3	0.028
Concrete/IndustrialSaws	2023	121	175	568.299	0.022
Cranes	2020	26	50	517.9263	0.168
Cranes	2020	51	120	469.8821	0.152
Cranes	2020	121	175	474.5939	0.153
Cranes	2020	176	250	472.9488	0.153
Cranes	2020	251	500	472.5579	0.153
Cranes	2020	501	750	470.4254	0.152
Cranes	2020	1001	9999	472.0545	0.153
Cranes	2021	26	50	517.8995	0.167
Cranes	2021	51	120	469.8867	0.152
Cranes	2021	121	175	474.5458	0.153
Cranes	2021	176	250	472.9057	0.153
Cranes	2021	251	500	472.4553	0.153
Cranes	2021	501	750	470.5495	0.152
Cranes	2021	1001	9999	472.0545	0.153
Cranes	2022	26	50	517.8722	0.167
Cranes	2022	51	120	469.9929	0.152
Cranes	2022	121	175	474.5887	0.153
Cranes	2022	176	250	472.9832	0.153
Cranes	2022	251	500	472.1806	0.153
Cranes	2022	501	750	470.4755	0.152
Cranes	2022	1001	9999	472.0545	0.153
Cranes	2023	26	50	517.8722	0.167
Cranes	2023	51	120	469.8891	0.152
Cranes	2023	121	175	474.595	0.153
Cranes	2023	176	250	472.9738	0.153
Cranes	2023	251	500	472.294	0.153
Cranes	2023	501	750	470.2508	0.152
Cranes	2023	1001	9999	472.0545	0.153
CrawlerTractors	2020	26	50	515.679	0.167
CrawlerTractors	2020	51	120	476.3284	0.154
CrawlerTractors	2020	121	175	471.015	0.152
CrawlerTractors	2020	176	250	472.941	0.153
CrawlerTractors	2020	251	500	475.2338	0.154
CrawlerTractors	2020	501	750	473.3119	0.153
CrawlerTractors	2020	751	1000	475.6525	0.154
CrawlerTractors	2021	26	50	516.1077	0.167
CrawlerTractors	2021	51	120	476.437	0.154
CrawlerTractors	2021	121	175	471.421	0.152
CrawlerTractors	2021	176	250	472.9246	0.153
CrawlerTractors	2021	251	500	474.4843	0.153
CrawlerTractors	2021	501	750	473.0941	0.153

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
CrawlerTractors	2021	751	1000	471.8224	0.153
CrawlerTractors	2022	26	50	516.1476	0.167
CrawlerTractors	2022	51	120	476.0219	0.154
CrawlerTractors	2022	121	175	471.5674	0.153
CrawlerTractors	2022	176	250	472.0975	0.153
CrawlerTractors	2022	251	500	474.4115	0.153
CrawlerTractors	2022	501	750	472.876	0.153
CrawlerTractors	2022	751	1000	470.7007	0.152
CrawlerTractors	2023	26	50	516.1587	0.167
CrawlerTractors	2023	51	120	476.1575	0.154
CrawlerTractors	2023	121	175	471.7805	0.153
CrawlerTractors	2023	176	250	471.6244	0.153
CrawlerTractors	2023	251	500	474.6128	0.153
CrawlerTractors	2023	501	750	472.5297	0.153
CrawlerTractors	2023	751	1000	473.6655	0.153
Crushing/Proc.Equipment	2020	26	50	568.299	0.085
Crushing/Proc.Equipment	2020	51	120	568.299	0.042
Crushing/Proc.Equipment	2020	121	175	568.299	0.033
Crushing/Proc.Equipment	2020	176	250	568.299	0.026
Crushing/Proc.Equipment	2020	251	500	568.299	0.025
Crushing/Proc.Equipment	2020	501	750	568.299	0.025
Crushing/Proc.Equipment	2020	1001	9999	568.299	0.029
Crushing/Proc.Equipment	2021	26	50	568.299	0.077
Crushing/Proc.Equipment	2021	51	120	568.299	0.039
Crushing/Proc.Equipment	2021	121	175	568.299	0.031
Crushing/Proc.Equipment	2021	176	250	568.299	0.024
Crushing/Proc.Equipment	2021	251	500	568.3	0.024
Crushing/Proc.Equipment	2021	501	750	568.299	0.024
Crushing/Proc.Equipment	2021	1001	9999	568.299	0.028
Crushing/Proc.Equipment	2022	26	50	568.299	0.071
Crushing/Proc.Equipment	2022	51	120	568.299	0.037
Crushing/Proc.Equipment	2022	121	175	568.299	0.029
Crushing/Proc.Equipment	2022	176	250	568.299	0.023
Crushing/Proc.Equipment	2022	251	500	568.299	0.023
Crushing/Proc.Equipment	2022	501	750	568.299	0.023
Crushing/Proc.Equipment	2022	1001	9999	568.299	0.027
Crushing/Proc.Equipment	2023	26	50	568.299	0.066
Crushing/Proc.Equipment	2023	51	120	568.299	0.034
Crushing/Proc.Equipment	2023	121	175	568.299	0.027
Crushing/Proc.Equipment	2023	176	250	568.299	0.022
Crushing/Proc.Equipment	2023	251	500	568.299	0.022
Crushing/Proc.Equipment	2023	501	750	568.3	0.022
Crushing/Proc.Equipment	2023	1001	9999	568.299	0.025
Dumpers/Tenders	2021	16	25	568.299	0.061
Dumpers/Tenders	2022	16	25	568.299	0.061
Dumpers/Tenders	2022	16	25	568.299	0.061
Dumpers/Tenders	2023	16	25	568.299	0.061
Excavators	2020	16	25	525.3675	0.17
Excavators	2020	26	50	525.3675	0.17
Excavators	2020	51	120	468.0546	0.151
Excavators	2020	121	175	472.2891	0.153
Excavators	2020	176	250	471.8828	0.153
Excavators	2020	251	500	470.2956	0.152
Excavators	2020	501	750	468.8706	0.152

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
Excavators	2021	16	25	525.3774	0.17
Excavators	2021	26	50	525.3774	0.17
Excavators	2021	51	120	467.7906	0.151
Excavators	2021	121	175	472.3586	0.153
Excavators	2021	176	250	471.7931	0.153
Excavators	2021	251	500	469.6156	0.152
Excavators	2021	501	750	469.547	0.152
Excavators	2022	16	25	525.4468	0.17
Excavators	2022	26	50	525.4468	0.17
Excavators	2022	51	120	467.6256	0.151
Excavators	2022	121	175	472.1917	0.153
Excavators	2022	176	250	472.0412	0.153
Excavators	2022	251	500	469.7105	0.152
Excavators	2022	501	750	469.2892	0.152
Excavators	2023	16	25	525.4286	0.17
Excavators	2023	26	50	525.4286	0.17
Excavators	2023	51	120	467.1573	0.151
Excavators	2023	121	175	472.277	0.153
Excavators	2023	176	250	472.2131	0.153
Excavators	2023	251	500	469.8892	0.152
Excavators	2023	501	750	468.6826	0.152
Forklifts	2020	26	50	525.4833	0.17
Forklifts	2020	51	120	471.5285	0.153
Forklifts	2020	121	175	472.1062	0.153
Forklifts	2020	176	250	473.3255	0.153
Forklifts	2020	251	500	473.6151	0.153
Forklifts	2021	26	50	525.4833	0.17
Forklifts	2021	51	120	471.5285	0.153
Forklifts	2021	121	175	472.1062	0.153
Forklifts	2021	176	250	473.3255	0.153
Forklifts	2021	251	500	473.6151	0.153
Forklifts	2022	26	50	525.4833	0.17
Forklifts	2022	51	120	471.5285	0.153
Forklifts	2022	121	175	472.1062	0.153
Forklifts	2022	176	250	473.3255	0.153
Forklifts	2022	251	500	473.6151	0.153
Forklifts	2023	26	50	525.4833	0.17
Forklifts	2023	51	120	471.5285	0.153
Forklifts	2023	121	175	472.1062	0.153
Forklifts	2023	176	250	473.3255	0.153
Forklifts	2023	251	500	473.6151	0.153
GeneratorSets	2020	6	15	568.299	0.058
GeneratorSets	2020	16	25	568.299	0.065
GeneratorSets	2020	26	50	568.299	0.062
GeneratorSets	2020	51	120	568.299	0.032
GeneratorSets	2020	121	175	568.299	0.024
GeneratorSets	2020	176	250	568.299	0.017
GeneratorSets	2020	251	500	568.299	0.017
GeneratorSets	2020	501	750	568.299	0.017
GeneratorSets	2020	1001	9999	568.3	0.021
GeneratorSets	2021	6	15	568.299	0.057
GeneratorSets	2021	16	25	568.299	0.064
GeneratorSets	2021	26	50	568.299	0.055
GeneratorSets	2021	51	120	568.299	0.029

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
GeneratorSets	2021	121	175	568.299	0.021
GeneratorSets	2021	176	250	568.299	0.016
GeneratorSets	2021	251	500	568.299	0.015
GeneratorSets	2021	501	750	568.299	0.016
GeneratorSets	2021	1001	9999	568.3	0.019
GeneratorSets	2022	6	15	568.299	0.056
GeneratorSets	2022	16	25	568.299	0.063
GeneratorSets	2022	26	50	568.299	0.05
GeneratorSets	2022	51	120	568.299	0.027
GeneratorSets	2022	121	175	568.299	0.02
GeneratorSets	2022	176	250	568.299	0.015
GeneratorSets	2022	251	500	568.299	0.015
GeneratorSets	2022	501	750	568.299	0.015
GeneratorSets	2022	1001	9999	568.299	0.018
GeneratorSets	2023	6	15	568.299	0.055
GeneratorSets	2023	16	25	568.299	0.063
GeneratorSets	2023	26	50	568.299	0.046
GeneratorSets	2023	51	120	568.299	0.025
GeneratorSets	2023	121	175	568.299	0.019
GeneratorSets	2023	176	250	568.299	0.014
GeneratorSets	2023	251	500	568.299	0.014
GeneratorSets	2023	501	750	568.299	0.014
GeneratorSets	2023	1001	9999	568.299	0.017
Graders	2020	26	50	492.8615	0.159
Graders	2020	51	120	469.3371	0.152
Graders	2020	121	175	478.0403	0.155
Graders	2020	176	250	475.3037	0.154
Graders	2020	251	500	471.9795	0.153
Graders	2020	501	750	568.299	0.028
Graders	2021	26	50	492.9352	0.159
Graders	2021	51	120	469.0701	0.152
Graders	2021	121	175	478.5289	0.155
Graders	2021	176	250	474.5386	0.153
Graders	2021	251	500	471.8981	0.153
Graders	2021	501	750	568.299	0.027
Graders	2022	26	50	493.0249	0.159
Graders	2022	51	120	469.6301	0.152
Graders	2022	121	175	478.5664	0.155
Graders	2022	176	250	474.239	0.153
Graders	2022	251	500	471.9278	0.153
Graders	2022	501	750	568.299	0.026
Graders	2023	26	50	494.0202	0.16
Graders	2023	51	120	469.2859	0.152
Graders	2023	121	175	478.4629	0.155
Graders	2023	176	250	473.9256	0.153
Graders	2023	251	500	471.0306	0.152
Graders	2023	501	750	568.3	0.024
OtherConstructionEquipment	2020	6	15	527.9656	0.171
OtherConstructionEquipment	2020	16	25	527.9656	0.171
OtherConstructionEquipment	2020	26	50	527.9656	0.171
OtherConstructionEquipment	2020	51	120	472.2162	0.153
OtherConstructionEquipment	2020	121	175	469.9837	0.152
OtherConstructionEquipment	2020	251	500	475.2326	0.154
OtherConstructionEquipment	2021	6	15	527.7834	0.171

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
OtherConstructionEquipment	2021	16	25	527.7834	0.171
OtherConstructionEquipment	2021	26	50	527.7834	0.171
OtherConstructionEquipment	2021	51	120	472.275	0.153
OtherConstructionEquipment	2021	121	175	469.7642	0.152
OtherConstructionEquipment	2021	251	500	475.2124	0.154
OtherConstructionEquipment	2022	6	15	529.1825	0.171
OtherConstructionEquipment	2022	16	25	529.1825	0.171
OtherConstructionEquipment	2022	26	50	529.1825	0.171
OtherConstructionEquipment	2022	51	120	472.3178	0.153
OtherConstructionEquipment	2022	121	175	469.6126	0.152
OtherConstructionEquipment	2022	251	500	475.9983	0.154
OtherConstructionEquipment	2023	6	15	529.3389	0.171
OtherConstructionEquipment	2023	16	25	529.3389	0.171
OtherConstructionEquipment	2023	26	50	529.3389	0.171
OtherConstructionEquipment	2023	51	120	471.9899	0.153
OtherConstructionEquipment	2023	121	175	469.5579	0.152
OtherConstructionEquipment	2023	251	500	476.1847	0.154
OtherGeneralIndustrialEquipment	2020	6	15	526.1761	0.17
OtherGeneralIndustrialEquipment	2020	16	25	526.1761	0.17
OtherGeneralIndustrialEquipment	2020	26	50	526.1761	0.17
OtherGeneralIndustrialEquipment	2020	51	120	469.9998	0.152
OtherGeneralIndustrialEquipment	2020	121	175	471.8502	0.153
OtherGeneralIndustrialEquipment	2020	176	250	473.2231	0.153
OtherGeneralIndustrialEquipment	2020	251	500	472.929	0.153
OtherGeneralIndustrialEquipment	2020	501	750	473.4638	0.153
OtherGeneralIndustrialEquipment	2020	751	1000	472.0545	0.153
OtherGeneralIndustrialEquipment	2021	6	15	526.1761	0.17
OtherGeneralIndustrialEquipment	2021	16	25	526.1761	0.17
OtherGeneralIndustrialEquipment	2021	26	50	526.1761	0.17
OtherGeneralIndustrialEquipment	2021	51	120	469.9998	0.152
OtherGeneralIndustrialEquipment	2021	121	175	471.8502	0.153
OtherGeneralIndustrialEquipment	2021	176	250	473.2231	0.153
OtherGeneralIndustrialEquipment	2021	251	500	472.929	0.153
OtherGeneralIndustrialEquipment	2021	501	750	473.4638	0.153
OtherGeneralIndustrialEquipment	2021	751	1000	472.0545	0.153
OtherGeneralIndustrialEquipment	2022	6	15	526.1761	0.17
OtherGeneralIndustrialEquipment	2022	16	25	526.1761	0.17
OtherGeneralIndustrialEquipment	2022	26	50	526.1761	0.17
OtherGeneralIndustrialEquipment	2022	51	120	469.9998	0.152
OtherGeneralIndustrialEquipment	2022	121	175	471.8502	0.153
OtherGeneralIndustrialEquipment	2022	176	250	473.2231	0.153
OtherGeneralIndustrialEquipment	2022	251	500	472.929	0.153
OtherGeneralIndustrialEquipment	2022	501	750	473.4638	0.153
OtherGeneralIndustrialEquipment	2022	751	1000	472.0545	0.153
OtherGeneralIndustrialEquipment	2023	6	15	526.1761	0.17
OtherGeneralIndustrialEquipment	2023	16	25	526.1761	0.17
OtherGeneralIndustrialEquipment	2023	26	50	526.1761	0.17
OtherGeneralIndustrialEquipment	2023	51	120	469.9998	0.152
OtherGeneralIndustrialEquipment	2023	121	175	471.8502	0.153
OtherGeneralIndustrialEquipment	2023	176	250	473.2231	0.153
OtherGeneralIndustrialEquipment	2023	251	500	472.929	0.153
OtherGeneralIndustrialEquipment	2023	501	750	473.4638	0.153
OtherGeneralIndustrialEquipment	2023	751	1000	472.0545	0.153
OtherMaterialHandlingEquipment	2020	26	50	523.7088	0.169

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
OtherMaterialHandlingEquipment	2020	51	120	473.5884	0.153
OtherMaterialHandlingEquipment	2020	121	175	472.2193	0.153
OtherMaterialHandlingEquipment	2020	176	250	471.482	0.152
OtherMaterialHandlingEquipment	2020	251	500	470.2972	0.152
OtherMaterialHandlingEquipment	2020	1001	9999	472.0545	0.153
OtherMaterialHandlingEquipment	2021	26	50	523.7088	0.169
OtherMaterialHandlingEquipment	2021	51	120	473.5884	0.153
OtherMaterialHandlingEquipment	2021	121	175	472.2193	0.153
OtherMaterialHandlingEquipment	2021	176	250	471.482	0.152
OtherMaterialHandlingEquipment	2021	251	500	470.2972	0.152
OtherMaterialHandlingEquipment	2021	1001	9999	472.0545	0.153
OtherMaterialHandlingEquipment	2022	26	50	523.7088	0.169
OtherMaterialHandlingEquipment	2022	51	120	473.5884	0.153
OtherMaterialHandlingEquipment	2022	121	175	472.2193	0.153
OtherMaterialHandlingEquipment	2022	176	250	471.482	0.152
OtherMaterialHandlingEquipment	2022	251	500	470.2972	0.152
OtherMaterialHandlingEquipment	2022	1001	9999	472.0545	0.153
OtherMaterialHandlingEquipment	2023	26	50	523.7088	0.169
OtherMaterialHandlingEquipment	2023	51	120	473.5884	0.153
OtherMaterialHandlingEquipment	2023	121	175	472.2193	0.153
OtherMaterialHandlingEquipment	2023	176	250	471.482	0.152
OtherMaterialHandlingEquipment	2023	251	500	470.2972	0.152
OtherMaterialHandlingEquipment	2023	1001	9999	472.0545	0.153
Pavers	2020	16	25	526.2098	0.17
Pavers	2020	26	50	526.2098	0.17
Pavers	2020	51	120	469.8815	0.152
Pavers	2020	121	175	472.7746	0.153
Pavers	2020	176	250	472.8337	0.153
Pavers	2020	251	500	466.2059	0.151
Pavers	2021	16	25	526.5153	0.17
Pavers	2021	26	50	526.5153	0.17
Pavers	2021	51	120	469.7736	0.152
Pavers	2021	121	175	472.5552	0.153
Pavers	2021	176	250	472.4765	0.153
Pavers	2021	251	500	465.5908	0.151
Pavers	2022	16	25	526.8963	0.17
Pavers	2022	26	50	526.8963	0.17
Pavers	2022	51	120	470.1854	0.152
Pavers	2022	121	175	472.7599	0.153
Pavers	2022	176	250	472.3718	0.153
Pavers	2022	251	500	466.0042	0.151
Pavers	2023	16	25	526.8595	0.17
Pavers	2023	26	50	526.8595	0.17
Pavers	2023	51	120	470.0839	0.152
Pavers	2023	121	175	472.7178	0.153
Pavers	2023	176	250	472.6051	0.153
Pavers	2023	251	500	466.0038	0.151
PavingEquipment	2020	16	25	520.1235	0.168
PavingEquipment	2020	26	50	520.1235	0.168
PavingEquipment	2020	51	120	473.3249	0.153
PavingEquipment	2020	121	175	470.7359	0.152
PavingEquipment	2020	176	250	472.1514	0.153
PavingEquipment	2021	16	25	520.3965	0.168
PavingEquipment	2021	26	50	520.3965	0.168

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
PavingEquipment	2021	51	120	473.2205	0.153
PavingEquipment	2021	121	175	470.6495	0.152
PavingEquipment	2021	176	250	472.151	0.153
PavingEquipment	2022	16	25	520.6594	0.168
PavingEquipment	2022	26	50	520.6594	0.168
PavingEquipment	2022	51	120	473.4475	0.153
PavingEquipment	2022	121	175	470.6646	0.152
PavingEquipment	2022	176	250	472.169	0.153
PavingEquipment	2023	16	25	521.1138	0.169
PavingEquipment	2023	26	50	521.1138	0.169
PavingEquipment	2023	51	120	473.427	0.153
PavingEquipment	2023	121	175	470.663	0.152
PavingEquipment	2023	176	250	472.169	0.153
PlateCompactors	2020	6	15	568.299	0.059
PlateCompactors	2021	6	15	568.299	0.059
PlateCompactors	2022	6	15	568.299	0.059
PlateCompactors	2023	6	15	568.299	0.059
PressureWashers	2020	6	15	568.299	0.058
PressureWashers	2020	16	25	568.299	0.065
PressureWashers	2020	26	50	568.299	0.045
PressureWashers	2020	51	120	568.299	0.026
PressureWashers	2020	121	175	568.299	0.023
PressureWashers	2020	176	250	568.299	0.008
PressureWashers	2021	6	15	568.299	0.057
PressureWashers	2021	16	25	568.299	0.064
PressureWashers	2021	26	50	568.299	0.039
PressureWashers	2021	51	120	568.299	0.023
PressureWashers	2021	121	175	568.299	0.021
PressureWashers	2021	176	250	568.299	0.008
PressureWashers	2022	6	15	568.299	0.056
PressureWashers	2022	16	25	568.299	0.063
PressureWashers	2022	26	50	568.3	0.035
PressureWashers	2022	51	120	568.299	0.021
PressureWashers	2022	121	175	568.299	0.019
PressureWashers	2022	176	250	568.299	0.008
PressureWashers	2023	6	15	568.299	0.055
PressureWashers	2023	16	25	568.299	0.063
PressureWashers	2023	26	50	568.299	0.032
PressureWashers	2023	51	120	568.299	0.02
PressureWashers	2023	121	175	568.299	0.018
PressureWashers	2023	176	250	568.299	0.008
Pumps	2020	6	15	568.299	0.066
Pumps	2020	16	25	568.299	0.069
Pumps	2020	26	50	568.299	0.068
Pumps	2020	51	120	568.299	0.034
Pumps	2020	121	175	568.299	0.025
Pumps	2020	176	250	568.299	0.019
Pumps	2020	251	500	568.3	0.018
Pumps	2020	501	750	568.299	0.018
Pumps	2020	1001	9999	568.3	0.023
Pumps	2021	6	15	568.299	0.064
Pumps	2021	16	25	568.299	0.067
Pumps	2021	26	50	568.299	0.06
Pumps	2021	51	120	568.3	0.031

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
Pumps	2021	121	175	568.299	0.023
Pumps	2021	176	250	568.299	0.017
Pumps	2021	251	500	568.299	0.017
Pumps	2021	501	750	568.299	0.017
Pumps	2021	1001	9999	568.3	0.021
Pumps	2022	6	15	568.299	0.063
Pumps	2022	16	25	568.299	0.066
Pumps	2022	26	50	568.299	0.055
Pumps	2022	51	120	568.299	0.029
Pumps	2022	121	175	568.299	0.021
Pumps	2022	176	250	568.299	0.016
Pumps	2022	251	500	568.3	0.016
Pumps	2022	501	750	568.3	0.016
Pumps	2022	1001	9999	568.299	0.019
Pumps	2023	6	15	568.299	0.063
Pumps	2023	16	25	568.299	0.065
Pumps	2023	26	50	568.299	0.051
Pumps	2023	51	120	568.299	0.026
Pumps	2023	121	175	568.299	0.02
Pumps	2023	176	250	568.299	0.015
Pumps	2023	251	500	568.3	0.015
Pumps	2023	501	750	568.299	0.015
Pumps	2023	1001	9999	568.299	0.018
Rollers	2020	6	15	525.8798	0.17
Rollers	2020	16	25	525.8798	0.17
Rollers	2020	26	50	525.8798	0.17
Rollers	2020	51	120	473.8594	0.153
Rollers	2020	121	175	471.9177	0.153
Rollers	2020	176	250	473.3669	0.153
Rollers	2020	251	500	479.3254	0.155
Rollers	2021	6	15	525.7908	0.17
Rollers	2021	16	25	525.7908	0.17
Rollers	2021	26	50	525.7908	0.17
Rollers	2021	51	120	473.9012	0.153
Rollers	2021	121	175	471.9799	0.153
Rollers	2021	176	250	473.4704	0.153
Rollers	2021	251	500	479.3294	0.155
Rollers	2022	6	15	525.691	0.17
Rollers	2022	16	25	525.691	0.17
Rollers	2022	26	50	525.691	0.17
Rollers	2022	51	120	473.9291	0.153
Rollers	2022	121	175	471.9475	0.153
Rollers	2022	176	250	473.5135	0.153
Rollers	2022	251	500	478.9817	0.155
Rollers	2023	6	15	525.8616	0.17
Rollers	2023	16	25	525.8616	0.17
Rollers	2023	26	50	525.8616	0.17
Rollers	2023	51	120	473.9363	0.153
Rollers	2023	121	175	471.9351	0.153
Rollers	2023	176	250	473.5164	0.153
Rollers	2023	251	500	478.3028	0.155
RoughTerrainForklifts	2020	26	50	525.6222	0.17
RoughTerrainForklifts	2020	51	120	472.9842	0.153
RoughTerrainForklifts	2020	121	175	471.7152	0.153

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
RoughTerrainForklifts	2020	176	250	472.5671	0.153
RoughTerrainForklifts	2020	251	500	465.7709	0.151
RoughTerrainForklifts	2021	26	50	525.3844	0.17
RoughTerrainForklifts	2021	51	120	473.11	0.153
RoughTerrainForklifts	2021	121	175	471.7575	0.153
RoughTerrainForklifts	2021	176	250	472.5469	0.153
RoughTerrainForklifts	2021	251	500	465.7442	0.151
RoughTerrainForklifts	2022	26	50	525.0151	0.17
RoughTerrainForklifts	2022	51	120	473.089	0.153
RoughTerrainForklifts	2022	121	175	471.6773	0.153
RoughTerrainForklifts	2022	176	250	472.5408	0.153
RoughTerrainForklifts	2022	251	500	466.5598	0.151
RoughTerrainForklifts	2023	26	50	524.8024	0.17
RoughTerrainForklifts	2023	51	120	473.1584	0.153
RoughTerrainForklifts	2023	121	175	471.6217	0.153
RoughTerrainForklifts	2023	176	250	472.7784	0.153
RoughTerrainForklifts	2023	251	500	466.554	0.151
RubberTiredDozers	2020	121	175	473.0116	0.153
RubberTiredDozers	2020	176	250	474.7928	0.154
RubberTiredDozers	2020	251	500	479.7569	0.155
RubberTiredDozers	2020	501	750	473.0562	0.153
RubberTiredDozers	2020	751	1000	568.299	0.047
RubberTiredDozers	2021	121	175	472.9751	0.153
RubberTiredDozers	2021	176	250	474.7984	0.154
RubberTiredDozers	2021	251	500	478.9868	0.155
RubberTiredDozers	2021	501	750	473.0459	0.153
RubberTiredDozers	2021	751	1000	568.299	0.044
RubberTiredDozers	2022	121	175	473.9122	0.153
RubberTiredDozers	2022	176	250	474.6166	0.154
RubberTiredDozers	2022	251	500	479.3107	0.155
RubberTiredDozers	2022	501	750	473.035	0.153
RubberTiredDozers	2022	751	1000	568.299	0.042
RubberTiredDozers	2023	121	175	473.9009	0.153
RubberTiredDozers	2023	176	250	474.5967	0.153
RubberTiredDozers	2023	251	500	479.4678	0.155
RubberTiredDozers	2023	501	750	473.0234	0.153
RubberTiredDozers	2023	751	1000	568.299	0.04
RubberTiredLoaders	2020	16	25	524.6967	0.17
RubberTiredLoaders	2020	26	50	524.6967	0.17
RubberTiredLoaders	2020	51	120	465.6735	0.151
RubberTiredLoaders	2020	121	175	471.2135	0.152
RubberTiredLoaders	2020	176	250	469.5127	0.152
RubberTiredLoaders	2020	251	500	466.7831	0.151
RubberTiredLoaders	2020	501	750	462.193	0.149
RubberTiredLoaders	2020	751	1000	469.9352	0.152
RubberTiredLoaders	2021	16	25	524.5505	0.17
RubberTiredLoaders	2021	26	50	524.5505	0.17
RubberTiredLoaders	2021	51	120	466.4213	0.151
RubberTiredLoaders	2021	121	175	471.0804	0.152
RubberTiredLoaders	2021	176	250	469.5642	0.152
RubberTiredLoaders	2021	251	500	467.9277	0.151
RubberTiredLoaders	2021	501	750	462.0548	0.149
RubberTiredLoaders	2021	751	1000	471.2577	0.152
RubberTiredLoaders	2022	16	25	524.7914	0.17

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
RubberTiredLoaders	2022	26	50	524.7914	0.17
RubberTiredLoaders	2022	51	120	466.4936	0.151
RubberTiredLoaders	2022	121	175	470.9274	0.152
RubberTiredLoaders	2022	176	250	469.9041	0.152
RubberTiredLoaders	2022	251	500	468.1288	0.151
RubberTiredLoaders	2022	501	750	463.8194	0.15
RubberTiredLoaders	2022	751	1000	472.8577	0.153
RubberTiredLoaders	2023	16	25	524.304	0.17
RubberTiredLoaders	2023	26	50	524.304	0.17
RubberTiredLoaders	2023	51	120	466.5584	0.151
RubberTiredLoaders	2023	121	175	470.6601	0.152
RubberTiredLoaders	2023	176	250	469.824	0.152
RubberTiredLoaders	2023	251	500	468.466	0.152
RubberTiredLoaders	2023	501	750	464.5553	0.15
RubberTiredLoaders	2023	751	1000	472.3032	0.153
SignalBoards	2020	6	15	568.299	0.059
SignalBoards	2020	26	50	568.299	0.071
SignalBoards	2020	51	120	568.299	0.035
SignalBoards	2020	121	175	568.299	0.026
SignalBoards	2020	176	250	686.695	0.024
SignalBoards	2021	6	15	568.299	0.059
SignalBoards	2021	26	50	568.299	0.064
SignalBoards	2021	51	120	568.299	0.032
SignalBoards	2021	121	175	568.299	0.025
SignalBoards	2021	176	250	686.695	0.023
SignalBoards	2022	6	15	568.3	0.059
SignalBoards	2022	26	50	568.299	0.059
SignalBoards	2022	51	120	568.299	0.03
SignalBoards	2022	121	175	568.299	0.023
SignalBoards	2022	176	250	686.695	0.022
SignalBoards	2023	6	15	568.299	0.059
SignalBoards	2023	26	50	568.299	0.054
SignalBoards	2023	51	120	568.299	0.028
SignalBoards	2023	121	175	568.299	0.022
SignalBoards	2023	176	250	686.695	0.021
SkidSteerLoaders	2020	16	25	527.7577	0.171
SkidSteerLoaders	2020	26	50	527.7577	0.171
SkidSteerLoaders	2020	51	120	471.9075	0.153
SkidSteerLoaders	2021	16	25	527.4501	0.171
SkidSteerLoaders	2021	26	50	527.4501	0.171
SkidSteerLoaders	2021	51	120	471.9774	0.153
SkidSteerLoaders	2022	16	25	527.2726	0.171
SkidSteerLoaders	2022	26	50	527.2726	0.171
SkidSteerLoaders	2022	51	120	472.4321	0.153
SkidSteerLoaders	2023	16	25	527.4231	0.171
SkidSteerLoaders	2023	26	50	527.4231	0.171
SkidSteerLoaders	2023	51	120	472.656	0.153
SkidSteerLoaders	2024	16	25	527.8005	0.171
SkidSteerLoaders	2024	26	50	527.8005	0.171
SkidSteerLoaders	2024	51	120	472.847	0.153
SurfacingEquipment	2020	26	50	535.5275	0.173
SurfacingEquipment	2020	51	120	473.8188	0.153
SurfacingEquipment	2020	121	175	469.2079	0.152
SurfacingEquipment	2020	176	250	476.4261	0.154

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
SurfacingEquipment	2020	251	500	471.6331	0.153
SurfacingEquipment	2020	501	750	469.6252	0.152
SurfacingEquipment	2021	26	50	535.784	0.173
SurfacingEquipment	2021	51	120	474.0906	0.153
SurfacingEquipment	2021	121	175	469.1687	0.152
SurfacingEquipment	2021	176	250	476.8023	0.154
SurfacingEquipment	2021	251	500	471.7484	0.153
SurfacingEquipment	2021	501	750	470.4087	0.152
SurfacingEquipment	2022	26	50	535.8364	0.173
SurfacingEquipment	2022	51	120	473.6362	0.153
SurfacingEquipment	2022	121	175	469.1259	0.152
SurfacingEquipment	2022	176	250	476.9511	0.154
SurfacingEquipment	2022	251	500	470.5248	0.152
SurfacingEquipment	2022	501	750	470.4004	0.152
SurfacingEquipment	2023	26	50	535.9295	0.173
SurfacingEquipment	2023	51	120	474.4698	0.153
SurfacingEquipment	2023	121	175	470.0141	0.152
SurfacingEquipment	2023	176	250	476.9606	0.154
SurfacingEquipment	2023	251	500	470.3746	0.152
SurfacingEquipment	2023	501	750	472.4466	0.153
Sweepers/Scrubbers	2020	16	25	525.3284	0.17
Sweepers/Scrubbers	2020	26	50	525.3284	0.17
Sweepers/Scrubbers	2020	51	120	474.1157	0.153
Sweepers/Scrubbers	2020	121	175	473.1221	0.153
Sweepers/Scrubbers	2020	176	250	470.1263	0.152
Sweepers/Scrubbers	2021	6	15	525.3284	0.17
Sweepers/Scrubbers	2021	16	25	525.3284	0.17
Sweepers/Scrubbers	2021	26	50	525.3284	0.17
Sweepers/Scrubbers	2021	51	120	474.1157	0.153
Sweepers/Scrubbers	2021	121	175	473.1221	0.153
Sweepers/Scrubbers	2021	176	250	470.1263	0.152
Sweepers/Scrubbers	2022	6	15	525.3284	0.17
Sweepers/Scrubbers	2022	16	25	525.3284	0.17
Sweepers/Scrubbers	2022	26	50	525.3284	0.17
Sweepers/Scrubbers	2022	51	120	474.1157	0.153
Sweepers/Scrubbers	2022	121	175	473.1221	0.153
Sweepers/Scrubbers	2022	176	250	470.1263	0.152
Sweepers/Scrubbers	2023	6	15	525.3284	0.17
Sweepers/Scrubbers	2023	16	25	525.3284	0.17
Sweepers/Scrubbers	2023	26	50	525.3284	0.17
Sweepers/Scrubbers	2023	51	120	474.1157	0.153
Sweepers/Scrubbers	2023	121	175	473.1221	0.153
Sweepers/Scrubbers	2023	176	250	470.1263	0.152
Tractors/Loaders/Backhoes	2020	16	25	515.874	0.167
Tractors/Loaders/Backhoes	2020	26	50	515.874	0.167
Tractors/Loaders/Backhoes	2020	51	120	475.1543	0.154
Tractors/Loaders/Backhoes	2020	121	175	467.5132	0.151
Tractors/Loaders/Backhoes	2020	176	250	470.4998	0.152
Tractors/Loaders/Backhoes	2020	251	500	468.2447	0.151
Tractors/Loaders/Backhoes	2020	501	750	468.6602	0.152
Tractors/Loaders/Backhoes	2021	16	25	515.1213	0.167
Tractors/Loaders/Backhoes	2021	26	50	515.1213	0.167
Tractors/Loaders/Backhoes	2021	51	120	475.3621	0.154
Tractors/Loaders/Backhoes	2021	121	175	467.5285	0.151

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
Tractors/Loaders/Backhoes	2021	176	250	470.5716	0.152
Tractors/Loaders/Backhoes	2021	251	500	469.3025	0.152
Tractors/Loaders/Backhoes	2021	501	750	466.4564	0.151
Tractors/Loaders/Backhoes	2022	16	25	514.4613	0.166
Tractors/Loaders/Backhoes	2022	26	50	514.4613	0.166
Tractors/Loaders/Backhoes	2022	51	120	475.8975	0.154
Tractors/Loaders/Backhoes	2022	121	175	467.8004	0.151
Tractors/Loaders/Backhoes	2022	176	250	470.1236	0.152
Tractors/Loaders/Backhoes	2022	251	500	469.2562	0.152
Tractors/Loaders/Backhoes	2022	501	750	466.6327	0.151
Tractors/Loaders/Backhoes	2023	16	25	513.7962	0.166
Tractors/Loaders/Backhoes	2023	26	50	513.7962	0.166
Tractors/Loaders/Backhoes	2023	51	120	476.4307	0.154
Tractors/Loaders/Backhoes	2023	121	175	468.821	0.152
Tractors/Loaders/Backhoes	2023	176	250	469.7518	0.152
Tractors/Loaders/Backhoes	2023	251	500	469.4652	0.152
Tractors/Loaders/Backhoes	2023	501	750	466.6756	0.151
Trenchers	2020	6	15	527.0962	0.17
Trenchers	2020	16	25	527.0962	0.17
Trenchers	2020	26	50	527.0962	0.17
Trenchers	2020	51	120	475.1265	0.154
Trenchers	2020	121	175	467.7348	0.151
Trenchers	2020	176	250	473.5951	0.153
Trenchers	2020	251	500	470.6367	0.152
Trenchers	2020	501	750	472.6556	0.153
Trenchers	2021	6	15	527.0165	0.17
Trenchers	2021	16	25	527.0165	0.17
Trenchers	2021	26	50	527.0165	0.17
Trenchers	2021	51	120	475.287	0.154
Trenchers	2021	121	175	467.7343	0.151
Trenchers	2021	176	250	473.8538	0.153
Trenchers	2021	251	500	470.701	0.152
Trenchers	2021	501	750	472.5289	0.153
Trenchers	2022	6	15	527.0258	0.17
Trenchers	2022	16	25	527.0258	0.17
Trenchers	2022	26	50	527.0258	0.17
Trenchers	2022	51	120	475.3262	0.154
Trenchers	2022	121	175	467.7337	0.151
Trenchers	2022	176	250	473.8512	0.153
Trenchers	2022	251	500	470.5845	0.152
Trenchers	2022	501	750	474.2887	0.153
Trenchers	2023	6	15	527.0954	0.17
Trenchers	2023	16	25	527.0954	0.17
Trenchers	2023	26	50	527.0954	0.17
Trenchers	2023	51	120	475.6903	0.154
Trenchers	2023	121	175	467.7332	0.151
Trenchers	2023	176	250	473.8485	0.153
Trenchers	2023	251	500	471.6125	0.153
Trenchers	2023	501	750	474.4705	0.153
Welders	2020	6	15	568.299	0.066
Welders	2020	16	25	568.299	0.069
Welders	2020	26	50	568.299	0.084
Welders	2020	51	120	568.299	0.041
Welders	2020	121	175	568.299	0.031

OFFROAD2011 Emission Rates - Construction Equipment

EquipmentType	Year	LowHP	HighHP	CO2	CH4
Welders	2020	176	250	568.299	0.023
Welders	2020	251	500	568.299	0.022
Welders	2021	6	15	568.299	0.064
Welders	2021	16	25	568.299	0.067
Welders	2021	26	50	568.299	0.074
Welders	2021	51	120	568.299	0.037
Welders	2021	121	175	568.299	0.028
Welders	2021	176	250	568.299	0.021
Welders	2021	251	500	568.299	0.021
Welders	2022	6	15	568.3	0.063
Welders	2022	16	25	568.299	0.066
Welders	2022	26	50	568.299	0.068
Welders	2022	51	120	568.299	0.034
Welders	2022	121	175	568.3	0.026
Welders	2022	176	250	568.299	0.02
Welders	2022	251	500	568.3	0.02
Welders	2023	6	15	568.3	0.063
Welders	2023	16	25	568.299	0.065
Welders	2023	26	50	568.299	0.062
Welders	2023	51	120	568.299	0.032
Welders	2023	121	175	568.299	0.025
Welders	2023	176	250	568.299	0.019
Welders	2023	251	500	568.299	0.019

Vehicle Trips Emissions Calculations

WORKERS

SCEN	Year	Description	Length (months)	Length (days)
1	2020	Access Road Paving	3	60
2	2020	Site Mobilization	2	40
3	2020	LAAS REALIGNMENT	5	100
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
6	2021	Plant Excavation & Grading	4	80
7	2021	Plant Structural	1	20
8	2022	Plant Structural	4	80
9	2022	Plant Construction & Finishing	8	160
10	2023	Plant Construction & Finishing	7	140
11	2023	Demobilization	1	20

HAUL TRUCKS (OFFSITE)

SCEN	Year	Description	Length (months)	Length (days)
1	2020	Access Road Paving	3	60
2	2020	Site Mobilization	2	40
3	2020	LAAS REALIGNMENT	5	100
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
6	2021	Plant Excavation & Grading	4	80
7	2021	Plant Structural	1	20
8	2022	Plant Structural	4	80
9	2022	Plant Construction & Finishing	8	160
10	2023	Plant Construction & Finishing	7	140
11	2023	Demobilization	1	20

Vehicle Trips Emissions Calculations

WORKERS

SCEN	Year	Workers	Trips (/day)	Trip Length	W-VMT (mi/day)	Worker Emission Rates (g/mi)		Worker Emissions (lb/day)		Worker Emissions (ton CO2e/phase)	
						CO2	CH4	CO2	CH4	CO2	CH4
1	2020	15	30	15	450	274.4835137	0.008121496	272.3098757	0.008057182	8.169296271	0.006768033
2	2020	10	20	15	300	274.4835137	0.008121496	181.5399171	0.005371455	3.630798343	0.003008015
3	2020	25	50	15	750	274.4835137	0.008121496	453.8497929	0.013428636	22.69248964	0.018800091
4	2021	45	90	15	1350	265.4584967	0.00738496	790.0689839	0.021979434	23.70206952	0.018462725
5	2021	75	150	15	2250	265.4584967	0.00738496	1316.78164	0.03663239	52.67126559	0.041028277
6	2021	25	50	15	750	265.4584967	0.00738496	438.9272133	0.012210797	17.55708853	0.013676092
7	2021	25	50	15	750	265.4584967	0.00738496	438.9272133	0.012210797	4.389272133	0.003419023
8	2022	25	50	15	750	256.2610758	0.006715622	423.7195693	0.011104068	16.94878277	0.012436556
9	2022	20	40	15	600	256.2610758	0.006715622	338.9756554	0.008883254	27.11805243	0.01989849
10	2023	20	40	15	600	246.6656956	0.006100753	326.2831296	0.008069921	22.83981907	0.015817045
11	2023	20	40	15	600	246.6656956	0.006100753	326.2831296	0.008069921	3.262831296	0.002259578

HAUL TRUCKS (OFFSITE)

SCEN	Year	Workers	Haul Trips (one-way/day)	Trip Length	H-VMT (mi/day)						
1	2020	15	26	20	520	1565.630761	0.012281282	1794.84646	0.014079319	53.8453938	0.011826628
2	2020	10	4	20	80	1565.630761	0.012281282	276.1302246	0.002166049	5.522604492	0.001212988
3	2020	25	32	20	640	1565.630761	0.012281282	2209.041797	0.017328393	110.4520898	0.024259751
4	2021	45	118	20	2360	1546.235907	0.011443607	8044.93188	0.059540097	241.3479564	0.050013681
5	2021	75	96	20	1920	1546.235907	0.011443607	6545.029326	0.048439401	261.8011731	0.054252129
6	2021	25	12	20	240	1546.235907	0.011443607	818.1286658	0.006054925	32.72514663	0.006781516
7	2021	25	20	20	400	1546.235907	0.011443607	1363.547776	0.010091542	13.63547776	0.002825632
8	2022	25	96	20	1920	1525.955475	0.010716674	6459.184713	0.045362382	258.3673885	0.050805868
9	2022	20	16	20	320	1525.955475	0.010716674	1076.530785	0.007560397	86.12246284	0.016935289
10	2023	20	16	20	320	1485.291732	0.009356406	1047.843335	0.006600755	73.34903347	0.01293748
11	2023	20	4	20	80	1485.291732	0.009356406	261.9608338	0.001650189	2.619608338	0.000462053

Vehicle Trips Emissions Calculations

HAUL TRUCKS (ON-SITE)

SCEN	Year	Description	Length (months)	Length (days)
1	2020	Access Road Paving	3	60
2	2020	Site Mobilization	2	40
3	2020	LAAS REALIGNMENT	5	100
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
6	2021	Plant Excavation & Grading	4	80
7	2021	Plant Structural	1	20
8	2022	Plant Structural	4	80
9	2022	Plant Construction & Finishing	8	160
10	2023	Plant Construction & Finishing	7	140
11	2023	Demobilization	1	20

DUMP/PICKUP/WATER (ON-SITE)

SCEN	Year	Description	Length (months)	Length (days)
1	2020	Access Road Paving	3	60
2	2020	Site Mobilization	2	40
3	2020	LAAS REALIGNMENT	5	100
4	2021	Reservoir Demo & Relining+LAAS Realignment	3	60
5	2021	Reservoir Demo & Relining+LAAS Realignment	4	80
6	2021	Plant Excavation & Grading	4	80
7	2021	Plant Structural	1	20
8	2022	Plant Structural	4	80
9	2022	Plant Construction & Finishing	8	160
10	2023	Plant Construction & Finishing	7	140
11	2023	Demobilization	1	20

Vehicle Trips Emissions Calculations

HAUL TRUCKS (ON-SITE)

SCEN	Year	Workers	Haul Trips (one-way/day)	Trip Length	H-VMT (mi/day)	Truck Emission Rates (g/mi)		Truck Emissions (lb/day)		On-Site Truck Emissions (lb/phase)	
1	2020	15		0.25	0	2296.76066	0.055784587	0.000	0.000	0	0
2	2020	10		0.25	0	2296.76066	0.055784587	0.000	0.000	0	0
3	2020	25		0.25	0	2296.76066	0.055784587	0.000	0.000	0	0
4	2021	45		0.25	0	2262.252942	0.052077301	0.000	0.000	0	0
5	2021	75		0.25	0	2262.252942	0.052077301	0.000	0.000	0	0
6	2021	25	676	0.25	169	2262.252942	0.052077301	842.874	0.019	33.71494623	0.021731405
7	2021	25		0.25	0	2262.252942	0.052077301	0.000	0.000	0	0
8	2022	25		0.25	0	2225.908649	0.04886701	0.000	0.000	0	0
9	2022	20		0.25	0	2225.908649	0.04886701	0.000	0.000	0	0
10	2023	20		0.25	0	2151.813973	0.042575655	0.000	0.000	0	0
11	2023	20		0.25	0	2151.813973	0.042575655	0.000	0.000	0	0

DUMP/PICKUP/WATER (ON-SITE)

SCEN	Year	Count	Trips (one-way/day)	Trip Length	H-VMT (mi/day)	Truck Emission Rates (g/mi)		Truck Emissions (lb/day)		Site Dump/Pickup/Water Emissions (lb/ph	
1	2020	4	480	0.25	120	1742.217312	0.026764014	460.9121798	0.007080552	13.82736539	0.005947664
2	2020	4	480	0.25	120	1742.217312	0.026764014	460.9121798	0.007080552	9.218243596	0.003965109
3	2020	14	1680	0.25	420	1742.217312	0.026764014	1613.192629	0.024781931	80.65963146	0.034694704
4	2021	20	2400	0.25	600	1722.163535	0.016453378	2278.034271	0.021764111	68.34102814	0.018281853
5	2021	17	2040	0.25	510	1722.163535	0.016453378	1936.329131	0.018499494	77.45316522	0.020719434
6	2021	18	2160	0.25	540	1722.163535	0.016453378	2050.230844	0.0195877	82.00923376	0.021938224
7	2021	6	720	0.25	180	1722.163535	0.016453378	683.4102814	0.006529233	6.834102814	0.001828185
8	2022	6	720	0.25	180	1713.526169	0.014462229	679.9826947	0.005739081	27.19930779	0.006427771
9	2022	7	840	0.25	210	1713.526169	0.014462229	793.3131439	0.006695595	63.46505151	0.014998132
10	2023	7	840	0.25	210	1693.283096	0.011630805	783.9411855	0.005384727	54.87588299	0.010554065
11	2023	3	360	0.25	90	1693.283096	0.011630805	335.9747938	0.00230774	3.359747938	0.000646167

Vehicle Trips Emissions Calculations

Total		Daily Emissions (lb/day)		Total Emissions (tonCO2e/phase)	
SCEN	Year	CO2	CH4	CO2	CH4
1	2020	2528.069	0.029	75.842	0.025
2	2020	918.582	0.015	18.372	0.008
3	2020	4276.084	0.056	213.804	0.078
4	2021	11113.035	0.103	333.391	0.087
5	2021	9798.140	0.104	391.926	0.116
6	2021	4150.160	0.057	166.006	0.064
7	2021	2485.885	0.029	24.859	0.008
8	2022	7562.887	0.062	302.515	0.070
9	2022	2208.820	0.023	176.706	0.052
10	2023	2158.068	0.020	151.065	0.039
11	2023	924.219	0.012	9.242	0.003

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2020	Los Angeles (MD)	HHDT	RUNEX	15	CH4	0.0558
2020	Los Angeles (MD)	LDA	RUNEX	15	CH4	0.0159
2020	Los Angeles (MD)	LDT1	RUNEX	15	CH4	0.0506
2020	Los Angeles (MD)	LDT2	RUNEX	15	CH4	0.0220
2020	Los Angeles (MD)	MHDT	RUNEX	15	CH4	0.0268
2020	Los Angeles (MD)	HHDT	RUNEX	40	CH4	0.0123
2020	Los Angeles (MD)	LDA	RUNEX	40	CH4	0.0047
2020	Los Angeles (MD)	LDT1	RUNEX	40	CH4	0.0164
2020	Los Angeles (MD)	LDT2	RUNEX	40	CH4	0.0067
2020	Los Angeles (MD)	MHDT	RUNEX	40	CH4	0.0070
2020	Los Angeles (MD)	HHDT	RUNEX	15	CO2	2296.7607
2020	Los Angeles (MD)	LDA	RUNEX	15	CO2	504.9740
2020	Los Angeles (MD)	LDT1	RUNEX	15	CO2	620.0575
2020	Los Angeles (MD)	LDT2	RUNEX	15	CO2	693.2800
2020	Los Angeles (MD)	MHDT	RUNEX	15	CO2	1742.2173
2020	Los Angeles (MD)	HHDT	RUNEX	40	CO2	1565.6308
2020	Los Angeles (MD)	LDA	RUNEX	40	CO2	238.7100
2020	Los Angeles (MD)	LDT1	RUNEX	40	CO2	292.9571
2020	Los Angeles (MD)	LDT2	RUNEX	40	CO2	327.5569
2020	Los Angeles (MD)	MHDT	RUNEX	40	CO2	1135.6515
2021	Los Angeles (MD)	HHDT	RUNEX	15	CH4	0.0521
2021	Los Angeles (MD)	LDA	RUNEX	15	CH4	0.0143
2021	Los Angeles (MD)	LDT1	RUNEX	15	CH4	0.0464
2021	Los Angeles (MD)	LDT2	RUNEX	15	CH4	0.0200
2021	Los Angeles (MD)	MHDT	RUNEX	15	CH4	0.0165
2021	Los Angeles (MD)	HHDT	RUNEX	40	CH4	0.0114
2021	Los Angeles (MD)	LDA	RUNEX	40	CH4	0.0043
2021	Los Angeles (MD)	LDT1	RUNEX	40	CH4	0.0150
2021	Los Angeles (MD)	LDT2	RUNEX	40	CH4	0.0060
2021	Los Angeles (MD)	MHDT	RUNEX	40	CH4	0.0043
2021	Los Angeles (MD)	HHDT	RUNEX	15	CO2	2262.2529
2021	Los Angeles (MD)	LDA	RUNEX	15	CO2	486.6508
2021	Los Angeles (MD)	LDT1	RUNEX	15	CO2	604.1234
2021	Los Angeles (MD)	LDT2	RUNEX	15	CO2	669.4416
2021	Los Angeles (MD)	MHDT	RUNEX	15	CO2	1722.1635
2021	Los Angeles (MD)	HHDT	RUNEX	40	CO2	1546.2359
2021	Los Angeles (MD)	LDA	RUNEX	40	CO2	230.0547
2021	Los Angeles (MD)	LDT1	RUNEX	40	CO2	285.4285
2021	Los Angeles (MD)	LDT2	RUNEX	40	CO2	316.2961
2021	Los Angeles (MD)	MHDT	RUNEX	40	CO2	1134.8120
2022	Los Angeles (MD)	HHDT	RUNEX	15	CH4	0.0489
2022	Los Angeles (MD)	LDA	RUNEX	15	CH4	0.0130
2022	Los Angeles (MD)	LDT1	RUNEX	15	CH4	0.0426
2022	Los Angeles (MD)	LDT2	RUNEX	15	CH4	0.0182
2022	Los Angeles (MD)	MHDT	RUNEX	15	CH4	0.0145
2022	Los Angeles (MD)	HHDT	RUNEX	40	CH4	0.0107

EMFAC2014 Emission Rates

calendar_year	sub_area	vehicle_class	process	speed_time	pollutant	emission_rate
2022	Los Angeles (MD)	LDA	RUNEX	40	CH4	0.0038
2022	Los Angeles (MD)	LDT1	RUNEX	40	CH4	0.0137
2022	Los Angeles (MD)	LDT2	RUNEX	40	CH4	0.0055
2022	Los Angeles (MD)	MHDT	RUNEX	40	CH4	0.0037
2022	Los Angeles (MD)	HHDT	RUNEX	15	CO2	2225.9086
2022	Los Angeles (MD)	LDA	RUNEX	15	CO2	468.2379
2022	Los Angeles (MD)	LDT1	RUNEX	15	CO2	587.2545
2022	Los Angeles (MD)	LDT2	RUNEX	15	CO2	645.2626
2022	Los Angeles (MD)	MHDT	RUNEX	15	CO2	1713.5262
2022	Los Angeles (MD)	HHDT	RUNEX	40	CO2	1525.9555
2022	Los Angeles (MD)	LDA	RUNEX	40	CO2	221.3561
2022	Los Angeles (MD)	LDT1	RUNEX	40	CO2	277.4582
2022	Los Angeles (MD)	LDT2	RUNEX	40	CO2	304.8739
2022	Los Angeles (MD)	MHDT	RUNEX	40	CO2	1130.2966
2023	Los Angeles (MD)	HHDT	RUNEX	15	CH4	0.0426
2023	Los Angeles (MD)	LDA	RUNEX	15	CH4	0.0118
2023	Los Angeles (MD)	LDT1	RUNEX	15	CH4	0.0389
2023	Los Angeles (MD)	LDT2	RUNEX	15	CH4	0.0166
2023	Los Angeles (MD)	MHDT	RUNEX	15	CH4	0.0116
2023	Los Angeles (MD)	HHDT	RUNEX	40	CH4	0.0094
2023	Los Angeles (MD)	LDA	RUNEX	40	CH4	0.0035
2023	Los Angeles (MD)	LDT1	RUNEX	40	CH4	0.0125
2023	Los Angeles (MD)	LDT2	RUNEX	40	CH4	0.0050
2023	Los Angeles (MD)	MHDT	RUNEX	40	CH4	0.0030
2023	Los Angeles (MD)	HHDT	RUNEX	15	CO2	2151.8140
2023	Los Angeles (MD)	LDA	RUNEX	15	CO2	449.8968
2023	Los Angeles (MD)	LDT1	RUNEX	15	CO2	569.4104
2023	Los Angeles (MD)	LDT2	RUNEX	15	CO2	618.5496
2023	Los Angeles (MD)	MHDT	RUNEX	15	CO2	1693.2831
2023	Los Angeles (MD)	HHDT	RUNEX	40	CO2	1485.2917
2023	Los Angeles (MD)	LDA	RUNEX	40	CO2	212.6907
2023	Los Angeles (MD)	LDT1	RUNEX	40	CO2	269.0272
2023	Los Angeles (MD)	LDT2	RUNEX	40	CO2	292.2542
2023	Los Angeles (MD)	MHDT	RUNEX	40	CO2	1120.9666

GHG Emissions Calculations

Operation

			EF (g/mi)		E (lb/day)			
Haul Trips (one-way/day)	**Trip Length (mi)**	**H-VMT (mi/day)**	**CO2**	**CH4**	**CO2**	**CH4**	**Total CO2e (lb/day)**	**Total CO2e (ton/year)**
20	40	800	1485.291732	0.009356406	2619.608338	0.016501888	2,620	478

Electricity

kWh/day	**lb CO2e/kWh**	**lb CO2e/day**	**ton CO2e/year**
25691.70137	0.705	18,113	3,306
9,377,471 / 365			
	Total	20,733	3,784

Table 5 - Fairmont Sedimentation Plant Energy Requirement Estimates

Densadeg Rapid Mixers

Item	Quantity	Unit HP	Total HP	Annual Run-Time	Annual HP * hr	Annual kWh
Rapid mixer	3	7.5	22.5	8,760	197,100	148,456
Reactor mixer	3	15	45	8,760	394,200	296,911
Scraper drive & mechanism	3	0.75	2.25	8,760	19,710	14,846
Recycle and sludge blowdown pumps	6	40	240	8,760	2,102,400	1,583,528
					TOTAL	**2,043,740**

Centrifuges

Item	Quantity	Unit HP	Total HP	Annual Run-Time	Annual HP * hr	Annual kWh
Centrifuge	5	250	1250	6552	8,190,000	**6,168,708**

Sludge Collector system - plate settlers

Item	Quantity	Unit HP	Total HP	Annual Run-Time	Annual HP * hr	Annual kWh
Chain and Flight	16	0.25	4	8760	35,040	**26,392**

Screw and Transfer Conveyors

Item	Quantity	Unit HP	Total HP	Annual Run-Time	Annual HP * hr	Annual kWh
Centrifuge screw conveyor - 1, 2, 3, 4, 5	5	3	15	6552	98,280	74,024
Transfer screw conveyors - 6, 7	2	20	40	6552	262,080	197,399
Transfer screw conveyors - 8, 9	2	30	60	6552	393,120	296,098
Loadout screw conveyors - 10, 11, 12	3	15	45	6552	294,840	222,073
					TOTAL	**789,595**

Chemical Feed

Item	Quantity	Unit HP	Total HP	Annual Run-Time	Annual HP * hr	Annual kWh
Ferric Chloride	1	12	12	8,760	105,120	79,176
Polymer	1	2.7	2.7	8,760	23,652	17,815
					TOTAL	**96,991**

Additional Major Components

Item	Quantity	Unit HP	Total HP	Annual Run-Time	Annual HP * hr	Annual kWh
Central Sump Pumps	2	12.7	25.4	8,760	222,504	167,590
EQ Basins	2	6.4	12.8	8,760	112,128	84,455
					TOTAL	**252,045**
					GRAND TOTAL	**9,377,471**

LADWP FAIRMONT SEDIMENTATION PLANT PROJECT

NOISE & VIBRATION IMPACT STUDY

Prepared for

AECOM

Prepared by

TERRY A. HAYES ASSOCIATES INC.

APRIL 2018

taha 2017-031

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1.0 SUMMARY OF FINDINGS

Terry A. Hayes Associates Inc. (TAHA) completed a noise and vibration impact analysis for the Los Angeles Department of Water and Power (LADWP) Fairmont Sedimentation Plant Project (proposed project). The analysis assessed construction and operational impacts associated with the proposed project. Impact conclusions associated with the California Environmental Quality Act (CEQA) are shown in **Table 1-1**. The proposed project would result in a less-than significant impact or no impact for each impact statement.

TABLE 1-1: SUMMARY OF IMPACT STATEMENTS

Impact Statement	Proposed Project Level of Significance	Applicable Mitigation Measures	Level of Significance After Mitigation
Would the proposed project expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less-than-Significant Impact	None	Less-than-Significant Impact
Would the proposed project expose people to or generate excessive ground-borne vibration or ground-borne noise levels?	Less-than-Significant Impact	None	Less-than-Significant Impact
Would the proposed project create a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	Less-than-Significant Impact	None	Less-than-Significant Impact
Would the proposed project create a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	Less-than-Significant Impact	None	Less-than-Significant Impact
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, expose people residing or working in the project area to excessive noise levels?	No Impact	None	No Impact
For a project located within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels?	No Impact	None	No Impact

SOURCE: TAHA, 2017.

2.0 INTRODUCTION

2.1 PURPOSE OF REPORT

The purpose of this report is to evaluate the potential noise and vibration impacts associated with the proposed project.

2.2 PROJECT DESCRIPTION

Background

To maintain the quality and reliability of the City of Los Angeles' potable water supply, LADWP is proposing to implement the proposed project to improve raw water quality through a reduction in sediment in the water delivered by the First and Second Los Angeles Aqueducts (LAA1 and LAA2) to the Los Angeles Aqueduct Filtration Plant (LAAFP), where the water receives additional treatment and disinfection before entering the City's potable water distribution system. The proposed sedimentation plant would utilize plate settler technology to increase the efficiency and effectiveness of the sediment removal process and minimize the new plant's required footprint.

Project Location

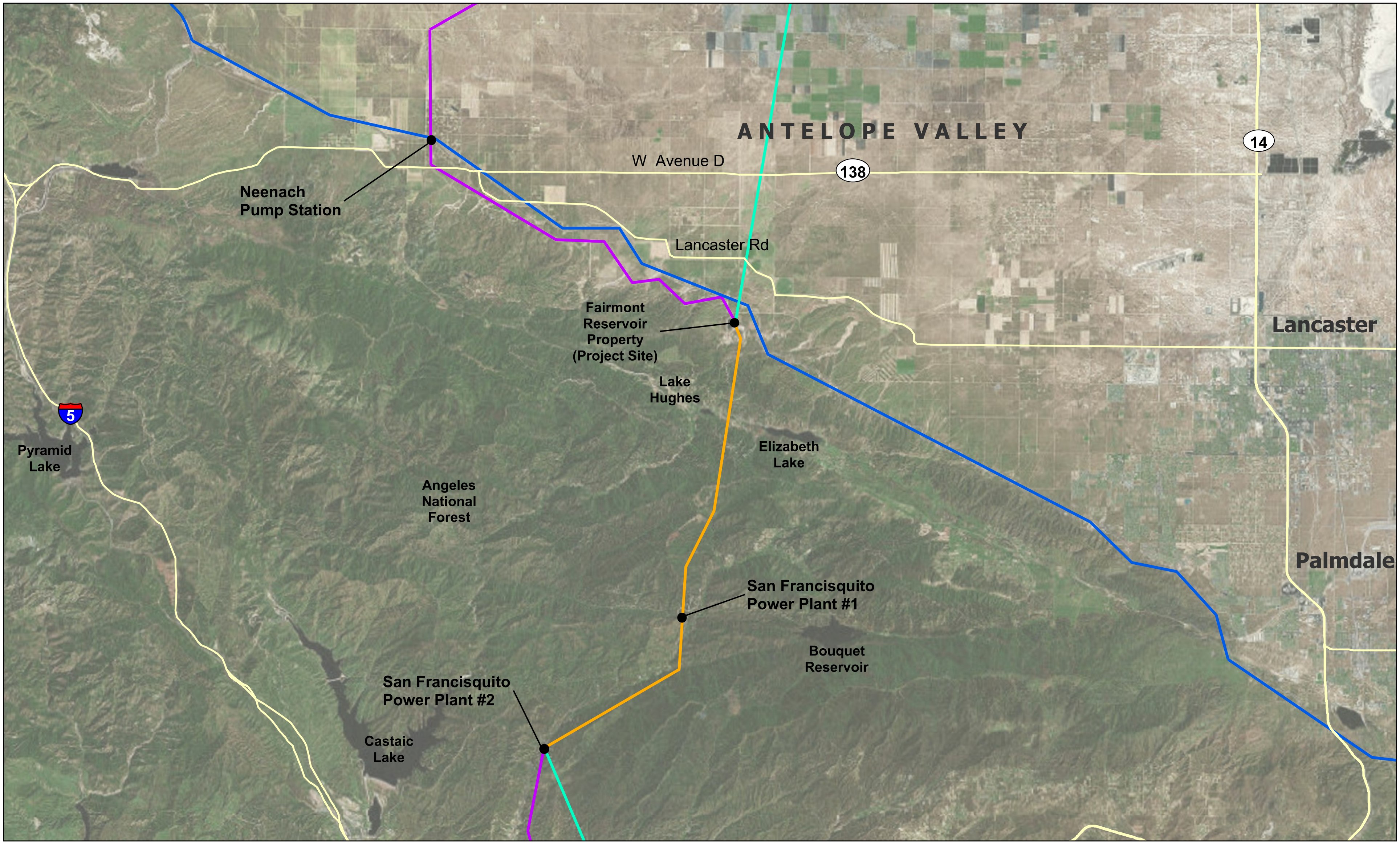
The project site is located on LADWP-owned property adjacent to LADWP Fairmont Reservoir #2. The Fairmont Reservoir property is located at West Avenue H and 170th Street West, approximately 6 miles west of the City of Lancaster, in the Antelope Valley in northwest Los Angeles County (see **Figure 2-1**). Regional access to the site is provided by State Highway 138, an east-west thoroughfare that is located approximately 4 miles north of the property and provides linkage between State Highway 14 (about 15 miles east of the project site) and Interstate Route 5 (about 20 miles west of the project site). The nearest paved road to the project site is Lancaster Road, which is approximately 1 mile to the northeast at its closest point. Immediate access to the project site is provided by unpaved roads. The proposed project site consists of an approximately 20-acre vacant parcel located just northeast of Fairmont Reservoir #2. The parcel is relatively flat, sparsely vegetated, and maintained by tilling. An ephemeral drainage course, which contains some vegetation, crosses the site generally from southwest to northeast. Along its northern and eastern edges, the site is bounded by a chain-link fence, which is part of the LADWP Fairmont Reservoir property perimeter security fence (see **Figure 2-2**).

Proposed Project

In addition to the key characteristics described above, in order to achieve the project objectives, the sedimentation plant would include the following primary facilities and components (see **Figure 2-3**).

LAA Realignment

LAA1 and LAA2 converge at the Fairmont Reservoir property. However, the actual convergence occurs downstream of the Fairmont Reservoir #2, at the outlet pipeline of the reservoir, and downstream of the proposed sedimentation plant site. Currently, only LAA1 water passes through the Fairmont Reservoir #2, while LAA2 is routed directly to the outlet pipeline. In order to allow both LAA1 and LAA2 to flow to the proposed sedimentation plant, they would be diverted into a new buried pipeline located upstream of the reservoir and connected to the plant intake facility. The existing buried aqueduct pipelines would remain in place with new isolation valves to allow for bypassing the sedimentation plant if necessary.



LEGEND

- LAA1
- LAA2
- Combined LAA1 and LAA2 Flow
- State Water Project - East Branch

0 100 200 Miles

N

SOURCE: AECOM, 2018.

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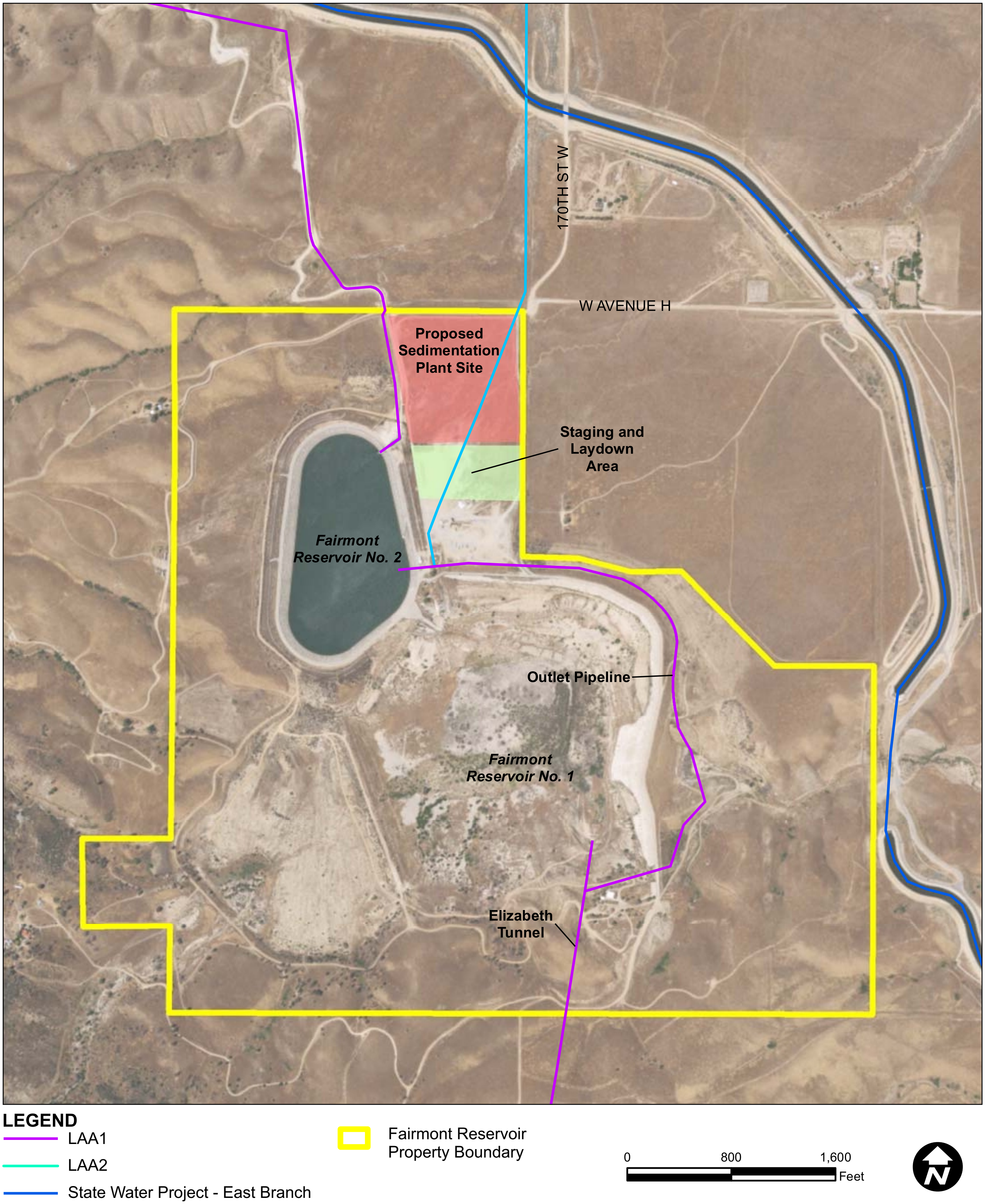
Fairmont Sedimentation Plant Project
Noise & Vibration Impact Study

LADWP

FIGURE 2-1

REGIONAL LOCATION MAP



SOURCE: LADWP, 2017; AECOM, 2017.

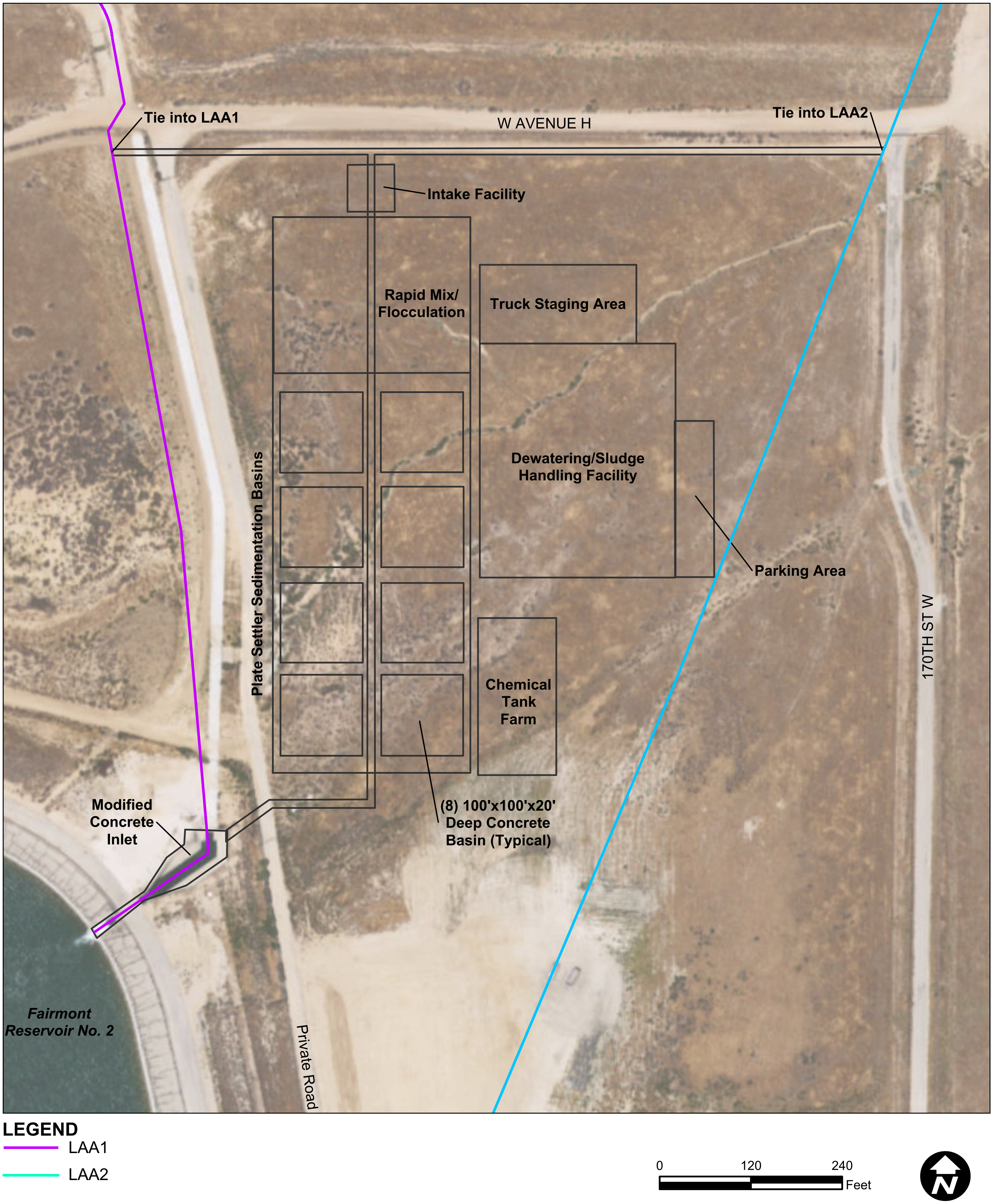
Fairmont Sedimentation Plant Project
Noise & Vibration Impact Study

LADWP

TAHA 2017-031

FIGURE 2-2

FAIRMONT RESERVOIR PROPERTY



SOURCE: LADWP, 2017; AECOM, 2017.

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Fairmont Sedimentation Plant Project
Noise & Vibration Impact Study

LADWP

FIGURE 2-3

CONCEPTUAL SITE PLAN

Intake Facility

An intake facility would meter total flow into the plant from the LAAs to determine the hydraulic conditions for plant operations. The intake facility would also include coarse screens to capture algae and larger debris.

Rapid Mix Coagulation/Flocculation

Following the intake facility but prior to the sedimentation basins, the water would pass through rapid mix coagulation/flocculation tanks. The application of coagulants/flocculants would improve the settling rate of sediment, resulting in more effective and efficient treatment and allowing for increased flow velocities through the sedimentation basins. Chemical storage tanks, with appropriate safety measures, including spill containment, would be required to store the coagulants/flocculants.

Sludge Processing Facility

The plate settler treatment process would result in the accumulation of sediment on the bottom of the sedimentation basins. The accumulated sediment would be removed from the basins by means of a mechanical system to a collection pit. The sediment would then be conveyed to a sludge thickening facility consisting of rapid mix coagulation settling tanks and equalization basins. The thickened sludge would then be conveyed to a mechanical dewatering facility where additional coagulants may be added and mechanical dewatering equipment would separate solid material from the water in the sludge. The resulting residual sludge would be temporarily stored in a hopper or loaded directly into trucks at an on-site staging facility to be transported to a suitable off-site landfill.

Administration and Support Facilities

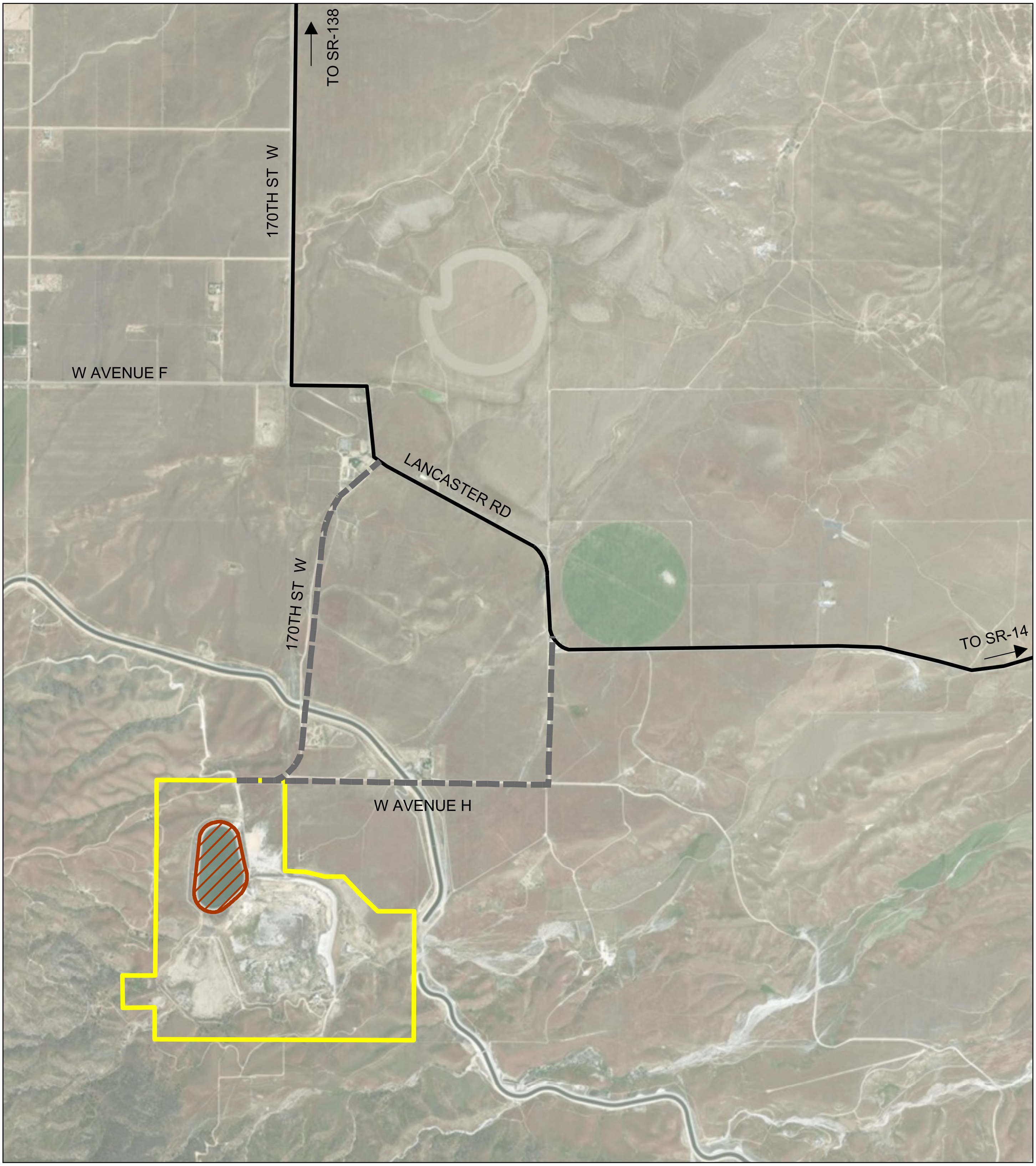
To operate the sedimentation plant, support facilities including, but not limited to, offices and other administrative spaces, a control room, laboratory, and necessary shop and materials storage areas would be provided.

Sanitary Waste and Water Treatment

Given the location of the proposed project, a septic system would be required to handle sanitary waste. Since the effluent from the sedimentation plant would not be considered potable, a small on-site potable water treatment system and storage tank would be required to provide for personnel and operational needs.

Access Road Paving

Immediate access to the project site is currently provided via unpaved roads. To provide a stable and durable road surface for trucks and to minimize the creation of dust from vehicle travel on the unpaved road surfaces, approximately 3 miles of existing access roads would be paved prior to the outset of construction activities at the project site. This would entail paving Avenue H east of the project site to 160th Street and 160th Street north of Avenue H to its intersection with Lancaster Road, which is a paved roadway. In addition, 170th Street would be paved north of the project site to its intersection with Lancaster Road. This would provide two paved ingress/egress routes to the site (see **Figure 2-4**).



LEGEND

Fairmont Reservoir #2 Modifications

Fairmont Reservoir Property Boundary

Existing Paved Road

Proposed Road Paving

0 2,850 5,700 Feet

SOURCE: LADWP, 2017; AECOM, 2018.

taha environmental planners

TAHA 2017-031

Fairmont Sedimentation Plant Project

Noise & Vibration Impact Study

LADWP

FIGURE 2-4

PROPOSED ROAD PAVING

Fairmont Reservoir #2 Modifications

Reservoir Inlet Structure. LAA1 currently empties into Fairmont Reservoir #2, and LAA2 intercepts the outflow from the Fairmont Reservoir #2 at the outlet pipeline directly downstream of the reservoir. However, under the proposed project, both LAA1 and LAA2 would flow into the sedimentation plant, and after treatment, the effluent from the plant, which would consist of the combined flows of both aqueducts, would be directed to Fairmont Reservoir #2. Modification of the open-channel concrete inlet structure for the reservoir would be required to accommodate the combined flow from the plant.

Reservoir Relining. Fairmont Reservoir #2 is fully lined with asphalt. However, this lining has not been replaced since the reservoir was first constructed in 1982, and it has deteriorated to the extent that maintenance of the reservoir is difficult. Since LAA1 would be out of service for a period of time during project construction (and therefore not flow into Fairmont Reservoir #2), the opportunity to reline the reservoir would be available. This relining would include asphalt sidewalls and a concrete bottom for durability and maintenance.

Electrical Power

Electrical power for the project would be drawn from the existing Southern California Edison power feed to the Fairmont Reservoir property, which currently enters the property near the northwest corner of the sedimentation plant site. A diesel-powered backup power generator would also be installed to support minimal critical treatment processes as well as communications, human-machine interface, and alarm systems in the event of an outage on the Southern California Edison feed.

Project Construction

Construction of the proposed project is scheduled to begin in early 2020. As shown in **Figure 2-5**, construction would consist of several tasks, including access road paving; LAA1 and LAA2 realignment; Fairmont Reservoir #2 modifications; excavation and grading for the sedimentation plant; construction of the structural elements of the plant (e.g., concrete foundations, basins, and tanks); and installation of the plant equipment and support facility construction. The general work that would occur in each of these phases is described below. While these phases are distinct and generally must precede or be preceded by others, some work associated with various phases could occur concurrently at different locations within the project site as construction of the plant proceeds. The exact sequencing of various tasks would be determined prior to the start of construction, but the total construction period, from mobilization to completion of the plant is anticipated to last approximately 3.5 years, including a plant commissioning period of several months.

Construction activities would normally occur Mondays through Fridays during the daytime hours, generally beginning no earlier than 7:00 a.m. and ending by late afternoon/early evening. Contractors and LADWP would require temporary trailers for construction management activities and temporary laydown areas and storage facilities for construction materials and equipment. All required administrative, staging, storage, and laydown areas related to project construction would be located within the existing Fairmont Reservoir property boundaries. Direct vehicular access to the site during construction would be provided along 170th Street West and West Avenue H, which, as discussed below, would be paved in the first phase of the project.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Access Road Paving	■	■	■																																							
Site Mobilization				■	■																																					
LAA1 & LAA2 Realignment						■	■	■	■	■	■	■	■	■	■	■	■																									
Reservoir #2 Modifications											■	■	■	■	■	■	■																									
Plant Excavation & Grading																		■	■	■	■																					
Plant Structures																						■	■	■	■	■																
Plant Equip. & Support Facilities																											■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Demobilization																																										■
Average Daily Equipment	9	9	9	6	6	22	22	22	22	22	32	32	32	29	29	29	29	30	30	30	30	7	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	6
Average Daily Truck Roundtrips	13	13	13	2	2	16	16	16	16	16	59	59	59	48	48	48	48	6	6	6	6	10	48	48	48	48	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	2
Average Daily Workers	15	15	15	10	10	25	25	25	25	25	45	45	45	75	75	75	75	25	25	25	25	25	25	25	25	25	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10

SOURCE: AECOM, 2017.

Construction of the plant and modification of the reservoir would require the operation of various pieces of heavy equipment on site, including excavators, front end loaders, bulldozers, motor graders, cranes, and concrete pump trucks. The type and level of use of this equipment would vary across the phases of work, with an estimated daily peak of about 32 pieces of equipment occurring during a few months of the project when the realignment of the LAAs and modification of the reservoir would overlap.

The peak number of daily off-site truck roundtrips would be about 59, also occurring when the realignment of the LAAs and modifications of the reservoir would overlap. Secondary peaks of about 48 daily truck roundtrips would occur for several months in association with concrete deliveries for the reservoir relining and the plant structural elements. During the balance of the project, the average number of daily truck roundtrips would be substantially lower, at no greater than 16 and often less than 10 per day. These truck trips would generally be distributed throughout the work day, rather than concentrated during a particular portion of the day.

The number of daily on-site workers would range from a low of 15 to a high of 75, which would occur during the overlap of the LAA realignment and reservoir relining (i.e., asphalt and concrete work). It was assumed that each individual worker would generate a vehicle trip inbound to the project site in the morning and a vehicle trip outbound from the project site in the afternoon (i.e., no reduction in the number of worker trips associated with carpooling has been considered).

Access Road Paving

As discussed above, the roads that provide direct access to the Fairmont Reservoir property are currently unpaved. Because construction and operation of the plant would involve the delivery of heavy loads to the site (during construction) and the hauling of heavy loads from the site (during both construction and operation), access roads would be paved to provide a stable and durable surface and minimize dust that would be generated by travel on the unpaved roads (see **Figure 2-4**). The road paving would occur before work at the reservoir property would begin.

The paving would involve portions of 170th Street West, West Avenue H, and 160th Street West to link the project site to Lancaster Road in two different locations. The total length of road included in the paving would be approximately 15,000 feet, and the width of the paved surface would be 24 feet. The road would consist of 4 inches of structural base material and 2 inches of asphalt paving. Some grading of the existing unpaved road surface may be required prior to paving. The road paving would involve several pieces of equipment, including an excavator, dump truck, front end loader, asphalt paving machine, and compaction roller. It is estimated that approximately eight truckloads of base material and four truckloads of hot mix asphalt would be delivered each day. Approximately 15 construction personnel would be required throughout the paving phase, which is anticipated to take approximately 3 months to complete.

LAA1 and LAA2 Realignment

As discussed above, LAA1 and LAA2 physically converge at the Fairmont Reservoir property downstream of the Fairmont Reservoir #2 outlet. To feed into the proposed sedimentation plant, they would need to be realigned, so that they converge upstream of Fairmont Reservoir #2. The 120-inch diameter LAA1 crosses into the property at the northwest corner of the project site, and the 90-inch diameter LAA2 crosses into the property at the northeast corner of the site. New supply lines of similar size would be installed below grade across the northern end of the site to connect each aqueduct to the sedimentation plant intake facility (see **Figure 2-3**). Isolation valves would be installed at the existing LAA connection points to allow for the temporary shutoff of flows to the plant from one or both LAAs. In addition, double block and bleed bypass valves would be installed on the existing LAA1 and LAA2 (both of which would remain in place) downstream of each new connection point. This would completely isolate the existing lines during normal operating conditions at the plant but also allow for flows to be temporarily diverted around the plant through the lines if necessary. The flow in each LAA would be discontinued non-concurrently while these valves were installed. After the installation of the valves, flows would continue through the existing LAA lines during the duration of plant construction.

The installation of the new line, which would be approximately 1,000 feet in length, would entail the excavation of a trench, with the excavated material stockpiled adjacent to the trench to be used as backfill once the line was installed. Because of the width and depth of the trench, shoring would be required. Energy dissipaters or other controls may also be installed to ensure proper inlet velocities at the plant intake facility from the combined flows of the two LAAs. Pipe sections and other material would be delivered to the site, and some demolition material and debris would be hauled from the site. This would involve an average of 16 daily truck roundtrips throughout the phase.

Numerous pieces of equipment would be needed to install the realigned LAA pipeline, including excavators, dump trucks, front end loaders, bulldozers, and a crawler crane. An average of about 22 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Approximately 25 construction personnel would be required throughout the pipeline installation, which is anticipated to take approximately 12 months to complete.

Fairmont Reservoir #2 Modifications

The current concrete inlet structure for Fairmont Reservoir #2 was constructed to accommodate the flows from only LAA1. As discussed above, LAA2 currently bypasses Fairmont Reservoir #2 and connects to the outlet pipeline immediately downstream of the reservoir. However, after completion of the sedimentation plant, the reservoir would accept the combined flows of LAA1 and LAA2 discharged from the plant. Therefore, the existing inlet structure would be enlarged to accommodate this combined flow. This would require the demolition and reconstruction of at least a portion of the existing inlet structure.

In addition, because Fairmont Reservoir #2 was constructed 35 years ago, the original asphalt lining has deteriorated. Since the enlargement of the inlet structure, as well as the realignment of LAA1, would mean that discharges to the reservoir would be paused for a period of time, an opportunity would be provided to replace the existing liner when the reservoir could be emptied. This replacement would involve the demolition of the liner and the repaving of the reservoir side walls with asphalt and the reservoir bottom with unreinforced concrete.

The demolition of the existing reservoir liner would involve the removal of approximately 18,000 cubic yards (CY) of asphalt, which would be hauled off site. This would result in approximately 43 haul truck roundtrips per day for about three months. The relining of the reservoir bottom would require approximately 3,000 CY of asphalt and 22,000 CY of concrete, which would result in approximately 32 delivery truck roundtrips per day for about 4 months.

The demolition and relining of the reservoir would require numerous pieces of equipment, including dump trucks, front end loaders, concrete pump trucks, a bulldozer, an asphalt paver, and a compaction roller. A peak of 10 pieces of equipment (including pickup trucks and water trucks) would be in operation daily for about 3 months, during demolition. A peak of approximately 50 daily construction personnel would be required during the relining operation. The entire reservoir modification phase is anticipated to take about 7 months to complete.

The number of daily truck trips, construction equipment, and personnel described above relate to the reservoir modification work only. However, as discussed above, this work would occur concurrently with the LAA realignment phase because discharges to the reservoir would temporarily cease during the aqueduct realignment. Because these two phases of work would overlap, the actual daily peak of construction activity at the Fairmont Reservoir property during the 7-month reservoir modification would be higher. The combined work under these two phases would result in a peak of approximately 59 truck roundtrips and 32 pieces of operating equipment per day during the 3-month demolition task and 75 construction personnel per day during the 4-month repaving task.

Sedimentation Plant Excavation and Grading

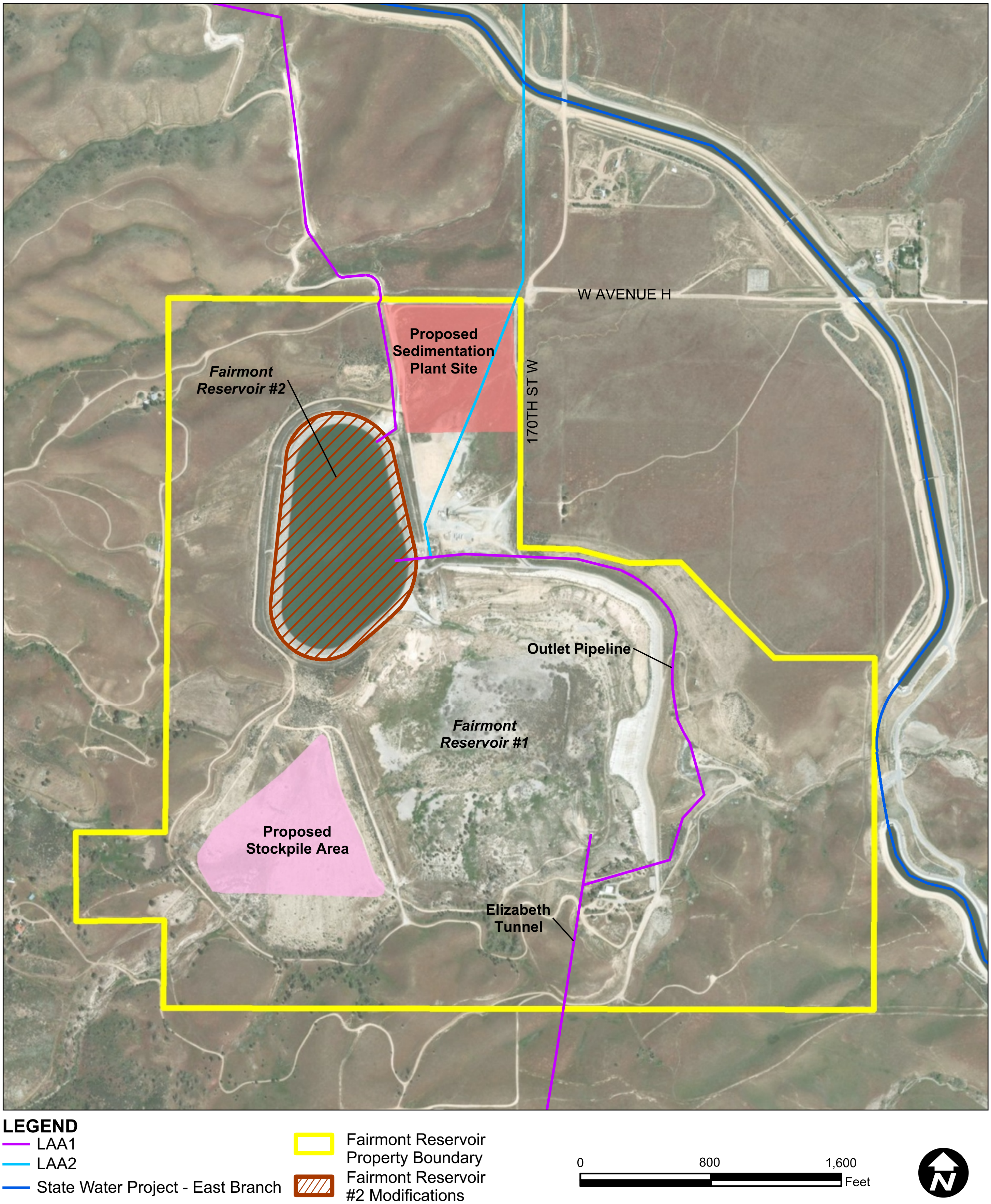
The LAAs operate via gravity flow, and in order to maintain this gravity flow, the various plant components must be situated at the appropriate elevation so that water would continue to flow through the plant and discharge into Fairmont Reservoir #2 without pumping. This would require excavation and grading for the proposed sedimentation basins and the rapid mix coagulation/flocculation tanks, which would each need to be about 20 feet deep, and the sludge processing facility, which would need to be about 10 feet deep. Because of the depth of excavation, shoring may be required in locations stable slopes cannot be built. Suitable excavated material would be used as necessary as fill to achieve the proper elevation across the entire plant. However, it is estimated that over 200,000 CY of excess material may be generated during the excavation and grading for the plant. This excess material would be placed into the empty Fairmont Reservoir #1, as indicated in **Figure 2-6**. To stabilize the material placed in Reservoir #1 to reduce erosion and windborne dust, it would be seeded with locally adapted native species and temporarily irrigated as appropriate to facilitate germination and growth. During the grading phase, runoff currently carried in the open drainage channel that crosses the proposed project site would be intercepted and redirected. The final drainage plan would be designed and permitted in consultation with the appropriate regulatory agencies (i.e., CDFW, RWQCB).

The excavation and grading phase would require numerous pieces of equipment, including dump trucks, excavators, front end loaders, bulldozers, and motor graders, and compaction rollers. An average of about 30 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Although most excavated material would remain on site, about six off-site haul truck round trips per day would be required to remove general debris during this phase. Approximately 25 construction personnel would be required throughout the excavation and grading phase, which is anticipated to take approximately 4 months to complete.

Sedimentation Plant Structures

The foundations for the sedimentation plant and ancillary facilities, as well as the walls for the plate settler sedimentation basins, the rapid mix coagulation/flocculation tanks, and the sludge processing facility would require substantial quantities of concrete. The total volume of concrete for the structures is estimated at approximately 30,000 CY, which would require a total of 3,000 concrete truck roundtrips over the 4 to 5 months of this phase of work. Along with the delivery of materials, such as reinforcing steel and form material, and the hauling of construction debris from the site, the peak number of daily off-site truck roundtrips would be about 48.

The primary pieces of on-site equipment required to complete the structures would be concrete pump trucks and a crawler crane. A peak of 9 pieces of equipment (including pickup trucks and water trucks) would be in operation daily for about 4 months. Approximately 25 construction personnel would be required throughout the structures phase, which is anticipated to take approximately 5 months to complete.



SOURCE: LADWP, 2017; AECOM, 2018.

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Fairmont Sedimentation Plant Project
Noise & Vibration Impact Study

LADWP

FIGURE 2-6

PROPOSED STOCKPILE AREAS

Plant Equipment and Support Facilities

The final phase of the sedimentation plant construction involves the installation of the plant equipment and the construction and finishing of the support facilities. The equipment includes: flow meters, regulators, and screens at the intake facility; mechanical mixers and chemical feed apparatus at the rapid mix coagulation/flocculation tanks; plate settlers and mechanical sediment removal systems in the sedimentation basins; chemical feed apparatus, mechanical mixers, and centrifuge dewatering systems at the sludge processing facility; conveyance systems to transfer processed sludge to trucks at the truck staging area; and chemical storage tanks for coagulants and flocculants. Support facility construction would involve structural and architectural elements and exterior and interior finishing, including plant control rooms, laboratories, administrative space, security systems, and personnel support facilities. In addition, septic and potable water treatment systems would be constructed during this phase.

The delivery of materials and the hauling of construction debris would result in about 8 truck roundtrips through the plant equipment and support facilities phase. Equipment required would include a front end loader, crawler crane, backhoe, and forklifts. An average of about 12 pieces of equipment (including pickup trucks and water trucks) would be in operation on a given day. Approximately 20 construction personnel would be required throughout the phase, which is anticipated to take approximately 15 months to complete.

Project Operation

The proposed sedimentation plant would be sized to operate at a peak inflow of 720 cfs, which is the maximum combined flow of LAA1 and LAA2 based on the physical characteristics of the aqueducts. The plant would be designed to treat LAA influent water with sediment load derived from the last 10 years of available data. The addition of SWP East Branch water to LAA1 would not increase these concentration levels because the maximum anticipated concentration of sediment in the SWP East Branch is lower than that of the LAAs. The sedimentation plant as proposed would achieve a higher treatment standard than is currently achieved at CTP, even under the highly conservative design assumptions for influent quantity and quality.

Treatment Process

Water from LAA1 and LAA2, as well as water recycled from the sludge processing facility (see below), would enter the intake facility, where it would be metered to determine the hydraulic conditions and chemical dosing requirements for plant operations. The water would also pass through a coarse screen at the intake to remove algae and larger debris. From the intake facility, water would flow into the coagulation/flocculation tanks, where chemicals would be injected and mixed into the water by means of mechanical rapid mixers. This process would induce suspended particles to clump together into molecularly destabilized charged particles so they will more readily settle out in the sedimentation basins.

The water would then enter the sedimentation basins through inlet structures that could be independently opened or closed for each of the sedimentation basins. The number of basins that would be operated at a given time would be based on the quantity and quality of the influent raw water. The influent water would flow upward between the inclined settler plates, and based on the design velocity of the flow, the sediment would move downward on the surface of the plates and settle on the bottom of the basins, while the clarified water would continue to flow upward to collection channels. The effluent from the sedimentation basins would be discharged to a pipe and conveyed to the Fairmont Reservoir #2 inlet structure. The sediment that has accumulated on the bottom of the basins would be collected by means of a mechanical system and conveyed to the sludge processing facility.

The sludge collected from the basins would include a substantial mixture of sediment and water that must be further dewatered before the sludge could be transported off-site for disposal. The sludge would first flow to settling tanks, where coagulants would be injected and mixed with the sludge. The destabilized particles would settle to the bottom of the tank as thickened sludge, while the clear water lying above the solids layer would be recycled to the sedimentation plant intake facility. The thickened sludge would then enter a flow equalization basin(s) that would provide storage capacity to temporarily retain, as necessary, the sludge, which could then be released into the dewatering facility system at a controlled rate to help maintain a more uniform volume of influent. From the equalization basins, the thickened sludge would then be conveyed to a mechanical dewatering facility, where additional coagulants may be added to the solids and water would be separated from solids by mechanical means. The water would be recycled to the plant intake facility, and the residual sludge would be temporarily stored in a sludge hopper, from which it would be loaded onto trucks for transport offsite.

Plant Operation and Maintenance

The sedimentation plant would generally be in operations 24 hours per day, 7 days per week, whenever the LAAs are flowing. The plant would require up to 10 personnel, who would be distributed between two to three shifts during a day. After commissioning of the sedimentation plant, CTP would be taken out of operation. However, the existing equipment would remain in place, and if circumstances required, it could be used to add coagulants and flocculants to LAA1 at CTP, as is currently done. Although both LAA1 and LAA2 would flow through Fairmont Reservoir #2 after completion of the sedimentation pant, the reservoir would continue to operate with approximately the same freeboard elevation as it currently does, providing storage and regulating flows to Power Plants #1 and #2.

Based on a flow of 320 cfs and turbidity of 14 Nephelometric Turbidity Units (NTU) averaged across the last 10 years of available LAA water quality data, approximately 144 wet tons of residual sludge would be processed on average each day. However, at peak flow and sediment concentration levels for the LAAs, approximately 346 wet tons of residual sludge would be processed in 1 day. Because arsenic, a naturally occurring trace element in LAA water, would be present in the sludge, it would be treated as California hazardous waste and disposed of at an approved hazardous waste landfill. Based on the average sludge production rate, it would require about 10 truck trips a day, Monday through Friday (typical landfill operating days), to transport about 200 tons of sludge. The sludge hopper at the plant would be sized to accommodate a minimum of 1 week of processed sludge to help maintain uniformity in the number of daily haul trucks trips.

Under emergency conditions when the Fairmont Sedimentation Plant must be shut down, the LAA1 and LAA2 isolation valves would be closed to shut off flow to the plant, and the double block and bleed bypass valves on the original aqueduct lines would be opened to allow water to flow through. As currently happens, LAA1 water would flow through Fairmont Reservoir #2, and LAA2 water would flow into the reservoir outlet pipeline downstream of the reservoir. If during the emergency shutdown it is determined, based on the concentrations of sediment in the LAA water or on the length of the shutdown, that the LAAFP cannot adequately treat the water, coagulants and flocculants would be added to LAA1 at CTP as described above, inducing sediment to settle out in North Haiwee Reservoir.

Scheduled maintenance of the plant would occur during lower-flow periods of the LAAs, generally between October 1 and March 31. During maintenance in normal precipitation years, the LAA1 and LAA2 isolation valves would be closed to shut off flow to the plant, and the double block and bleed bypass valves on LAA1 and/or LAA2 would be opened to allow flows through to Elizabeth Tunnel and the LAAFP, which would have the capability to temporarily treat the relatively low volumes of water without pretreatment at the Fairmont Sedimentation Plant. During high precipitation years, the plant shutdown during maintenance would be similar, but greater control of flows from the various sources (i.e., LAA1, LAA2, and SWP East Branch) may be necessary, depending on the sediment load in each source.

3.0 NOISE & VIBRATION

This section describes the characteristics of noise and vibration, discusses the applicable regulatory framework, defines the existing setting, and evaluates noise and vibration levels associated with the proposed project.

3.1 NOISE AND VIBRATION CHARACTERISTICS AND EFFECTS

3.1.1 Noise

Characteristics of Sound

Sound is technically described in terms of the loudness (amplitude) and frequency (pitch).[1] The standard unit of measurement for sound is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The A-weighted scale, abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA. **Figure 3-1** provides examples of A-weighted noise levels from common sounds.

Noise Definitions

This noise analysis discusses average sound levels in terms of Equivalent Noise Level (L_{eq}) and Community Noise Equivalent Level (CNEL).

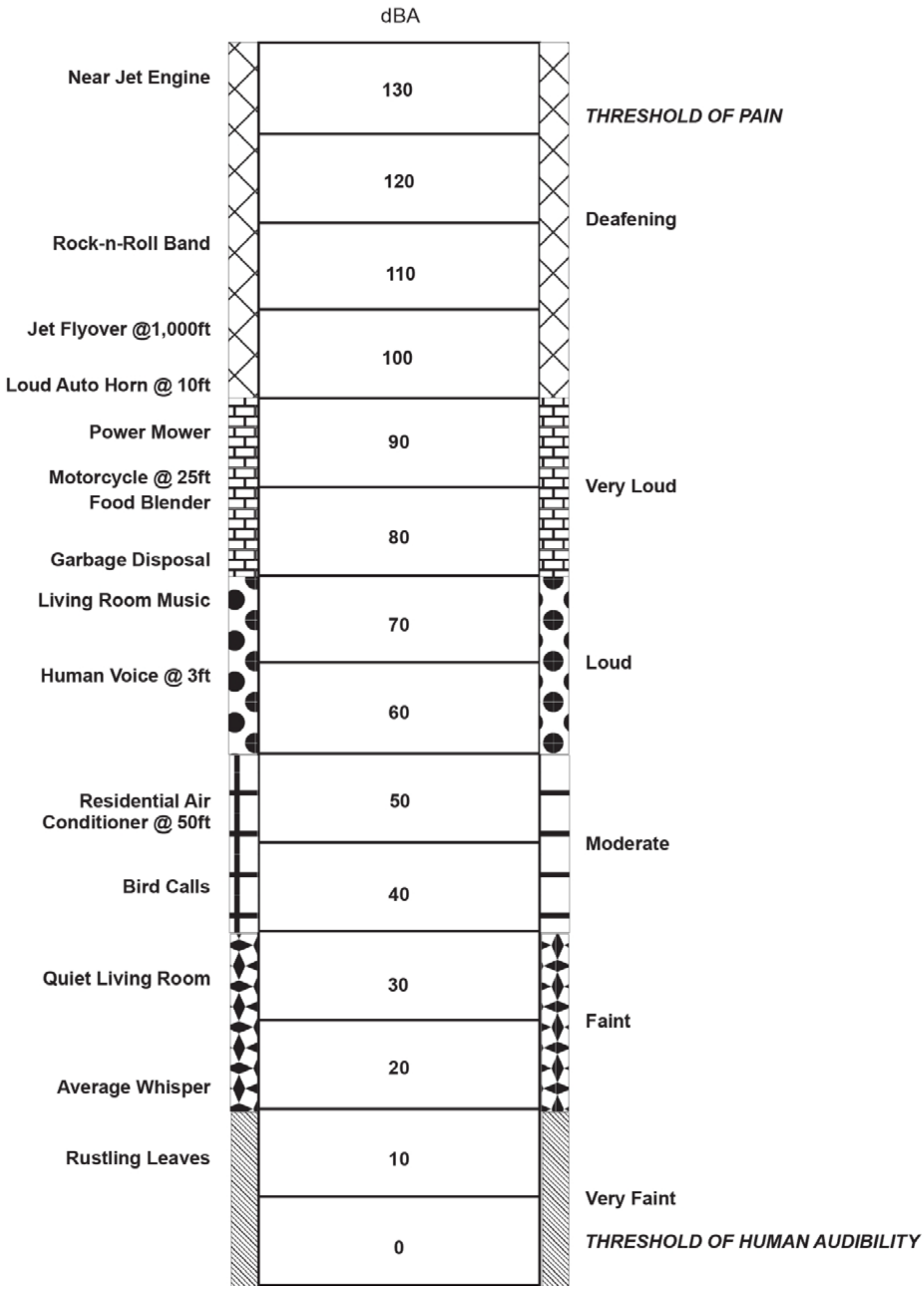
Equivalent Noise Level (L_{eq}). L_{eq} is the average sound level for any specific time period, on an energy basis. The L_{eq} for one hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. L_{eq} can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. L_{eq} is expressed in units of dBA.

Community Noise Equivalent Level (CNEL). CNEL is an average sound level during a 24-hour period. CNEL is a noise measurement scale, which accounts for noise source, distance, single-event duration, single-event occurrence, frequency and time of day. Due to the lower background noise level, human reaction to sound between 7:00 p.m. and 10:00 p.m. is as if the sound were actually 5 dBA higher than if it occurred from 7:00 a.m. to 7:00 p.m. From 10:00 p.m. to 7:00 a.m., humans perceive sound as if it were 10 dBA higher. Hence, the CNEL is obtained by adding an additional 5 dBA to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and 10 dBA to sound levels in the night from 10:00 p.m. to 7:00 a.m. Because CNEL accounts for human sensitivity to sound, CNEL is always a higher number than the actual 24-hour average sound level.

Effects of Noise

Noise is generally defined as unwanted sound. The degree to which noise can impact the human environment ranges from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise, the amount of background noise present before the intruding noise, the nature of work or human activity that is exposed to the noise source.

[1] California Department of Transportation, *Technical Noise Supplement*, November 2013.



Source: Cowan, James P., Handbook of Environmental Acoustics, 1993.

FIGURE 3-1

A-WEIGHTED DECIBEL SCALE

Audible Noise Changes

Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA would be noticeable and may evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would likely cause a community response.

Noise levels decrease as the distance from the noise source to the receiver increases. Noise levels generated by a stationary noise source, or “point source,” will decrease by approximately 6 dBA over hard surfaces (e.g., pavement) and 7.5 dBA over soft surfaces (e.g., grass) for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level would be 83 dBA at a distance of 100 feet over hard surface from the noise source, 77 dBA at a distance of 200 feet, and so on. Noise levels generated by a mobile source will decrease by approximately 3 dBA over hard surfaces and 4.5 dBA over soft surfaces for each doubling of the distance.

Generally, noise is most audible when traveling by direct line-of-sight.[2] In urban environments, barriers, such as walls, berms, or buildings, are often present, which breaks the line-of-sight between the source and the receiver, greatly reducing noise levels from the source since sound can only reach the receiver by bending over the top of the barrier (diffraction). However, if a barrier is not high or long enough to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced. In situations where the source or the receiver is located 3 meters (approximately 10 feet) above the ground, or whenever the line-of-sight averages more than 3 meters above the ground, sound levels would be reduced by approximately 3 dBA for each doubling of distance.

3.1.2 Vibration

Characteristics of Vibration

Vibration is an oscillatory motion through a solid medium in which the motion’s amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as rock blasting, pile driving, and heavy earth-moving equipment.

Vibration Definitions

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to measure RMS. The Vdb acts to compress the range of numbers required to describe vibration.[3]

[2] Line-of-sight is an unobstructed visual path between the noise source and the noise receptor.
[3] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

Effects of Vibration

High levels of vibration may cause physical personal injury or damage to buildings. However, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that may affect concentration or disturb sleep. In addition, high levels of vibration may damage fragile buildings or interfere with equipment that is highly sensitive to vibration (e.g., electron microscopes).

Perceptible Vibration Changes

Unlike noise, groundborne vibration is not a phenomenon that most people experience every day. The background vibration velocity level in residential areas is usually 50 RMS or lower, well below the threshold of perception for humans which is around 65 RMS. Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people or slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible. Typical levels of groundborne vibration are shown in **Figure 3-2**.

3.2 REGULATORY SETTING

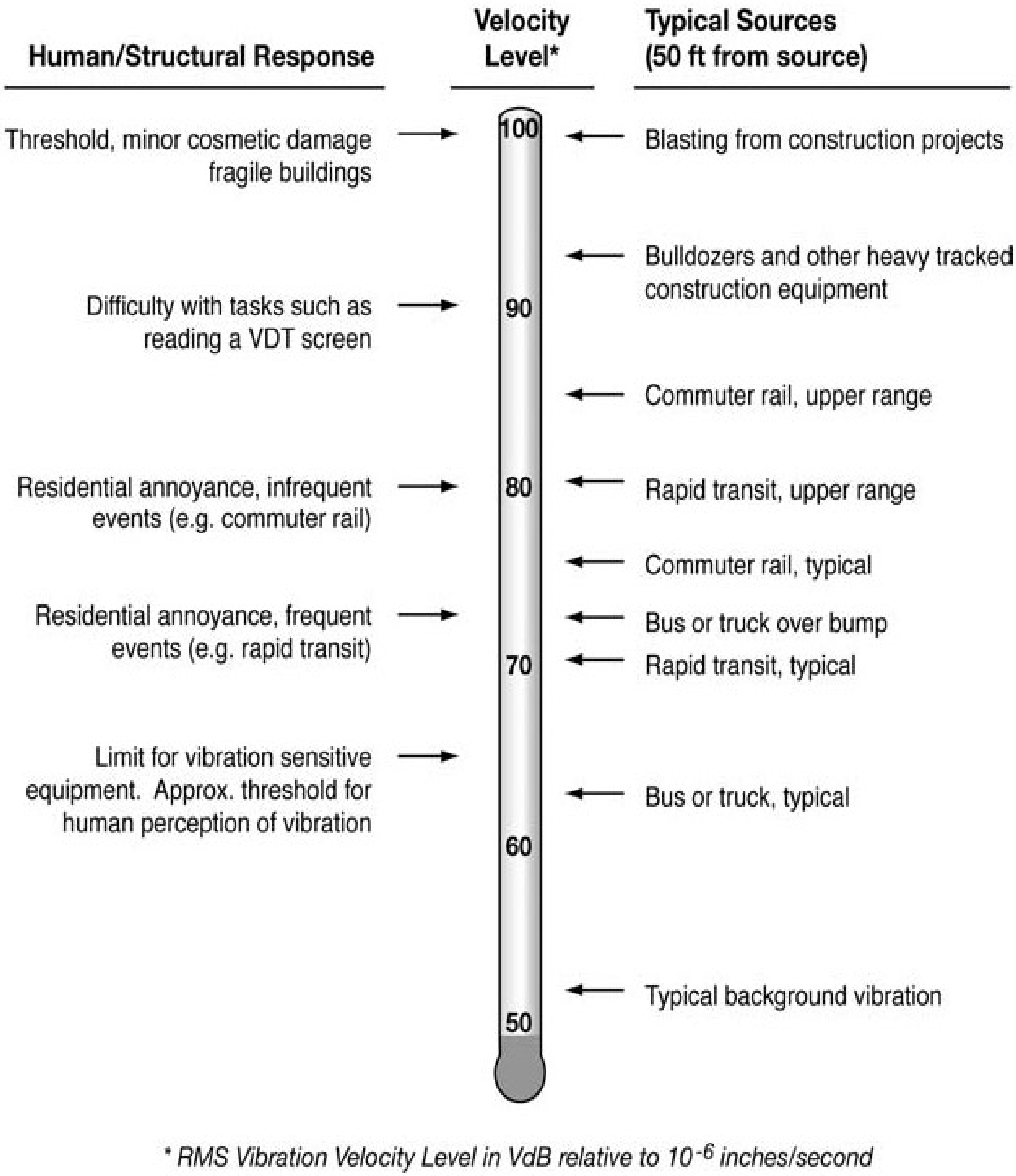
3.2.1 Noise

Federal

The Noise Control Act of 1972 established programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In 1981, the United States Environmental Protection Agency (USEPA) determined that subjective issues such as noise would be better addressed at local levels of government, thereby allowing more individualized control for specific issues by designated federal, state, and local government agencies. Consequently, in 1982, responsibilities for regulating noise control policies were transferred to specific federal agencies, and state and local governments. However, noise control guidelines and regulations contained in the USEPA rulings in prior years remain in place. No federal noise regulations are directly applicable to the proposed project.

State

The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation. State regulations governing noise levels generated by individual motor vehicles and occupational noise control are not applicable to planning efforts, nor are these areas typically subject to CEQA analysis.



Source: FTA, Transit Noise and Vibration Assessment, 2006.

FIGURE 3-2

TYPICAL LEVELS OF GROUND-BORNE VIBRATION

Regional

County of Los Angeles Noise Ordinance

The County of Los Angeles has established policies and regulations concerning the generation and control of noise that could adversely affect its citizens and noise-sensitive land uses. Chapter 12.08 (Noise Control) of the Los Angeles County Code of Ordinances (County Code) establishes regulations to control unnecessary, excessive and annoying noise and vibration in the County of Los Angeles. Within Chapter 12.08 of the County Code, Section 12.08.380 assigned the following noise zones for receptor properties in the County.

1. Noise Zone 1 – Noise-sensitive areas
2. Noise Zone 2 – Residential properties
3. Noise Zone 3 – Commercial properties
4. Noise Zone 4 – Industrial properties

With respect to operational noise, Section 12.08.390 of the County Code establishes exterior noise levels that should be applied to all receptor properties within a designated noise zone in the County. These exterior noise levels are shown in **Table 3-1**.

TABLE 3-1: EXTERIOR NOISE STANDARDS

Noise Zone	Designated Noise Zone Land Use (Receptor Property)	Time Interval	Exterior Noise Level (dB)
1	Noise-Sensitive Area	Anytime	45
2	Residential Properties	10:00 p.m. to 7:00 a.m. (nighttime)	45
		7:00 a.m. to 10:00 p.m. (daytime)	50
3	Commercial Properties	10:00 p.m. to 7:00 a.m. (nighttime)	55
		7:00 a.m. to 10:00 p.m. (daytime)	60
4	Industrial Properties	Anytime	70

SOURCE: County Code, *Section 12.08.390*, 2017.

The exterior noise levels shown in **Table 3-1** are meant to be further applied as noise standards based on the duration of the noise; i.e., the louder the noise, the shorter the time it is allowed to last. The County Code uses a number of noise metrics to define the permissible noise levels. These metrics include L_{50}, L_{25}, $L_{8.3}$, $L_{1.7}$, and L_{max}, and are based upon a 1-hour timeframe which indicates exceedance of 50, 25, 8.3, and 1.7 percent of the time, plus the maximum sound level during that time period. The following noise standards should be applied to the exterior noise levels provided in **Table 3-1**:

- Standard No. 1 shall be the exterior *noise* level which may not be exceeded for a cumulative period of more than 30 minutes in any hour. Standard No. 1 shall be the applicable *noise* level from subsection A of this section; or, if the ambient L_{50} exceeds the foregoing level, then the ambient L_{50} becomes the exterior *noise* level for Standard No. 1.
- Standard No. 2 shall be the exterior *noise* level which may not be exceeded for a cumulative period of more than 15 minutes in any hour. Standard No. 2 shall be the applicable *noise* level from subsection A of this section plus 5 dB; or, if the ambient L_{25} exceeds the foregoing level, then the ambient L_{25} becomes the exterior *noise* level for Standard No. 2.
- Standard No. 3 shall be the exterior *noise* level which may not be exceeded for a cumulative period of more than five minutes in any hour. Standard No. 3 shall be the applicable *noise* level from subsection A of this section plus 20 dB; or, if the ambient $L_{8.3}$ exceeds the foregoing level, then the ambient $L_{8.3}$ becomes exterior *noise* level for Standard No. 3.

- Standard No. 4 shall be the exterior *noise* level which may not be exceeded for a cumulative period of more than one minute in any hour. Standard No. 4 shall be the applicable *noise* level from subsection A of this section plus 15 dB; or, if the ambient $L_{1.7}$ exceeds the foregoing level, then the ambient $L_{1.7}$ becomes the exterior *noise* level for Standard No. 4.
- Standard No. 5 shall be the exterior *noise* level which may not be exceeded for any period of time. Standard No. 5 shall be the applicable *noise* level from subsection A of this section plus 20 dB; or, if the ambient L_0 exceeds the foregoing level then the ambient L_0 becomes the exterior *noise* level for Standard No. 5.

Section 12.08.400 of the County Code also establishes interior noise standards for dwelling units in the County, which are specified in **Table 3-2**.

TABLE 3-2: INTERIOR NOISE STANDARDS

Noise Zone	Designated Land Use	Time Interval	Interior Noise Level (dB)
All	Multi-family	10:00 p.m. to 7:00 a.m. (nighttime)	40
	Residential	7:00 a.m. to 10:00 p.m. (daytime)	45

SOURCE: County Code, *Section 12.08.440*, 2017

With respect to construction noise, Section 12.08.440(a) of the County Code states that construction, drilling, repair, alteration, or demolition work between the weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays is prohibited. Furthermore, Section 12.12.030 of the County Code states that a person shall not perform any construction or repair work of any kind upon any building or structure, or perform any earth excavating, filling or moving, where any of the foregoing entails the use of any air compressors; jackhammers; power-driven drill; riveting machine; excavator, diesel-powered truck, tractor or other earth moving equipment; hand hammers on steel or iron, or any other machine, tool, device or equipment which makes loud noises to the disturbance of persons occupying sleeping quarters in a dwelling, apartment, hotel, mobile home, or other place of residence on any Sunday, or at any other time between the hours of 8:00 p.m. and 6:30 a.m. the following day.

Section 12.08.440 of the County Code establishes construction noise restrictions at affected structures, which are shown in **Table 3-3**. However, as stated in Section 12.08.57(d) of the County Code, construction noise is exempted from the exterior noise standards outlined in **Table 3-1**. Section 12.08.460 of the County Code states that loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans or similar objects between the hours of 10:00 p.m. and 6:00 a.m. is prohibited.

The County Code requirements are not applicable to mobile noise sources such as automobiles or heavy trucks when traveling in a legal manner on public roadways or on private property. Mobile noise source control is preempted by federal and State laws.

3.2.2 Vibration

Federal

The Federal Transit Administration (FTA) has published guidance for assessing building damage impacts from vibration. **Table 3-4** shows the FTA building damage criteria for vibration. FTA has also established criteria related to vibration annoyance, which are shown in **Table 3-5**.

TABLE 3-3: CONSTRUCTION NOISE RESTRICTIONS			
Time Period	**Single-Family Residential**	**Multi-Family Residential**	**Semi-Residential/ Commercial**
MOBILE EQUIPMENT /a/			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	60 dBA	64 dBA	70 dBA
STATIONARY EQUIPMENT /b/			
Daily, except Sundays and legal holidays, 7:00 a.m. to 8:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, 8:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA

/a/ Maximum *noise* levels for nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment.
/b/ Maximum *noise* level for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment.
SOURCE: County Code, *Section 12.08.440 (b)*, 2017.

TABLE 3-4: CONSTRUCTION VIBRATION DAMAGE CRITERIA	
Building Category	**PPV (inches per second**
I. Reinforced-concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

SOURCE: FTA, *Transit Noise and Vibration Impact Assessment*, May 2006.

TABLE 3-5: CONSTRUCTION VIBRATION ANNOYANCE CRITERIA			
	Vibration Impact Level (VdB re micro-inch per second)		
Land Use Category	**Frequent Events /a/**	**Occasional Events /b/**	**Infrequent Events /c/**
1. Buildings where vibration would interfere with interior operations.	65 /d/	65 /d/	65 /d/
2. Residences and buildings where people normally sleep.	72	75	80
3. Institutional land uses with primarily daytime use.	75	78	83

/a/ Frequent Events are defined as more than 70 vibration events of the same source per day.
/b/ Occasional Events are defined as between 30 and 70 vibration events of the same source per day.
/c/ Infrequent Events are defined as fewer than 30 vibration events of the same kind per day.
/d/ This criterion limit is based on levels that are acceptable for most moderately-sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
SOURCE: FTA, *Transit Noise and Vibration Impact Assessment*, May 2006.

State

There are no adopted State vibration standards.

Regional

Section 12.08.560 of the County Code prohibits the operation of any device that creates vibration above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet (46 meters) from the source if on a public space or public right-of way. The perception threshold shall be a motion velocity of 0.01 inches per second over a range of 1 to 100 Hertz.

3.3 EXISTING SETTING

3.3.1 Existing Noise and Vibration Environment

To characterize the existing noise environment around the project site, ambient noise was monitored using a SoundPro DL Sound Level Meter on Wednesday, May 18, 2017, between 11:00 a.m. and 1:30 p.m. The noise monitoring locations are shown in **Figures 3-3**. Noise monitoring data and site pictures can be found in **Appendix A**. Measurements were taken for 15-minute periods at each site. As shown in **Table 3-6**, the existing ambient sound levels range between 47.7 and 64.3 dBA L_{eq}. Traffic was the primary source of noise at each site.

TABLE 3-6: EXISTING AMBIENT NOISE LEVELS

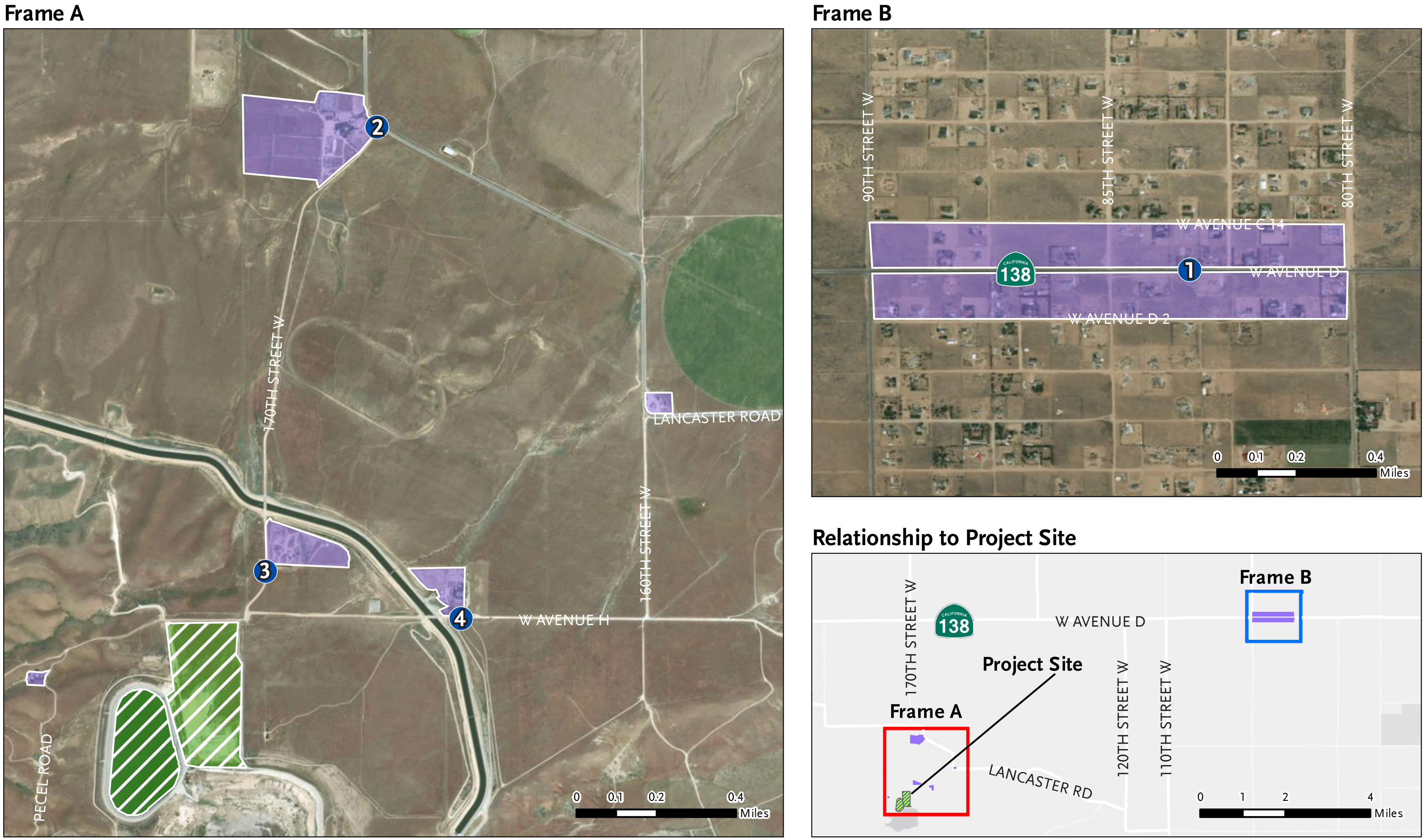
Figure 3-3 Key	Noise Monitoring Location	Sound Level (dBA, L_{eq})
1	Residence along SR-138 (8215 W. Ave. D)	64.3
2	Healy Farms Residence (16700 Lancaster Rd.)	55.1
3	Residence along 170th St. West (approximately 700 feet north of Ave. H)	47.7
4	Residence along Ave. H (approximately 400 feet east of the California Aqueduct)	51.3

SOURCE: TAHA, 2017.

3.3.2 Sensitive Receptors

Sensitive receptors are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. They typically include residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas. The proposed project is located in a rural environment and there are no sensitive receptors located within 500 feet of the Sedimentation Plant. However, the proposed project includes paving the 160th Street West, 170th Street West, and Avenue H. There are several sensitive receptors (residences) located along these roads that could be potentially impacted by the proposed project. Furthermore, there are also sensitive receptors located along potential haul routes with the majority grouped along State Route 138 (SR-138). Sensitive receptor locations are shown in **Figures 3-3** and **Figure 3-4**.

- Residence (Healy Farms) located adjacent the intersection of Lancaster Road and 170th Street West;
- Residence located adjacent to 170th Street West, approximately 700 feet north of Avenue H;
- Residence located adjacent to Avenue H, approximately 400 feet east of the California Aqueduct;
- Church (15861 Lancaster Road) located adjacent to the intersection of Lancaster Road and 160th Street West;
- Residences and other sensitive uses located along SR-138 between State Route 14 (SR-14) and 170th Street West and to the west in and around Neenach; and
- Residence along Pecel Road located approximately 1,690 feet to the west of the Sedimentation Plant.



LEGEND

Project Site | Sensitive Receptors | Noise Monitoring Locations

Source: TAHA, 2017.

taha environmental planners

TAHA 2017-031

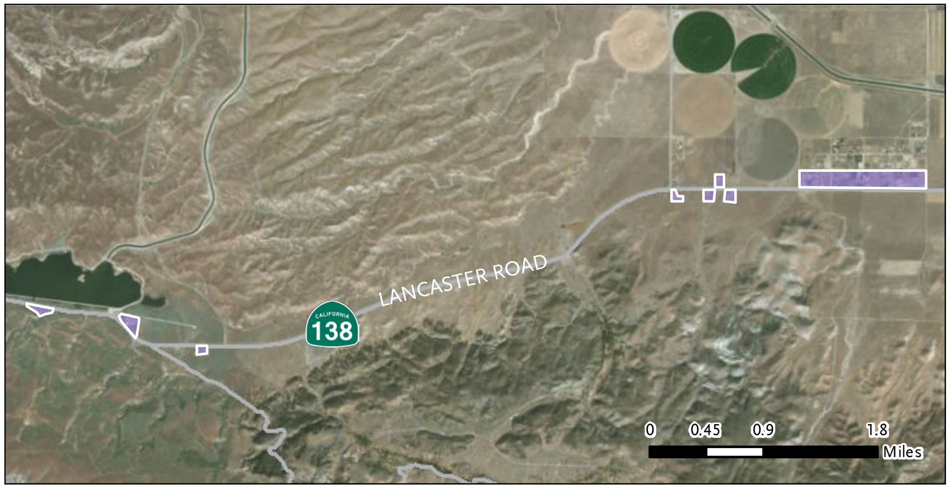
Fairmont Sedimentation Plant Project
Noise & Vibration Impact Study

LADWP

FIGURE 3-3

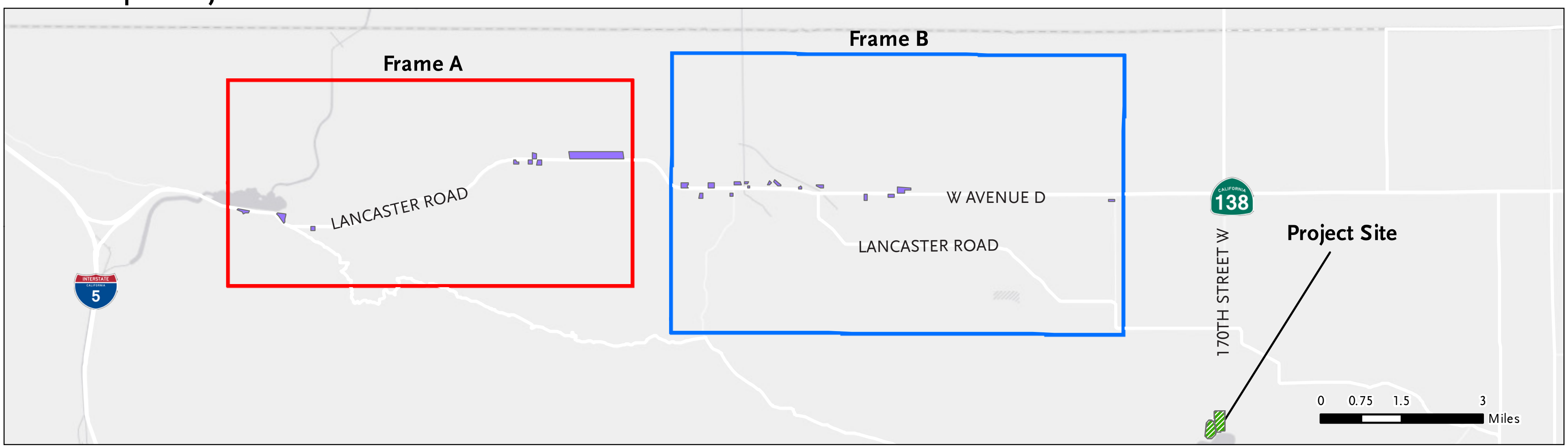
NOISE MONITORING LOCATIONS AND SENSITIVE RECEPTORS

Frame A



Frame B

Relationship to Project Site



LEGEND

Project Site Sensitive Receptors

Source: TAHA, 2017.

taha environmental planners

TAHA 2017-031

Fairmont Sedimentation Plant Project
Noise & Vibration Impact Study

LADWP

FIGURE 3-4

SENSITIVE RECEPTORS ALONG SR-138 WEST OF 170TH STREET

3.4 METHODOLOGY AND SIGNIFICANCE THRESHOLDS

3.4.1 Methodology

The noise and vibration analysis considers construction and operational sources. Combined construction noise levels were based on information obtained from USEPA. Noise levels at receptors were estimated by making a distance adjustment to the combined USEPA construction source noise level. The methodology used for this analysis can be viewed in Section 2.1.4 (Sound Propagation) of the California Department of Transportation (Caltrans) Technical Noise Supplement.

Mobile source noise levels were quantified using traffic data supplied by the project team and Federal Highway Administration's Traffic Noise Model (TNM) version 2.5. The analysis takes into account vehicle volumes, roadway width, and speed.

Vibration levels generated by construction equipment were estimated using example vibration levels and propagation formulas provided by FTA.[4] The methodology used for the analysis can be viewed in Section 12.2 (Construction Vibration Assessment) of the FTA guidance.

3.4.2 Significance Thresholds

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would have a significant impact related to noise and vibration if it would:

- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose people to or generate excessive ground-borne vibration or ground-borne noise levels;
- Create a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Create a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- 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, expose people residing or working in the project area to excessive noise levels; and/or
- For a project located within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

Construction Significance Thresholds

Based on the County Code, the proposed project would exceed the local standards and substantially increase temporary construction noise levels if:

- Construction activities would occur outside of the allowable hours of construction which is 7:00 a.m. to 7:00 p.m. Monday through Saturday. No construction activity is allowed on Sundays or on federal holidays.
- Construction activities would result in noise levels that would be in the exceedance of standards defined in **Table 3-3** at affected structures.

Operational Significance Thresholds

Based on the County Code a substantial increase in permanent noise levels would occur if:

- Operational activities would increase noise levels at the property line of sensitive receptors that would exceed the exterior noise standards outlined in **Table 3-1** or the measured ambient noise level (whichever is higher).

[4] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

Vibration Significance Thresholds

The proposed project would result in a significant construction or operational vibration impact if:

- Construction vibration levels would exceed 0.3 inches per second or 72 VdB at engineered concrete and masonry buildings (e.g., typical residential buildings) (**Table 3-4**).
- Operational vibration levels would exceed 0.01 inches per second at 150 feet (46 meters) from a source located within a public space or public right-of way.

3.5 ENVIRONMENTAL IMPACTS

3.5.1 Would the proposed project expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? (*Less-than-Significant Impact*)

Impact Analysis

Construction

On-Site Equipment. Noise impacts from construction of the proposed project would fluctuate depending on the construction phase, equipment type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers. Construction activities typically require the use of numerous pieces of noise-generating equipment. Typical noise levels from various types of equipment that may be used during construction are listed in **Table 3-7**. Noise levels from individual pieces of equipment typically are between 70.3 and 81.0 dBA L_{eq} at 50 feet.

TABLE 3-7: NOISE LEVEL RANGES OF TYPICAL CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level at 50 feet (dBA)
Backhoe	73.6
Compactor (ground)	76.2
Concrete Mixer Truck	74.8
Concrete Pump Truck	74.4
Crane	72.6
Dozer	77.7
Dump Truck	72.5
Excavator	76.7
Flat Bed Truck	70.3
Front End Loader	75.1
Generator	77.6
Grader	81.0
Paver	74.2

SOURCE: FHWA, *Roadway Construction Noise Model*, Version 1.1, 2008.

Table 3-7 presents anticipated noise levels when construction equipment is operating under full power conditions. However, equipment used on construction sites often operates at less than full power. To more accurately characterize construction-period noise levels, the noise levels shown in **Table 3-8** take into account the likelihood that multiple pieces of construction equipment would be operating simultaneously and the typical overall noise levels that would be expected for each phase of construction. When considered as an entire process with multiple pieces of equipment, excavation and finishing activity would generate the loudest noise level of approximately 89 dBA L_{eq} at 50 feet.

TABLE 3-8: TYPICAL OUTDOOR CONSTRUCTION NOISE LEVELS	
Construction Method	**Noise Level at 50 feet (dBA, L_{eq})**
Ground Clearing	84
Site Preparation	89
Foundations	78
Structural	85
Finishing	89

SOURCE: USEPA, *Noise from Construction Equipment and Operations, Building Equipment and Home Appliances*, PB 206717, 1971.

Fairmont Sedimentation Plant Intake Facility

The impact analysis is based on the construction time and noise limits in the County Code. Construction activity would comply with the allowable hours of construction in the County Code, including 7:00 a.m. to 7:00 p.m. Monday through Saturday, and no construction activity on Sundays or holidays. As shown in **Table 3-9**, the maximum noise level at a sensitive receptor would be 56.8 dBA L_{eq}, which would below the 60 dBA thresholds established for single-family residences. Furthermore, many of the residences do not have a line-of-sight to the project site and would likely experience noise levels lower than those calculated for the analysis. As a conservative measure, noise levels were calculated assuming line-of-sight. Calculations can be found in **Appendix B**. Therefore, the proposed project would result in a less-than-significant impact related to construction activity at the Sedimentation Plant.

TABLE 3-9: TYPICAL CONSTRUCTION NOISE LEVELS AT RECEPTORS – SEDIMENTATION PLANT				
Sensitive Receptor	**Distance (feet) /a/**	**Maximum Noise Level (dBA)**	**Existing Ambient (dBA, L_{eq})**	**New Ambient at Receptor (dBA, L_{eq})**
Residence along 170th St. West (approximately 700 feet north of Ave. H)	1,020	56.3	47.7	56.8
Residence along Pecel Rd.	1,830	49.9	47.7 /b/	52.0
Residence along Ave. H (approximately 400 feet east of the California Aqueduct)	2,950	44.7	51.3	52.2

/a/ Distance is the setback of the residence from the roadway.
/b/ Used measured noise level at residence along 170th Street, as existing noise conditions are similar for these two receptors.
SOURCE: TAHA, 2017.

Road Paving on 160th Street West, 170th Street West, and Avenue H

The proposed project would include paving the existing dirt roads of 160th Street West, 170th Street West, and Avenue H and there are several sensitive receptors located along these roads. Construction activity would comply with the allowable hours of construction in the County Code, including 7:00 a.m. to 7:00 p.m. Monday through Saturday, and no construction activity on Sundays or holidays. Paving would take approximately three months. Equipment associated with road paving typically includes a grader, paver, and dozer and would have a noise level most similar to the site preparation phase, 89 dBA at 50 feet. This would be the noise level at the property line of affected sensitive receptors, which are listed in **Table 3-10**. Paving activity would move quickly along each segment and would typically not be at one location for more than 10 days, thus the 75 dBA threshold is the appropriate threshold to assess noise impacts from paving activity. The maximum noise level at a sensitive receptor would be 74.0 dBA L_{eq}, which would below the 75 dBA threshold established for single-family residences. Although paving activity would temporarily increase noise levels, construction would be intermittent and short-term in any given location.

Therefore, the proposed project would result in a less-than-significant impact related to road paving activity along 160th Street West, 170th Street West, and Avenue H.

TABLE 3-10: TYPICAL CONSTRUCTION NOISE LEVELS AT RECEPTORS – ROAD PAVING				
Sensitive Receptor	Distance (feet) /a/	Maximum Noise Level (dBA)	Existing Ambient (dBA, L_{eq})	New Ambient at Receptor (dBA, L_{eq})
Residence along 170th St. West (approximately 700 feet north of Ave. H)	200	73.9	47.7	74.0
Residence along Ave. H (approximately 400 feet east of the California Aqueduct)	250	71.5	51.3	71.6
Healy Farms Residence (16700 Lancaster Rd.)	330	68.5	55.1	68.7

/a/ Distance is the setback of the residence from the roadway.
SOURCE: TAHA, 2017.

Off-Site Trucks. In addition to on-site construction activities, noise would be generated off-site by construction-related trucks and construction worker vehicles. Construction trucks generate higher noise levels than construction worker-related traffic. For example, one heavy-duty truck, traveling 35 miles per hour, generates the equivalent noise of 31 passenger vehicles.[5] The anticipated haul route for incoming haul trucks to the project site is from SR-138, south down 170th Street, left onto Lancaster Road, and right onto 170th Street, then into the project site. Outgoing haul trucks would likely use the same route or travel down Avenue H, turn left onto 160th Street and continue onto Lancaster Road back to SR-138. It is also possible trucks could come from I-5 and travel east along SR-138 to the project site. The maximum number of haul truck trips would occur during the LAA realignment and Reservoir Demolition and Relining. It is anticipated that construction activity could result in a maximum of approximately 59 haul truck trips per day (118 one-way trips) or 15 haul truck trips per hour over an 8-hour work day. The majority of employee trips would occur during the start and end of each work day. There would be approximately 19 construction employee trips for each starting and ending hour. Hourly construction truck volumes and construction employee vehicle trips were added to the existing traffic volumes on SR-138 between 170th Street and SR-14 and Lancaster Road near Healy Farms to determine if project noise levels would exceed 75 dBA at sensitive receptors. Due to the low traffic volumes along 170th Street between Lancaster Road and Avenue H and along Avenue H between 170th Street and Lancaster Road, existing noise levels were used as the baseline rather than a modeled existing noise level using traffic volumes. TNM model runs can be found in **Appendix B**.

A significant impact would result if mobile source noise levels cause the ambient noise level measured at the affected single-family residences to exceed 75 dBA from 7:00 a.m. to 8:00 p.m. As shown in **Table 3-11**, ambient noise levels would still be relatively low with the inclusion of construction traffic. The noise levels along SR-138 between 170th Street and Interstate 5 (I-5), SR-138 between 170th Street and SR-14, Lancaster Road, 170th Street, and Avenue H would be 67.1, 61.6 dBA L_{eq}, 47.1 dBA L_{eq}, 62.1 dBA L_{eq} and 62.4 dBA L_{eq}, respectively. As such, noise levels would not prove to be exceedingly loud and would be less than 75 dBA for daytime construction. Nighttime construction is not anticipated. Therefore, the proposed project would result in a less-than-significant impact related to off-site vehicle noise.

[5] California Department of Transportation, *Technical Noise Supplement*, September 2013.

TABLE 3-11: HAUL TRUCK NOISE LEVELS			
Roadway Segment	**Sensitive Receptor**	**Existing Noise Level (2017) (dBA, L_{eq})**	**Noise Level at Affected Structure (dBA, L_{eq})**
SR-138 between 170th St and I-5	Residences and other sensitive uses along SR-138	66.7	67.1
SR-138 between 170th St. and SR-14	Residences along SR-138	59.7	61.6
Lancaster Rd. near Healy Farms	Healy Farms Residence	42.9	47.1
170th St. between Lancaster Rd. and Ave. H	Residence along 170th St.	47.7	62.1
Ave. H between 170th St and Lancaster Rd.	Residence along Ave. H	51.3	62.4
SOURCE: TAHA, 2017.			

Operations

Fairmont Sedimentation Plant Intake Facility

The proposed sedimentation plant would be sized to operate at a peak inflow of 720 cfs, which is the maximum combined flow of LAA1 and LAA2 based on the physical characteristics of the aqueducts. The proposed project is intended to treat the maximum combined LAA condition of 720 cfs. A mixer and valve motors would operate along the northern side of the project site for the rapid mix flocculation process. Noise associated with these uses would be similar to a low humming or churning sound. The nearest sensitive receptor would be located approximately 1,020 feet away along 170th Street and noise from mechanical equipment and the mixer would not be audible at this distance. Therefore, the proposed project would result in a less-than-significant impact related to on-site operational noise.

Proposed Project Off-Site Operational Activity

A doubling of traffic volumes is needed for a person with normal hearing to perceive an increase mobile noise levels. The existing daily traffic volumes along SR-138 and Lancaster Road are approximately 14,400 and 792 trips per hour, respectively. Traffic volumes along 160th Street, 170th Street, Avenue H are likely less than 100 daily trips as the roadways are unpaved and only used for local access by a few residences and LADWP. During project operation, these roadways would be paved. However, trips along these roadways would likely be similar to existing conditions, other than the minor increase from project operations. Ambient noise levels within the project area range from 47.7 dBA L_{eq} to 55.1 dBA L_{eq}. The proposed project would add approximately 10 daily employee trips and 10 material export trips a day (20 one-way export trips). Employee trips would only occur during shift changes and would only result in a maximum of five trips per hour during shift changes (assuming two shifts per day). Employees would be distributed between two to three shifts per day. Landfills are open 12 hours from 6:00 a.m. to 6:00 p.m. and material export trips will only occur during landfill operating hours. As such, the proposed project would generate approximately two pass-by trips per hour, assuming 20 one-way trips per day. Trips associated with the proposed project may instantaneously increase noise levels, but would be short and infrequent, as project trips per hour would be low. Operational activities associated with truck trips would not increase noise levels at the property line of sensitive receptors that would exceed the exterior noise standards outlined in **Table 3-1** for a cumulative period of 30 minutes in any hour. Therefore, the proposed project would result in a less-than-significant impact related to operational mobile noise.

Mitigation Measures

No significant impacts have been identified related to construction or operational noise. Therefore, no mitigation measures are required.

3.5.2 Would the proposed project expose people to or generate excessive ground-borne vibration or ground-borne noise levels? (*Less-than-Significant Impact*)

Impact Analysis

Construction

Construction activity can generate varying degrees of vibration, depending on the procedure and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of a construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, and to slight damage at the highest levels. In most cases, the primary concern regarding construction vibration relates to damage.

On-Site Equipment. The FTA provides vibration levels for various types of construction equipment with an average source level reported in terms of velocity.[6] **Table 3-12** provides estimates of vibration levels for a wide range of soil conditions. The reference levels were used to estimate vibration levels at the sensitive receptors most likely to be impacted by equipment at each location of construction activity. Calculations can be found in **Appendix B**.

TABLE 3-12: VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Equipment	PPV at 25 feet (Inches/Second)
Large Bulldozer	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer	0.003

/a/ RMS velocity in decibels (VdB) related to 1 micro-inch/second.
SOURCE: FTA, *Transit Noise and Vibration Impact Assessment*, May 2006.

<u>Fairmont Sedimentation Plant Intake Facility</u>

Construction at the Sedimentation Plant would include a number of vibration generating activities. The nearest residence is Receptor 3 (see **Figure 3-3)**, located approximately 1,000 feet to the northeast. Construction activity would utilize equipment that is best characterized in **Table 3-12**, above, by large bulldozers. A large bulldozer produces a vibration level of 0.089 inches per second at 25 feet. At 25 feet, the vibration level would be below the 0.3 inches per second significance threshold. As the nearest receptor is located approximately 1,000 feet away, no vibration impacts would occur at this receptor or any other receptor near the Sedimentation Plant. Therefore, the proposed project would result in a less-than-significant impact related to construction vibration at the Sedimentation Plant.

<u>Road Paving on 160th Street West, 170th Street West, and Avenue H</u>

The proposed project would include paving the existing dirt roads of 160th Street West, 170th Street West, and Avenue H. The nearest residence is Receptor 2 (see **Figure 3-3)**, setback approximately 200 feet from 170th Street West where paving activity would occur. Equipment associated with road paving typically includes a grader, paver, and dozer, which are best characterized in **Table 3-12**, above, by large bulldozers. At 25 feet, the vibration level would be

[6] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

below the 0.3 inches per second significance threshold. As the nearest residence is setback approximately 200 feet from the roadway, no vibration impacts would occur at this receptor or any other receptor near road paving activity. Therefore, the proposed project would result in a less than-significant-impact related to construction vibration associated with road paving activity along 160th Street West, 170th Street West, and Avenue H.

Off-Site Trucks. In addition to on-site construction activities, construction trucks on the roadway network have the potential to expose vibration-sensitive land uses located near the proposed project access route. As shown in **Table 3-12**, above, loaded trucks generate vibration levels of 0.076 inches per second at a distance of 25 feet. Rubber-tired vehicles, including trucks, do not generate significant roadway vibrations that can cause building damage. At 150 feet from the right-of-way loaded trucks would generate a vibration level of 0.005 inches per second, well below the 0.01 inches per second vibration annoyance threshold. Therefore, the proposed project would result in a less-than-significant impact related to construction truck vibration.

Operations

The primary sources of operational-related vibration would include on-road vehicles related to routine inspection, maintenance activities and trucks arriving at the site and carrying away export of materials. Rubber-tired vehicles, including trucks, do not generate significant roadway vibrations that can cause building damage. It is possible that trucks would generate perceptible vibration at sensitive receptors adjacent to the roadway. As shown in **Table 3-12**, above, loaded trucks generate vibration levels of 0.076 inches per second at a distance of 25 feet. At 150 feet from the right-of-way loaded trucks would generate a vibration level of 0.005 inches per second, well below the 0.01 inches per second vibration annoyance threshold. The proposed project would not introduce any significant stationary sources of vibration, including mechanical equipment that would be perceptible at sensitive receptors. Therefore, the proposed project would result in a less-than-significant impact related to operational vibration.

Mitigation Measures

No significant impacts have been identified related to construction or operational vibration. Therefore, no mitigation measures are required.

3.5.3 Would the proposed project create a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? (*Less-than-Significant Impact*)

Impact Analysis

As discussed in Section 3.5.1, above, permanent operational noise levels were considered for each project component. Operational activity would not generate mechanical or mobile noise that would exceed the significance thresholds. Therefore, the proposed project would result in a less-than-significant impact related to operational noise.

Mitigation Measures

No significant impacts have been identified related to the proposed project creating a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the proposed project. Therefore, no mitigation measures are required.

3.5.4 Would the proposed project create a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? (*Less-than-Significant Impact*)

Impact Analysis

Fairmont Sedimentation Plant Intake Facility

It is acknowledged that construction activity at the Sedimentation Plant would temporarily increase ambient noise levels. As discussed above in Section 3.5.1, construction activity would comply with the allowable hours of construction in the County Code, including 7:00 a.m. to 7:00 p.m. Monday through Saturday, and no construction activity on Sundays or holidays. As shown in **Table 3-9**, the maximum noise level at a sensitive receptor would be 56.8 dBA L_{eq}, which would below the 60 dBA threshold established for single-family residences. Therefore, the proposed project would result in a less-than-significant impact related to a substantial temporary or periodic increase in ambient noise levels at the Sedimentation Plant.

Road Paving on 160th Street West, 170th Street West, and Avenue H

It is acknowledged that roadway paving activity would temporarily increase ambient noise levels. As discussed above in Section 3.5.1, construction activity would comply with the allowable hours of construction in the County Code, including 7:00 a.m. to 7:00 p.m. Monday through Saturday, and no construction activity on Sundays or holidays. Paving activity would move fairly quickly along each roadway and would not remain directly in front of any residence for a long period of time. Therefore, the proposed project would result in a less-than-significant impact related to a substantial temporary or periodic increase in ambient noise levels related to road paving activity.

Off-Site Trucks. It is acknowledged that off-site truck activity would temporarily increase ambient noise levels. As discussed above in Section 3.5.1, construction activity would comply with the allowable hours of construction in the County Code, including 7:00 a.m. to 7:00 p.m. Monday through Saturday, and no construction activity on Sundays or holidays. As shown in **Table 3-11,** the maximum noise level at a sensitive receptor would be 62.4 dBA L_{eq}, which would below the 75 dBA threshold established for single-family residences. Therefore, the proposed project would result in a less-than-significant impact related to a substantial temporary or periodic increase in ambient noise levels related to off-site vehicle noise.

Mitigation Measures

No significant impacts have been identified related to the proposed project creating a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the proposed project. Therefore, no mitigation measures are required.

3.5.5 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, expose people residing or working in the project area to excessive noise levels? (*No Impact*)

Impact Analysis

The project site is not located within an airport land use plan nor is it located two miles of a public airport or public use airport. The nearest public use airport to the proposed project is the General William J. Fox Airfield, located approximately 11 miles to the northwest. Therefore, the proposed project would not result in an impact related airport noise.

Mitigation Measures

No significant impacts have been identified related to public use airports. Therefore, no mitigation measures are required.

3.5.6 For a project located within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels? (*No Impact*)

Impact Analysis

The project site is not located within the vicinity of a private airstrip. Therefore, the proposed project would not result in an impact related to airport noise.

Mitigation Measures

No significant impacts have been identified related to private airstrips. Therefore, no mitigation measures are required.

3.6 CUMULATIVE IMPACTS

The cumulative impacts analysis addresses the potential combined effect of the proposed project in combination with the related projects. Cumulative impacts are first determined by assessing whether the proposed project combined with the related projects could result in a significant cumulative impact. If it is determined that proposed project combined with the related projects could result in a significant cumulative impact, the proposed project's incremental contribution is evaluated to determine whether it would be cumulatively considerable. If the combined impact of the proposed project with the related projects would not be significant, no analysis of the proposed project's incremental contribution is necessary.

The proposed project site is located in a rural and isolated area. There is no potential for the proposed project to combine with past, present, and reasonably probable future related projects to create a cumulative construction impact. Therefore, significant cumulative noise and vibration impacts are not anticipated.

4.0 REFERENCES

California Department of Transportation, *Technical Noise Supplement*, November 2013.

Federal Highway Administration, *Roadway Construction Noise Model*, Software Version 1.1.

Federal Highway Administration, *Traffic Noise Model Version 2.5,* 2004.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

Los Angeles County Code of Ordinances, *Chapter 12.08 (Noise Control)*.

U.S. Environmental Protection Agency, *Noise from Construction Equipment and Operations, Building Equipment and Home Appliances*, PB 206717, 1971.

APPENDIX A

Noise Monitoring Data and Site Pictures

Fairmont - Site 1

Information Panel

Name	Fairmont - Site 5
Start Time	Thursday, May 18, 2017 10:11:53
Stop Time	Thursday, May 18, 2017 10:26:53
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	64.3 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	3 dB
Weighting	2	C	Response	2	FAST

Monitoring Location 1

Fairmont - Site 2

Information Panel

Name	Fairmont - Site 1
Start Time	Thursday, May 18, 2017 11:01:44
Stop Time	Thursday, May 18, 2017 11:16:44
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	55.1 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	3 dB
Weighting	2	C	Response	2	FAST

Monitoring Location 2

Fairmont - Site 3

Information Panel

Name	Fairmont - Site 2 - Session 2
Start Time	Thursday, May 18, 2017 11:49:03
Stop Time	Thursday, May 18, 2017 12:04:03
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	47.7 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	3 dB
Weighting	2	C	Response	2	FAST

Monitoring Location 3

Fairmont - Site 4

Information Panel

Name	Fairmont - Site 4
Start Time	Thursday, May 18, 2017 12:13:51
Stop Time	Thursday, May 18, 2017 12:28:51
Device Model Type	SoundPro DL
Comments	

General Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	51.3 dB	Exchange Rate	1	3 dB
Weighting	1	A	Response	1	SLOW
Bandwidth	1	OFF	Exchange Rate	2	3 dB
Weighting	2	C	Response	2	FAST

Monitoring Location 4

APPENDIX B

Noise and Vibration Calculations

Noise Formulas

Noise Distance Attenuation

Soft Site

Equation: Ni = No - 25(log Di/Do)

Di = distance to receptor (Di>Do)

Ni = attenuated noise level of interest

Do = reference distance

No = reference noise level

Source: (Bolt, Beranek, and Newman, 1971)

Summation of Noise Levels

Equation: Ns=10 x LOG10((10^(N1/10))+(10^(N2/10))+(10^(N3/10))+(10^(N4/10)))

Ns = Noise Level Sum
N1 = Noise Level 1
N2 = Noise Level 2
N3 = Noise Level 3
N4 = Noise Level 4

Source: California Department of Transportation, *Technical Noise Supplement* , 2009

Construction Noise Analysis

Outdoor Construction Noise Levels		
Construction Phase	Noise Level at 50 feet (dBA)	Noise Level at 100 feet (dBA)
Ground Clearing	84	78
Grading/Excavation	89	83
Foundations	78	72
Structural	85	79
Finishing	89	83

Source: EPA. 1971. Noise from Construction Equipment and Operations, Building Equipment and Home Appliances. PB 206717.

Sedimentation Plant Construction: Resulting Noise Level Increases					
Sensitive Receptor	Distance (feet)	Reference Noise Level (dBA)	Max Construction Noise (dBA, Leq)	Existing Ambient (dBA, Leq)	New Ambient (dBA, Leq)
Residence along 170th Street West (approximately 700 feet north of Ave. H)	1020	89	56.3	47.7	56.8
Residence along Pecal Road	1830	89	49.9	47.7	52.0
Residence along Ave. H (approximately 400 feet east of the California Aqueduct)	2950	89	44.7	51.3	52.2

Roadway Paving Construction: Resulting Noise Level Increases					
Sensitive Receptor	Distance (feet)	Reference Noise Level (dBA)	Max Construction Noise (dBA, Leq)	Existing Ambient (dBA, Leq)	New Ambient (dBA, Leq)
Residence along 170th Street West (approximately 700 feet north of Ave. H)	200	89	73.9	47.7	74.0
Residence along Ave. H (approximately 400 feet east of the California Aqueduct)	250	89	71.5	51.3	71.6
Healy Farms Residence (16700 Lancaster Rd.)	330	89	68.5	55.1	68.7

Vibration Formulas

Vibration PPV Attenuation

Equation: PPVequip = PPVref x (25/D)^1.5
PPV (equip) is the peak particle velocity in in/sec of the equipment adjusted for distance
PPV (ref) is the reference vibration level in in/sec at 25 feet from Table 12-2
D is the distance from the equipment to the receiver.

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

Vibration VdB Attenuation

Equation: Lv(D) = Lv(25 ft) – 30log(D/25)
D = Distance (feet)
Lv(D) = Vibration Level

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

Vibration Damage and Annoyance Analysis

Vibration Velocities for Construction Equipment		
Equipment	PPV at 25 Feet (Inches/Second)	VdB at 25 feet (Micro-Inches/Second)
Hoe Ram	0.089	87
Caisson Drilling	0.089	87
Jackhammer	0.035	79
Large Bulldozer	0.089	87
Loaded Trucks	0.076	86
Small Bulldozer	0.003	58

Vibration VdB Attenuation		
Equipment	VdB at 25 feet (Micro-Inches/Second)	VdB at 150 feet (Micro-Inches/Second)
Hoe Ram	87	64
Caisson Drilling	87	64
Jackhammer	79	56
Large Bulldozer	87	64
Loaded Trucks	86	63
Small Bulldozer	58	35

Traffic Study for
LADWP Fairmont Sedimentation Plant
Draft MND

April 2018

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JB71098

Table of Contents

List of Tables

1. Introduction

The purpose of this traffic study is to assess the traffic impacts on the surrounding roadway system of construction activities and post-construction operations for the proposed Los Angeles Department of Water and Power (LADWP) Fairmont Sedimentation Plant Project (Project). The report was prepared while under contract for AECOM for inclusion in the environmental documentation.

A. Project Location

The proposed Project site is located on LADWP-owned property adjacent to LADWP Fairmont Reservoir #2. The Fairmont Reservoir property is located at West Avenue H and 170th Street West, approximately 6 miles west of the City of Lancaster, in the Antelope Valley in northwest Los Angeles County.

Regional access to the site is provided by State Highway 138, an east-west thoroughfare that is located approximately four miles north of the property and provides linkage between State Highway 14 (about 15 east of the Project site) and the Interstate 5 freeway (about 20 miles west of the Project site). The nearest paved road to the Project site is Lancaster Road, which is approximately one mile to the northeast at its closest point. Immediate access to the site is provided by local unpaved roads.

B. Project Description

To maintain the quality and reliability of the City of Los Angeles' potable water supply, LADWP is proposing to implement the proposed project to improve raw water quality through a reduction in sediment in the water delivered by the First and Second Los Angeles Aqueducts (LAA1 and LAA2) prior to the water entering the Los Angeles Aqueduct Filtration Plant (LAAFP), where it the water receives additional treatment and disinfection before entering the City's potable water distribution system. The proposed sedimentation plant would utilize plate settler technology to increase the efficiency and effectiveness of the sediment removal process and minimize the new plant's required footprint.

Site Access

Direct vehicular access to the Project site during construction would be provided along 170th Street West and West Avenue H, which, would be paved in the first phase of the Project.

Construction Duration and Intensity

Construction of the proposed project would occur over an approximate three and one-half year period, planned by LADWP to start in in early 2020 and last for 42 months. Construction activities would normally occur Mondays through Fridays during the daytime hours, generally beginning no earlier than 7:00 a.m. and ending by late afternoon/early evening.

The peak number of daily off-site truck roundtrips would be about 59, occurring when the realignment of the LAAs and modifications of the reservoir would overlap. The peak activity year would be 2021.

Secondary peaks of about 48 daily truck roundtrips would occur for several months in association with concrete deliveries for the reservoir relining and the plant structural elements. During the balance of the

Project, the average number of daily truck roundtrips would be substantially lower, at no greater than 16 and often less than 10 per day. These truck trips would generally be distributed throughout the work day, rather than concentrated during a particular portion of the day.

The number of daily on-site workers would range from a low of 15 to a high of 75, which would occur during the overlap of the LAA realignment and reservoir relining (i.e., asphalt and concrete work).

Operations Phase Traffic

The sedimentation plant would generally be in operations 24 hours per day, 7 days per week, whenever the LAAs are flowing. The plant would require up to 10 personnel, who would be distributed between 2 to 3 shifts during a day. The small permanent workforce and a minor number of supporting truck trips (an average of 10 roundtrips per day on weekdays and none on weekends) would not generate a significant number of trips that would create impacts on the local transportation network or otherwise substantially affect levels of service in the area. Consequently, operations period trip generation is not discussed further in this report.

C. Project Study Area

The study quantitatively assesses Project construction impacts on roadway segments in the vicinity of the proposed site. The Project construction activities would generate additional vehicle trips in the immediate area, based on necessary truck hauling/delivery trips and the construction employee population.

Roadway segment counts were compiled from Caltrans Annual Average Daily Traffic (AADT) data. The following are the study roadway segments included in the traffic impact analysis:

1. State Route (SR)138
2. Lancaster Road

D. Analysis Methodology

KOA analyzed the trip distribution, trip assignment, and daily roadway volumes for the designated study area. In the sections that follow, impacts of the construction of the proposed Project on study area roadways are discussed. The analysis is based on the impacts of Project during the peak of construction activity.

Project construction would peak in 2021. This year was defined as the future analysis year, because it represents the period of highest combined construction truck and worker traffic.

2. Existing Conditions

The following describes the study area, along the primary routes to and from the Project site.

Direct vehicular access to the Project site during construction would be provided along 170th Street West and West Avenue H, which, would be paved in the first phase. These are two-lane unpaved roadways under existing conditions.

The analyzed roadway of Lancaster Road has an intersection with 170th Street, to the north of the Project site. Lancaster Road is a two-lane paved roadway, and 170th Street has a stop sign at its approach to Lancaster Road.

The analyzed roadway of SR-138 has an intersection with a paved portion of 170th Street, approximately four miles north of the Project site. 170th Street has a stop sign at its approach to this roadway. SR-138 is a two-lane paved highway and provides east-west regional access.

3. Project Construction Trips

This section focuses on the definition of construction truck and employee vehicle trip total that are expected to occur during the peak period of Project construction. The distribution and assignment of those trips to the study area roadway network is also discussed here.

A. Project Trip Generation Methodology

Project trip generation calculations included construction truck trip estimates and construction employee vehicle trips. The trip generation totals were determined based on the period which would generate the highest number of combined trips for the Project. Truck volumes were multiplied by a Passenger Car Equivalency (PCE) factor of 2.5 to estimate the real effect of total Project, consistent with truck studies in the area.

Although some carpooling would likely occur during Project construction, trip generation calculations conservatively assumed that each employee would commute in a single personal vehicle.

To provide a conservative analysis, the total number of trips analyzed represents the highest trips generated by both construction employees and trucks, even though current estimates indicate that these peaks would not overlap during project construction.

B. Trip Generation Totals

The total daily Project trips defined by Table 1 represent one-way inbound and outbound trips by both the construction personnel vehicles and construction trucks.

Table 1 – Project Construction Weekday Trip Generation

	AVERAGE DAILY TRIPS		
TRIP GENERATION	Trucks*	Employee	Total
Field Personnel	0	150	150
Construction Truck	295	0	295
TOTAL TRIPS	**295**	**150**	**445**

** Truck trips include a Passenger Car Equivalency (PCE) factor of 2.5.*

Note: An average of 59 daily construction truck round trips would occur during the most intense construction period. Daily totals were multipled by the PCE factor.

During the peak period of construction, the Project site is estimated to generate a weekday daily total of 445 passenger car-equivalent trips. This total daily number of trips is compared in the analysis to the daily carrying capacity of the affected roads while also accounting for existing traffic volumes. Peak-hour trips related to construction (i.e., during the morning and evening period when workers would be arriving and departing the site) were not considered because there is no discernable peak traffic period in the vicinity of the project site.

C. Project Trip Distribution

Construction employee and truck vehicle trip patterns were based on the local roadway network that would provide primary access to the project site.

Although the I-5 freeway has an interchange with SR-138 to the west, the population center of Lancaster/Palmdale, as well as SR-14, is located to the east. Therefore, employee and truck trip distribution was estimated to be 75 percent to and from the east, and 25 percent to and from the west.

Project traffic from and to the west was analyzed on SR-138, which would provide access to and from the I-5 freeway. Project traffic to and from the east was analyzed on Lancaster Road, which would provide access to and from the Lancaster/Palmdale area and SR-14.

4. Project Impacts Analysis

As both existing and future projected volumes at the analyzed roadway segments are very low and do not approach the capacities of the roadways, this analysis focuses on daily volumes and, as discussed above, an analysis of peak-hour volumes was considered to not be necessary.

The tables below provide a comparison of the analyzed existing and future volumes with and without the Project, for the study roadway segments. Comparisons to the total roadway capacity are provided, based on the configuration of both roadways as two-lane paved facilities, and daily volume capacities generally defined by the Highway Capacity Manual that range from 7,500 vehicles per lane for minor roadways to 10,000 vehicles per lane for major roadways.

Table 2 provides a Project volume analysis based on the existing period analysis, included here based on precedents set by the *Sunnyvale* and *Smart Rail* CEQA court cases, which indicated that project impact analyses should include a scenario without future estimated traffic growth.

Table 2 – Project Study Roadway Segment Existing Volumes Analysis

Roadway Segment	Existing Daily Volumes	Daily Construction Trips	Existing with Construction	Roadway Capacity
SR-138, west of 170th Street W	**2,885**	**111**	**2,996**	**20,000**
Lancaster Road, east of 170th Street W	**1,016**	**334**	**1,350**	**15,000**

Table 3 provides a Project volume analysis at the roadway segments based on a future volume analysis. Future year-2021 volumes were defined by multiplying the existing volumes by an ambient growth rate for the area defined by modeled sub-region analysis within the Metro Congestion Management Program (CMP).

Table 3 – Project Study Roadway Segment Future Volumes Analysis

Roadway Segment	Existing Daily Volumes	Future 2021 without Construction	Daily Construction Trips	Existing with Construction	Roadway Capacity
SR-138, west of 170th Street W	**2,885**	**3,002**	**111**	**3,113**	**20,000**
Lancaster Road, east of 170th Street W	**1,016**	**1,057**	**334**	**1,391**	**15,000**

For the remainder of the construction period, construction traffic volumes would decline from the peak levels analyzed in these tables.

Capacities based on the Highway Capacity Manual are generally 7,500 to 10,000 vehicles per lane per day. The roadway segments analyzed here would be operating in the range of 1,350 to 3,113 vehicles per day based on Table 2 and Table 3, with Project construction trips. On both roadway study segments, adequate capacity would remain during the construction period. During the other non-peak months of the overall construction schedule, traffic volumes would decline from these peak levels.

The proposed Project would not create any significant impacts at the analyzed locations.