Initial Study/Mitigated Negative Declaration

Haynes Generating Station Unit 8
Recycled Water Cooling System Retrofit Project

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Environmental Planning and Assessment
111 North Hope Street, Room 1044
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CEQA Initial Study and Mitigated Negative Declaration

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Acronyms and Abbreviations

AB	Assembly Bill
AQMP	Air Quality Management Plan
ASI	application screening index
BACT	best available control technology
BMP	best management practices
BSA	biological survey area
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CCGS	combined cycle generation system
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CH_4	methane
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Ranks
CTG	combustion turbine generator
dB	decibel
dBA	A-weighted decibel
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Act
FESA	Federal Endangered Species Act
GHGs	greenhouse gases
GPD	gallons per day
GPM	gallons per minute
g/s	grams per second
Haynes	Haynes Generating Station
HIA	non-cancer acute hazard index
HIC	non-cancer chronic hazard index
HRA	health risk assessment
HRI	California State Historic Resources Inventory
HRSG	heat recovery steam generator
IS	initial study
kW	kilowatt
LADWP	Los Angeles Department of Water and Power
lbs/hr	pounds per hour
LBWD	City of Long Beach Water Department
Leq	equivalent continuous sound pressure level
LST	localized significance threshold
m	meter
MBTA	Migratory Bird Treaty Act

MG	million gallons
MGD	million gallons per day
mg/L	milligrams per liter
MICR	maximum individual cancer risk
MND	mitigated negative declaration
MRZ	Mineral Resource Zone
MT	metric tons
MW	megawatt
MWh	megawatt-hour
NAAQS	National Ambient Air Quality Standards
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NREL	Department of Energy National Renewable Energy Laboratory
NRHP	National Register of Historic Places
O_3	ozone
OTC	once-through cooling
OTC Policy	Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling
PD	Planned Development District
PM_{10}	particulate matter less than 10 microns
$PM_{2.5}$	particulate matter less than 2.5 microns
PPV	peak particle velocity
PSI	pollutant standard index
QSD	Qualified Stormwater Developer
QSP	Qualified Stormwater Practitioner
RWQCB	Regional Water Quality Control Board
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCGS	simple cycle generation system
SEASP	Long Beach Southeast Area Specific Plan
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxide
SR	state route
SRA	source receptor area
SSC	species of special concern
STG	steam-turbine generator
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
T-BACT	best available control technology for toxics
TDS	total dissolved solids
USFWS	United States Fish and Wildlife Service
VHFHSZ	very high fire hazard severity zone
VMT	vehicle miles traveled
VOC	volatile organic compound
WRP	Long Beach Water Reclamation Plant
$\mu g/m^3$	micrograms per cubic meter

SECTION 1
PROJECT DESCRIPTION

1.1 OVERVIEW OF THE PROJECT

The Los Angeles Department of Water and Power (LADWP) proposes to implement the Haynes Generating Station (Haynes) Unit 8 Recycled Water Cooling System Retrofit Project (referred to herein as the project or proposed project), which would modify the Haynes Generation Unit 8 cooling system by removing the existing ocean-water once-through cooling (OTC) system from service and installing a wet cooling system consisting of a cooling tower. This action is necessary to allow for the continued operation of Unit 8 while complying with mandates related to the statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (OTC Policy), implemented by the California State Water Resources Control Board (SWRCB) to establish standards to comply with federal Clean Water Act Section 316(b) to reduce potential effects on aquatic life associated with the operation of cooling water intake structures. Based on a preliminary schedule, the construction of the proposed project is scheduled to begin in late 2024, and primary facilities construction would be substantially complete by mid-2026. The cooling tower would become operational by mid-2027, after a commissioning phase. By implementing the proposed project, Haynes Unit 8 would comply with the OTC Policy by the December 31, 2029, deadline stipulated in the policy to eliminate OTC at Haynes.

1.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA; California Public Resources Code Section 21000 et seq.) applies to proposed projects initiated by, funded by, or requiring discretionary approvals from state or local government agencies. The proposed project constitutes a project as defined by CEQA. The CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000–15387) Section 15367 states that the lead agency is “the public agency which has the principal responsibility for carrying out or approving a project.” Therefore, as a municipal utility that will implement the proposed project, LADWP is the lead agency responsible for compliance with CEQA.

As the lead agency, LADWP must complete an environmental review to determine if implementation of the proposed project would result in significant adverse environmental impacts and to propose measures, as feasible, to eliminate or reduce any such identified impacts. LADWP has prepared a CEQA Initial Study (IS) to assist in making this determination. Based on the nature and scope of the proposed project and the evaluation contained in the IS environmental checklist (included herein), LADWP, as the lead agency, has concluded that a Mitigated Negative Declaration (MND) is the proper level of CEQA environmental documentation for the project. The IS shows that impacts caused by the proposed project are either less than significant or significant but mitigable to a less than significant level with 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:

> 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 BEST MANAGEMENT PRACTICES

The following best management practices (BMPs) would be employed during construction and, as applicable, during operation of the proposed project, to avoid or minimize potential impacts to the environment. BMPs are distinguished from mitigation measures because they are based on existing regulatory requirements and/or are standard practices and procedures of LADWP and/or its contractors that are not unique to the proposed project.

Air Quality

The proposed project shall implement Rule 402 measures required by the South Coast Air Quality Management District (SCAQMD), which prohibits the discharge from any source whatsoever, such quantities of air contaminants or other materials that 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 that cause or have a natural tendency to cause injury or damage to business or property.

The proposed project shall implement Rule 403 fugitive dust control measures required by the SCAQMD, which requires reasonable precautions to be taken to prevent visible particulate matter from being airborne, under normal wind conditions, beyond the property from which the emission originates. Reasonable precautions include, but are not limited to, the following:

- Application of water on material stockpiles and other exposed surfaces that can give rise to airborne dusts; and
- Maintenance of roadways in a clean condition (i.e., free of accumulated dirt).

The proposed project shall comply with the California Air Resources Board's (CARB) Airborne Toxics Control Measure, which restricts heavy-duty diesel vehicle idling time to 5 minutes.

Stormwater Pollution Prevention Plan

A Stormwater Pollution Prevention Plan (SWPPP) shall be prepared for project construction and operation in accordance with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit requirements (SWRCB Order 2009-0009-DWQ). A Qualified Stormwater Developer (QSD) shall develop the SWPPP, and a Qualified Stormwater Practitioner (QSP) shall implement as the measures delineated in the SWPPP. The objectives of the SWPPP are to identify sources of pollution associated with construction activity and project operations that may affect the quality of stormwater runoff that could discharge from the site and to design and implement stormwater pollution prevention measures to reduce pollutants. Examples of such measures include, but are not limited to, a spill prevention and control plan for the accidental release of petroleum or chemical substances during project construction and operation, and the use of barriers (e.g., straw wattles, catch basin inserts, sandbags) to divert and capture potentially polluted runoff during construction. The SWPPP shall include specific protective measures to prevent polluted runoff from entering the Haynes cooling water intake channel and the San Gabriel River channel.

Erosion Control Plan

An Erosion Control Plan shall be prepared to prevent or minimize the erosion, transport, and sedimentation of soil resulting from various processes and exposure of the ground surface during project construction. The Erosion Control Plan shall include specific protective measures to prevent sediment from entering the Haynes cooling water intake channel and the San Gabriel River channel.

Examples of erosion control BMPs during construction include, but not be limited to:

- Minimizing the extent of surface disturbance at a given time and limiting the duration of exposure;
- Stabilizing and protecting disturbed areas, including soil stockpiles;
- Reducing runoff velocities; and
- Retaining any resultant sediment within the construction area and removing the sediment promptly.

Erosion control devices may include, but are not limited to, the following:

- Soil stabilizers such as binders, mattresses, or mulch;
- Silt fences;
- Gravel bag barriers;
- Diversion dikes and interceptor swales;
- Desilting basins; and
- Drainage inlet protection.

Nesting Bird Surveys

If the initiation of project construction activities outside the nesting bird season (which generally occurs February 1 through September 1) is not practicable, the following measures shall be employed:

- A pre-construction nesting survey shall be conducted by a qualified biologist within 72 hours prior to the initiation of construction activities to determine whether active nests are present within or adjacent to the construction zone. In the event an active nest is detected, a qualified biologist shall monitor the nest to determine if a nest avoidance buffer zone is necessary to restrict construction activities in proximity to the nest to protect the nest from failing during construction. In determining the need for and establishing the size of any buffer zone, the qualified biologist shall take into account existing baseline conditions (e.g., topography, buffering buildings or other structures, etc.). In addition, observed avian response to disturbances related to existing station operations (e.g. noise and human activity) shall factor into the requirement for and size of a nest avoidance buffer.
- The qualified biologist shall monitor all such detected nests, including those with and without an established buffer, at least once per week to determine whether birds are being disturbed. If signs of disturbance or stress are observed, the qualified biologist shall implement adaptive measures to reduce disturbance. These measures could include increasing buffer distances, placing visual screens or sound dampening structures

between the nest and construction activity, or temporarily halting construction activities until fledging is confirmed. The qualified biologist shall monitor each active nest until they determine that nestlings have fledged and dispersed, or the nest is no longer active. Until such a determination is made, activities that might, in the opinion of the qualified biologist, disturb nesting activities shall be prohibited within the nest buffer zone.

- Should an active nest of any federal or state-listed bird species be detected during pre-construction monitoring or subsequent construction monitoring, construction activity in the immediate area shall not commence or shall cease if already underway, and the applicable federal and/or state agency (United States Fish and Wildlife Service [USFWS], California Department of Fish and Wildlife [CDFW]) shall be notified. Work in other areas of the project site may continue until the active nests has been evaluated.

Human Remains

If human remains are discovered, work in the immediate area of the discovery shall be suspended, and the Los Angeles County Coroner contacted. If the remains are deemed Native American in origin, the Coroner shall contact the Native American Heritage Commission and identify a Most Likely Descendant pursuant to Public Resources Code Section 5097.98 and California Code of Regulations Section 15064.5. Work may be resumed at the site of the discovery only after consultation and treatment have been concluded. Work may continue on other parts of the project site while consultation and treatment are conducted at the affected site.

Paleontological Resources

In the event previously undiscovered paleontological resources are encountered during project construction, work in the immediate area of the discovery shall be suspended. In accordance with CEQA Guidelines Section 15064.5(f), LADWP shall retain a qualified paleontologist to evaluate the significance and appropriate treatment of the resource. Construction may resume at the site of the discovery only after the evaluation and treatment have been concluded. Construction activities may continue on other parts of the construction site while evaluation and treatment, as necessary, of paleontological resources take place.

Noise

Other than to address emergency situations, no noise-generating construction activities shall be conducted before 7:00 a.m. or after 7:00 p.m. on weekdays, before 9:00 a.m. or after 6:00 p.m. on Saturdays, or at all on Sundays, consistent with the Long Beach Noise Ordinance, Section 8.80.202.

1.4 PROJECT LOCATION AND SETTING

Haynes is one of four LADWP natural-gas generating stations located in the Los Angeles basin and one of three that are located along the coast, as shown in Figure 1-1. The proposed project would be sited within Haynes, which is located at 6801 East 2nd Street in the City of Long Beach. Figure 1-2 shows the vicinity of Haynes. Haynes is located immediately south of State Route (SR) 22 (Garden Grove Freeway) and approximately 1 mile east of SR-1 (Pacific Coast Highway). Primary access to Haynes is provided from 2nd Street, which forms the southern boundary of the station. The San Gabriel River channel borders the west boundary of Haynes, and an Orange County Flood Control District flood control channel borders the eastern boundary.

Haynes is a fully developed industrial property, consisting of approximately 130 acres, the majority of which is located in the City of Long Beach, County of Los Angeles. Approximately 7.5 acres in the northeast corner of Haynes are located in the City of Seal Beach, County of Orange. Most of the eastern station boundary is also the boundary between Los Angeles and Orange counties as well as the boundary between Long Beach and Seal Beach. The Haynes property is designated for industrial use in the Long Beach Southeast Area Specific Plan and industrial light use in the Seal Beach General Plan, Planning Area 3. The proposed cooling tower and auxiliary facilities would be located entirely within the Long Beach portions of the property.

Uses surrounding Haynes consist primarily of industrial, commercial, and residential functions, including the Leisure World Seal Beach residential community along the entire eastern boundary of Haynes, separated from Haynes by the Orange County Flood Control District flood control channel; light industrial functions (including office, research and development, and manufacturing) in the Boeing Integrated Defense Systems Specific Plan Area (Seal Beach) to the southeast; the Island Village residential community to the south, across 2nd Street; the Los Cerritos Wetlands Complex properties in the historical Seal Beach Oil Field to the southwest; the Alamitos Generating Station (an electrical generating station operated by the AES Corporation) along the entire western boundary, across the San Gabriel River channel; and residential and open space recreation uses to the north, across SR-22.

1.5 PROJECT BACKGROUND

1.5.1 Haynes Generating Station

The site of Haynes was acquired by LADWP in 1957 for the purpose of constructing a steam-boiler electrical generating station to replace the Seal Beach Steam Generating Plant, which had been operating in the area since the mid-1920s. Generation Units 1 and 2 at Haynes were placed into operation in 1962 and 1963, respectively; Units 3 and 4 were placed into operation in 1964 and 1965, respectively; and Units 5 and 6 were placed into operation in 1966 and 1967, respectively. Unit 7, a 2-megawatt (MW) diesel emergency backup power generator, was added in 1970. Figure 1-3 shows the existing Haynes site.

The six original steam-boiler units (Units 1 through 6) were constructed with ocean-water OTC systems for generation unit cooling, drawing water from an intake structure located in Alamitos Bay Marina via a channel that passes beneath the San Gabriel River and extends about 1 mile northeastward from the marina into the southern part of Haynes. The OTC water was passed through the generation unit condensers and discharged into the San Gabriel River channel.

In 2004, a combined cycle generation system (CCGS, Units 8, 9, and 10) operationally replaced steam-boiler Units 3 and 4, which were decommissioned. The CCGS adapted the OTC systems from Units 3 and 4 to condense steam exhausted from Unit 8. Unit 8 is a steam-turbine generator (STG) that is operationally paired with two natural-gas-fired combustion turbine generators (CTGs; Units 9 and 10). The CCGS has a total nameplate generation capacity of 630 MW and a net generation capacity of approximately 575 MW, making it one of the largest generation resources in the LADWP portfolio, when counting the three units as a single source.

In 2013, a simple cycle generation system (SCGS), consisting of six separate CTGs (Units 11 through 16, each with a net generation capacity of approximately 99 MW), operationally replaced steam-boiler Units 5 and 6, which were decommissioned. The SCGS utilizes an air cooled heat exchanger for cooling; therefore, upon commissioning of the SCGS, the Unit 5 and 6 OTC systems were decommissioned.

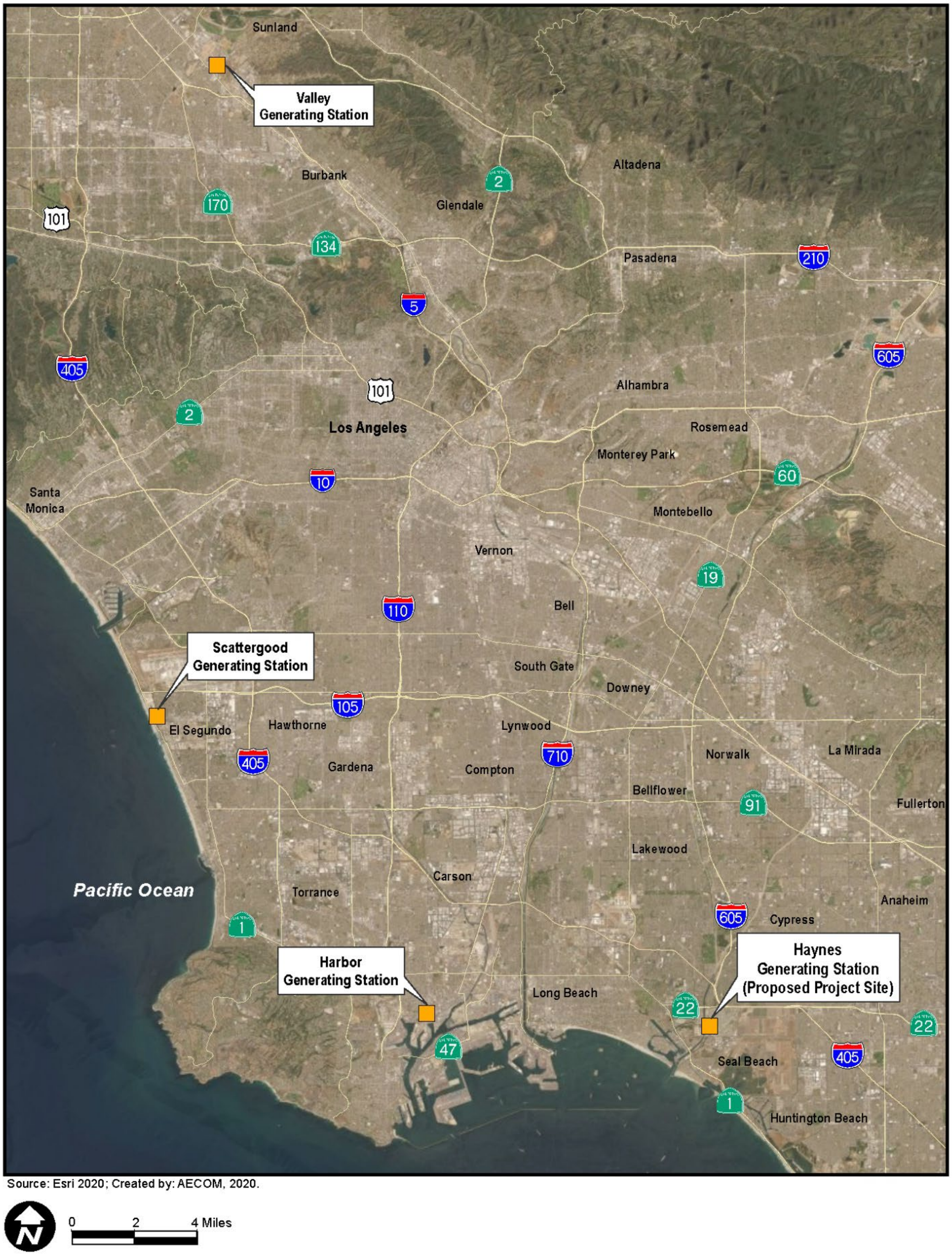
The original steam-boiler Units 1 and 2, including the OTC systems, remain operational. The total installed generating capacity of Haynes is currently 1,738 MW, and the net generating capacity is approximately 1,614 MW.

Decommissioned Units 3, 4, 5, and 6 are currently being demolished along with numerous ancillary facilities. This demolition work is scheduled to be completed by the end of 2021. In addition to addressing health and safety and property management objectives, this demolition will provide an approximately 8-acre vacant area in the central part of Haynes that can be used in the future for new facilities, including potential energy storage and/or renewable energy generation projects. The proposed cooling tower would occupy about 30,000 square feet (approximately 0.7 acres) in the northeast corner of the 8-acre parcel previously occupied by Units 3 through 6.

1.5.2 OTC Elimination

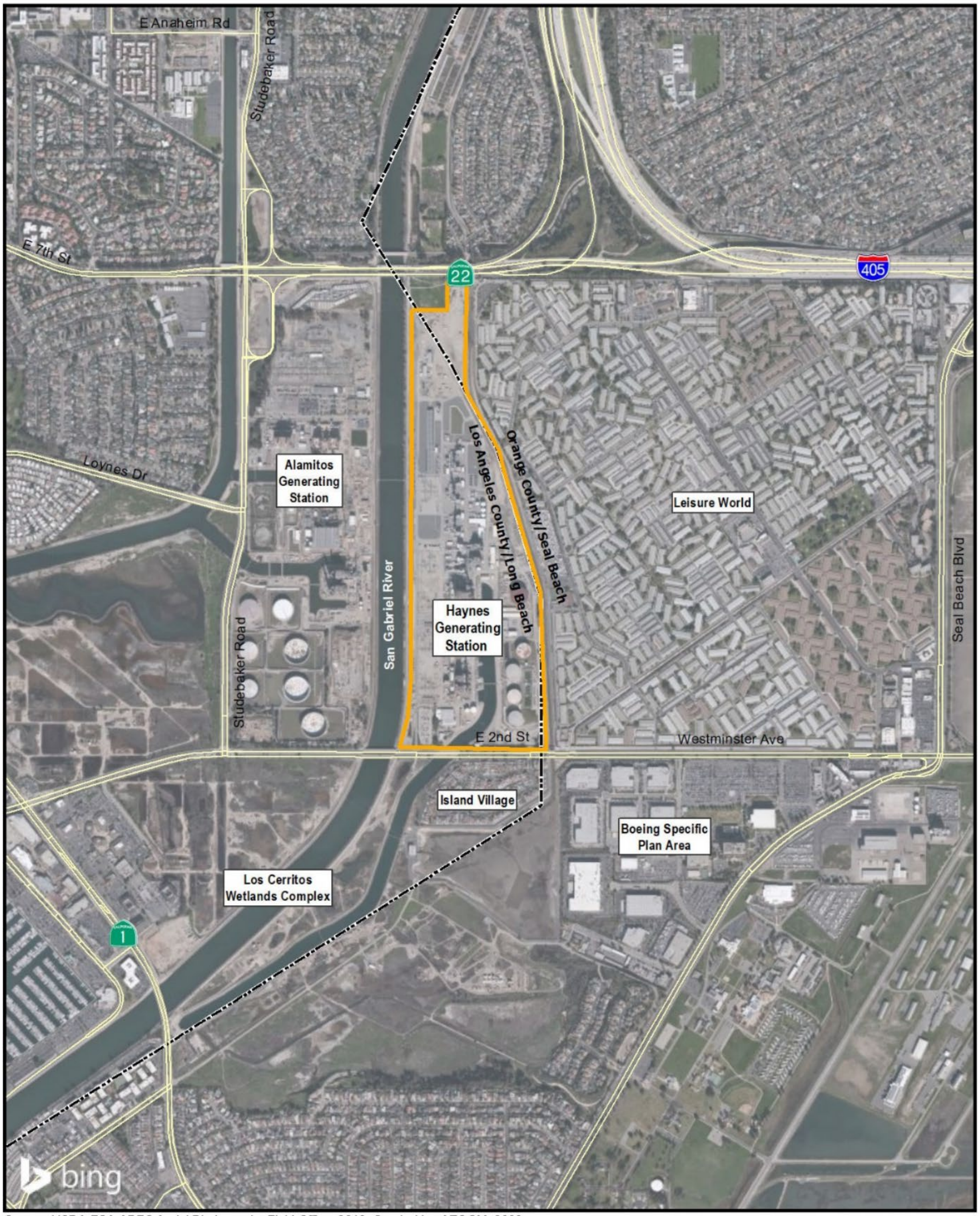
In an OTC system, cooling water is drawn into the condenser of a steam turbine from an external water body, passed through the condenser, and discharged back to an external water body. Because of water’s high thermal conductivity, an OTC system is a very efficient means to condense steam to water after the steam is exhausted from the steam turbine, to then be recycled within the closed-loop steam generation system. OTC systems are a prevalent means of providing cooling for steam generation units, as evidenced by numerous power plants in California and across the nation that are sited along coastal and inland water bodies. The locations of three LADWP generating stations along the coast were established based on the availability of ocean water for cooling and the ability to discharge the cooling process water to the ocean once it had been used to condense steam.

An OTC system for large steam generation units requires a constant flow of substantial volumes of relatively cool water in order to continually condense steam. However, state and federal regulations have now established stricter limitations on the operation of OTC systems related to environmental impacts potentially created by the use of ocean water for generation unit cooling. In 2010, in response to potential impacts related to the use of OTC and the impingement and entrainment of aquatic organisms, the SWRCB adopted the OTC Policy. Based on the OTC Policy mandates, LADWP will eliminate all remaining OTC systems at Haynes by no later than the end of 2029, under a schedule agreed upon by LADWP and the SWRCB.



Source: Esri 2020; Created by: AECOM, 2020.

Figure 1-1
Regional Location Map



Source: USDA-FSA-APFO Aerial Photography Field Office, 2016; Created by: AECOM, 2020.

N
0 1,000 2,000 Feet

Haynes Generating Station Boundary

Figure 1-2
Vicinity Map

Figure 1-3
Haynes Generating Station Site Plan

1.5.3 Haynes Combined Cycle Generation System

The Haynes CCGS is one of LADWP's most important generation assets because of its large capacity, high efficiency, advanced pollution control systems, and ability to be dispatched rapidly in a controlled manner to respond to fluctuations in demand for electricity. This dispatchable characteristic differs from the intermittent and variable nature of renewable energy resources, whose generation capacity fluctuates widely based on the environmental conditions at a given moment (e.g., the current availability of sun or wind), regardless of demand. Dispatchable resources such as the Haynes CCGS complement renewable resources and play a crucial role in the integration of renewable resources into the electrical energy system.

In the Haynes CCGS, heat created by the two CTGs during power production is diverted to heat recovery steam generators (HRSGs) rather than escaping directly through the CTGs' exhaust stacks. In the HRSGs, this heat is used to create steam, which is delivered to the STG to produce additional power. By capturing waste heat, over 75 percent additional power can be produced by the Haynes CCGS using the same amount of fuel required to drive the CTGs alone. When compared to the CTGs and STG operating in isolation, each of which would require its own fuel source, the increased efficiency of the CCGS not only conserves fuel but also substantially reduces the production of greenhouse gases (GHGs) in relation to the amount of energy produced, and, when combined with advanced pollution control systems, also substantially reduces air pollutant emissions.

The conversion of Unit 8 to a non-OTC cooling system (a cooling tower) would allow the continued operation of the CCGS beyond 2029, providing approximately 575 MW net dispatchable generation capacity to ensure the reliability and resilience of the City of Los Angeles's electrical power system while additional renewable generation, energy storage, distributed generation, and transmission system improvements are implemented, thereby facilitating the transition to a clean energy future. While the long-term goal of the City of Los Angeles is to achieve 100 percent renewable energy over the next decades, the LA100 renewable energy study conducted for the City by the Department of Energy's National Renewable Energy Laboratory (NREL)[1] has recognized the criticalness of maintaining in-basin dispatchable generation resources to maintain system reliability under a range of foreseeable circumstances. This would include the limited use of natural-gas generation where emissions could be offset by renewable energy credits and/or the conversion of existing natural-gas combustion units or the construction of new combustion units to operate on clean-burning renewable fuels.

To prevent fouling of the STG, the quality of the water in the HRSGs must be maintained at a high level. Therefore, the water/steam circulation system in the HRSG/STG is a closed loop, where water is converted into steam in the HRSG, the steam is used to drive the STG, and the exhaust steam exiting the STG is condensed into water, which is recycled to the HRSG. The existing OTC system for the Haynes CCGS STG (Unit 8) uses colder ocean water to dissipate heat from the exhaust steam within the condenser without making physical contact with the HRSG/STG closed loop. The ocean water passes through the condenser and then is discharged back to the ocean via the San Gabriel River channel adjacent to Haynes.

1 Cochran, Jaquelin, and Paul Denholm, eds. 2021. The Los Angeles 100% Renewable Energy Study. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-79444. https://maps.nrel.gov/la100/.

1.6 DESCRIPTION OF THE PROPOSED PROJECT

1.6.1 Cooling Tower Process

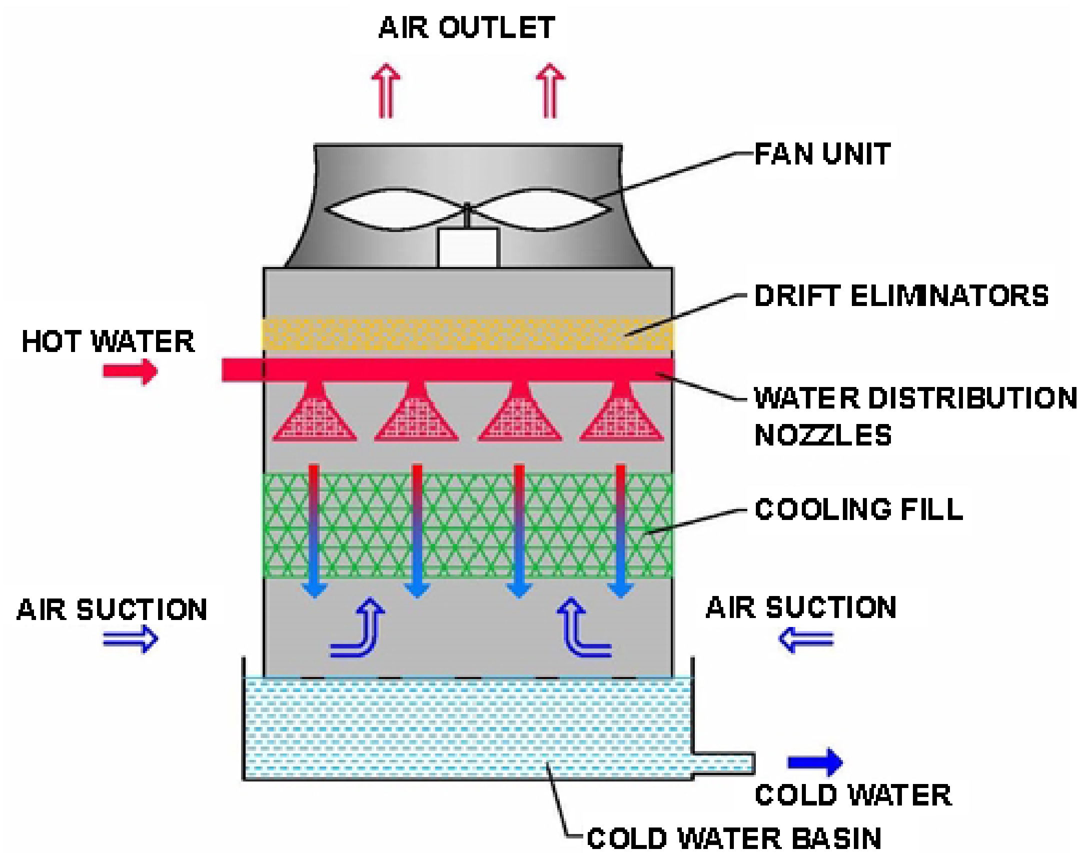
Similar to the existing OTC system, the proposed cooling tower system would pass water through the Unit 8 condenser to dissipate heat, but, unlike in the OTC system, the cooling water would be continually recycled through the condenser rather than being discharged to the San Gabriel River. However, because the temperature of the cooling process water would increase as it passes through the condenser and dissipates heat from the steam, it would first need to be cooled before being cycled back through the condenser.

A cooling tower uses an open circuit in which the water is exposed to the air and cooled predominantly through the process of evaporation, whereby heat is transferred to the surrounding air. While a relatively small portion of the cooling water would be lost to the air as water vapor, the evaporative process would provide significant cooling for the remaining water stream, allowing it to be repeatedly cycled through the condenser to meet the cooling demand of the STG.

The cooling tower to be installed at Haynes under the proposed project would be a mechanical draft tower, in which fans are used to assist in circulating air through the tower to dissipate heat in the cooling process water. The fans would be located at the top of the tower, inducing air flow upward through the tower and inward at the base of the tower. This is known as a counter flow induced draft cooling tower. The lower side walls of the tower would consist of baffles, which would help direct air flow and provide protection from the elements. Figure 1-4 is a diagram of a counter flow induced draft cooling tower.

Cooling process water exiting the condenser at an increased temperature (due to the transfer of heat from the STG exhaust steam) would be pumped to an upper level in the cooling tower and delivered to a manifold and nozzle system. The nozzles would evenly distribute the water over the surface of a structure known as the cooling fill, which would occupy the horizontal cross section of the interior of the tower. Due to the force of gravity, the water would drip down the fill in a thin film in a direction counter to the upward movement of the air flow through the tower.

The fill serves to distribute the water across a large surface area to provide greater contact with the surrounding air, which would evaporate a relatively small portion of the water, changing it from liquid to water vapor. During this process, the liquid water remaining on the fill would experience significant cooling from evaporation. This cooler water would continue its downward path through the fill and fall into a detention basin at the base of the tower. The cooler water would then be pumped from the basin back to the condenser, where it would again be used to condense the exhaust steam from the STG.



Source: LADWP, 2020

Not to Scale

Figure 1-4
Counter Flow Induced Draft Cooling Tower

1.6.2 Cooling System Water Losses

Because a cooling tower relies on an open-air design to allow for direct contact between the cooling process water and the surrounding air to facilitate evaporative cooling, a certain amount of water is continually lost from the system from various processes.

Evaporation

The primary loss of cooling process water occurs from evaporation as water vapor escapes through the top of the tower. At a projected maximum design flow rate of 160,000 gallons per minute (GPM) through the cooling tower and based on the design inlet and outlet water temperatures for the Haynes Unit 8 system, it is estimated that approximately 2,150 GPM would be lost through evaporation. While this is a small percentage of the total cooling water flow, it would represent a loss of over 3 million gallons per day (MGD), assuming 24 hours of full capacity operation for the CCGS.

Drift

Water droplets (as opposed to water vapor resulting from evaporation) can also become entrained in the flow of air as it rises through the tower and can be carried out the top of the tower. These suspended droplets are known as drift. However, drift eliminator devices would be installed within the proposed cooling tower above the water distribution manifold and nozzle system and below the exhaust fans. Water droplets rising in the air stream would impinge on the drift eliminators and drip back through the cooling fill and into the detention basin rather than escaping through the top of the tower. Based on current best available control technology (BACT) for drift elimination, this would reduce the volume of water escaping the tower via drift to 0.0005 percent of the total cooling water flow, resulting in a loss of approximately 1,150 gallons per day (GPD), assuming 24 hours of full capacity operation for the CCGS.

Blowdown

In addition to evaporation and drift, cooling water can be lost through what is termed the cycles of concentration of the cooling tower operations. As evaporation occurs in the tower, water molecules are removed in the form of water vapor, but minerals and other impurities from the evaporated water are left behind to be absorbed by the remaining water that falls into the detention basin. As the cooling process water continues to recirculate through the system, the concentration of minerals and other impurities increases. If concentrations of these constituents become too great, they can cause scaling, corrosion, and other issues in the cooling tower and condenser equipment, decreasing system efficiency and increasing maintenance, which could include temporary shutdown of the cooling system and the CCGS.

Therefore, to prevent a critical level of concentration being reached, a portion of the higher-content water would be continually discharged from the detention basin in a process called blowdown. The operating parameters for the proposed project have established four cycles of concentration (i.e., when the circulating cooling water has four times the concentration of solids as the original source water for the system) as the requirement for blowdown. Based on four cycles of concentration and at the projected maximum flow rate of 160,000 GPM through the proposed cooling tower, an average of approximately 715 GPM would be lost to blowdown. This would represent a loss of approximately 1 MGD, assuming 24 hours of full capacity operation for the CCGS.

1.6.3 Makeup Water

Based on the above described losses from evaporation, drift, and blowdown, the total maximum loss of process water from the cooling tower system would be approximately 4 MGD. This total is based on 24 hours of full capacity operation of the CCGS. Since the CCGS usually operates at considerably less than full capacity across a 24-hour period, average daily losses would be substantially lower. Based on projected annual operations for the CCGS, the average daily losses are estimated at 1 to 2 MGD.

This lost process water must be continually replaced with makeup water. The makeup water would not only ensure the required volume of water is available to maximize system efficiency, it would also maintain water quality by replacing the higher-concentration blowdown water with lower-concentration makeup water that has not yet been subject to the evaporation process, which, as discussed above, leads to higher concentrations of minerals and other impurities.

Recycled water from the Long Beach Water Reclamation Plant (WRP) would be utilized as the primary source of makeup water for the cooling tower. The Long Beach WRP is owned and operated by the Los Angeles County Sanitation District. It has a design capacity to provide primary, secondary, and tertiary treatment for 25 MGD of wastewater. The plant currently treats approximately 18 MGD of wastewater to a tertiary level to produce recycled water. This recycled water is not permitted to be used as drinking water, but it is suitable for certain other purposes. A share of the recycled water from the WRP is supplied to the City of Long Beach Water Department (LBWD), which distributes it through a recycled water pipeline system separate from the potable system to provide for irrigation needs, street sweeping, and industrial processes, which are permitted uses for recycled water. The LBWD's long-term goal is to provide an average of approximately 8 MGD for these uses. Based on the treatment capacity of the WRP and the LBWD's current and projected uses for recycled water, it is anticipated there would be future supply of recycled water to provide a large portion of the makeup water for the proposed cooling tower.

In addition to recycled water, it is LADWP's goal, to the extent feasible, to utilize industrial wastewater generated by certain processes at Haynes for the proposed cooling tower's makeup water. A maximum of approximately 1.7 MGD of industrial wastewater is generated under current operations. Actual wastewater generation is intermittent and generally substantially less than these maximums. In addition, certain wastewater streams could not be utilized for tower makeup water. These include the reject generated from reverse osmosis processes at Haynes due to the high conductivity of the water and the blowdown from the future operations of the cooling tower itself because of the relatively high concentration of minerals and other impurities. The wastewater that could be utilized in the cooling tower would consist predominantly of demineralized blowdown water from the Units 9 and 10 HRSGs, which would provide a portion of the tower makeup water.

Although it is anticipated that a combination of recycled water from the Long Beach WRP and industrial wastewater from Haynes would normally fulfill the need for cooling tower makeup water, potable water would also be available as a backup supply in the event that volumes from the other identified sources were insufficient, depending on the available supply versus the demand of the cooling tower at a given time. The potable water would also be provided by the LBWD. Based on supply and demand at a given time, the requirement for makeup water may be met by any combination of these various sources.

1.6.4 Makeup Water Supply Infrastructure

While enough water from the various sources mentioned above could generally be provided to accommodate the average daily needs for makeup water for the cooling tower, an aboveground water storage tank, approximately 7 million gallons (MG) in volume, would also be a component of the proposed project. All makeup water, regardless of source (i.e., recycled water, wastewater, or potable water), would be routed to the tank. The tank would accommodate variability in flow rate of supply water and provide makeup water to the tower even if demand temporarily exceeded supply. The tank would also facilitate more precise regulation of flow to the tower. A makeup water supply line would be required between the tank and the tower, where it would discharge into the detention basin at the base of the tower.

In order to utilize industrial wastewater from Haynes for tower makeup water, the existing wastewater collection infrastructure would be modified to segregate waste streams that are suitable for use as makeup water from those that are not. This would entail the rerouting of some existing wastewater collection pipelines within Haynes and the installation of new pipelines to deliver the wastewater to the proposed makeup water storage tank.

As discussed above, recycled water would be provided from the Long Beach WRP, which is located approximately 2 miles north of the Haynes northern boundary along Coyote Creek channel, which is a tributary to the San Gabriel River. There is currently no recycled water pipeline between the WRP and Haynes. Therefore, a new pipeline would need to be installed. Since the LBWD would supply the recycled water to Haynes under its Recycled Water Expansion Program, it would own and operate the portion of this pipeline located outside of Haynes as part of its recycled water system. Therefore, the LBWD would also be responsible for the installation of this portion of the pipeline, and it would not be part of the proposed project. Preliminarily, this pipeline would enter Haynes at the southeast corner of the station. A continuation of the recycled water supply line would be necessary within the Haynes property to connect to the aboveground makeup water storage tank. LADWP would own and operate the portion of the line within the Haynes property, and, therefore, would be responsible for its installation as part of the proposed project.

The LBWD has supplied potable water to Haynes since the mid-1960s for various purposes, including the operation of the six original steam boiler generation units (Units 1 through 6), which required substantial volumes of water. Therefore, no major upgrades to the existing LBWD potable water system would be necessary to deliver the potable water to Haynes necessary to support the operation of the proposed cooling tower. Some minor modifications of the existing potable water system within Haynes would be necessary to make connections to the makeup water storage tank.

1.6.5 Makeup Water Quality and Treatment

To ensure the performance and reliability of the cooling tower, the quality of the cooling process water must be maintained. Both the quality of the system makeup water and the wet, warm, and open-air conditions of the tower operation could contribute to less than optimal water quality. Water quality can contribute to several issues related to cooling tower operation and maintenance. These include chemical corrosion, which can be destructive to metal components of the tower and the condenser; scaling (mineral deposits), which can obstruct flow and diminish the heat exchanging process in the cooling system; fouling (deposits of fine particles), which can also obstruct flow and reduce heat exchange; and microbiological activity, which can contribute to fouling, corrosion, and a reduction in heat exchange.

The formation and buildup of the impurities that cause these issues in the process water is partially a function of the operational characteristics of the cooling tower, including the wet, warm environment and the cycles of concentration. However, substances originating in the system makeup water may also contribute to poor water quality. Blowdown helps resolve these issues by physically removing water when concentrations of impurities reach a certain level, but pre-treatment of the makeup water would also be required to help maintain water quality.

Therefore, to ensure water quality, which would optimize the cooling system performance and maintain the desired cycles of concentration (thereby also conserving water), the makeup water would be pretreated with chemical additives, including anti-scalants, corrosion inhibitors, and non-oxidizing biocides. Similar pretreatment is currently conducted at Haynes for various processes associated with the existing generation units. The water treatment would require storage tanks for the chemical additives and injection systems to add the chemicals to the cooling tower basin.

1.6.6 Plume Abatement

The air exhausted from the cooling tower would be relatively warm and moist due to the evaporative cooling of the process water. Warmer air has a greater capacity to hold moisture in the form of water vapor. That is, the same water vapor content in a mass of air results in a lower relative humidity in warmer air than cooler air. When an air mass becomes completely saturated with water vapor for a given temperature, the water vapor will begin to condense into droplets. This phenomenon can be an issue in relation to cooling towers, where relatively warm, moist exhaust air may mix with cooler ambient air as it exits the tower. If the temperature differential between the two air masses is great enough, condensation may occur, and a visible plume arising from the tower may form.

Because of the prevailing weather conditions around Haynes, where temperatures are moderated by the marine influence, it is projected that visible plume would occur only about 9 percent of the time on an annual basis, even assuming full operation of the CCGS and cooling tower system throughout the year. Such plumes would occur primarily during nighttime hours in winter months.

Nonetheless, the proposed project would incorporate a plume abatement system that would reduce the relative moisture in the air column rising in the tower. The air column exiting the tower would then be dryer, reducing the likelihood of condensation in the atmosphere and resulting in the elimination of most visible plumes.

1.6.7 Wastewater

Under current conditions, industrial wastewater at Haynes (a maximum of approximately 1.7 MGD) is discharged through the OTC flows associated with Generation Units 1, 2, and 8. However, at the completion of the proposed project, the OTC flows for Unit 8 would no longer be available for the purpose of wastewater discharge. In addition, based on mandates related to the OTC Policy, LADWP will cease using the Units 1 and 2 OTC systems by the end of 2029, which will eliminate the potential for wastewater discharges via OTC flows. As discussed above in Section 1.6.3, a portion of this industrial wastewater would be recycled to be used as makeup water for the proposed cooling tower. However, certain wastewater streams, such as reject from reverse osmosis systems and the blowdown from the future operations of the cooling tower itself, could not be utilized as cooling tower makeup water. This wastewater unsuitable for the cooling tower would be routed to the Long Beach WRP via a new dedicated return pipeline. The wastewater would provide additional influent to the WRP that would be processed through the plant to produce recycled water. In this manner, Haynes would partially provide the wastewater influent required by the WRP to serve the cooling tower makeup water needs with recycled water. As with the recycled water supply line, LADWP would be responsible for the portion of the new return pipeline within the Haynes property as part of the proposed project, and the LBWD would be responsible for the portion outside the property limits, which would not be part of the project. To regulate the flow of wastewater to the WRP, the wastewater would first be routed to a new aboveground wastewater holding tank within Haynes, approximately 3 MG in volume, from which it would be discharged to the return pipeline to the WRP.

1.6.8 Stormwater

Stormwater at Haynes is currently collected in a series of catchments and basins within the station and either discharged through the OTC flows associated with Units 1, 2, and 8, or discharged to the Orange County Flood Control District flood control channel located along the eastern boundary of Haynes. Stormwater is not a dependable source of makeup water for the cooling tower because it is unpredictable and intermittent. In addition, stormwater presents particular concerns relative to quality that would require significant treatment before it would be suitable as a source of makeup water for the cooling tower. However, under the proposed project, stormwater that would have previously been discharged to the San Gabriel River through the OTC flows or to the flood control channel would instead be detained in new stormwater holding tanks from which it would be routed to the Long Beach WRP via the dedicated return pipeline discussed above. Similar to the Haynes wastewater flows returned to the WRP, this stormwater would provide additional influent to the WRP that would be processed into recycled water to serve the cooling tower makeup water needs. The stormwater holding tanks, which would be located to minimize new infrastructure connections from existing detention basins, would provide a total storage capacity of approximately 3 MG. The tanks would help regulate the flow of stormwater to the WRP, but if the tanks reach their capacity during relatively rare but large individual storm events, excess stormwater would first be captured in the existing Haynes detention basins and, if necessary, may then be routed to the flood control channel.

1.6.9 Summary and Siting of Project Facilities

The proposed project facilities would all be located in areas of Haynes which have been highly disturbed from past construction and operations, dating to the early 1960s, when construction first began on the original generating station. This includes the proposed cooling tower and adjacent support facilities, which are located on the site of steam-boiler Generation Units 5 and 6, which became operational in in 1966 and 1967, respectively, and which required extensive site preparation, including substantial grading and excavation for subterranean foundation systems. These generation units as well as surrounding support facilities have recently been removed as part of ongoing demolition activities at Haynes, which have required additional ground disturbance and grading activities. The makeup water, wastewater, and stormwater storage tanks would be located on the sites of large, since-demolished fuel oil tanks associated with the early operations at Haynes. The construction of these tanks and the surrounding spill containment basins likewise required extensive grading and excavation work. Some of these areas have since been redeveloped with modern generation units that replaced the original steam-boiler units and whose construction required additional site grading and excavation work. Proposed infrastructure improvements, including new and modified recycled water, wastewater, stormwater, and potable water pipelines, would also be located primarily in areas of Haynes that have been highly disturbed in relation to the construction of the original generation units and support facilities in the southern portion of Haynes or replacement generation units that, along with support facilities, encompass the central and northern portions of Haynes.

Preliminarily, the proposed cooling tower would consist of nine cells. Each cell would include the elements previously described: an exhaust fan, plume abatement system, drift eliminators, hot water inlet from the STG condenser, manifold and nozzle system, cooling fill, cold water detention basin, cold water outlet to the STG condenser, and a blowdown outlet. A cooling tower operates most efficiently when oriented parallel to the prevailing wind, which in the area of Haynes is southerly. Therefore, the cells would be arranged in a single row of nine cells oriented in a north-south direction. The entire tower would be approximately 50 feet wide, 500 feet long, and 60 feet tall. As mentioned above, the tower would be sited in the central part of Haynes on a portion of the site previously occupied by Generation Units 5 and 6, which are currently undergoing demolition (see Figure 1-5).

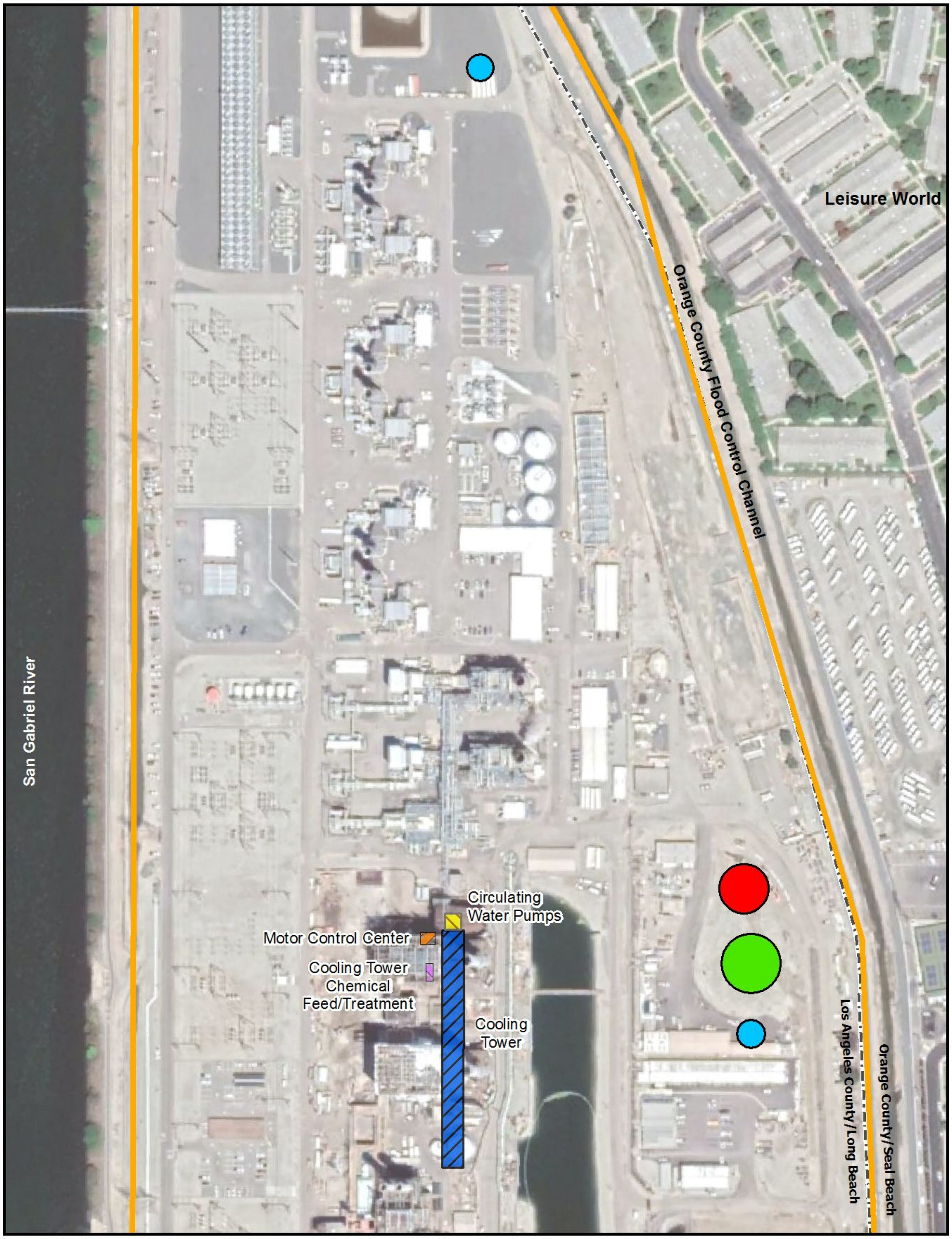
New water lines would be installed to conduct hot water from the STG condenser to the cooling tower cells, and a new cold water return lines would be installed to conduct water from the cooling tower cell basins to the condenser.

The makeup water storage tank would be an aboveground pre-stressed concrete tank. Depending on the final configuration, the tank would be approximately 150 feet in diameter and 50 feet tall. It would be located on the eastern side of the Haynes property, roughly parallel with the cooling tower, at the site of a recently demolished fuel oil tank of similar size (see Figure 1-5). A pipeline approximately 18 inches in diameter, which may be partially underground and partially aboveground, would be installed linking the tank to the cooling tower.

The makeup water treatment facilities would be located adjacent to the tower and would include several aboveground chemical storage tanks, ranging in capacity from approximately 2,000 gallons to 7,500 gallons (see Figure 1-5). Injection equipment would be included to add the chemicals to the cooling tower basin. The treatment facilities would also include a truck off-loading area where chemicals would be transferred to the tanks. The tanks would be protected by a spill and leak containment system.

The recycled water supply line would be an estimated 24-inch-diameter pipeline that may be partially underground and partially aboveground and that would be routed from the southeast corner of Haynes (where the LBWD-owned and operated line would enter the station) to the makeup storage tank.

The wastewater holding tank would be an aboveground pre-stressed concrete or welded steel tank. Depending on the final configuration, the tank would be approximately 100 feet in diameter and 50 feet tall. It would be located on the eastern side of Haynes, adjacent to the makeup water storage tank, at the site of a recently demolished fuel oil tank (See Figure 1-5). Pipelines would be modified or newly installed to deliver wastewater not usable in the cooling tower (including the tower blowdown) to the tank. The dedicated return line to the Long Beach WRP would be an estimated 14-inch pipeline that would be routed from the wastewater holding tank to the boundary



Source: Esri 2021; Created by: AECOM, 2021.

Figure 1-5
Preliminary Project Facilities Site Plan

of Haynes, where the LBWD-owned and operated return line would begin and continue to the Long Beach WRP. Within Haynes, the line may be partially underground and partially aboveground.

The stormwater holding tanks would be aboveground welded-steel tanks. There would be two separate tanks sited to store stormwater runoff collected from different areas of Haynes. One would be located on the eastern side of Haynes, adjacent to the proposed makeup water storage tank and north of existing settling basins in the southeast corner of the station. The other tank would be located adjacent to the existing stormwater detention basin in the northern part of the station. Each tank would be approximately 1.5 MG in volume. Depending on the final configuration, each tank would be approximately 70 feet in diameter and 50 feet tall. Pipelines to transfer stormwater from the adjacent detention basins to the tanks would be installed, and the tanks would be connected via new pipelines to the proposed return line to the Long Beach WRP.

1.6.10 Construction Schedule, Procedures, and Phases

Construction of the proposed project is scheduled to begin in late 2024. As shown in Table 1-1, construction would consist of several primary phases, including site preparation and earthwork; foundation and pile installation; cooling tower and auxiliary equipment construction; makeup water storage tank, wastewater holding tank, and stormwater holding tank erection; water infrastructure construction; final tie-ins to existing equipment and system commissioning; and demolition of portions of the existing aboveground OTC supply and discharge pipelines and appurtenant equipment. The general work that would occur in each of these phases is described below. While these phases are distinct and often must precede or be preceded by others (in whole or in part), some work associated with various phases could occur concurrently at different locations within the project site as construction of the project proceeds.

The exact sequencing of various tasks would be determined prior to the start of construction, but the total construction period, from mobilization to commissioning of the plant is anticipated to last approximately 2.5 years. The primary facilities would be substantially complete in less than 2 years, which would provide a contingency period to complete this construction to ensure that the tie-in and commissioning could be started and completed during the non-peak energy demand season. This is necessary because a generation unit outage is required to accomplish the tie-in and commissioning work. The tie-in and commissioning phase would begin in fall 2026 and be completed in spring 2027, a period of about 6 to 7 months.

Construction activities would normally occur Mondays through Fridays during the daytime hours, beginning no earlier than 7:00 a.m. and generally ending by 5:00 p.m. Personnel may arrive on site prior to 7:00 a.m. to conduct safety meetings and other pre-construction activities, but no noise-generating construction activities would occur before 7:00 a.m. Likewise, personnel may remain on site after 5:00 p.m., conducting closeout activities, but noise-generating construction activities would generally not occur after 5:00 p.m., except under unusual circumstances. Construction on Saturdays may also occasionally be necessary but is not generally anticipated. On Saturdays, noise-generating construction activities would not begin before 9:00 a.m. and would normally end by 5:00 p.m. No construction work would occur on Sundays, except under emergency conditions. In any event, noise-generating construction activities would be restricted based on the limits established in the Noise BMP outlined in Section 1.3 of this IS/MND, which is reflective of the City of Long Beach Noise Ordinance.

Temporary trailers for construction management activities and temporary laydown areas and storage facilities for construction materials and equipment would be required. All required administrative, staging, storage, laydown areas, as well as worker parking related to project construction would be located within the existing Haynes property boundaries. Vehicular access to the site during construction would be provided at the gates in the southwest and southeast corners of Haynes, along 2nd Street.

The phases described below, and indicated in Table 1-1, 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 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 tower and support facilities would require the operation of various pieces of heavy equipment on site, including a drill rig, vibratory roller, motor grader, concrete pump truck, cranes, backhoe loaders, excavators, and dump trucks. The type and level of use of this equipment would vary across the phases of work, with an estimated daily peak of about 26 pieces of equipment occurring during the two months of the project when site preparation and foundation work would overlap.

The estimated number of daily off-site truck round trips would not exceed 12, with a peak occurring when foundation work and cooling tower construction would overlap. These truck trips would generally be distributed throughout the workday, rather than concentrated during a particular portion of the day. It is estimated that approximately 15,000 cubic yards of soil and construction debris would be hauled and transported for disposal.

The estimated number of peak daily on-site workers would range from a low of 17 to a high of 32, which would occur during months 7 through 21. It is 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 at the end of the workday.

The average numbers of on-site personnel and equipment and off-site truck trips across the various phases and months of the proposed project are indicated in Table 1-1.

Table 1-1: Project Construction Schedule, Equipment, Truck Trips, and Personnel

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
Date	**Dec 24**	**Jan 25**	**Feb 25**	**Mar 25**	**Apr 25**	**May 25**	**Jun 25**	**Jul 25**	**Aug 25**	**Sep 25**	**Oct 25**	**Nov 25**	**Dec 25**	**Jan 26**	**Feb 26**	**Mar 26**	**Apr 26**	**May 26**	**Jun 26**	**Jul 26**	**Aug 26**	**Sep 26**	**Oct 26**	**Nov 26**	**Dec 26**	**Jan 27**	**Feb 27**	**Mar 27**	**Apr 27**	**May 27**
Phase 1	*Site Preparation & Earthwork*																													
Phase 2							*Foundations/Piles*																							
Phase 3									*Cooling Tower & Auxiliary Equipment*																					
Phase 4												*Makeup Water, Wastewater, and Stormwater Tanks*																		
Phase 5																		*Water Infrastructure*												
Phase 6																								*Outage, Tie-ins, & Commissioning*						
Phase 7																									*Demolish OTC Pipeline*					
Avg. Daily Equipment	*19*	*19*	*19*	*19*	*19*	*19*	*26*	*26*	*22*	*22*	*22*	*20*	*20*	*20*	*20*	*20*	*20*	*17*	*17*	*17*	*17*			*12*	*17*	*17*	*17*	*12*	*12*	*12*
Avg. Daily Truck Trips	*3*	*3*	*3*	*3*	*3*	*3*	*11*	*11*	*12*	*12*	*12*	*9*	*9*	*9*	*9*	*9*	*9*	*6*	*6*	*6*	*6*			*4*	*6*	*6*	*6*	*4*	*4*	*4*
Avg. Daily Personnel	*24*	*24*	*24*	*24*	*24*	*24*	*32*	*32*	*32*	*32*	*32*	*32*	*32*	*32*	*32*	*32*	*32*	*32*	*32*	*32*	*32*			*17*	*27*	*27*	*27*	*17*	*17*	*17*

1.6.11 Phase 1: Site Preparation and Earthwork

The sites for the cooling tower, auxiliary equipment, makeup water storage tank, and wastewater and stormwater holding tanks must be prepared to properly support the foundations for the various facilities. This may include the removal of substructures remaining from facilities previously located on the sites (e.g., Generation Units 5 and 6); over-excavation, filling, and compaction as required based on detailed geotechnical evaluations; and final grading of the site to allow for foundations to be installed.

Site preparation would involve several pieces of equipment, including a motor grader, backhoe loader, wheel loader, vibratory roller, compactor, excavators, and dump trucks. It is estimated that an average of approximately 3 truck trips per day would be required to haul or deliver material. Approximately 24 construction personnel would be required on a daily basis during this phase, which is anticipated to take approximately 8 months to complete.

1.6.12 Phase 2: Foundations and Piles

The cooling tower would require a pile foundation system to help support the load of the structure. While some piles from Generation Units 5 and 6 may remain on site and may be adequate to provide support, it is anticipated that additional piles would need to be installed, and some existing piles may need to be removed. The piles would be cast in place concrete rather than driven piles. Once the piles are installed, forms, reinforcing steel (rebar), and structural base material would be placed, and a concrete foundation would be poured. Underground piping associated with the cooling tower basin, including the cold water discharge pipe and the blowdown discharge pipe, would also be installed during foundation work.

Foundation construction would involve several pieces of equipment, including a drill rig, backhoe loader, excavator, compactor, concrete pump truck, cranes, and dump trucks. It is estimated that an average of approximately 8 truck trips per day would be required to deliver material, including concrete. Approximately 18 construction personnel would be required on a daily basis during this phase, which is anticipated to take approximately 5 months to complete.

1.6.13 Phase 3: Cooling Tower and Auxiliary Equipment

The components of the cooling tower, as described above, would be constructed starting with the detention basin at the base of the tower. A steel structure would be erected to frame each tower cell, and the interior components of each cell, including the fill, manifold and nozzle system, drift eliminators, plume abatement system, would be installed. Side walls, including baffles along the lower portion of the tower cells, and the roof with an exhaust fan at each cell would then be constructed. Auxiliary equipment, including the makeup water chemical treatment system, pumping stations as required, and a motor control center, would also be constructed during this phase.

The cooling tower construction would require several pieces of equipment, including a hydraulic crane, wheel loader, articulated aerial lift, and welders. It is estimated that an average of approximately 4 truck trips per day would be required to deliver equipment and material. Approximately 14 construction personnel would be required on a daily basis during this phase, which is anticipated to take approximately 9 months to complete.

1.6.14 Phase 4: Makeup Water Storage Tank, Wastewater and Stormwater Holding Tanks

For aboveground tanks of relatively large volume, like the proposed makeup water storage tank, pre-stressed concrete provides the most structural integrity. There are various methods for constructing pre-stressed concrete tanks, but all involve tensioning steel cables and/or rods embedded in the concrete to provide compressive strength to counteract the anticipated load of the stored water. For aboveground tanks the size of the wastewater holding tank (3 MG), either pre-stressed concrete or welded steel may provide sufficient strength. For tanks the size of the stormwater holding tanks (1.5 MG), welded steel would likely provide sufficient strength and would be more cost-effective.

Tank erection, depending on the type of construction, would require several pieces of equipment, including a hydraulic crane, wheel loader, concrete pump truck, excavator, and welders. It is estimated that an average of approximately 5 truck trips per day would be required to deliver material. Approximately 18 construction personnel would be required during this phase, which is anticipated to take approximately 6 months to complete.

1.6.15 Phase 5: Water Infrastructure

The installation of new water lines of various types or the modification of existing water lines would be necessary to provide makeup water to the cooling tower, collect and dispose of industrial wastewater that is not suitable as cooling tower makeup water, and collect and dispose of stormwater runoff. Figure 1-6 is a flow diagram that depicts the proposed water infrastructure. Depending on the need, conditions, and type of material, these lines may be installed partially aboveground or underground, but all would be located within the confines of Haynes. The installation of these pipelines would require several pieces of equipment, including an excavator, backhoe loader, trencher, welder, and vibratory roller. It is estimated that an average of approximately 6 truck trips per day would be required to deliver material and haul debris. Approximately 32 construction personnel would be required on a daily basis during this phase, which is anticipated to take approximately 4 months to complete.

Makeup Water Supply Pipelines

The pipelines providing water to the makeup water supply tank would include the recycled water line carrying supply delivered to Haynes from the Long Beach WRP, wastewater lines carrying reusable industrial wastewater streams, primarily from Generation Units 9 and 10, and a connection to the potable water system within Haynes. While the precise location of these various lines is currently unknown, the recycled water line would be routed from the southeastern corner of Haynes (where the LBWD owned and operated recycled line would enter the station) to the proposed makeup water storage tank in the southeast part of Haynes. The wastewater supply line would involve modifications to the existing industrial wastewater collection system that currently delivers waste streams to the settling basins in the southeast corner of Haynes to segregate usable waste streams and deliver them to the makeup water storage tank. In addition to these connections to the makeup water storage tank, a new line would be installed from the tank to the cooling tower to provide the makeup water to the tower.

Industrial Wastewater Collection Pipelines

The proposed wastewater collection system would involve segregating unusable waste streams from various Haynes processes (primarily reverse osmosis system reject and blowdown from the future operations of the cooling tower itself) and modifying the existing wastewater pipelines to direct the streams to the proposed wastewater holding tank located on the eastern side of Haynes. A new pipeline would also be installed to direct the cooling tower blowdown waste stream to the wastewater holding tank. In addition, the new return line conveying wastewater to the Long Beach WRP would be installed. The installation of the return line under the proposed project would terminate at the boundary of Haynes, where it would connect to the LBWD owned and operated return line.

Stormwater Runoff Collection Pipelines

The proposed stormwater collection system would involve installing new pipelines connecting existing detention basins, where stormwater is currently collected, to the proposed stormwater holding tanks. This would include a new pipeline from the settling basins in the southeast corner of Haynes to the proposed holding tank north of the basins and a pipeline from the stormwater detention basin in the northern part of Haynes to the adjacent holding tank. In addition, new pipelines connecting the stormwater holding tanks to the wastewater return line would be installed.

1.6.16 Phase 6: Outage, Tie-Ins, and Commissioning

In order to accomplish the final tie-ins of the cooling tower system to the Unit 8 condenser, an outage is required, temporarily removing the CCGS from service. After the tie-ins are complete, the CCGS would be returned to service, and the system would be tested to confirm operational integrity. Commissioning would involve running and adjusting the cooling system with the CCGS under full operational conditions to ensure the system is functioning as required. This phase would also include final site cleanup, including any necessary repaving.

This phase would require several pieces of equipment, including a forklift, wheel loader, backhoe loader, excavator, paver, vibratory plate compactor, and welders. It is estimated that an average of approximately 4 truck trips per day would be required to deliver material and haul debris. A peak of approximately 17 construction personnel would be required during this phase, which is anticipated to take approximately 7 months to complete.

1.6.17 Phase 7: Demolition of Aboveground OTC Pipelines

The demolition phase would involve the removal of portions of the aboveground pipelines and appurtenant equipment, such as valves and pumps, of the OTC system that currently supply the Unit 8 condenser from the original Units 3 and 4 intake structures. These pipelines run west of and parallel to the Haynes cooling water intake channel. In addition, the portions of the aboveground Unit 8 OTC discharge pipeline, which runs parallel to the San Gabriel River channel along the west side of the Haynes property, would also be removed.

The demolition phase would require several pieces of equipment, including a wheel loader, backhoe loader, hydraulic crane, skip loader, and articulated aerial lift. It is estimated that an average of approximately 2 truck trips per day would be required to haul demolition material. A peak of approximately 10 construction personnel would be required during this phase, which is anticipated to take approximately 3 months to complete, accomplished concurrently with the tie-in and commissioning phase (Phase 6).

1.7 PROJECT OPERATIONS

The cooling tower would operate any time Unit 8 (the STG of the CCGS) is operated. The operation of Unit 8 varies throughout the year, depending on demand for energy within the LADWP service area. Based on operational data for the last 6 reporting years (2015 through 2020), during which operations varied based on such factors as demand, system maintenance, and the availability of other generation resources, Unit 8 was operated at an average annual capacity factor of approximately 45 percent. This is equivalent to an average daily operating time of approximately 11 hours across the year. However, actual daily hours of operation can vary considerably from this average.

As discussed above, the cooling tower would have a maximum flow rate of approximately 160,000 GPM based on the projected inlet temperature (i.e., the temperature of the water entering the cooling tower from the Unit 8 condenser) and required outlet temperature (i.e., the temperature of the water transmitted from the tower to the condenser to achieve the necessary condensation of the STG exhaust steam). The actual daily throughput of water (and therefore the quantity of makeup water) would depend on the level and duration of the Unit 8 operations and ambient conditions. As discussed above, based on 24 hours of full capacity operation of the CCGS, the makeup water required for the cooling tower would be approximately 4 MGD. However, since the CCGS usually operates at considerably less than full capacity across a 24-hour period, average daily makeup water is estimated at 1 to 2 MGD.

The cooling tower would require energy, which would be provided by Unit 8, primarily to operate the circulating water pumps and the tower cell exhaust fans. The net output loss of power compared to current OTC operations is estimated to be up to approximately 8 MW, which would result in a net reduction in power output from the STG (Unit 8) of about 3.3 percent and a net reduction from the entire CCGS, which has a 6-year annual average capacity factor of 52 percent, of about 1.25 percent.

The operation of the cooling tower would require the delivery and storage of chemicals required to provide pretreatment for the recycled makeup water. As described above, the chemicals would be stored in aboveground tanks adjacent to the tower. The treatment facilities would include a truck off-loading area where chemicals would be transferred to the tanks within a spill and leak containment area with sump pumps and emergency shut-off for the transfer pumps. Depending on the level of operation of the CCGS (based primarily on seasonal demand) and the type of chemical, it is anticipated that chemical deliveries would range from twice a month to every four months.

The operation of the cooling tower is not anticipated to substantially increase the number of permanent personnel at Haynes as most functions would be performed by existing station personnel.

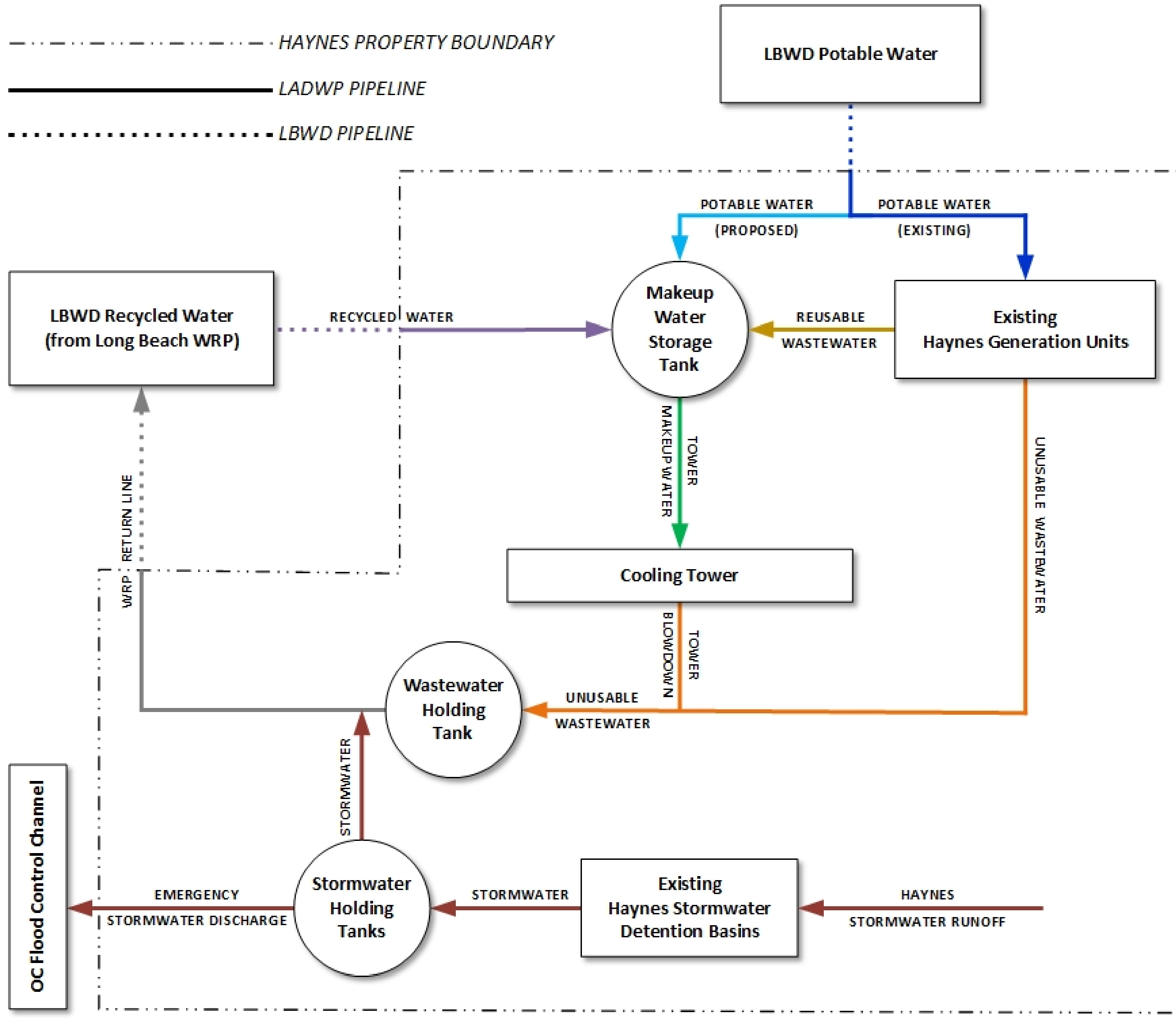


Figure 1-6
Proposed Water Infrastructure

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:

City of Los Angeles Department of Water and Power

- Adoption of the MND by the Board of Commissioners
- Approval of the proposed project by the Board of Commissioners

State Water Resources Control Board and Los Angeles Regional Water Quality Control Board

- Groundwater Dewatering Permit, under Order No. R4-2013-0095 and General National Pollutant Discharge Elimination System (NPDES) Permit No. CAG994004 with the RWQCB, if groundwater is encountered
- Construction General Permit Order 2009-0009-DWQ coverage with the Los Angeles Regional Water Quality Control Board (RWQCB)

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 (2021) to determine if the proposed project may have a significant effect on the environment.

CEQA INITIAL STUDY FORM

Project Title:
Haynes Generating Station Unit 8 Recycled Water Cooling System Retrofit Project

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:
Kathryn Laudeman, Environmental Project Manager
(213) 367-6376

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

Project Location:
The proposed project would be sited within the LADWP-owned Haynes Generating Station, located at 6801 East 2nd Street in the City of Long Beach.

General Plan Designation:
Haynes has a general plan land use designation of Industrial/Energy/Storage in the Long Beach Southeast Area Specific Plan (SEASP).

Zoning:
The project site is zoned for Planned Development District 1 (PD-1).

Description of Project:
The proposed project involves the modification of the Haynes Generation Unit 8 cooling system by removing the existing ocean-water once-through cooling system from service and installing a wet cooling system consisting of a cooling tower, water storage tanks, and other water infrastructure to allow for the continued operation of Unit 8 while complying with the statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, implemented by the California State Water Resources Control Board (SWRCB).

Surrounding Land Uses and Setting:
Uses surrounding Haynes consist primarily of industrial, commercial, and residential functions.

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

____________________________ ________________________

Signature Date

Charles C. Holloway
Manager of Environmental Assessment and Planning
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. Except as provided in Public Resources Code Section 21099, 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. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?				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 district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?			X	
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality?			X	
c. Expose sensitive receptors to substantial pollutant concentrations?			X	
d. Result in other emissions (such as those leading to odors) adversely 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 state or federally protected wetlands (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
V. CULTURAL RESOURCES. Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?				X

	Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?		X		
c. Disturb any human remains, including those interred outside of formal cemeteries?			X	
VI. ENERGY. Would the project:				
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	
VII. GEOLOGY AND SOILS. Would the project:				
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to California Geological Survey 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 direct or indirect 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
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			X	

	Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. GREENHOUSE GAS EMISSIONS: Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X	
IX. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			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 or excessive noise for people residing or working in the project area?				X
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?				X
X. HYDROLOGY AND WATER QUALITY. Would the project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?			X	
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?			X	

	Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
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:				
i) Result in substantial erosion or siltation on- or off-site?			X	
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?			X	
iii) Create or contribute runoff water which would exceed the capacity of existing or planner stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	
iv) Impeded or redirect flood flows?			X	
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?			X	
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			X	
XI. LAND USE AND PLANNING. Would the project:				
a. Physically divide an established community?				X
b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?				X
XII. MINERAL RESOURCES. Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				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
XIII. NOISE. Would the project result in:				
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		X		
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			X	

	Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
XIV. POPULATION AND HOUSING. Would the project:				
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				X
XV. PUBLIC SERVICES.				
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i) Fire protection?				X
ii) Police protection?				X
iii) Schools?				X
iv) Parks?				X
v) Other public facilities?				X
XVI. RECREATION.				
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				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
XVII. TRANSPORTATION. Would the project:				
a. Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?				X
b. Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?				X

	Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
d. Result in inadequate emergency access?				X
XVIII. TRIBAL CULTURAL RESOURCES. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:				
a. 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
b. 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 the 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		
XIX. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects?			X	
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?			X	
c. Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			X	
d. Generate solid waste in excess of state or local standards, or in excess of the future capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?			X	
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?				X

	Potentially Significant Impact	Less Than Significant Impact After Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?				X
b. Due to slope, prevailing winds, and other factors, exacerbate wildland fires risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?				X
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may result in temporary or ongoing impacts to the environment?				X
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?				X
XXI. MANDATORY FINDINGS OF SIGNIFICANCE.				
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			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. The City of Long Beach General Plan Draft Urban Design Element identifies important visual resources within the city. Important vistas in the city include views to the Pacific Ocean, downtown Long Beach, the marinas, and to the distant San Gabriel and Santa Ana Mountains to the northeast, as well as vistas to the southwest from high points, such as near Signal Hill.[2]

The Scenic Routes Element of the General Plan that Long Beach adopted in 1975 also identifies scenic assets within the city, such as the Pacific Ocean, port facilities, oil islands, Bixby Park, Bluff Park, and flood control channels.[3] The project site is located at 6801 East 2nd Street, within the Long Beach Southeast Area Specific Plan (SEASP). The SEASP establishes view corridors along East 2nd Street, SR-1, and Studebaker Road, which are defined as "roadway areas that provide special distinguishing features for the SEASP area." The SEASP identifies view corridors as having views of wetlands resources, entry views from elevated bridges into the area, and the views created by the built environment that create a sense of arrival into the SEASP, particularly the proposed mixed-use activity center located at the heart of the SEASP (2nd Street and SR-1). The view corridors closest to the project site include Studebaker Road (approximately 0.5 miles west of the project site) and East 2nd Street (which forms the southern boundary of Haynes). Additionally, a "gateway" is identified at the intersection of East 2nd Street and Studebaker Road. Further, the SEASP identifies public viewsheds and view opportunities to water and wetlands resources located within the Los Cerritos Wetlands Complex properties in the historical Seal Beach Oil Field to the southwest of Haynes.[4]

The proposed project would be located within the existing property boundaries of Haynes, a fully developed industrial complex that began operations in the early 1960s and consists of large generator units, fuel tanks, and other facilities related to electrical power generation. The proposed project would not contribute to increased

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2 City of Long Beach. 2019. General Plan Urban Design Element, available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/advance/lueude/urban-design-element-final-adopted-december-2019, accessed November 23, 2020.

3 City of Long Beach. 1975. General Plan Scenic Routes Element (Scenic Highways), available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/advance/general-plan/scenic-routes-element, accessed November 23, 2020.

4 City of Long Beach. 2017. Southeast Area Specific Plan, available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/environmental/seasp/docs/seasp_r5_web_10-2-17-reduced, accessed November 23, 2020.

blockage of a scenic vista because the project structures would be comparable to or smaller in height and mass than the structures that have been located on the sites of the proposed project facilities since the 1960s. Therefore, the project would not have a substantial 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. There are no officially designated state scenic highways near the proposed project site. SR-1 is an eligible (although not officially designated) state scenic highway.[5] It is located approximately 1 mile west of the project site. There are no other scenic highways in the vicinity of the project site. Because of distance and intervening development, limited visibility of Haynes is available from SR-1. In addition, the proposed cooling tower and support facilities would be smaller in scale than the Haynes generation units that have been located on the project site since the 1960s. The proposed project would not require removal of, or impact views of, any scenic resources such as trees, rock outcroppings, or historic buildings within a state scenic highway. Therefore, the proposed project would result in no impact to scenic resources within a state scenic highway.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of the site and its surroundings? If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

No Impact. Haynes is a fully developed industrial property, consisting of approximately 130 acres, the majority of which is located in the City of Long Beach, County of Los Angeles. Approximately 7.5 acres in the northeast corner of Haynes are located in the City of Seal Beach, County of Orange. The proposed cooling tower system would be located entirely within the Long Beach portions of the property. The areas surrounding the project site consist of industrial, commercial, and residential uses. The Haynes property has a general plan land use designation of Industrial/Energy/Storage and a zoning designation of Planned Development District 1 (PD-1) and is located within the SEASP.[6][7] The SEASP establishes view corridors that provide views of special distinguishing features in the SEASP area, such as wetlands resources and entry views from elevated bridges into the area. As previously discussed in Section I(a), the project would not result in adverse impacts to established view corridors or visual resources in the city. The proposed project facilities would be comparable to or smaller in scale than existing structures at Haynes, and the proposed industrial use of the project site is consistent with the existing PD-1 zoning designation and industrial land use designation of Haynes. Therefore, the project would not conflict with applicable zoning or other regulations governing scenic quality. The project would result in no impact.

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5 Caltrans. 2018. Scenic Highways, available at: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways, accessed November 23, 2020.

6 City of Long Beach. 2019. General Plan Land Use Element, available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/advance/lueude/land-use-element-final-adopted-december-2019, accessed November 23, 2020.

7 City of Long Beach. 2012. Zoning Map, available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/maps/zoning-maps/zoning_color_map_book, accessed November 23, 2020.

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

No Impact. Project construction is not anticipated to occur at night; therefore, no new sources of substantial light or glare would be added that would adversely affect day or nighttime views in the area during construction. Lighting already exists on site to provide for the safety of workers who are at the facility at night and to provide for security of the plant. Similar lighting would accompany the proposed project facilities. No substantial new sources of light or glare would be added to the project site, and no change in lighting or glare is anticipated as a result of the proposed project. Therefore, there would be no impact.

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 project would be located within an existing fully developed industrial site that does not meet the definition of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as shown on maps pursuant to the California Department of Conservation's Farmland Mapping and Monitoring Program.[8] Further, surrounding land uses do not include agricultural uses. Therefore, no impact would occur.

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

No Impact. The proposed project would be located within the existing Haynes property, which is industrially developed and zoned PD-1.[9] Based on the existing and historical uses at Haynes, the proposed project site is not subject to a Williamson Act contract. Therefore, there would be no conflict with zoning for agricultural uses or a Williamson Act contract.[10] No impact would occur.

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. The proposed project would be located within the existing Haynes property, which is industrially developed and zoned PD-1.[11] Haynes is not zoned for forestland or timberland and is not zoned for timberland production. Therefore, there

8 State of California. 2016. Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program, *Important Farmland in California, 2016* map, available at: https://maps.conservation.ca.gov/DLRP/CIFF/, accessed November 23, 2020.

9 City of Long Beach. 2012. Zoning Map, available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/maps/zoning-maps/zoning_color_map_book, accessed November 23, 2020.

10 State of California. 1965. Department of Conservation, Division of Land Resource Protection, Williamson Act Program, available at: https://www.conservation.ca.gov/dlrp/wa, accessed November 23, 2020.

11 City of Long Beach. 2012. Zoning Map, available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/maps/zoning-maps/zoning_color_map_book, accessed November 23, 2020.

would be no conflict with zoning for forest land or timber production. No impact would occur.

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

No Impact. The proposed project would be located within the existing Haynes Generation Station. Further, surrounding land uses do not include forest land. Therefore, the project would not result in the loss or conversion of forest land. 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 proposed project would be located within the existing Haynes property, which is industrially developed and zoned PD-1. As previously discussed, surrounding land uses do not include agricultural uses, forest land or timberland, and therefore, the proposed project would not involve other changes to the environment that would result in the conversion of farmland to non-agricultural use or forest land to non-forest use. Therefore, there would be no impact.

III. AIR QUALITY

Potential impacts related to air quality described in this section are based on the results presented in the *Air Quality, Greenhouse Gas, and Health Risk Studies* report prepared for the proposed project, which is included as Appendix A to this IS/MND.

Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact. The proposed project is located in the coastal zone of the South Coast Air Basin (SCAB), within the jurisdiction of the SCAQMD. The SCAB is designated nonattainment for the 1-hour and 8-hour state ozone (O_3) standards, the 8-hour federal O_3 standard, the 24-hour state particulate matter less than 10 microns (PM_{10}) standard, and the state and federal annual particulate matter less than 2.5 microns ($PM_{2.5}$) standards. The Los Angeles County portion of the SCAB is also designated a nonattainment area for the federal lead standard on the basis of source-specific monitoring at two impacted industrial locations as determined by the United States Environmental Protection Agency (EPA) using 2007-2009 data. However, all air monitoring stations in the SCAB, including the near-source monitoring in Los Angeles County, have remained below the National Ambient Air Quality Standards (NAAQS) for lead for the period from 2012 through 2015. In June 2013, the EPA approved re-designation of the SCAB as an attainment area for the federal 24-hour PM_{10} standard. The SCAB also continues to be in attainment of the carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) NAAQS.[12, 13]

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12 SCAQMD. 2017. Air Quality Management Plan, available at: http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp, accessed June 17, 2021.

13 SCAQMD. 2018. NAAQS and CAAQS Attainment Status for South Coast Air Basin, available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf?sfvrsn=14, accessed June 17, 2021.

Due to the nonattainment status of the identified pollutants, the SCAQMD is required under the Clean Air Act to adopt and periodically update its Air Quality Management Plan (AQMP) to meet federal requirements and/or to incorporate the latest technical information. State and federal planning requirements include developing control strategies, attainment demonstrations, reasonable further progress, and maintenance plans. The AQMP is the SCAQMD's contribution to the State Implementation Plan (SIP), and each iteration of the AQMP is an update of the previous AQMP. The most recently adopted plan for SCAQMD is the 2016 AQMP. This plan is a regional and multi-agency effort produced with collaboration between the SCAQMD, California Air Resources Board (CARB), the Southern California Association of Governments (SCAG), and the EPA. Each successive AQMP incorporates the latest scientific and technical information and planning assumptions, including the latest applicable growth assumptions, SCAG's Regional Transportation Plan/Sustainable Communities Strategy, and updated emission inventory methodologies for various source categories.[14]

As outlined in Section 1.3 of this IS/MND, the proposed project would comply with applicable SCAQMD and CARB rules and regulations during construction and operation (e.g., vehicle emission standards, equipment registration, fuel specifications, visible emissions, nuisance, fugitive dust control, etc.). These rules and regulations are adopted as part of the SIP and submitted by CARB to the EPA for approval under the Clean Air Act. The potential for air pollutant emissions from fuel combustion would primarily occur during construction. The duration of the construction would be approximately 30 months and would utilize diesel-powered off-road equipment and on-road vehicles. Workers would commute in personal vehicles, mainly gasoline powered. Construction emissions would be temporary and permanently cease upon completion of work. Per compliance criteria, the construction of the cooling tower would not conflict with or obstruct implementation of the AQMP.

Under paragraph (d)(3)(B) of SCAQMD Rule 219, written permits are not required for "industrial cooling towers located in a chemical plant, refinery or other industrial facility, provided a filing pursuant to Rule 222 is submitted to the Executive Officer." The proposed cooling tower would operate in compliance with these SCAQMD rules and thus not conflict with or obstruct implementation of the AQMP. As such, impacts would be less than significant.

14 SCAQMD. 2017. Air Quality Management Plan, available at: http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp, accessed June 17, 2021.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Less Than Significant Impact.

Construction

Emissions from mobile sources (including on-road vehicles and off-road equipment) associated with the project would primarily occur during the construction of the cooling tower and related facilities. The construction of the project is estimated to last approximately 30 months, occurring in several phases, as indicated in Table 3.3-1.

Table 3.3-1: Construction Schedule and Working Days (5 days/week)

Construction Phase	CalEEMod Phase Type	Start Date	End Date	Number of Months	Number of Working Days
Site Preparation and Earthwork	Site Preparation	December 2024	July 2025	8	168
Foundation and Piles	Grading	June 2025	October 2025	5	107
Cooling Tower and Auxiliary Equipment	Building Construction	August 2025	April 2026	9	188
Makeup Water and Wastewater Tanks	Building Construction	November 2025	April 2026	6	123
Water Infrastructure	Pipelines Infrastructure	May 2026	August 2026	4	83
Outage, Tie-ins, and Commissioning	Construction	November 2026	May 2027	7	148
Demo OTC Pipeline	Demolition	December 2026	February 2027	3	58

Many of the construction phases indicated above are projected to overlap with other phases, as indicated below.

- Phases 1 and 2 in June and July 2025 (2 months);
- Phases 2 and 3 in August thru October 2025 (3 months);
- Phases 3 and 4 in November 2025 thru April 2026 (6 months);
- Phase 5 in 2026 (overlaps with no other phase); and
- Phases 6 and 7 in December 2026 thru February 2027 (3 months).

The construction emissions analysis was performed using the California Emissions Estimator Model® (CalEEMod) version 2016.3.2, the official statewide land use computer model designed to provide a uniform platform for estimating potential criteria pollutant and greenhouse gases (GHG) emissions associated with construction of projects under CEQA. Emissions predicted by CalEEMod were used to determine the maximum daily peak emissions that would occur during project construction. Predicted peak volatile organic compounds (VOC), oxides of nitrogen

(NO_x), CO, and sulfur oxides (SO_x) emissions would occur between November 2025 and April 2026 with the overlap of Phases 3 and 4. Peak PM_{10} and $PM_{2.5}$ emissions occur in June and July 2025 with the overlap of Phases 1 and 2. Peak criteria pollutant emissions are summarized in Table 3.3-2 and compared to the SCAQMD emissions significance thresholds. The results indicate that project related criteria pollutant emissions during construction would not exceed SCAQMD significance thresholds; these emissions would be temporary and would permanently cease upon completion of construction work. Therefore, the impact during project construction would be less than significant.

Table 3.3-2: Construction Emissions Summary and Significance Evaluation

Criteria Pollutants	Peak Emissions (lbs/day)	Threshold (lbs/day)	Exceed Threshold?
VOC	4.7	75	No
NO_x	36.0	100	No
CO	43.0	550	No
SO_x	0.1	150	No
Total PM_{10}	2.7	150	No
Total $PM_{2.5}$	1.5	55	No

Note: Total PM_{10}/$PM_{2.5}$ comprises fugitive dust plus engine exhaust.
Sources: CalEEMod version 2016.3.2.
SCAQMD. 2019. Air Quality Significance Thresholds. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-airquality-significance-thresholds.pdf?sfvrsn=2), accessed May 21, 2021.

Operation

Particulate matter emission would result from operation of the proposed cooling tower. Daily mass emissions were estimated based on the maximum concentration of total dissolved solids (TDS) in cooling tower water allowable to maintain operational integrity. This level is 5,000 milligrams per liter (mg/L). This is a highly conservative assumption because the TDS concentrations in the actual source water utilized for cooling tower makeup water would be considerably lower. As discussed above, the cooling tower would use makeup water from various sources, including recycled water, industrial wastewater (predominantly demineralized blowdown water from the HRGSs of Generation Units 9 and 10), and potable water. Of these sources, the recycled water is anticipated to have the highest level of TDS, which is expected to range from 600 mg/L to 700 mg/L (maximum supplied concentration) based on reporting from the Long Beach WRP. The cooling tower would also be equipped with 0.0005 percent drift eliminators, which is current BACT and would substantially reduce the emission of particulate matter. Per SCAQMD methodology, computed emissions of PM_{10} and $PM_{2.5}$ are summarized in Table 3.3-3, which compares maximum potential cooling tower emissions to the SCAQMD significance thresholds for project operations. As shown, the impact during project operation would be less than significant.

Table 3.3-3: Operational Emissions Summary and Significance Evaluation

Criteria Pollutants	Maximum Potential Emissions (lbs/day)	Threshold (lbs/day)	Exceed Threshold?
Total PM_{10}	34	150	No
Total $PM_{2.5}$	20	55	No

Based on the above, the proposed project would not cause a cumulatively considerable net increase in emissions of any criteria air pollutants during either project construction or project operation, and the impact would be less than significant.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact.

Construction

Localized Significance Thresholds

The SCAQMD's Localized Significance Threshold (LST) methodology was used to evaluate the impacts of NO_x, CO, PM_{10}, and $PM_{2.5}$ emissions associated with project construction activities on potential receptors in the local area.[15] This is as opposed to assessing mass daily emissions for criteria pollutants, which is primarily a regional-level analysis. For determining localized air quality impacts, the LST methodology provides emissions rate lookup tables for projects up to 5 acres in size. Thus, the tabulated LSTs can be used for this project. The tabulated LSTs represent the maximum emissions from a project that would not cause or contribute to an exceedance of California ambient air quality standards (CAAQS) or NAAQS for the identified criteria pollutants and were developed based on ambient concentrations of these pollutants for each source-receptor area (SRA) in the SCAB.[16]

The active project site area is approximately 2 acres overall in SRA Zone 4 – South Coastal Los Angeles County. Thus, the 2-acre category screening lookup tables were used to evaluate NO_x, CO, PM_{10}, and $PM_{2.5}$ impacts on nearby receptors. The nearest residential receptor is approximately 950 feet (290 meters) away from the cooling tower site. To ensure impacts are not underestimated, the impact evaluation was performed using the closest distance within the SCAQMD LST tables of 200 meters for construction. LST results are shown in Table 3.3-4.

15 SCAQMD. 2008. Localized Significance Threshold Methodology, available at: http://www.aqmd.gov/docs/defaultsource/ceqa/handbook/localized-significance-thresholds/final-lst-methodologydocument.pdf?sfvrsn=2), accessed May 21, 2021.

16 *Ibid.*

Table 3.3-4: Construction Localized Significance Threshold Evaluation

Criteria Pollutants	Peak Emissions (lbs/day)	Threshold (lbs/day)	Percent of Threshold	Result
NO_x	36.0	106	34%	Pass
CO	43.0	2,869	2%	Pass
Total PM_{10}	2.7	70	4%	Pass
Total $PM_{2.5}$	1.5	30	5%	Pass

Sources: CalEEMod Version 2016.3.2.
SCAQMD. 2008. Localized Significance Threshold Methodology, available at: http://www.aqmd.gov/docs/defaultsource/ceqa/handbook/localized-significance-thresholds/final-lst-methodologydocument.pdf?sfvrsn=2), accessed May 21, 2021.

The LST results provided in Table 3.3-4 show that on-site emissions from construction would meet the LST passing criteria at the nearest receptor, and the impact would be less than significant.

Health Risk Assessment

Diesel particulate matter emissions, as toxic air contaminants (TACs), are generated from the diesel-fueled construction equipment, in particular during the most intensive construction phases (Phase 1 site preparation and Phase 2 foundation work). As planned, these two phases would last 11 months in total and would overlap for 2 months in June and July 2025. All engine-driven equipment would operate intermittently and only when needed, generally not more than a few hours on some days, or about 25-30 percent overall equipment utilization during the course of the project construction. A Tier 3 Health Risk Assessment (HRA) was performed to determine the health risk impacts of project construction at nearby receptors. The air dispersion modeling was performed AERSCREEN (version 21112), the EPA-recommended screening model.

The SCAQMD has established the following significance criteria for emissions of TACs, including carcinogens and non-carcinogens:[17]

- Maximum individual cancer risk (MICR) ≥10 in one million;
- Cancer burden >0.5 excess cancer cases (in areas ≥1 in one million); and
- Cancer risk and non-cancer chronic hazard index (HIC) and non-cancer acute hazard index (HIA) ≥1.0.

Construction related TAC emissions are limited to diesel particulate matter from engine exhaust emitted during on-site activities during the construction period. For the most conservative case, the thresholds related to the lowermost age bins (third trimester, 0-2 years, 2-5 years) of receptors were used. Table 3.3-5 presents the results of the construction HRA. As shown, all cumulative cancer risk values for the conservative lowermost age bins are less than the 10 in one million threshold, and chronic non-cancer risks are below the unity threshold (1.0). Because the nearest

[17] SCAQMD. 2019. Air Quality Significance Thresholds, available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-airquality-significance-thresholds.pdf?sfvrsn=2, accessed May 21, 2021.

residential area is a retirement community (Leisure World), the lowermost age bin conservative case is unlikely, and actual impacts would be less.

Table 3.3-5: Construction Tier 3 HRA Results – Conservative Case

Scenario	Maximum Modeled 1-Hour X/Q (μg/m³)/(g/s)	Maximum Annual X/Q Concentration (μg/m³)/(g/s)	Annual Emissions (g/s)	Maximum Annual Concentration (μg/m³)	Cancer Risk (in one million)	Cancer Risk Exposure Duration (years)	Chronic Hazard Index
Fence line (250 m)	54.11	5.41	4.11E-03	0.02226	7.94	2.5	0.0045
Leisure World – Resident (280 m)	47.81	4.78	4.11E-03	0.01967	7.02	2.5	0.0039
AES – Worker (340 m)	37.47	3.75	4.11E-03	0.01542	3.98	25	0.0031

Operation

Screening Health Risk Assessment

An operational HRA is required if TAC emissions from the operation of the cooling towers exceeds the screening emission levels. The nearest residential receptor is more than 100 meters (330 feet) from the cooling tower, which is the farthest source-receptor distance in the SCAQMD Tier 1 Screening Emissions Levels lookup tables. Since the actual source-receptor distance is greater than 250 meters (820 feet) (at the east fence line of Haynes), these evaluations are objectively conservative because concentrations would be more dilute than the screening table limits.

TAC emissions are limited to those resulting from TAC present in the makeup water treatment agents and in the recycled water used in the cooling tower. The cooling tower would use sulfuric acid and sodium hypochlorite as water treatment agents to limit scaling and biological growth within the tower and condenser. Sulfuric acid is considered a TAC. While sodium hypochlorite is not considered a TAC, based on the Safety Data Sheet for the sodium hypochlorite aqueous solution that would be used in the makeup water treatment, it contains a trace amount (1 percent by weight) of sodium hydroxide, which is considered a TAC. It should be noted that while these chemical compounds are individually considered TACs, when in the presence of each other in the cooling tower basin water, they would chemically react to form non-toxic compounds (sulfate and water). Therefore, the calculation of TAC emissions related to the makeup water treatment agents is inherently conservative.

The calculated maximum cooling water flow rate is 84,096 million gallons per year if the cooling tower operated continuously, which is a highly conservative assumption. The Tier 1 screening level involves a look-up table in which equipment emissions are compared to the screening level. The screening levels are pollutant emission thresholds which are not expected to produce a maximum individual cancer risk greater than 1 in one million nor a hazard index greater than 1.0. The screening levels are based on a 100-meter distance to the nearest receptor. Exceedances of these screening levels indicate that a screening HRA is required. The screening levels and the emissions comparison are summarized in Table 3.3-6. As indicated, the impact related to makeup water treatment would be less than significant.

Table 3.3-6: Water Treatment Emissions Screening Level Results – Maxima

Chemical TACs	Annual Emissions (lbs/year)	Hourly Emissions (lbs/hr)	Annual Pollutant Screening Level (lbs/year)	Hourly Pollutant Screening Level (lbs/hr)	Exceed Threshold?
Sodium Hydroxide	2.70E-04	3.08E-08	–	1.10E-02	No
Sulfuric Acid	1.27E-03	1.45E-07	3.01E+02	1.66E-01	No

As discussed above, the cooling tower would use makeup water from various sources. In particular, the use of recycled water from the Long Beach WRP in the cooling tower could ultimately introduce trace levels of pollutants into the atmosphere. Thus, the conservative assumption for assessing water source risk is that 100 percent recycled water would be used in the cooling tower, and the trace constituents would provide a basis for determining the TAC emissions from the tower. Table 3.3-7 presents the SCAQMD Rule 1401 Tier 1 application screening index (ASI) calculation for the computed amounts of trace compounds (maxima) and corresponding pollutant standard indices (PSIs), and cumulatively compares these amounts to the Rule 1401 Tier 1 ASI threshold of 1 (unity) for annual or hourly emission rates.

Table 3.3-7: Estimated Water TAC Emissions Screening Level Results – Maxima

TAC Code	Reportable Compounds	Average Annual Emission Rate (lbs/year)	Max Hourly Emission Rate (lbs/hr)	Cancer/ Chronic Pollutant Screening Level (lbs/year)	Acute Pollutant Screening Level (lbs/hr)	Cancer/ Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
A11	Arsenic and Compounds (Inorganic)	1.10E-02	1.25E-06	3.81E-03	2.76E-04	2.87E+00	4.54E-03
C23	Copper and Compounds	6.75E-03	7.73E-07	–	1.38E-01	–	5.60E-06
M3	Mercury and Compounds (Inorganic)	9.45E-06	1.08E-09	2.34E+00	8.28E-04	4.04E-06	1.31E-06
N12	Nickel and Compounds	4.30E-03	4.93E-07	4.88E-01	2.76E-04	8.82E-03	1.79E-03
A9	Ammonia	1.26E+01	1.44E-03	6.02E+04	4.42E+00	2.09E-04	3.26E-04
D12	1,4-Dioxane (1,4-Diethylene Dioxide)	4.90E-03	5.61E-07	1.65E+01	4.14E+00	2.97E-04	1.35E-07
C11	Chloroform	2.83E-02	3.24E-06	2.34E+01	2.07E-01	1.21E-03	1.57E-05
F1	Fluorides	2.31E+00	2.65E-04	6.86E+02	3.31E-01	3.37E-03	8.00E-04
N4	n-Nitrosodimethylamine	3.18E-04	3.65E-08	2.78E-02	–	1.15E-02	–
T3	Toluene	2.97E-03	3.40E-07	9.03E+04	5.11E+01	3.29E-08	6.66E-09
Total Application Screening Index (ASI)						**2.90E+00**	**7.48E-03**
Results						**Fail**	**Pass**

Under Rule 1401, the following requirements must be met:[18]

- The cumulative increase from all TACs emitted from a single piece of equipment shall not cause the MICR to exceed 1 in one million (10-6) if Best Available Control Technology for Toxics (T-BACT) is not used, or 10 in one million (10-5) if T-BACT is used;

- The cumulative cancer burden from all TACs emitted from a single piece of equipment (increase in cancer cases in the population) shall not exceed 0.5; and

- Neither the HIC, the 8-hour chronic hazard index (HIC-8), nor the HIA from all TACs emitted from a single piece of equipment shall exceed 1.0 for any target organ system, or an alternate hazard index level deemed to be safe.

Because the Rule 1401 Tier 1 ASI calculation results shown in Table 3.3-7 exceed the annual threshold of 1 (fail), a Rule 1401 Tier 2 screening analysis was performed for MICR at the nearest receptor, as well as HIA, HIC, and HIC-8. The MICR results shown in Table 3.3-8 and hazard index results shown in Table 3.3-9 indicate passing scores for all parameters (i.e., MICR less than 1 in one million, HIA less than 1, HIC less than 1, and HIC-8 less than 1).

Table 3.3-8: Rule 1401 Tier 2 MICR Summary

TAC Code	Reportable Compounds	Residential	Commercial
A11	Arsenic and Compounds (Inorganic)	2.21E-07	8.46E-09
C23	Copper and Compounds	0.00E+00	0.00E+00
M3	Mercury and Compounds (Inorganic)	0.00E+00	0.00E+00
N12	Nickel and Compounds	6.77E-10	5.58E-11
A9	Ammonia	0.00E+00	0.00E+00
D12	1,4-Dioxane (1,4-Diethylene Dioxide)	2.28E-11	1.88E-12
C11	Chloroform	9.30E-11	7.67E-12
F1	Fluorides	0.00E+00	0.00E+00
N4	n-Nitrosodimethylamine	8.80E-10	7.26E-11
T3	Toluene	0.00E+00	0.00E+00
Total MICR		**2.22E-07**	**8.60E-09**
Results		**Pass**	**Pass**

[18] SCAQMD. 2017. Risk Assessment Procedures for Rules 1401, 1401.1 and 212, Version 8.1, available at: http://www.aqmd.gov/home/permits/riskassessment, accessed May 21, 2021.

Table 3.3-9: Rule 1401 Tier 2 Hazard Index Summary

Target Organs	Acute (HIA)	Chronic (HIC)	8-Hour Chronic (HIC)	Acute (Pass/Fail)	Chronic (Pass/Fail)	8-Hour Chronic (Pass/Fail)
Alimentary system (liver) – AL	0.00E+00	2.45E-08	0.00E+00	**Pass**	**Pass**	**Pass**
Bones and teeth – BN	–	2.59E-04	0.00E+00	**Pass**	**Pass**	**Pass**
Cardiovascular system – CV	1.49E-04	1.64E-02	1.86E-04	**Pass**	**Pass**	**Pass**
Developmental – DEV	1.49E-04	1.65E-02	1.86E-04	**Pass**	**Pass**	**Pass**
Endocrine system – END	–	0.00E+00	0.00E+00	**Pass**	**Pass**	**Pass**
Eye	3.68E-05	0.00E+00	0.00E+00	**Pass**	**Pass**	**Pass**
Hematopoietic system – HEM	0.00E+00	7.84E-05	0.00E+00	**Pass**	**Pass**	**Pass**
Immune system – IMM	5.84E-05	0.00E+00	1.83E-05	**Pass**	**Pass**	**Pass**
Kidney – KID	–	3.35E-07	4.02E-08	**Pass**	**Pass**	**Pass**
Nervous system – NS	1.49E-04	1.64E-02	1.86E-04	**Pass**	**Pass**	**Pass**
Reproductive system – REP	1.49E-04	1.65E-02	1.86E-04	**Pass**	**Pass**	**Pass**
Respiratory system – RESP	3.75E-05	1.67E-02	2.05E-04	**Pass**	**Pass**	**Pass**
Skin	0.00E+00	1.64E-02	1.86E-04	**Pass**	**Pass**	**Pass**

Based on the above, the proposed project would not expose sensitive receptors to substantial pollutant concentrations during either construction or operation, and the impact would be less than significant.

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

Less Than Significant Impact. No odorous materials would be used during construction or operation. The required use of CARB specification ultra-low sulfur diesel fuel in off-road equipment (e.g., backhoes, generators) and on-road vehicles (e.g., heavier trucks) would prevent substantial emissions of sulfur-containing odorous gases (e.g., sulfur dioxide, hydrogen sulfide, etc.). As discussed in Section 1.3 of this IS/MND, construction contractors would be required to comply with SCAQMD Rule 402 (Nuisance) which states that "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." Since none of the water treatment agents documented above are odorous, and recycled water has had nearly all odorous compounds removed by the treatment process, no nuisance from cooling tower operation is expected. The project would not result in odors or nuisance emissions adversely affecting a substantial number of people, and impacts would be less than significant.

IV. BIOLOGICAL RESOURCES

Potential impacts to biological resources described in this section are based on the results presented in the *Biological Resources Report* prepared for the proposed project, which is included as Appendix B to this IS/MND.

The area evaluated for biological resources includes the Haynes property and a 500-foot survey buffer, which combined compose the study area. A field survey, focusing on areas where the proposed project components would be installed was conducted on January 11, 2021, to document existing biological resources that occur or have the potential to occur within and adjacent to the study area, and to evaluate the potential for special-status plant and wildlife species to occur within the study area. It should be noted that the Haynes cooling water intake channel, located to the east of the proposed cooling tower site, contains beds of eelgrass (*Zostera marina*) habitat, which also includes three native marine alga species and supports several managed vertebrate and invertebrate marine wildlife species. In addition, a population of federally-threatened green sea turtles (*Chelonia mydas*) is known to occur in the San Gabriel River adjacent to Haynes. The proposed project components would be located in upland areas of Haynes and entirely outside of the Haynes cooling water intake channel and the San Gabriel River. However, the potential exists to indirectly impact the channel and river from polluted runoff, sedimentation and turbidity, and debris potentially created from project construction activities. Therefore, BMPs requiring a SWPPP and Erosion Control Plan, as outlined in Section 1.3 of this IS/MND, would be implemented to protect the channel and river during project construction and avoid impacts to sensitive marine resources.

Based on the implementation of these BMPs and location of project facilities, the assessment of existing biological resources at Haynes and potential impacts to those resources from the construction and operation of the proposed project focuses on terrestrial species (including avian species that may forage in the channel and river) as opposed to the aquatic species present in the channel and river.

Would the project:

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

Less Than Significant Impact. A significant impact could occur if the proposed project removed or modified the habitat for, or otherwise directly or indirectly affected, any species identified or designated as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulation, or by the California Department of Fish and Wildlife (CDFW) or the United States Fish and Wildlife Service (USFWS).

The area surrounding Haynes consists primarily of residential, commercial, and industrial uses serviced by a network of freeways, highways, and local roads. Some areas of landscaped ornamental vegetation are dispersed throughout the biological survey area (BSA), with most occurring in residential communities east and south of the Haynes property. The Haynes property itself has been completely developed and is composed of power generation facilities, including support functions, and paved, gravel, or bare ground surfaces, with only minor areas of vegetation, all of which consists of non-native ornamental species.

Sensitive 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), those listed by CDFW under the California Endangered Species Act (CESA), and or those listed by the California Native Plant Society (CNPS).[19,20,21] The CNPS inventory is sanctioned by the CDFW and essentially serves as the list of candidate plant species for state listing. CNPS's California Rare Plant Ranks (CRPR) 1B and 2 species are considered eligible for state listing as endangered or threatened.

As mentioned above, very little vegetation occurs within Haynes because the property has been completely developed, and no vegetation occurs at the sites for the proposed cooling tower and other support facilities. Small clumps of vegetation occur about 250 feet north-northeast and 150 feet east of the proposed location for the water tanks, along the eastern-perimeter fence line of Haynes, where ironbark eucalyptus (*Eucalyptus sideroxylon*) and olive (*Olea europaea*) trees, with some ornamental non-native shrubs occur. Other vegetation occurs within Haynes at the entrance to the property and at the administration building at the southern end of Haynes, where Mexican fan palm (*Washingtonia robusta*), canary island date palm (*Phoenix canariensis*), and fig (*Ficus macrophylla*) trees occur in landscaped areas with non-native ornamental shrubs.

The surrounding survey area includes the San Gabriel River channel and concrete-lined Orange County Flood Control District channel, and residential development further to the east and to the south, where ornamental trees and shrubs are incorporated into landscaping. An undeveloped area south of the Haynes property, between the intake channel and San Gabriel River channel, falls within the study area. This strip of land consists of native and non-native grasses and other herbaceous species and areas of bare ground.

No special-status plant species were observed during the field survey, and no records of special-status plant species were found during the database reviews to coincide with the study area. Only non-native ornamental tree and shrub species were observed on the Haynes property. Due to the developed nature of the study area, natural habitats potentially suitable to support special-status plants are absent. The nearest occurrences of special-status plant species are primarily from the Los Cerritos Wetlands Complex property south of Haynes, the Seal Beach National Wildlife Refuge, approximately 1.5 miles southeast of Haynes, and Bolsa Chica Ecological Reserve, approximately 4 miles southeast of Haynes. No USFWS-

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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 17.12 [listed plants], Title 50 Code of Federal Regulations 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 are under the California Native Plant Protection Act (California Fish and Game Code Section 1900 *et seq.*).

designated critical habitat for any special-status plant species coincides with the study area.

Construction

Direct impacts to special-status plant species would occur if individual plants were damaged or destroyed from crushing or trampling during construction activities. However, no federal or state-listed plant species have been identified within the survey area, and special-status plants are not expected to occur in the survey area due to a lack of suitable habitat. As a result, direct impacts to special-status plants would not occur.

Indirect impacts to vegetation inside and outside the project site could result from the accumulation of fugitive dust and the colonization of non-native, 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 beyond the project's footprint. However, since the project site is completely developed and already consists of modified surfaces and no natural vegetation communities occur in the survey area, indirect impacts to vegetation would not occur.

Indirect impacts to special-status plant species occurring outside the project site could result from construction-related habitat loss and modification of sensitive natural communities related to dust, noise, stormwater runoff, and through the potential spread of noxious and invasive plant species into these communities. Such impacts would be considered significant; however, suitable habitat for special-status plants is not present in the urbanized environment surrounding the project. As a result, indirect impacts to special-status plants are not anticipated.

Operation

Significant impacts to special-status plant species during operations and routine maintenance of the project are not anticipated. The project site is located within the completely developed Haynes property, and these resources do not occur within the project site, and suitable habitat is absent. No impact would occur.

Sensitive Wildlife Species

Special-status wildlife species include those listed by USFWS under FESA and by CDFW under CESA. USFWS and CDFW officially list species as either threatened, endangered, or as candidates for listing. 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 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 and others are on a CDFW Watch List. The California Natural Diversity Database (CNDDB) tracks species within California for which there is conservation concern, including many that are not formally listed, and assigns them a CNDDB Rank.[22] Although CDFW species of special concern (SSC) and watch list 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 environmental review process. CDFW further classifies some species as "Fully Protected", indicating that the species may not be taken or possessed except for scientific purposes under special permit from CDFW. Additionally, CFGC Sections 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 authorization is obtained from CDFW.

No special-status wildlife species were detected during the field survey. Two CDFW species of special concern that may coincide with the study area were identified during database reviews.[23] A record of coast horned lizard (*Phrynosoma blainvillii*; CDFW SSC) from 1961 coincides with the northern portion of the Haynes property; this species is considered extirpated due to a lack of suitable habitat. A CNDDB record of burrowing owl (*Athene cunicularia*; CDFW SSC) from 1983 coincides with the far southeastern portion of the BSA, in the vicinity of the Island Village Community and the area east towards Seal Beach Boulevard. However, due to a lack of suitable habitat for this species, it is not expected to occur within the Haynes property.

The nearest occurrences of special-status wildlife species are primarily from native habitats 3 miles north and 1.5 miles southeast of the project site in the vicinity of the El Dorado Nature Center and the Seal Beach National Wildlife Refuge, respectively. No USFWS-designated critical habitat for any special-status wildlife species coincides with the survey area.

Although the developed nature and lack of vegetation in the project site limits wildlife use, several special-status avian species known from coastal areas have been documented in the project vicinity, although they were not identified during database searches. During nesting bird surveys conducted in 2007 and 2009 in support of the Alamitos Bay Marina Rehabilitation Project, located approximately 1 mile southwest of the study area, double-crested cormorant (*Phalacrocorax auritus*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), black-crowned night-heron (*Nycticorax nycticorax*), long-billed curlew (*Numenius americanus*), Caspian tern (*Hydroprogne caspia*), Foster’s tern (*Sterna forsteri*), and elegant tern (*Thalasseus elegans*) were observed foraging in Alamitos Bay. These non-listed special-status bird species are colonial nesters known to nest along the coast and in proximity to bodies of water located further inland; however, only great blue heron was observed actually nesting in Alamitos Bay.[24] As discussed above, limited eucalyptus and olive trees, and non-

[22] CDFW. 2019. California Natural Diversity Database (CNDDB). Special Animals List. California Natural Diversity Data Base. April, available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406, accessed May 10, 2021.

[23] CDFW. 2021. California Natural Diversity Data Base (CNDDB). Full report for Los Alamitos, South Gate, Whittier, La Habra, Long Beach, Anaheim, Seal Beach, and Newport Beach quadrangles. Generated May 10, 2021.

[24] LSA Associates (LSA). 2009. Draft Environmental Impact Report. Alamitos Bay Marina Rehabilitation Project, City of Long Beach, available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/environmental/environmental-reports/approvedcertified-part-1/alamitos-bay-marina/4-3-biological-resources, accessed March 17, 2021.

native ornamental shrub, occur onsite; however, they lack the number, size and/or density required to support nesting activity.

In addition, American peregrine falcon (*Falco peregrinus anatum*; CDFW Fully Protected) have been known in the past to nest on site in inactive, abandoned generation units at Haynes that have since been demolished or are currently undergoing demolition. However, these species are not expected to nest within the project site, although they may occur across the survey area as migrating or foraging transients.

Construction

Ground disturbing activities could result in direct impacts to individual wildlife species, including crushing those with limited mobility or that occupy burrows within the construction zone, which could be crushed during project activities. Additionally, short-term indirect effects on wildlife, primarily common bird species (discussed further below), would occur due to noise disturbances, increased human activity, and vibrations caused by heavy equipment, which would cause wildlife to avoid the immediate construction area. Very little common non-avian wildlife was observed onsite, and the sites for the proposed project facilities are currently or have recently been fully occupied by large facilities associated with power generation at Haynes. As a result, direct or indirect impacts to common non-avian wildlife are not anticipated to occur.

Structures within Haynes and the limited on-site vegetation provide some potential nesting habitat for bird species. As a result, birds protected by the MBTA and CFGC could nest in and near the project. However, no structures suitable for nesting or vegetation would be removed under the project, and as a result, direct impacts to nesting birds would not occur.

Project construction would occur within an active industrial complex with existing noise and human activity; however, project construction activities occurring during the nesting bird season could nonetheless indirectly impact birds protected by the MBTA and CFGC as a result of additional construction noise, dust, increased human presence, and vibrations. These disturbances could result in increased nestling mortality due to nest abandonment or decreased feeding frequency; if they occurred, such impacts would be considered significant. However, with implementation of the Nesting Bird BMP, as outlined in Section 1.3 of this IS/MND, prior to and during construction, indirect impacts to nesting birds protected under the MBTA and CFGC would be reduced to less than significant.

Individual special-status wildlife species could be directly and indirectly affected during construction in the same manner as described above; however, no federal or state-listed wildlife species have been identified on-site, and potentially suitable habitat for such species is absent from the project site and immediately surrounding vicinity within the BSA. However, a number of special-status avian species have been recorded in the vicinity, particularly coast-line species. Although expected to only occur in flight across the project site as transients, implementing the Nesting Bird BMP (Section 1.3) would ensure indirect impacts to special-status birds that may occur on-site to be less than significant.

Operation

Significant impacts to vegetation, special-status wildlife species, during operations and routine maintenance of the project are not anticipated. The project site is located within the completely developed Haynes property, and these resources do not occur within the project site and suitable habitat is absent. No impact would occur.

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 Wildlife or U.S. Fish and Wildlife Service?

Less Than Significant Impact. 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 and/or Sections 1600 et seq. of the CFGC).

Five sensitive vegetative communities were identified during a search of the CNDDB for the Los Alamitos and surrounding seven quadrangles (eight-quad search; bordered by the Pacific Ocean to the south, encompassing an area of approximately 100 square miles surrounding the Haynes property): California Walnut Woodland, Southern Coastal Salt Marsh, Southern Cottonwood Willow Riparian Forest, Southern Dune Scrub, and Southern Foredunes. These communities are known from inland mountain ranges and coastal areas, generally occurring five to ten miles northeast and southeast of the project site. One sensitive vegetative community, Southern Coastal Salt Marsh, is located approximately one half-mile east of the project site; however, this community is separated from the project site by the San Gabriel River channel and the Alamitos Generation Station and would not be affected by the proposed project. No USFWS-designated critical habitats that support federally-listed species or any other sensitive, protected, or managed communities or habitats were identified to coincide with the survey area.[25]

Construction

Implementation of the project would not result in direct impacts to any sensitive natural communities. As discussed above, no sensitive natural communities or sensitive aquatic habitats under regulatory jurisdiction of the U.S. Army Corps of Engineers, CDFW, RWQCB, or National Marine Fisheries Service occur within the areas of direct project impacts. As a result, direct impacts to sensitive natural communities would not occur.

The San Gabriel River channel and the Haynes cooling water intake channel are aquatic features under regulatory jurisdiction of various federal and state agencies. Indirect impacts to these features and the protected and/or managed or wildlife species within them related to runoff, erosion, and sedimentation during construction could occur. However, with the implementation of BMPs regarding a SWPPP and Erosion Control Plan, as detailed in Section 1.3 of this IS/MND, indirect impacts to any sensitive natural community or aquatic habitat would be less than significant.

25 USFWS. 2021. Information for Planning and Conservation, available at: https://ecos.fws.gov/ipac/, accessed May 10, 2021.

Operation

Significant impacts to sensitive natural terrestrial communities during operations and routine maintenance of the project would not occur. The project site is located within the completely developed Haynes property, and these resources do not occur within the project site. No impact would occur.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less Than Significant Impact. As presented in Section IV(b) above, no sensitive aquatic communities (i.e. wetlands or other waters) under regulatory jurisdiction of the U.S. Army Corps of Engineers, CDFW, RWQCB, or National Marine Fisheries Service occur within the areas of direct project impacts. As a result, direct impacts to state or federally protected wetlands would not occur.

The San Gabriel River channel and the Haynes cooling water intake channel are aquatic features under regulatory jurisdiction of various federal and state agencies. Indirect impacts to these features and the protected and/or managed or wildlife species within them related to runoff, erosion, and sedimentation during construction could occur. However, with the implementation of BMPs regarding a SWPPP and Erosion Control Plan, as detailed in Section 1.3, indirect impacts to any state or federally protected wetlands would be less than significant.

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?

No Impact. In an urban context, 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 areas or between a habitat area and some vital resource that encourages population growth and diversity. Habitat fragments are undisturbed habitat areas isolated by foreign or inhospitable uses, such as urban tracts or highways. Two types of wildlife migration corridors seen in urban settings are regional corridors, defined as those linking two or more large areas of natural open space, and local corridors, defined as those allowing resident wildlife to access critical resources (food, cover, and water) in a smaller area that might otherwise be isolated by urban development.

The Haynes property is a fully developed industrial property, and there are no vegetated corridors on site that would allow for wildlife movement between green/open space areas that may provide more suitable opportunities for wildlife cover, resting, foraging, and nesting. Vegetation on site is very limited and provides little if any opportunities for nesting or foraging by local bird populations. Ornamental trees and shrubs within residential communities in the surrounding survey area may provide some opportunities for cover, resting, foraging, and nesting to localized bird populations; however, they do not provide functions as a significant local wildlife movement corridor.

Adjacent to the Haynes property, the San Gabriel River channel along the western perimeter provides a movement corridor for aquatic animal species to move between ocean waters and upstream areas of the river channel, where foraging, resting, and cover opportunities exist for such species.

On the west side of the Haynes property, the Orange County Flood Control District channel is concrete lined and generally has little discharge, providing little function as a wildlife movement corridor for aquatic and bird species. However, some urbanized mammals, such as coyote, may utilize this channel to move between areas and provide escape cover.

Construction

There are no terrestrial corridors within the project site. As a result, direct impacts to a regional or local wildlife movement corridor would not occur. Project construction activities (i.e., increased noise, human presence) could result in bird species avoiding the immediate project vicinity; however, such indirect effects would be temporary in nature, restricted to the project construction time period and would not interfere substantially with the movement of migratory birds.

The San Gabriel River channel adjacent to the site serves as a wildlife movement corridor, and the adjacent Orange County Flood Control District channel may also provide some movement opportunities. Project construction activities would occur within the developed Haynes property and are not anticipated to directly impact wildlife movement within the San Gabriel River channel or the Orange County Flood Control District channel. As such, no impact would occur.

Operation

Significant impacts to wildlife movement during operations and routine maintenance of the project are not anticipated. The project site is located within the completely developed Haynes property, and no wildlife migration corridors exist within the station boundaries. As such, no impact would occur.

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. The primary vegetation on the Haynes property consists of ornamental perimeter trees and shrubs along the east property line. There are no oak trees, heritage trees, or other unique tree specimens. No trees would be removed or impacted during implementation of the proposed project. As a result, the proposed project would not conflict with a local tree protection ordinance, and 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 study area is not located within any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved regional or state habitat conservation plan areas. Thus, the proposed project would not be subject to the provisions of any such conservation plans. Accordingly, implementation of the proposed project would not conflict with any Habitat Conservation Plan; Natural

Community Conservation Plan; or other approved local, regional, or state habitat conservation plans, and no impact would occur.

V. CULTURAL RESOURCES

Potential impacts related to cultural resources resulting from implementation of the proposed project were evaluated in the *Cultural Resources Assessment* prepared for the proposed project, which is included as Appendix C to this IS/MND. The project area evaluated for cultural resources includes Haynes plus a 0.5-mile survey buffer around the project site, combined as the cultural resources study area.

Would the project:

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

No Impact. Archival research for the project site included review of previously recorded archaeological site records and reports, historic site and property inventories, and historic maps. Inventories of the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), the California State Historic Resources Inventory (HRI), the California Historical Landmarks and Points of Interest, and local historical registers were also reviewed to identify cultural resources within a 0.5-mile radius of the project site.

A resource is generally considered "historically significant" if the resource meets at least one of the four criteria for listing on the CRHR (Public Resources Code Section 5024.1[a]). The CRHR is used as a guide by state and local agencies, private groups, and citizens to identify the state historical resources and properties that are to be protected, to the extent prudent and feasible, from substantial adverse change. The CRHR evaluation criteria are similar to the NRHP criteria. For a property to be eligible for inclusion in the CRHR, it must meet one or more of the following criteria:

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

The CRHR may also include various other types of historical resources that meet the criteria for eligibility, including the following:

- Individual historic resources
- Resources that contribute to a historic district
- Resources identified as significant in historic resource surveys
- Resources with a significance rating of Category 3 through Category 5 in the State Inventory (Categories 3 and 4 refer to potential eligibility for the NRHP; Category 5 indicates a property with local significance)

Although the NRHP standard includes the evaluation of resources that are 50 years old or older, the California Office of Historic Preservation endorses recording and evaluating resources over 45 years of age to accommodate the five-year lag in the planning process.

The records search identified 45 previously recorded cultural resources mapped within 0.5 mile of the project site. However, none of the resources are located within the project site itself. While the HRI identified three buildings (two single-family residences and one commercial structure all dating to 1962) that are located within 0.5 mile of the project site, none are eligible for inclusion in the NRHP. Additionally, No California Historical Landmarks, City of Long Beach Historic Monuments, or Orange County Historical Monuments are located within 0.5 mile of the project site. As such, no impacts related to historical resources would occur on the project site.

As discussed above, the site of Haynes was acquired by LADWP in 1957 for the purpose of constructing a steam-boiler electrical generating facility to replace the Seal Beach Steam Generating Plant, which had been operating in the area since the mid-1920s. Generation Units 1 and 2 at Haynes were placed into operation in 1962 and 1963, respectively; Units 3 and 4 were placed into operation in 1964 and 1965, respectively; and Units 5 and 6 were placed into operation in 1966 and 1967, respectively. The Haynes plant has been continuously operated since this time. Subsequent upgrades and modifications have resulted in the decommissioning of most of the 1960s units and the addition of new units in 2004 and 2013. Haynes was evaluated in 2017 and found not to be eligible for inclusion in the NRHP or the CRHR.[26] Since that date, decommissioned Units 3, 4, 5, and 6, along with numerous ancillary facilities, have been or are currently being demolished. The station is not considered a historical resource for the purposes of CEQA; no impact would occur.

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 After Mitigation Incorporated. An archaeological field survey of the project area was conducted on January 11, 2021, in order to identify and record cultural resources that are at least 45 years old and evaluate any discovered resources for historical significance based on criteria for listing in the CRHR. In the course of the field survey, no archaeological resources meeting the age criterion of 45 years or more were identified.

As discussed in 1.6.9 of this IS/MND, the proposed project facilities would all be located in areas of Haynes which have been highly disturbed from past facilities construction and operations, dating to as early as the early 1960s, when construction first began on the original generating station. Nonetheless, based on the results of the archival research and field survey, there is moderate potential that archaeological resources could be encountered during ground-disturbing activities for the proposed project, especially in previously undisturbed areas. Haynes is located near the coast and within the area previously occupied by the San Gabriel River delta prior to the channelization of the river. This location would have been ideal for resource procurement of both marine and freshwater species. Therefore,

26 Murray, Samantha, Kara Dotter, and Adriane Dorrler. 2017. *Cultural Resources Study for the Haynes Generating Station Units 3 through 6 Demolition Project, Los Angeles County, California*. Document prepared by Dudek for LADWP.

Mitigation Measure CUL-1 has been incorporated requiring archaeological monitoring and the evaluation of any discovered cultural resources, including the preparation of treatment plans, as necessary. With the incorporation of this mitigation measure, impacts that may result in a substantial adverse change in the significance of an archaeological resource would be less than significant.

Mitigation Measures

CUL-1 An archaeological monitor shall be present during ground-disturbing activities within native soils. The on-site archaeological monitor shall work under the direction of a qualified archaeologist who meets the Secretary of the Interior's Professional Qualification Standards for Archaeology. In the event a previously unknown archaeological resource is unearthed during excavation activities, work shall be suspended within 50 feet of the find, and the discovery shall be evaluated by the qualified archaeologist. If disturbance to such a resource cannot be avoided, the qualified archaeologist shall develop an appropriate treatment plan for the resource in coordination with LADWP and in accordance with Public Resources Code Section 21083.2(i). If in the course of monitoring, the qualified archaeologist determines that the project site is so severely disturbed that there is little or no sensitivity for cultural resources, then monitoring may be reduced or eliminated at the discretion of the qualified archaeologist.

c) 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. Nonetheless, as described above in Section V(b), based on the results of the archival research and field survey, there is moderate potential that archaeological resources, including burial sites, will be encountered during ground-disturbing activities for the proposed project. However, compliance with the Human Remains BMP as outlined in Section 1.3 of this IS/MND would ensure that the impact related to human remains would be less than significant.

VI. ENERGY

Potential impacts related to energy described in this section are based on the results presented in the *Air Quality, Greenhouse Gas, and Health Risk Studies* report prepared for the proposed project, which is included as Appendix A to this IS/MND.

Would the project:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less Than Significant Impact. During the course of project construction, it is estimated that current age-weighted fleet-average off-road equipment and on-road vehicles would consume approximately 175,000 gallons of liquid fuels as shown in Table 3.6-1.

Table 3.6-1: Estimated Construction Fuel Consumption

Mobile Sources	Types	Fuels	Fuel Consumption (gallons)
Off-Road	Tiers 1-4	Diesel	154,800
Trucks	MHDT, HHDT	Diesel	9,700
Worker	LDA, LDT1, LDT2	Gasoline	10,600
		Totals	**175,100**

As explained in Section VI(b) below, the proposed project would allow the Haynes CCGS to remain operational for its full design life and continue to help integrate renewable resources into the electrical energy system. As shown in Table 3.6-2, cooling tower operation could result in a maximum potential utilization of 72,708 megawatt-hours (MWh) net of electric power annually when compared to current OTC operations, assuming full capacity operations throughout the year. This would be considered part of the parasitic (auxiliary) load for Unit 8 and would decrease the net output available for distribution to the grid by a comparable amount.

Table 3.6-2: Estimated Operation Electric Power

Power (kW)	Operation (hrs/yr)	Maximum Consumption (MWh/yr)
8,300	8,760	72,708

Unit 8 has a net generation capacity 250 MW, and historically operates in combination with Units 9 and 10 at about 45 percent annual capacity factor,[27] providing about 985,500 MWh annually to LADWP customers. At 45 percent capacity factor, the cooling tower would use about 32,719 MWh annually, which represents about 3.3 percent of Unit 8's total average annual output and 1.25 percent of the total average annual output of the CCGS, which is a small penalty. Thus, the project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation. Impacts would be less than significant.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less Than Significant Impact. In California, renewable solar and wind generation have grown exponentially in recent years. From 2010 to 2017, solar and wind generation increased by about 40,000 gigawatt-hours per year. Self-generation also grew, with installed rooftop solar increasing from about 2,000 MW in 2014 to about 5,800 MW in 2017.[28]

The Haynes CCGS is a high-efficiency generation unit essential for providing grid reliability and stability during renewable energy transient conditions. In order for renewable energy sources to be practicable, the use of the dispatchable generation provided by generation sources like the CCGS is necessary during times when

27 Based on a 6-year average (2015-2020).
28 CARB. 2017. California's 2017 Climate Change Scoping Plan, available at: https://ww3.arb.ca.gov/cc/scopingplan/scopingplan.htm, accessed May 21, 2021.

renewables are not available, such as at night (solar), and calm or light wind conditions (wind). The proposed project would allow the CCGS to remain operational for its full design life and continue to play a crucial role in the integration of renewable resources into the electrical energy system. Thus, the project would not conflict with or obstruct a state or local plan (e.g., CARB's California's 2017 Climate Change Scoping Plan) for renewable energy or energy efficiency. Impacts would be less than significant.

VII. GEOLOGY AND SOILS

Would the project:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

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

Less Than Significant Impact. The closest Alquist-Priolo Earthquake Fault Zone (associated with the active Newport-Inglewood Fault) to the project site is 0.26 mile southwest. [29,30] However, no known active or potentially active faults underlie the project site. The proposed project would occur within the existing Haynes property and would retrofit the Unit 8 cooling system by removing an existing OTC system and installing a cooling tower and ancillary components, including aboveground water storage tanks and pipelines. The proposed project would not include the construction of any habitable structures nor would the use of the project site change upon implementation of the project. In addition, all project facilities would be designed based on a detailed geotechnical investigation and report related to seismic loads and would be constructed in accordance with all applicable federal, state, and local codes related to seismic criteria. Therefore, impacts related to the proposed project directly or indirectly causing potential adverse effects from the rupture of a known earthquake fault would be less than significant.

ii) Strong seismic ground shaking?

Less Than Significant Impact. The proposed project site is located within a seismically active region, and, as with all locations in Southern California, is subject to strong seismic ground shaking. However, as discussed in Section VII(a)(i) above, no known active or potentially active faults underlie the site, and the proposed project would not include the construction of any habitable structures. The proposed project would not change the use of the project site. In addition, all project facilities would be designed based on a detailed geotechnical investigation and report related to seismic loads and would be constructed in accordance with all applicable federal, state, and local codes related to seismic

29 California Department of Conservation, California Geologic Survey, Earthquake Hazards Zones: Fault Traces Map, available at: https://gis.conservation.ca.gov/server/rest/services/CGS_Earthquake_Hazard_Zones/SHP_Fault_Traces/MapServer, accessed February 3, 2021.

30 United States Geologic Survey, Quaternary Fault and Fold Database of the United States, Interactive Map, available at: https://doi.org/10.5066/F7S75FJM, accessed February 3, 2021.

criteria. Therefore, impacts related to strong seismic ground shaking would be less than significant.

iii) Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. The proposed project site is located within the San Gabriel River flood plain, which is characterized by shallow groundwater conditions. This location contributes to a soil profile characterized by marine alluvial deposits with cohesionless layers. This soil profile places the proposed project site in an area with liquefaction potential.[31] However, all project facilities would be designed based on a detailed geotechnical investigation and report related to soil conditions and would be constructed in accordance with all applicable federal, state, and local codes related to seismic criteria. Therefore, impacts related to seismic-related ground failure, including liquefaction, would be less than significant.

iv) Landslides?

No Impact. The project site and the surrounding land are relatively level. The proposed project site would not be within or proximate to an area susceptible to landslides.[32] Therefore, the project would have no impacts related to landslides.

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

Less Than Significant Impact. The proposed project components would be installed within an existing industrial facility, located on sites that have been previously developed with large-scale electrical generation and support facilities. Nonetheless, construction for the proposed project would involve some temporary soil disturbance. However, with the implementation of the BMPs related to a SWPPP and Erosion Control Plan, as outlined in Section 1.3 of this IS/MND, impacts related to soil erosion during project construction would be less than significant. Following construction, the areas disturbed by construction activities would be paved or otherwise stabilized, similar to current conditions. Therefore, the operation of the project would have no long-term impacts related to soil erosion. As such, impacts to soil erosion would be less than significant.

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 described above in Sections VII(a) and VII(b), the proposed project site would be within a seismically active area characterized by unconsolidated sediment with medium density and shallow groundwater levels and is thus susceptible to soil instability that could lead to lateral spreading and liquefaction, which are seismically-induced phenomena. However, all project facilities would be designed based on a detailed geotechnical investigation and report related to soil conditions and would be constructed in accordance with all

31 City of Long Beach, 1988, General Plan Seismic Safety Element, available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/advance/general-plan/seismic-safety-element_reduced, accessed February 3, 2021.

32 California Department of Conservation, California Geologic Survey, Earthquake Hazard Zones: Landslide Zones Map, available at: https://gis.conservation.ca.gov/server/rest/services/CGS_Earthquake_Hazard_Zones/SHP_Landslide_Zones/MapServer, accessed February 3, 2021.

applicable federal, state, and local codes related to seismic criteria. Therefore, impacts 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 direct or indirect risks to life or property?

No Impact. Expansive soils are clay-based soils that tend to expand (increase in volume) as they absorb water and contract (lessen in volume) as water is drawn away. If soils consist of expansive clay, foundation movement and/or damage can occur if wetting and drying of the clay does not occur uniformly across the entire area. The proposed project site would sit atop marine alluvial deposits of layered sand, silt, gravel, and clay.[33] This soil make-up is not considered to be expansive. Therefore, no impact would occur.

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?

No Impact. Haynes is connected to the municipal sanitary sewer system. The proposed project would not increase the number of personnel on site or require an expansion of an existing sanitary wastewater treatment facility. No septic tanks or alternative wastewater disposal system would be included as part of the proposed project. Therefore, no impact would occur.

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

Less Than Significant Impact. The proposed project would be contained within the existing Haynes property, and project facilities would be located on sites that have previously been fully developed, including structures with foundations deeper than those anticipated for the project facilities. Although not expected to occur because of the previously disturbed condition of the site, in the event previously undiscovered paleontological resources are encountered during project construction, compliance with the Paleontological Resources BMP, as outlines in Section 1.3 of this IS/MND, would ensure that the impact to paleontological resources would be less than significant.

[33] City of Long Beach. 1988. General Plan Seismic Safety Element, available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/advance/general-plan/seismic-safety-element_reduced, accessed February 3, 2021.

VIII. GREENHOUSE GAS EMISSIONS

Potential impacts related to greenhouse gas (GHG) emissions described in this section are based on results presented in the *Air Quality, Greenhouse Gas, and Health Risk Studies* report prepared for the proposed project, which is included as Appendix A to this IS/MND.

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. Cooling towers do not emit GHGs (i.e., carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], carbon dioxide equivalent [CO_2e]) during operation. Since the parasitic load of tower operations would be imposed on steam turbine Unit 8, there would be no effect on GHG emissions from gas turbine Units 9 and 10. Table 3.8-1 shows total construction project GHG emissions amortized over a 30-year period, which is the SCAQMD recommended timeframe for quantifying construction emissions, and compares these emissions to the SCAQMD annual industrial significance threshold. Off-site traffic emissions (i.e., construction worker commuting, truck transport) are included in these emissions estimates.

Table 3.8-1: 30-Year Construction GHG Emissions

GHGs	Construction Emissions (metric tons [MT]/year)	Amortized Annual Emissions (metric tons [MT]/year)	Threshold (MT/year)	Significance
CO_2	1,773	59.1	–	–
CH_4	0.45	0.015	–	–
N_2O	0.00	0.000	–	–
CO_2e	1,785	59.5	10,000	Less Than Significant

Sources: CalEEMod Version 2016.3.2.
SCAQMD. 2019. Air Quality Significance Thresholds, available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-airquality-significance-thresholds.pdf?sfvrsn=2) accessed May 21, 2021.

As indicated, construction GHG emissions are substantially below the SCAQMD significance threshold for industrial projects. Thus, the project would not generate greenhouse gas emissions, either directly or indirectly, and impacts 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. Units 8, 9, and 10 are a high-efficiency CCGS with low GHG emissions on a pound per MWh basis compared to other types of fossil-fuel generating resources, i.e., simple-cycle gas turbine, gas-fired steam turbine, coal-fired steam turbine, or diesel engine generators. In order for renewable energy sources to be practicable, the use of gas-fired generation is necessary for times when renewables are not available, such as at night (solar power), and calm or light wind conditions (wind power). The project would allow the Haynes CCGS to remain operational and continue to play a crucial role in the integration of renewable resources into the electrical energy system. Thus, the project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases (e.g., CARB's California's 2017 Climate Change Scoping Plan) because it would perform a supporting role in renewable energy development that enables GHG reductions. As such, impacts would be less than significant.

IX. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant Impact. Construction activities would involve the limited transport, storage, and use of hazardous materials such as fuels and lubricating fluids for construction equipment. In addition, during construction of the proposed project, paints, solvents, and other potentially hazardous materials may be used. Although these types of materials are not considered acutely hazardous, their storage, handling, and disposal are regulated by the California Department of Toxic Substances Control, EPA, the Occupational Safety & Health Administration, and the Long Beach Certified Unified Program Agency, which combines the City's Fire Department and Health Department programs. The handling of construction-related hazardous materials would occur in conformance with applicable federal, state, and local regulations. In addition, with the implementation of the BMP related to a SWPPP, as outlined in Section 1.3 of this IS/MND, the impact related to a significant hazard through the routine transport, use, and disposal of these materials during project construction would be less than significant.

The operation of the cooling tower would require the delivery and storage of chemicals required to provide pretreatment for the cooling tower makeup water. These chemicals would be consumed during project operation and would be delivered to the site on a regular basis and transferred to tanks adjacent to the tower designed for safe containment. Three tanks, ranging in size from approximately 2,000 gallons to 7,500 gallons, would be required. The treatment facilities would include a truck off-loading area where chemicals would be transferred to the tanks within a spill and leak containment area with sump pumps and emergency shut-off for the transfer pumps. Depending on the level of operation of the CCGS (based primarily on seasonal demand) and the type of chemical, it is anticipated that chemical deliveries would range from twice a month to every four months. This storage, use, and transport of these chemicals would be similar to pretreatment currently conducted at Haynes related to generation unit operation. All project components would be designed to ensure hazardous materials would be contained and that such substances would not spill or leak. The storage and use of these chemicals would comply with federal, state, and local regulations. With adherence to applicable regulations, the impact related to a significant hazard through the routine transport, use, and handling 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. As discussed above, during construction of the proposed project, limited quantities of hazardous materials (e.g., petroleum-based products, paints, solvents) would be transported, used, stored, and disposed of according to local, state, and federal regulations. These substances are not considered acutely hazardous. With the implementation of the project BMP related to a SWPPP (as outlined in Section 1.3 of this IS/MND), the potential for a significant hazard to the public or the environment related to a reasonably foreseeable accidental release involving these materials is less than significant.

As discussed above, chemicals required to provide pretreatment for the cooling tower makeup water would be stored in tanks adjacent to the tower designed for safe containment. The treatment facilities would include a truck off-loading area where chemicals would be transferred to the tanks within a spill and leak containment area with sump pumps and emergency shut-off for the transfer pumps. The storage and use of these chemicals would comply with federal, state, and local regulations. This storage, use, and transport of these chemicals would be similar to pretreatment currently conducted at Haynes related to generation unit operation. The chemical storage facilities would be designed to prevent and contain spills and leaks, and with adherence to applicable regulations, an increased hazard at Haynes related to a reasonably foreseeable upset or accident 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?

No Impact. The project site is not located within 0.25 miles of an existing or proposed school. The closest school (Francis Hopkinson Elementary, Los Alamitos Unified) is located over 0.5 miles northeast of Haynes. Due to the distance from the nearest school, the proposed project would not result in a safety hazard. No impact would occur.

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. The project site is not included on any hazardous waste site lists including the Department of Toxic Substances Control's EnviroStor database, which includes CORTESE sites, the SWRCB's GeoTracker site, the EPA's database of regulated facilities, or other lists compiled pursuant to Section 65962.5 of the Government Code.[34,35,36] As such, the proposed project would not create a significant hazard to the public or the environment, and no impact would occur.

34 California Department of Toxic Substances Control. EnviroStor Database. Search by Map Location, available at: http://www.envirostor.dtsc.ca.gov/public/, accessed February 5, 2021.
35 SWRCB. GeoTracker Database. Search by Map Location, available at: http://geotracker.waterboards.ca.gov/map/, accessed February 5, 2021.
36 EPA. Envirofacts Database, available at: https://enviro.epa.gov/, accessed February 5, 2021.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

No Impact. The project site is not located within two miles of a public airport. The project site is approximately 3.5 miles southeast of Long Beach Airport and falls outside the planning boundary for the Airport Influence Area.[37] The project site is approximately 2.1 miles southwest of Joint Forces Training Base, Los Alamitos, and falls within the Airport Planning Area. However, the project site is outside the noise contour impact zones of the Joint Forces Training.[38] Due to the distance from the nearest airport, the proposed project would not result in a safety hazard or excessive noise for people at the project site, which is located within an existing electrical generating station. No impact would occur.

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

No Impact. During construction activities, vehicles and equipment would access the project site via 2nd Street, which forms the southern boundary of Haynes. No road or lane closures are anticipated during construction of the proposed project. Project construction activities would be confined to the project site with the exception of haul and delivery trucks. During construction, ingress and egress to the site and surrounding area for emergency response vehicles would be maintained at all times. Operation of the proposed project would not alter the adjacent street system. Therefore, construction and operation of the proposed project would not interfere with implementation of an adopted emergency response plan or emergency evacuation plan. No impact would occur.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

No Impact. The project site is located within the existing Haynes boundary in an urbanized area of Long Beach and is not adjacent to wildlands. Therefore, there would be no impact related to exposing people or structures to wildland fires.

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37 Los Angeles County Airport Land Use Commission. 2003. Long Beach Airport Influence Area, available at: https://planning.lacounty.gov/assets/upl/project/aluc_airport-long-beach.pdf, accessed February 5, 2021.

38 Orange County Airport Land Use Commission. 2017. Airport Environs Land Use Plan for Joint Training Base Los Alamitos, available at: https://files.ocair.com/media/2021-02/JFTB%2CLosAlamitos-AELUP2017.pdf?VersionId=jhDzARCp3ECzHQ6jiMzrb06mM5H0Nv89, accessed February 5, 2021.

X. HYDROLOGY AND WATER QUALITY

Would the project:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less than Significant Impact. Short-term impacts to water quality, through exceedance of water quality standards, non-conformance with waste discharge requirements, or by other means, could potentially result from construction activities (e.g., erosion and sedimentation due to land disturbances, uncontained material and equipment storage areas). Because the proposed project would require construction activities resulting in a land disturbance of more than 1 acre, LADWP would be required to obtain an NPDES Construction General Permit that addresses pollution associated with construction activities. Compliance with the permit would require LADWP to file a Notice of Intent with the SWRCB and to prepare a SWPPP prior to project construction. As outlined under BMPs in Section 1.3 of this IS/MND, the preparation and implementation of the SWPPP and an Erosion Control Plan would minimize such impacts. Therefore, the impact from construction activities on surface or groundwater quality would be less than significant.

The proposed project would modify the existing industrial wastewater collection and stormwater collection systems at Haynes. As discussed above, under current conditions, industrial wastewater at Haynes is primarily discharged through the OTC flows associated with Generation Units 1, 2, and 8. Under the proposed project, industrial wastewater streams would be collected either to be utilized as makeup water for the proposed cooling tower or to be transmitted directly to the Long Beach WRP, where they would undergo treatment to provide recycled water to help supply the needs of the cooling tower. Stormwater at Haynes is currently collected in a series of catchments and basins within the station and either discharged through the OTC flows associated with Units 1, 2, and 8, or discharged to the Orange County Flood Control District flood control channel located along the eastern boundary of Haynes. Under the proposed project, the majority of stormwater flows at Haynes would be captured and transmitted to the Long Beach WRP, where they would also undergo treatment to provide recycled water to help supply the needs of the cooling tower. In this manner, the proposed project would minimize any potential for degradation of water quality related to discharges of industrial wastewater and stormwater, and the impact during project operations would be less than significant.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less Than Significant Impact. Although water would be used to suppress dust in compliance with SCAQMD Rule 403 and for other purposes during project construction (refer to Air Quality BMPs in Section 1.3 of this IS/MND), this would not result in the use of large amounts of water that would substantially deplete groundwater supplies or interfere with groundwater recharge. The proposed project facilities would be located on sites previously occupied by facilities associated with power generation at Haynes, and, therefore, would not interfere with existing groundwater recharge. As discussed above, the proposed cooling tower would require a continuous supply of makeup water during operation. However, recycled water from the Long Beach WRP and industrial wastewater from Haynes would primarily fulfill the need for this makeup water, with potable water used only as a supplemental supply. Therefore, the operation of the proposed project would not indirectly substantially decrease groundwater supplies. The impact to groundwater supplies during project construction and operation 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 or through the addition of impervious surfaces, in a manner, which would:

i) Result in substantial erosion or siltation on- or offsite?

Less Than Significant Impact. The proposed project would not alter the course of a stream or river. The project facilities would be located on sites previously occupied by facilities associated with power generation at Haynes, and, therefore, would not increase impervious surface in a manner that would result in substantial erosion or siltation on or off site. Furthermore, as discussed above, under the proposed project, the majority of existing stormwater flows at Haynes would be captured and transmitted to the Long Beach WRP, where they would also undergo treatment to provide recycled water to help supply the cooling tower. In this manner, the proposed project would minimize surface runoff that could contribute to erosion or siltation, and the impact would be less than significant.

ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?

Less Than Significant Impact. As discussed in Section X(c)(i), the proposed project facilities would be located on sites previously occupied by facilities associated with power generation at Haynes, and, therefore, would not increase impervious surface in a manner that would result in a substantial increase in the rate of surface runoff. Furthermore, as discussed above, under the proposed project, the majority of existing stormwater flows at Haynes would be captured and transmitted to the Long Beach WRP, where they would also undergo treatment to provide recycled water to help supply the needs of the cooling tower. In this manner, the proposed project would minimize surface runoff that could result in flooding on or off site. The impact would be less than significant.

iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less Than Significant Impact. The project facilities would be located on sites previously occupied by facilities associated with power generation at Haynes, and, therefore, would not 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. Furthermore, as discussed above, under the proposed project, the majority of existing stormwater flows at Haynes would be captured and transmitted to the Long Beach WRP, where they would also undergo treatment to provide recycled water to help supply the needs of the cooling tower. In this manner, the proposed project would minimize surface runoff water that could exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. The impact would be less than significant.

iv) Impede or redirect flood flows?

Less Than Significant Impact. The project facilities, including the cooling tower, would be located within an area of reduced risk for flooding (0.2 percent annual chance) due to levees.[39] As discussed above, the proposed project would not alter the course of a stream or river, and the project facilities would be located on sites previously occupied by facilities associated with power generation at Haynes. Therefore, the project would not impede or redirect flood flows. Furthermore, under the proposed project, the majority of existing stormwater flows at Haynes would be captured and transmitted to the Long Beach WRP, where they would also undergo treatment to provide recycled water to help supply the needs of the cooling tower. In this manner, the proposed project would minimize surface stormwater runoff that could contribute to flood flows. The impact would be less than significant.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Less Than Significant Impact. Haynes is not located within a tsunami hazard area as identified by the California Geological Survey and the Governor's Office of Emergency Services.[40] Haynes is not located within a seiche zone, which are related to enclosed bodies of water. Neither the cooling tower nor any of the aboveground auxiliary facilities (e.g., the water tanks, chemical treatment facilities, motor control center, circulating water pumps) would be located within a Special Flood Hazard Area as designated by the Federal Emergency Management Agency (FEMA), which would make the project sites more prone to flooding. The project facilities, including the cooling tower, would be located within an area of reduced risk for flooding (0.2 percent annual chance) due to levees. Therefore, the impact related to the risk of release of pollutants due to project inundation is less than significant.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less Than Significant Impact. The project site is located within the jurisdiction of the Los Angeles RWQCB and is subject to the Los Angeles Region Basin Plan.[41] As previously discussed in Section X(a), LADWP would be required to obtain an NPDES Construction General Permit that addresses pollution from construction activities. Construction activities would comply with applicable requirements of the Los Angeles RWQCB, including compliance with SWPPP-mandated measures. The project would not use large amounts of water that would substantially deplete groundwater supplies nor would it interfere with groundwater recharge. Therefore, the project would not conflict with or obstruct implementation of a water quality

[39] Federal Emergency Management Agency (FEMA). Flood Map Service Center, available at: https://msc.fema.gov/portal/search?AddressQuery=long%20beach%2C%20ca#searchresultsanchor, accessed May 20, 2021.

[40] California Geological Survey. 2021. *CGS Information Warehouse: Tsunami Hazard Area Map*, available at: https://www.conservation.ca.gov/cgs/tsunami/maps/los-angeles, accessed July 28, 2021.

[41] RWQCB. Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, available at: https://www.waterboards.ca.gov/losangeles/water_issues/programs/basin_plan/, accessed May 20, 2021.

control plan or sustainable groundwater management plan, and impacts would be less than significant.

XI. LAND USE AND PLANNING

Would the project:

a) Physically divide an established community?

No Impact. The proposed project would be completely contained within the existing Haynes property, which is owned by LADWP and occupied by facilities devoted to the generation and transmission of electricity. Therefore, the proposed project would not result in physical division of any established communities. No impact would occur.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. Haynes has a general plan land use designation of Industrial-Energy-Storage and a zoning designation of Planned Development District 1 (PD-1) in the City of Long Beach SEASP. The proposed retrofit of the Unit 8 cooling system is consistent with the PD-1 zoning designation as well as the general plan land use designation.

The southern portion of Haynes, encompassing most of the proposed project facilities, falls within the Coastal Zone Boundary of the SEASP. This zone includes all areas within Haynes outside the intake channel, which remains within the retained jurisdiction of the California Coastal Commission up to the mean high tide line. However, LADWP is exempt from the building, zoning, and general plan regulations of the City of Long Beach pursuant to Government Code Section 53090, et seq. (*Lawler v. City of Redding*, 7 Cal.App.4th 778 [1992]). This exemption, including in relation to the Local Coastal Plan, was affirmed in 2002 by the City of Long Beach Planning and Building Department with the issuance of Categorical Exclusion CPCE 29-02 for a Local Coastal Development Permit for Haynes Generating Station. Therefore, the proposed project would not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect, and no impact would occur.

XII. MINERAL RESOURCES

Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. According to the City of Long Beach General Plan Conservation Element, the primary mineral resources within the City have historically been oil and natural gas.[42] However, no oil, natural gas, or other mineral resources are known to

[42] City of Long Beach. 1973. General Plan Conservation Element, available at: http://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/advance/general-plan/1973-conservation-element, accessed November 23, 2020.

exist on the project site that would be affected by the proposed project. 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 proposed project would not result in the loss of a locally important mineral resource. The project site and vicinity are classified as Mineral Resource Zone 3 (MRZ-3): areas containing construction aggregate deposits, the significance of which cannot be evaluated from available data. Therefore, the project site is not located on significant mineral or energy deposits as mapped by the City of Long Beach or the state. [43,44,45] No impact would occur.

XIII. NOISE

Would the project result in:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of applicable standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less Than Significant Impact After Mitigation Incorporated.

Existing Ambient Noise

The existing ambient noise level is an important factor contributing to the assessment of potential noise impacts from the proposed project because such impacts would result from the composite noise level caused by the proposed project noise when combined with existing ambient noise. This composite noise level was evaluated in relation to the applicable agency noise standards for various land use types to determine potential project noise impacts. Existing ambient noise levels represent the baseline noise environment, and, in general, higher ambient noise levels will result in higher composite noise levels when combined with project-generated noise.

Continuous noise monitoring has been conducted at Haynes since July 2019 in association with ongoing construction activity related to the demolition of Generation Units 3, 4, 5, and 6 and numerous ancillary facilities. The generation units undergoing demolition are located immediately west of the Haynes cooling water intake channel, in the area where the proposed project cooling tower would be located. Other facilities that have undergone demolition in association with the generation unit demolition include two large aboveground storage tanks, which are located approximately 200 feet east of the intake channel and 120 feet west of the Haynes eastern boundary, in the area where the proposed project aboveground water storage tanks would be located. In addition to demolition activity, a warehouse has also been under construction near the eastern boundary of Haynes during this time.

43 *Ibid.*
44 State of California. 2017. Department of Conservation, Mineral Land Classification, available at: https://maps.conservation.ca.gov/cgs/informationwarehouse/, accessed November 23, 2020.
45 State of California. 2017. Department of Conservation, Division of Oil, Gas, & Geothermal Resources Well Finder, available at: https://www.conservation.ca.gov/calgem/Pages/Wellfinder.aspx, accessed November 23, 2020.

During this demolition and construction activity, noise monitoring equipment has been continuously present at several locations within Haynes, including at sites along the eastern boundary of the station, across the Orange County Flood Control District flood control channel from the nearest residences along Canoe Brook Drive in Leisure World (Figure 3.13-1). Given the location of the proposed cooling tower and auxiliary facilities, these monitoring sites at the eastern boundary would be the areas most affected by noise from project construction and operation.

The noise monitoring equipment has taken constant readings and provided equivalent continuous sound level measurements (known as L_{eq}) for each 1-hour period throughout the day (i.e., 24 hours) since July 1, 2019, when the above-stated demolition activity began. These noise levels are given in decibels (dB, the standard unit of measurement reflecting the intensity of sound) on an A-weighted scale (dBA), which compensates for sound detected at various frequency levels to provide a measurement approximating human perception of loudness. This monitoring has provided an extensive database from which to accurately characterize average noise levels at Haynes across various times of the day and week.

The noise monitoring data indicate that noise levels at the monitoring locations along the eastern boundary of Haynes were measured at 55 dBA or less approximately 62 percent of the time during the monitoring period used for this analysis (July 1, 2019, through October 16, 2020), throughout which weekday construction activity was occurring. For most of the balance of the monitoring period (approximately 35 percent of the time), noise levels were measured at between 55 dBA and 60 dBA. These measurements represent composite noise levels created by all sources impacting on the monitoring locations, which may have included at a given moment noise from operating generation units, maintenance activity at Haynes, demolition and construction activity, noise emanating from Leisure World, traffic along Westminster Boulevard/2nd Street, and/or overflights of aircraft.

The above described noise levels occurred throughout all hours of the day and night and on weekends and holidays as well as weekdays; therefore, they cannot be directly correlated with a single source. However, the pattern of noise levels based on the monitoring data can be generally associated with various timeframes, as shown in Table 3.13-1. The timeframes for nighttime and daytime reflected in Table 3.13-1 are based on the timeframes established in local noise ordinances, which adjust the allowable noise levels for certain land uses based on time of day.

Source: Esri 2021; CalTrans 2017; Created by: AECOM, 2021.

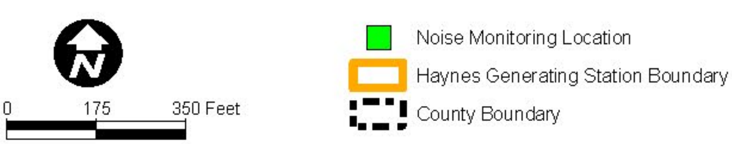

Figure 3.13-1
Noise Monitoring Locations

Table 3.13-1: Average Daily Hours per Noise Level (dBA)[a]

Timeframe	≤50	50≤55	55≤60	60≤65	>65	Total
Nighttime (10:00 pm-7:00 am)	0.7	6.0	2.2	0.1	0.0	9.0
Weekday Construction (7:00 am-4:00 pm)	0.1	3.7	4.5	0.6	0.1	9.0
Weekday Non-Construction (4:00 pm-10:00 pm)	0.2	3.2	2.5	0.1	0.0	6.0
Weekend Day (7:00 am-10:00 pm)	0.9	8.8	4.7	0.4	0.2	15.0
Holiday Day (7:00 am-10:00 pm)	0.2	10.7	3.8	0.1	0.2	15.0
Average Total Daily Hours	*1.2*	*13.6*	*8.4*	*0.7*	*0.1*	*24.0*
Average Total Percent of Day	*4.9%*	*56.8%*	*34.7%*	*3.0%*	*0.6%*	*100%*

[a] Haynes Generating Station noise monitoring data, July 1, 2019 – October 16, 2020.

These data indicate generally higher noise levels in daytime hours than nighttime hours and generally higher on weekdays than on weekend days. The data also show that the construction activity related to the generation unit demolition contributed to higher noise levels at the monitoring location than may have occurred in absence of the activity. (The construction activity associated with demolition was generally confined to between 7:00 a.m. and 4:00 p.m., Monday through Fridays.) However, even during construction, noise levels remained at or below 60 dBA the vast majority of the time (over 92 percent).

As shown in Table 3.13-1, noise levels were measured at between 60 dBA and 65 dBA only 3 percent of the total time and exceeded 65 dBA only a fraction of a percent of the time. Similar to all noise measured at the monitoring location, these higher noise levels (above 60 dBA) occurred during both daytime and nighttime hours and on weekdays, weekends, and holidays and cannot be directly correlated with a single source. However, they generally can be assumed to be associated with isolated short-duration events, such as the close approach of construction equipment in Haynes to the sound monitor, generator valve leaks or ruptures in steam lines, overflights of aircraft, loud vehicle engines on Westminster Boulevard/2nd Street, maintenance or construction activity within the flood control channel adjacent to the Haynes eastern boundary, or even landscape maintenance activities within Leisure World directly opposite the monitor locations.

Therefore, excluding these isolated atypical noise events exceeding 60 dBA, the data indicate that a maximum ambient noise level of up to 60 dBA occurs consistently across all timeframes throughout the day. However, noise is predominantly equal to or less than 55 dBA on a daily average across all timeframes, excluding the weekday construction timeframe.

While it is important to isolate and characterize noise levels occurring during major construction activities at Haynes to help in the assessment of similar construction activities that would be associated with the proposed project, it is also important to characterize noise in the post-construction environment within which the proposed cooling tower would be operating. This was achieved by apportioning the weekday non-construction timeframe (4:00 p.m. to 10:00 p.m.) noise levels reflected in Table 3.13-1 across the entire weekday timeframe (7:00 a.m. to 10:00 p.m.). This is a conservative approach to apportioning daytime noise levels since, on average, the Haynes generation units are used more frequently in the latter part of the day (i.e., the portion of the day reflected in the weekday non-construction timeframe in Table 3.13-1). In addition, in a post-construction environment, the only differentiation of timeframes for the regulation of noise, as established in local noise ordinances, is that between nighttime (10:00 p.m. to 7:00 a.m.) and daytime (7:00 a.m. to 10:00 p.m.) hours, regardless of whether those timeframes occur on weekdays, weekends, or holidays. Therefore, Table 3.13-2 reflects the total average hours and percentages of time at the various noise levels during the nighttime and daytime timeframes that would occur in a post-construction environment.

Table 3.13-2: Average Daily Nighttime & Daytime Noise Level (dBA), without Construction [a]

Timeframe	<u><</u>50	50<u><</u>55	55<u><</u>60	60<u><</u>65	>65	Total
Nighttime (10:00 pm-7:00 am) hours	0.7	6.0	2.2	0.1	0.0	9.0
Nighttime (10:00 pm-7:00 am) % of time	8.0%	67.1%	23.8%	1.1%	0.0%	100%
Daytime (7:00 am-10:00 pm) hours	0.5	8.3	5.7	0.4	0.1	15.0
Daytime (7:00 am-10:00 pm) % of time	3.7%	55.7%	37.7%	2.4%	0.5%	100%

[a] Haynes Generating Station noise monitoring data, July 1, 2019 – October 16, 2020.

As shown in Table 3.13-2, noise levels fluctuate throughout the day at Haynes, depending on the source of noise at a given time. However, the generally accepted ambient noise level for a given time period (e.g., 24-hours, daytime, or nighttime) is the median noise level (known as the L50 noise level) for that time period, during which noise is below the median level 50 percent of the time and above the median level 50 percent of the time. As shown in Table 3.13-2, the L50 noise level at the eastern boundary of Haynes, based on 15.5 months of continuous 24-hour monitoring, would fall below 55 dBA for both the daytime and nighttime periods. However, to provide a conservative basis to determine potential project noise impacts, a minimum ambient noise level of 55 dBA has been assumed for analysis purposes. In addition, based on the long-term noise monitoring data, it is recognized that ambient noise levels higher than 55 dBA, which would affect composite noise levels when combined with the project-generated noise, occur on average during substantial portions of both the daytime and nighttime periods.

<u>Local Noise Standards</u>

Noise is regulated under the noise ordinances of the City of Long Beach and the City of Seal Beach. The Long Beach Noise Ordinance is contained in Chapter 8.80 of the Municipal Code. It establishes exterior noise level standards for various land uses in Long Beach, within which the proposed project facilities and many uses surrounding Haynes, including the Island Village residential community, are located. The Seal Beach Noise Ordinance is contained in Chapter 7.15 of the Municipal Code. It establishes exterior noise level standards for various land uses in Seal Beach, within which some uses surrounding Haynes, including Leisure World, are located.

As shown in Figure 3.13-2, Haynes and Island Village, which was approved and developed in the early 1970s, approximately 10 years after Haynes first began operations, are both designated as Noise District 4 (predominantly industrial use) in the Long Beach Noise Ordinance (Section 8.80.160, Noise District Map). Noise District 4 is subject to a 70 dBA noise limit during all hours of the day. However, in accordance with Section 8.80.160, because the generation units at Haynes emit a steady audible tone, the noise standard for Haynes is reduced by 5 dBA to 65 dBA. Section 8.80.160 also states that the limit for Noise District 4 defines noise at the boundary of the district and is not intended for noise control within the district.

As discussed in the Section 1.4, most of the eastern boundary of Haynes is also the boundary between Los Angeles and Orange counties as well as the boundary between Long Beach and Seal Beach. In general, the legally enforceable noise standard derives from the jurisdiction in which the source is located, which, in the case of the proposed project, is Long Beach. However, for the purposes of impact analysis, a conservative assumption has been made that under CEQA, the noise standards at a receiving property may apply even if the noise generating source is located in a different adjacent jurisdiction.

Excluding the intervening Orange County Flood Control District flood control channel, Leisure World abuts Haynes along the entire eastern boundary of the station. As shown in Figure 3.13-2, Leisure World is classified as Noise Zone 1 (residential property) in the Seal Beach Noise Ordinance (City of Seal Beach, Section 7.15.010). Noise Zone 1 is subject to a 55 dBA daytime noise limit (7:00 a.m. to 10:00 p.m.) and a 50 dBA nighttime noise limit (10:00 p.m. to 7:00 a.m.).

According to the Long Beach Noise Ordinance (Section 8.80.150 D), if a measurement location is located on the boundary between two different land use districts (e.g., industrial and residential), the applicable noise level standard is the arithmetic mean of the standard for each district. Therefore, along the eastern boundary of Haynes, the standard would be 60 dBA (the mean of 65 and 55) during the daytime and 57.5 dBA (the mean of 65 and 50) during the nighttime.

Based on these limits, Section 8.80.150 B of the Long Beach Noise Ordinance states that:

> No person shall operate or cause to be operated any source of sound at any location within the incorporated limits of the City or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured from any other property, either incorporated or unincorporated, to exceed:
>
> 1. The noise standard for that land use district for a cumulative period of more than 30 minutes in any hour; or
> 2. The noise standard plus 5 decibels for a cumulative period of more than 15 minutes in any hour; or
> 3. The noise standard plus 10 decibels for a cumulative period of more than 5 minutes in any hour; or
> 4. The noise standard plus 15 decibels for a cumulative period of more than 1 minute in any hour; or
> 5. The noise standard plus 20 decibels or the maximum measured ambient, for any period of time.

Source: Esri 2021; CalTrans 2017; Created by: AECOM, 2021.

**Figure 3.13-2
Noise Zones for
Long Beach and Seal Beach**

Construction noise is separately regulated under Section 8.80.202 of the Long Beach Noise Ordinance, which restricts the hours that a person may "operate or permit the operation of any tools or equipment used for construction, alteration, repair, remodeling, drilling, demolition or any other related building activity which produce loud or unusual noise which annoys or disturbs a reasonable person of normal sensitivity." Based on this limitation, such noise associated with construction is permitted as long as the noise-generating activity occurs within specified hours. These hours include weekdays (including federal holidays) between 7:00 a.m. and 7:00 p.m. and Saturdays between 9:00 a.m. and 6:00 p.m.

Construction noise is regulated under Section 7.15.025 E of the Seal Beach Noise Ordinance, which expressly exempts noise associated with construction activity from the noise limits established in other sections of the ordinance as long as the noise-generating construction activity is performed between the hours of 7:00 a.m. and 8:00 p.m. on weekdays and between 8:00 a.m. and 8:00 p.m. on Saturdays.

Noise Impacts During Project Construction

During project construction, noise would be created from the operation of trucks and construction equipment on site. As discussed in Section 1 of the MND (Project Description), construction activities would normally occur Mondays through Fridays during the daytime hours, generally beginning no earlier than 7:00 a.m. and ending by 5:00 p.m. Personnel may arrive on site prior to 7:00 a.m. to conduct safety meetings and other pre-construction activities, but no noise-generating construction activities would occur before 7:00 a.m. Likewise, personnel may remain on site after 5:00 p.m. conducting closeout activities, but noise-generating construction activities would generally not occur after 5:00 p.m., except under unusual circumstances. Construction on Saturdays may also occasionally be necessary but is not generally anticipated. On Saturdays, noise-generating construction activities would not begin before 9:00 a.m. and would normally end by 5:00 p.m. No construction work would occur on Sundays, except under emergency conditions. (Refer to the Noise BMP in Section 1.3 regarding time-of-day limits on noise-generating construction activities.) These hours during which noise-generating construction activity normally would occur fall within the limits defined in the noise ordinances of both Long Beach and Seal Beach. Therefore, during construction, the project would not result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the noise ordinances of local agencies.

Furthermore, project construction activities for the cooling tower would occur in generally the same location as construction activities related to the demolition of existing Generation Units 3, 4, 5, and 6 that has been underway continually since July 2019. The proposed cooling tower would be erected on the site of Generation Units 5 and 6, and the proposed water storage tanks would be erected on the site of a large aboveground storage tank removed during the demolition process.

This demolition work has required the use of heavy equipment, including excavators, cranes, front loaders, hydraulic shears, and concrete crushing equipment. Trucks required to deliver material and haul away demolition debris have utilized the easternmost gate along 2nd Street at Island Village Drive and traversed the eastern portion of Haynes.

The proposed project would require similar types of construction equipment, use the same access gate for trucks, and conduct construction work in the same general area as the demolition project work discussed above. It is anticipated that noise levels at Haynes during the proposed project construction would be similar to the noise levels recorded on a continuous basis during the demolition work. As discussed above, these noise levels, except during infrequent and isolated short-duration events, have remained at or below 60 dBA throughout the demolition activities and, therefore, are consistent with the daytime noise standard established by the Long Beach Noise Ordinance at the boundary of Haynes.

Noise Impacts During Project Operation

During post-construction project operation, noise would be created by the operation of the proposed cooling tower. The primary sources of noise from the cooling tower would be the fans, the fan motors, the flow of air through the tower, and water as it falls from the tower fill into the basin. Several cooling tower manufacturers have provided noise data for a tower the size and configuration of the proposed Haynes tower operating at full capacity (Table 3.13-3). These data reflect noise that would be generated using standard fans and other equipment and incorporating no available noise attenuation devices or technology. The projected noise from the tower indicated in Table 3.13-3 is the far field sound pressure level expressed in dBA. The far field is the region distant enough from the source that the noise level obeys the inverse-square law; that is, the noise level decreases by 6 dB for each doubling of distance from the source. Far field noise measurements are appropriate to determine the potential noise impacts created by the tower at the boundary of Haynes.

Table 3.13-3: Cooling Tower Far Field Noise Data[a]

Tower Manufacturer	Distance from Tower (feet)	Sound Pressure Level (dBA)
Manufacturer 1	400	64.6
Manufacturer 2	500	56.3
Manufacturer 3	400	62.4

[a] Manufacturer provided data.

Noise District 4, as identified in the Long Beach Noise Ordinance (Section 8.80.160, Noise District Map), includes the area defined by the Long Beach-Seal Beach border on the east, SR-22 on the north, Studebaker Road on the west, and 2nd Street on the south. This area encompasses the Alamitos Generating Station, west of the San Gabriel River, as well as Haynes. In addition, the Island Village residential community, located on the south side of 2nd Street across from Haynes is also encompassed in within Noise District 4 because it was approved for development predicated on being located adjacent to an existing industrial land use. As discussed above, because it is an industrial use zone, the District 4 noise standard applies to the boundary of the property, rather than noise interior to the property. Therefore, noise generated by the proposed cooling tower, when combined with existing ambient noise, would not generate a significant noise impact for uses located within the Noise District 4 boundaries as described above. In addition, the proposed cooling tower would not be anticipated to contribute to a discernable increase in noise levels at the northern edge of Island Village because of its distance from the tower (approximately 1,425 feet) and the associated decrease in noise level from the source.

Therefore, the applicable noise standard of concern for the proposed cooling tower is that defined at the boundaries of Noise District 4. In relation to the proposed project, this would only apply to the shared boundary with the Leisure World residential community to the east of the cooling tower site. No other sensitive uses beyond the Noise District 4 boundary would be affected by noise from the proposed cooling tower because of the intervening distance and the associated decrease in noise level from the source. As discussed above, the noise standard at the eastern boundary is 60 dBA during the daytime (7:00 a.m. to 10:00 p.m.) and 57.5 dBA during the nighttime (10:00 p.m. to 7:00 a.m.). To avoid a less than significant impact, any exceedances of these standards created by the composite noise level of the proposed project when combined with the existing ambient noise level must be in accordance with the provisions of Section 8.80.150 B of the Long Beach Noise Ordinance, as outlined above.

The CCGS (including the cooling tower) would operate infrequently during the nighttime hours defined in the local noise ordinances (10:00 p.m. to 7:00 a.m.). However, since there may be a need to operate during these hours, the nighttime noise standard of 57.5 dBA is the most conservative threshold to determine potential impacts from the proposed project. According to Section 8.80.150 B of the noise ordinance, this standard may not be exceeded for more than a cumulative period of 30 minutes in an hour. Assuming less than significant impacts would occur based on this nighttime threshold, less than significant impacts would also occur based on the higher threshold of daytime hours (i.e., 60 dBA).

The distance from the cooling tower location to the eastern boundary of Haynes across from the nearest residence in Leisure World (at the north end of Canoe Brook Drive) is approximately 775 feet. Based on the inverse-square law (i.e., a decrease in noise level of 6 dB for each doubling of distance from the source) and the far field noise data provided by the cooling tower manufacturers, Table 3.13-4 reflects the noise level for the cooling tower (in absence of existing ambient noise) at this location along the eastern boundary.

Table 3.13-4: Cooling Tower Noise at Eastern Boundary

Tower Manufacturer	Distance from Tower (feet)	Noise Data Point (dBA)	Distance to Boundary (feet)	Tower Noise at Boundary (dBA)
Manufacturer 1	400	64.6	775	58.9
Manufacturer 2	500	56.3	775	52.5
Manufacturer 3	400	62.4	775	56.7

Combining these projected noise levels for the proposed cooling tower with the existing ambient noise level at the eastern boundary (55.0 dBA, as discussed above) results in the projected composite noise level during project operations, as reflected in Table 3.13-5. (Because the dB scale is logarithmic rather than linear, two noise levels are not added arithmetically.)

Table 3.13-5: Composite Noise at Eastern Boundary (dBA)

Tower Manufacturer	Tower Noise at Boundary	Existing Ambient Noise	Composite Noise	Noise Standard	Above/Below Standard
Manufacturer 1	58.9	55.0	60.5	57.5	3.0
Manufacturer 2	52.5	55.0	57.0	57.5	-0.5
Manufacturer 3	56.7	55.0	59.0	57.5	1.5

As can be seen in Table 3.13-5, the composite noise for an unattenuated cooling tower from Manufacturers 1 and 3 would exceed the noise standard, which must be achieved for a cumulative period of at least 30 minutes in an hour. In order to achieve the standard of 57.5 dBA, the tower noise must be attenuated such that the noise generated by the tower at the eastern boundary (in absence of existing ambient noise) would be no greater than 54.0 dBA. When added to the existing ambient level of 55.0 dBA, this would result in a composite noise level of 57.5 dBA.

The noise from cooling towers can be feasibly attenuated by several means. These include, but are not limited to, fans with blades designed to reduce noise, variable frequency drives to allow fan motors to operate at many speeds in response to cooling requirements, sound barriers at the perimeter of the fan deck, and various types of silencers to minimize the noise of falling water impacting the tower basin. One or more these methods could readily accomplish a noise reduction of approximately 5 dBA (from 58.9 dBA to 54.0 dBA) required to reduce the composite noise at the eastern boundary related to the operation of the Manufacturer 1 tower and thereby achieve the noise standard of 57.5 dBA. Therefore, Mitigation Measure NOI-1 has been incorporated requiring that the cooling tower generates noise that would not exceed 54.0 dBA at the eastern boundary.

With the tower noise established at 54.0 dBA, the ambient noise level remains the only variable in determining composite noise levels at the eastern boundary. Based on 15.5 months of continuous 24-hour noise monitoring at the boundary and the resultant average percent of time that the ambient nighttime noise level is equal to or less than 55.0 dBA, as reflected in Table 3.13-2, a tower attenuated to 54.0 dBA at the boundary, when combined with the ambient noise, would, on average, achieve the 57.5 dBA standard approximately 45 minutes of each hour (Table 3.13-6). Therefore, the composite noise level at the eastern boundary during project operations would not exceed the 57.5 dBA standard for a cumulative period of more than 30 minutes an hour.

Furthermore, based on the percent of time that the ambient nighttime noise level is greater than 55.0 dBA but equal to or less than 62.0 dBA, the attenuated tower, when combined with the ambient noise, would result in a composite noise level of 62.5 dBA (standard plus 5 dBA) for less than 15 minutes an hour. Therefore, the composite noise level at the eastern boundary during project operations would not exceed the 57.5 dBA standard plus 5.0 dBA for a cumulative period of more than 15 minutes an hour.

Table 3.13-6: Composite Noise Levels Minutes/Hour at Nighttime

Existing Ambient Noise (dBA)	Percent of Time	Attenuated Tower Noise	Composite Noise	Average Minutes/Hour
≤55.0	75.0%	54.0 dBA	57.5 dBA	45.0 Min.
55.0≤62.0	24.3%	54.0 dBA	62.5 dBA	14.6 Min.
62.0≤65.0	0.7%	54.0 dBA	65.5 dBA	0.4 Min.

Because the daytime noise standard at the eastern boundary (60 dBA) is higher than the nighttime standard but the existing ambient noise profile does not vary markedly between daytime and nighttime hours, the composite noise level resulting from the combination of the daytime ambient noise and a tower attenuated to 54.0 dBA would achieve the noise standard the vast majority of the time, as shown in Table 3.13-7.

Table 3.13-7: Composite Noise Levels Minutes/Hour at Daytime

Existing Ambient Noise (dBA)	Percent of Time	Attenuated Tower Noise	Composite Noise	Average Minutes/Hour
≤59.0	95.5%	54.0 dBA	60.0 dBA	57.3 Min.
59.0≤64.5	3.8%	54.0 dBA	65.0 dBA	2.3 Min.
>64.5	0.7%	54.0 dBA	>65.0 dBA	0.4 Min.

It should be noted that while, in accordance with the Long Beach Noise Ordinance, the above noise limits would be achieved at the eastern boundary of Haynes (775 feet from the cooling tower site), because of the intervening Orange County Flood Control District flood control channel, actual residences within Leisure World are located approximately 165 feet east of the boundary, or 940 feet from the cooling tower site. This additional distance would further reduce the noise emanating from the tower by approximately 1.7 dBA from that experienced at the Haynes eastern boundary.

Based on the above, the proposed project would not exceed either the daytime or nighttime noise level standard, as established in the local noise ordinances of Long Beach and Seal Beach, by more than 30 minutes in an hour, nor would it exceed the standard plus 5 dBA by more than 15 minutes in an hour. Therefore, with the incorporation of Mitigation Measure NOI-1, the project during operation would not result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the noise ordinances of local agencies.

Mitigation Measures

NOI-1 The cooling tower manufacturer shall incorporate noise attenuating elements in the cooling tower as necessary such that the noise generated by the tower, in absence of existing ambient noise, will be no greater than 54 dBA when measured at the eastern boundary of Haynes across from the nearest residence in Leisure World, at the north end of Canoe Brook Drive (a distance of approximately 775 feet from the east edge of the cooling tower).

Conclusion

With the incorporation of the above mitigation measure, impacts related to the generation of noise during project construction and operation would be less than significant.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less than Significant Impact.

Perception of Vibration

Groundborne vibration may cause buildings to shake and rumbling sounds to be heard, and at very high levels, vibration may cause damage to buildings or even physical injury to persons. However, in contrast to noise, vibration is not generally a common environmental problem, and it is unusual for vibration from sources such as passing trucks to be perceptible, even in closely adjacent locations. Some common sources of vibration that may be perceptible at relatively close distances are trains, large vehicles on rough road surfaces, and certain construction activities, such heavy earth-moving equipment. While vibration levels rarely affect human health, most people consider vibration to be an annoyance that may affect concentration or disturb sleep. Generally, human perception of vibration occurs at levels below those that would be detrimental to health or damaging to structures. The municipal codes of both the City of Long Beach and the City of Seal Beach regulate vibration based on its perception by persons at the boundary of the property where they are located. According to Section 8.80.200 G of the Long Beach Noise Ordinance, it is a violation of the ordinance to operate or permit to be operated:

> any device that creates vibration which is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at one hundred fifty feet (150') (forty-six [46] meters) from the source if on a public space or public right-of-way. For the purposes of this subsection, "vibration perception threshold" means the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such directed means as, but not limited to, sensation by touch or visual observation of moving objects.

According to of the Seal Beach Municipal Code, Chapter 11.4.10 (General Site Standards), Section 11.4.10.020 E (Vibration), “No use, activity or process shall produce vibrations that are perceptible without instruments by a reasonable person at or beyond the property line of the site on which they are situated.”

Peak particle velocity (PPV) is defined as the maximum instantaneous peak of a vibration signal. It is a measurement of maximum ground particle movement speed, specified in inches per second, caused by a vibration wave. Groundborne vibration, measured in PPV, is typically attenuated over relatively short distances, as determined by the following formula:

$$PPV=PPV_{ref} \times (ref/D)^{1.5}$$

Where: ***PPV*** is the peak particle velocity in inches per second at a receptor "D" distance from the source.

PPV$_{ref}$ is the reference peak particle velocity of the source

ref is the distance of the reference peak particle velocity from the source

D is the distance to the receptor from the source

For example, a large bulldozer would create a PPV of approximately 0.089 inches per second at a distance of 25 feet.[46] Based on the above formula, at 50 feet, the PPV would diminish to approximately 0.031 inches per second (a 65 percent reduction from the 25-foot reference distance), and at 100 feet, the PPV would diminish to approximately 0.011 inches per second (an 88 percent reduction from the reference distance).

In addition to distance, the character of the source vibration (i.e., whether it is transient or steady state) affects human perception of the vibration. Because vibration related to transient sources are very short duration and infrequent events, the threshold for perception in terms of PPV is higher than for steady state vibration sources (see Table 3.13-8). In relation to the generation of excessive groundborne vibration as well as to the limits provided in the local codes, the Distinctly Perceptible perception level would represent the threshold for a significant vibration impact.

Table 3.13-8: Human Perception of Vibration (PPV)[a]

Perception	Maximum PPV (inches per second)	
	Transient Source	Steady State Source
Barely Perceptible	0.035	0.012
Distinctly Perceptible	0.24	0.035
Strongly Perceptible	0.9	0.1
Severe	2.0	0.4

[a] Caltrans. 2020. Transportation and Construction Guidance Manual, available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf, accessed February 5, 2021.

46 Federal Transit Administration. 2018. Transit Noise and Vibration Impact Assessment Manual. https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Vibration Impacts During Project Construction

Most activities associated with the construction of the project would be considered steady state sources of vibration. In relation to construction, no activities that would create extreme vibration levels, such as blasting or impact pile driving, would occur (as discussed in Section 1.7.2, the piles required for the cooling tower foundation would be cast in place concrete rather than driven). In relation to the equipment that is anticipated to be employed during project construction, a vibratory roller would likely be the source with the highest vibration level, which is 0.21 PPV at 25 feet from the source.[47]

A vibratory roller would be employed during the Site Preparation & Earthwork and the Water Infrastructure phases of project construction, some of which may occur near the eastern boundary of Haynes, across from Leisure World. Groundborne vibration requires soil or another solid medium through which the vibration waves can propagate. Such a soil medium is disrupted by the void space created by the approximately 65-foot wide and 10-foot deep Orange County Flood Control District flood control channel located between Haynes and Leisure World.

Nonetheless, conservatively assuming that a continuous soil medium existed between Haynes and Leisure World and that the vibratory compactor would be operating at the eastern boundary line of Haynes, the groundborne vibration generated by the compactor would diminish to approximately 0.028 PPV at the boundary of Leisure World (approximately 120 feet east of the Haynes boundary) and to 0.015 PPV at the nearest residences (approximately 170 feet east of Haynes). These vibration levels would be below the Distinctly Perceptible level for a steady state vibration source shown in Table 3.13-8 (0.035 PPV). Therefore, during construction, the project would not result in the generation of excessive groundborne vibration or groundborne noise levels.

Vibration Impacts During Project Operation

The operation of the proposed cooling tower would also be considered a steady state source of vibration. However, the cooling tower during operation would not generate substantial groundborne vibration. Given its distance from the eastern boundary of Haynes (approximately 775 feet) and the nearest residence in Leisure World (approximately 940 feet), any vibration created would diminish to an imperceptible level. Therefore, during operation, the project would not result in the generation of excessive groundborne vibration or groundborne noise levels.

Conclusion

Impacts related to the generation of vibration during project construction and operation would be less than significant.

c) **For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?**

No Impact. The project site is not located within the vicinity of a private airstrip or within 2 miles of a public airport or public use airport. The project site is approximately 3.5 miles southeast of Long Beach Airport and falls outside the

[47] *Ibid.*

planning boundary for the Airport Influence Area.[48] The project site is approximately 2.1 miles southwest of Joint Forces Training Base, Los Alamitos, and falls within the Airport Planning Area. However, the project site is outside the 60 and 65 dBA noise contour impact zones of the Joint Forces Training.[49] Therefore, the proposed project would not expose people at the project site, which is located within an existing electrical generating station, to excessive noise levels from aviation activity. No impact would occur.

XIV. POPULATION AND HOUSING

Would the project:

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The proposed project would not directly induce unplanned population growth through the provision of new homes or businesses. Additionally, the project would not increase the power generating capacity at Haynes and, therefore, would not indirectly induce population growth in the area.

The estimated number of daily on-site workers during project construction would range from approximately 17 to 32. Given the temporary nature of construction industry jobs, the relatively large regional construction workforce, and the nominal number of construction workers needed to implement the proposed project, an influx of new workers and their families is not anticipated. Accordingly, construction employment generated by the project would not impact population growth in the region. The operation of the cooling tower is not anticipated to substantially increase the number of permanent personnel at Haynes as most functions would be performed by existing station personnel. No impact would occur.

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

No Impact. The proposed project is located within a fully developed industrial site owned by LADWP and would not displace any existing housing or people. No impact would occur.

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48 Los Angeles County Airport Land Use Commission. 2003. Long Beach Airport Influence Area, available at: https://planning.lacounty.gov/assets/upl/project/aluc_airport-long-beach.pdf, accessed February 5, 2021.

49 Orange County Airport Land Use Commission. 2017. Airport Environs Land Use Plan for Joint Training Base Los Alamitos, available at: https://files.ocair.com/media/2021-02/JFTB%2CLosAlamitos-AELUP2017.pdf?VersionId=jhDzARCp3ECzHQ6jiMzrb06mM5H0Nv89, accessed February 5, 2021.

XV. PUBLIC SERVICES

a) 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. Haynes is served by the City of Long Beach Fire Department. No new or expanded fire protection services would be required at the site due to the proposed project. Therefore, no impact would occur.

ii) Police protection?

No Impact. Haynes is served by the City of Long Beach Police Department and LADWP security personnel. No new or expanded police protection services would be required at the site due to the proposed project. Therefore, no impact would occur.

iii) Schools?

No Impact. The proposed project would retrofit an existing generation unit cooling system within Haynes property. As discussed in Section XIV(a), construction employment generated by the project would not impact population growth in the region. The project would not increase generation capacity at Haynes and, therefore, would not induce population growth that would necessitate the expansion of school services to serve new residents. Therefore, no impact to schools would occur.

iv) Parks?

No Impact. The proposed project would retrofit an existing generation unit cooling system within Haynes property. As discussed in Section XIV(a), construction employment generated by the project would not impact population growth in the region. The project would not increase generation capacity at Haynes and, therefore, would not induce population growth that would necessitate the expansion of parks or development of new parks to serve new residents. Therefore, no impacts to parks would occur.

v) Other public facilities?

No Impact. The proposed project would retrofit an existing generation unit cooling system within Haynes property. As discussed in Section XIV(a), construction employment generated by the project would not impact population growth in the region. The project would not increase generation capacity at Haynes and, therefore, would not induce population growth that would necessitate the expansion of other public facilities. Therefore, no impact to other public facilities would occur.

XVI. 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 proposed project would retrofit an existing generator cooling system within the Haynes property. Construction workers would likely come from the region and would not need to relocate. The project would not increase generation capacity at Haynes and, therefore, would not induce population growth that would increase the use of existing parks or other recreation facilities. Therefore, the project would not increase the use of existing neighborhood or regional parks or other recreational facilities. 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 would retrofit an existing generator cooling system within the Haynes property. It would not include recreational facilities or require the construction or expansion of recreational facilities. No impact would occur.

XVII. TRANSPORTATION

Would the project:

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

No Impact. The proposed project would retrofit the cooling system of an existing generation unit within Haynes, and project facilities would be located entirely within the boundaries of the station. The project would not, either temporarily during construction or permanently during operation, directly physically alter, cause to be physically altered, or physically interfere with any portion of the existing circulation system, including transit, roadway, bicycle, or pedestrian facilities. During construction, the project would generate a relatively low level of vehicle trips (see XVII(b), below), and during operation, the project would not substantially increase the number of permanent station personnel or maintenance procedures requiring vehicle trips. Therefore, the project would not create a need for any modifications to transportation systems and would not conflict with a program, plan, ordinance, or policy addressing the circulation system. No impact would occur.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

No Impact. Section 15064.3 pertains to the assessment of a project's potential transportation impacts based on the vehicle miles traveled (VMT) generated by a project (i.e., "the amount and distance of automobile travel attributable to a project," Section 15064.3(a)). The proposed project is a retrofit of an existing generator cooling system and would not change the land use at Haynes or substantially increase the number of permanent station personnel or maintenance procedures requiring vehicle trips. Therefore, there would be no expected change in VMT for Haynes associated with project operation.

Although the proposed project would generate vehicle trips during construction, Section 15064.3 addresses the long-term permanent VMT associated with land use development projects and is not specifically concerned with vehicle trips generated during the construction of a project. Therefore, the project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b).

In addition, even trips generated during the proposed project construction would be substantially below the VMT screening criteria for both the City of Long Beach and the City of Seal Beach, the local jurisdictions that would be affected by project construction traffic and that have been given responsibility by the California Office of Planning and Research to develop guidelines to determine VMT impacts within their cities.

At the peak of construction activity for the proposed project, approximately 32 construction personnel would be required, generating 64 daily one-way trips. Although Section 15064.3 specifically addresses automobile trips (i.e., commuter trips) and not truck trips associated with a use, during the peak of construction activity, approximately 24 daily one-way truck trips (12 round trips) would be generated.

According to the Long Beach Traffic Impact Analysis Guidelines (2020), a project that generates less than 500 average daily one-way trips is presumed to have a less than significant impact in relation to VMT.[50] According to the Seal Beach Transportation Analysis Guidelines (2020), a project that generates less than 250 vehicles per day is presumed to have a less than significant impact in relation to VMT.[51]

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

No Impact. The proposed project would be located entirely within the boundaries of Haynes and would not involve any permanent or temporary modifications to the existing public road system. On-road vehicles associated with construction personnel commute trips (a peak of 32 daily in-bound and 32 daily out-bound trips) would be a compatible use on the local road networks of Long Beach and Seal Beach and would not represent an increased hazard. Additionally, truck haul and delivery trips related to project construction (a peak of 12 daily round trips distributed throughout the work day) would generally follow designated local truck routes (Studebaker Road and 2nd Street east of Studebaker Road in Long Beach and Westminster Boulevard in Seal Beach) and would be consistent with existing similar uses related to operations at Haynes and other surrounding functions. Therefore, they would not represent an increased hazard. During project operation, few additional personnel would be required at Haynes, and minimal additional truck deliveries would be required. Therefore, the proposed project would not substantially increase hazards due to geometric design features or incompatible uses, and no impact would occur.

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50 City of Long Beach. June 2020. Traffic Impact Analysis Guidelines. Available at: https://www.longbeach.gov/globalassets/lbds/media-library/documents/planning/environmental/ environmental-planning/tia-guidelines, accessed June 2, 2021.

51 City of Seal Beach. June 2020. Transportation Analysis Guidelines, available at: https://www.sealbeachca.gov/Portals/0/Documents/Seal%20Beach%20Transportation%20Analysis%20Guidelines%20(FINAL).pdf?ver=2020-06-09-141939-997, accessed June 2, 2021.

d) Result in inadequate emergency access?

No Impact. As discussed above, the proposed project would be located entirely within the existing Haynes boundary and would not involve any permanent or temporary modifications to the existing public road system. Trips generated during either construction or operation of the project would not substantially increase traffic congestion. Therefore, the project would not interfere with emergency vehicles, resulting in inadequate emergency, and no impact would occur.

XVIII. TRIBAL CULTURAL RESOURCES

Potential impacts related to tribal cultural resources resulting from implementation of the proposed project were evaluated in the *Cultural Resources Assessment* prepared for the proposed project, which is included as Appendix C to this IS/MND.

Would the project:

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

No Impact. Tribal cultural resources include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe. Maps prepared by anthropologists, including those at the direction of local tribes, were consulted. An archaeological field survey of the project area was conducted on January 11, 2021. No tribal cultural resources that are either listed or eligible for listing in the CRHR or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k) are located within Haynes. Therefore, there would be no impact.

b) Cause a substantial adverse change in the significance of a tribal cultural resource 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 the Public Resources Code Section 5024.1?

Less Than Significant Impact After Mitigation Incorporated. As discussed in Section XVIII(a) above, no tribal cultural resources that are listed or are eligible for listing are located within Haynes or were identified during field surveys. Additionally, as discussed in 1.6.9 of this IS/MND, the proposed project facilities would all be located in areas of Haynes which have been highly disturbed from past facilities construction and operations, dating to the early 1960s, including structures with foundations deeper than those anticipated for the project facilities. Nonetheless, based on archival research and the results of the field survey, it was determined that Haynes is located in the vicinity of Puvungna, an ancient Gabrielino-Tongva village, and it is therefore considered moderately sensitive for archaeological resources that may be tribal cultural resources. Such resources, although currently unknown, may be inadvertently discovered during construction activities involving ground disturbance, especially in previously undisturbed areas.

Assembly Bill (AB) 52 requires outreach early in the CEQA process to tribal entities identified as potentially having ancestral ties to the proposed project area. The AB 52 consultation process and outreach for the project has been initiated by LADWP. As of the publication date of this IS/MND, the Juaneño Band of Mission Indians, Acjachemen Nation, had requested consultation with LADWP regarding the proposed project. At the tribe's request, the records search data for the project, which includes previously recorded archaeological site records and reports for resources within Haynes and within a 0.5-mile radius of Haynes, was provided for their review. Upon review of this information, the tribe indicated that they had no concerns at this time.

Because of the potential for the inadvertent discovery of previously unknown tribal cultural resources, Mitigation Measure TCR-1 has been incorporated providing an opportunity for Native American monitors to be present during construction and for the evaluation of any tribal cultural resources discovered during construction, including the preparation of treatment plans, as necessary. With the incorporation of this mitigation measure and continuing AB 52 consultation, impacts that may result in a substantial adverse change in the significance of a tribal cultural resource would be less than significant.

Mitigation Measures

TCR-1 A minimum of 45 days before the initiation of ground-disturbing construction activities, LADWP shall notify any Native American tribes that consulted on the project pursuant to California Assembly Bill 52 and provide an opportunity for qualified tribal representatives to participate in on-site monitoring. Any Native American representative who chooses to monitor construction activities shall have archaeological knowledge and the ability to represent the interests of the tribe. The monitor shall be responsible for identifying potential resources; making initial notifications in the event of finds; requesting diversions of construction activity; and preparing daily monitoring notes and logs. These monitoring logs shall be made available to any Native American tribes consulting on the project.

If a previously unknown archaeological resource of potential Native American origin is encountered, work shall be suspended within 50 feet of the find, LADWP shall be notified, and LADWP shall contact a qualified archaeologist who meets the Secretary of the Interior's standards to evaluate the significance of and determine appropriate treatment for the resource.

All consulting Native American parties shall be contacted to apprise them of the findings and solicit any comments they may have regarding appropriate treatment and disposition of the resources. Their input shall be taken into account in the preparation of any required treatment plan for the resources prepared by the qualified archaeologist. The evaluation 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 the resource takes place.

XIX. UTILITIES AND SERVICE SYSTEMS

Would the project:

a) Require or result in relocation or the construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects?

Less Than Significant Impact. The proposed project would include the modification of existing and the construction of new water infrastructure entirely within the boundaries of Haynes. This would include the modification of industrial wastewater collection pipelines and the construction of new aboveground wastewater holding tanks; the modification of potable water pipelines; the modification of stormwater collection systems and he construction of new aboveground stormwater holding tanks; and the construction of new recycled water supply pipelines and a new makeup water holding tank. These improvements are required to utilize recycled water from the Long Beach WRP and existing Haynes industrial wastewater to provide makeup water for the proposed cooling tower and to divert stormwater and wastewater discharges from the San Gabriel River and direct these discharges to the Long Beach WRP, where they would undergo treatment to provide recycled water to help supply the needs of the cooling tower. The construction of these facilities has been addressed in this IS/MND in regard to the potential to create significant impacts related to various environmental factors, and, based on the analysis contained in the IS/MND, it would not result in significant environmental effects.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

Less Than Significant Impact. A major element of the proposed project is to minimize the use of potable water to supply the makeup water needs of the proposed cooling tower. As discussed in Section 1.6.3 of this IS/MND, recycled water from the Long Beach WRP would be utilized as the primary source of makeup water for the cooling tower. Based on the treatment capacity of the WRP and the LBWD's current and projected uses for recycled water, it is anticipated there would be future supply of recycled water to provide a large portion of the makeup water for the proposed cooling tower.

In addition to recycled water, it is LADWP's goal, to the extent feasible, to utilize industrial wastewater generated by certain processes at Haynes for the proposed cooling tower's makeup water. While not all industrial wastewater would be of adequate quality to serve as tower makeup water, demineralized blowdown water from the Units 9 and 10 HRSGs would provide a portion of the tower makeup water.

Although it is anticipated that the combination of recycled water from the Long Beach WRP and industrial wastewater from Haynes would normally fulfill the need for cooling tower makeup water, potable water would also be available as a backup supply in the event that volumes from the other identified sources were insufficient, depending on the available supply versus the demand of the cooling tower at a given time. The potable water would also be provided by the LBWD. Based on supply and demand at a given time, the requirement for makeup water may be met by any combination of these various sources. Therefore, sufficient water supplies would be available to serve the project, and the impact would be less than significant.

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

Less Than Significant Impact. The proposed project would not result in any changes related to the volume of sanitary wastewater. However, the project would increase the volume of industrial wastewater treatment by the local provider. As discussed in Section 1.6.7 of this IS/MND, under current conditions, industrial wastewater at Haynes (a maximum of approximately 1.7 MGD) is discharged to the San Gabriel River through the OTC flows associated with Generation Units 1, 2, and 8. However, at the completion of the proposed project, the OTC flows for Unit 8 would no longer be available for the purpose of wastewater discharge. In addition, based on mandates related to the OTC Policy, LADWP will cease using the Units 1 and 2 OTC systems by the end of 2029, which will eliminate the potential for wastewater discharges via OTC flows. A portion of this industrial wastewater would be recycled to be used as makeup water for the proposed cooling tower. However, certain wastewater streams, such as reject from reverse osmosis systems and the blowdown from the future operations of the cooling tower itself, could not be utilized as cooling tower makeup water. This wastewater unsuitable for the cooling tower would be routed to the Long Beach WRP via a new dedicated return pipeline. The wastewater would provide additional influent to the WRP that would be processed through the plant to produce recycled water. In this manner, Haynes would partially provide the influent required by the WRP to serve the cooling tower makeup water needs. As discussed in Section 1.6.3 of this IS/MND, the Long Beach WRP has a design capacity to provide primary, secondary, and tertiary treatment for 25 MGD of wastewater. The plant currently treats approximately 18 MGD of wastewater to a tertiary level to produce recycled water. Therefore, the wastewater treatment provider has determined that it would have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments, and the impact would be less than significant.

d) Generate solid waste in excess of state or local standards, or in excess of the future capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less Than Significant Impact. Solid waste generated from the project would primarily consist of excavated soil and construction debris, in addition to nominal amounts of general waste created during construction. The project would not generate substantial solid waste during operation. Construction debris would be recycled or transported to a landfill and disposed of appropriately. In accordance with AB 939, LADWP would ensure that source reduction techniques and recycling measures are incorporated into project construction. It is anticipated that the proposed project would generate a total of approximately 15,000 cubic yards of excavated soil and construction debris, anticipated to occur over a period of 2.5 years. Any waste produced as a result of the project would be disposed of in compliance with state and local standards. Several landfills throughout the County of Los Angeles could serve the project, as listed in Table 3.19-1. The total permitted throughput for all landfills is 37,075 cubic yards per day, and approximately 180 million cubic yards of total capacity remain. The estimate of waste material to be generated and disposed during project construction represents a fraction of 1 percent of the remaining capacity of the landfill with the least capacity (Calabasas). Therefore, the project would not generate solid waste in excess of state or local standards, or in excess of the capacity of local landfills, or otherwise impact the attainment of solid waste reduction goals; impacts would be less than significant.

Table 3.19-1. Existing Landfills

Landfill	Location	Estimated Closing Year	Maximum Daily Capacity (cubic yards per day)	Current Remaining Capacity (million cubic yards)
Antelope Valley	Palmdale	2039	4,800	16.48
Calabasas Landfill	Unincorporated Area	2029	7,795	12.48
Chiquita Canyon Landfill	Unincorporated Area	2047	6,730	60.12
Lancaster Landfill	Unincorporated Area	2041	4,000	13.70
Sunshine Canyon Landfill	Los Angeles/ Unincorporated Area	2037	13,750	77.31
		Total	**37,075**	**180.9**

Source: County of Los Angeles. 2017. Countywide Integrated Waste Management Plan, 2017 Annual Report, available at: https://dpw.lacounty.gov/epd/swims/ShowDoc.aspx?id=11230&hp=yes &type= PDF, accessed November 24, 2020.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact. As previously discussed, the proposed project would generate various types of solid waste. In relation to the handling and disposal of this waste, LADWP would comply with all federal, state, and local solid waste diversion, reduction, and recycling mandates including compliance with the Countywide Integrated Waste Management Plan.[52] No impact would occur.

XX. WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

No Impact. A review of Los Angeles County Fire Hazard Severity Zone maps indicates that the project site is not located in a very high fire hazard severity zone (VHFHSZ).[53] Therefore, the project would result in no impact related to an adopted emergency response plan or emergency evacuation plan.

[52] County of Los Angeles. 2017. Countywide Integrated Waste Management Plan, 2017 Annual Report, available at: https://dpw.lacounty.gov/epd/swims/ShowDoc.aspx?id=11230&hp=yes&type= PDF, accessed November 24, 2020.

[53] County of Los Angeles, 2021, *County of Los Angeles Open Data, Fire Hazard Severity Zones*, available at: https://data.lacounty.gov/dataset/Fire-Hazard-Severity-Zones/jwg2-9k5y, accessed July 28, 2021.

b) **Due to slope, prevailing winds, and other factors, exacerbate wildland fires risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?**

No Impact. The project site is not located in a VHFHSZ. Therefore, the project would result in no impact related the exposure of project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.

c) **Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may result in temporary or ongoing impacts to the environment?**

No Impact. The project site is not located in a VHFHSZ. Therefore, the project would result in no impact related to the installation or maintenance of associated infrastructure.

d) **Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?**

No Impact. The project site is not located in a VHFHSZ. Therefore, the project would result in no impact related to the exposure people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

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

Less Than Significant Impact. As discussed in Section IV, the project site is located within the completely developed Haynes property, where special-status plant and wildlife species and habitat suitable to support such species are absent. As detailed in Section IV(a), project construction activities occurring during the nesting bird season could indirectly impact birds protected by the MBTA and CFGC, which could result in increased nestling mortality due to nest abandonment or decreased feeding frequency. However, implementation of the project BMP related to nesting bird surveys (Section 1.3 of this IS/MND), including pre-construction surveys, potential avoidance buffers around active nests, construction monitoring, and when needed, adaptive measures to avoid impacts to nesting birds during construction, would ensure less than significant impacts to nesting birds protected under the MBTA and CFGC. As such the impact of the project related to reducing the number or range of any rare or endangered species would be less than significant.

As discussed in Section V(a), a records search of the Haynes property identified no previously recorded cultural resources mapped within one half-mile of the project area. Archival research including inventories of the NRHP, the CRHR, the HRI, California Historical Landmarks and Points of Interest, and local historical registers also did not identify any historic resources within the project area. As described in Section V(b), based on the results of the archival research and field survey, there is moderate potential that archaeological resources would be encountered during ground-disturbing activities for the proposed project. As discussed in Section XVIII(a), while no tribal cultural resources were identified within the project site, the project site is located in the vicinity of Puvungna, and it is therefore considered moderately sensitive for archaeological resources that may be tribal cultural resources. However, as discussed in Sections V(b) and XVIII(b) mitigation measures have been established calling for the retention of a qualified archaeological monitor and providing the opportunity for Native American representatives to monitor ground-disturbing construction activity. The Native American monitor would be authorized to be present as necessary during ground-disturbing construction activities. If a previously unknown archaeological resource is discovered, the discovery shall be evaluated by the qualified archaeologist, and a treatment plan for the resource shall be developed, as necessary and appropriate, in accordance with Public Resources Code Section 21083.2(i). If a previously unknown archaeological resource of Native American origin is encountered, consultation with all Native American parties that consulted on the project pursuant to AB 52 shall occur to apprise them of the findings and solicit any comments they may have regarding appropriate treatment and disposition of the resources. With implementation of these mitigation measures, impacts related to important examples of the major periods of California history or prehistory 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 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 greater region, depending on the nature and scope of the project and environmental factor under consideration) and in time (i.e., recently completed projects, projects currently under construction, and/or projects anticipated to be implemented in the near-term future). In general, the effects of a proposed project when combined with the effects of past projects (other than projects recently completed) are accounted for in the baseline conditions for the analysis of the proposed project's environmental impacts.

The analysis of the combined impacts of more than one project 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 significant combined impact could result even when the individual impacts of related projects are less than significant. The combined effects of several related projects with individually less than 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 significant, an individual project's incremental contribution to those significant combined effects may be determined to be less than cumulatively considerable and, therefore, less than significant.

When a project would create no impact related to a particular environmental factor, there would be no potential for the project to contribute to a significant effect created by the combined impacts of closely related projects. Based on the analysis in this IS/MND, the proposed project would create no impacts related to aesthetics, agriculture and forestry resources, land use and planning, mineral resources, population and housing, public services, recreation, transportation, or wildfire.

Impacts for all other environmental factors considered in this IS/MND were determined to be less than significant without the need for mitigation measures, except for impacts related to archaeological resources, noise created by the tower operations, and tribal cultural resources not currently listed or identified as eligible for listing in the CRHR, which were determined to be less than significant with the incorporation of mitigation measures.

Air pollutant and GHG emissions, as assessed under CEQA, are inherently recognized as cumulative impacts. Project-level thresholds of significance for these emissions are used in the determination of whether a project's individual emissions would make a cumulatively considerable contribution to a significant impact. Based on the analysis contained in this IS/MND, both air quality and GHG emissions would remain substantially below the defined thresholds of significance. Therefore, the proposed project would not make a cumulatively considerable contribution to a wider adverse air quality or GHG impact.

The use of energy during project construction and operations is likewise considered an impact with broader effects based on the potential consumption of limited energy resources. However, while energy would be consumed during both the construction and operation phases of the project, it was determined that this consumption would not be wasteful and would have a less than significant impact. In addition, as discussed above, the project would result in a net benefit related to energy conservation by providing approximately 575 MW net dispatchable generation capacity to ensure the reliability and resilience of the City of Los Angeles's electrical power system while additional renewable generation, energy storage, distributed generation, and transmission system improvements are implemented, thereby facilitating the transition to a clean energy future. Such dispatchable resources play a crucial role in the integration of renewable resources into the electrical energy system. Therefore, the proposed project would not make a cumulatively considerable contribution to a wider adverse impact related to energy consumption and conservation.

Potential impacts to various resources, including biological resources, cultural resources, paleontological resources, and tribal cultural resources, although not anticipated, were determined in this IS/MND to be less than significant with the implementation of applicable BMPs established as part of the proposed project or mitigation measures introduced based on the results of the environmental analysis contained in the MND. However, such impacts, should they occur, are site-specific in nature, limited to the boundaries of Haynes, and would not, therefore, make a cumulatively considerable contribution to similar potentially adverse impacts resulting from other closely related projects in the geographic area.

Geology and hydrology impacts related to increased potential for erosion, runoff, siltation, flooding, and pollution discharges would also generally be site-specific in nature, but such impacts could also extend off site and result in a larger impact when combined with similar impacts from closely related projects in the area. However, given the nature of the proposed project and the existing setting and with the implementation of applicable BMPs established as part of the proposed project, off site impacts would be largely eliminated and would, therefore, not make a cumulatively considerable contribution to a more widespread impact potentially created by the combined effects of closely related projects.

Geology impacts related to seismic hazards and hazards created by various soil conditions pertain to the potential impacts from the environment upon the proposed project rather than impacts to the environment caused by the project. In this regard the project would not make a cumulatively considerable contribution to similar impacts experienced by closely related projects in the area.

Impacts related to noise and hazardous materials have the potential to affect a limited area beyond the boundary of Haynes. However, the assessment of such impacts in this IS/MND and the conclusion of a less than significant impact accounted for the combined effect of the project and the surrounding existing setting. The only closely related projects that have been currently identified are the installation by the LBWD of the recycled water supply line from the Long Beach WRP to Haynes and the dedicated wastewater return line from Haynes to the WRP. However, any impacts from these projects would be temporary, occurring during construction only, and the construction work is not anticipated to result in a cumulatively considerable contribution to impacts related to either noise or hazardous materials.

Impacts to utilities and service systems could contribute to a significant impact from the combined effects of more than one project on the limited capacity of services such as wastewater treatment, water supply, and solid waste disposal. As discussed in this IS/MND, the Long Beach WRP has a design capacity to provide treatment for 25 MGD of wastewater and currently treats only approximately 18 MGD. Therefore, the wastewater treatment provider has determined that it would have adequate capacity to serve the project’s projected demand (for industrial wastewater treatment) in addition to existing and known future commitments. Water for the project would be provided primarily with recycled water from the Long Beach WRP and industrial wastewater from Haynes, substantially reducing the need for supplemental potable water supplies. In addition, Haynes industrial wastewater would be routed to the Long Beach WRP, partially providing the supply required by the WRP to serve the project’s water needs. Solid waste requiring disposal in landfills would be temporary, generated only during project construction. The volume of this waste is anticipated to represent only a very small fraction of both the daily throughput and total remaining capacity of landfills in the region. Therefore, it is unlikely that the project would make a cumulatively considerable contribution to a wider adverse impact related utilities and service systems.

Based on the above, the project would not have environmental effects that are individually limited, but cumulatively considerable, and the impact is 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 After Mitigation Incorporated. Numerous factors discussed above in the CEQA Initial Study Checklist pertain to the quality of the human environment. Based on the analysis contained above, the environmental impacts created by the proposed project in relation to most of these factors would be less than significant. As discussed in Section XIII(a), the project as proposed could generate a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of applicable standards established in the local ordinances from the operation of the cooling tower. Therefore, Mitigation Measure NOI-1 would be required, stipulating that the tower manufacturer shall incorporate noise attenuating elements to reduce tower noise as specified such that operational noise, when combined with existing ambient noise, would not exceed the standards of local ordinances. With the incorporation of this mitigation measure, substantial adverse effects on human beings would not occur.

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SECTION 4
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APPENDIX A

AIR QUALITY, GREENHOUSE GAS, AND HEALTH RISK STUDIES

Air Quality, Greenhouse Gas, and Health Risk Studies for Haynes Generating Station Unit 8 Cooling Tower

Prepared For:
Los Angeles Department of
Water and Power (LADWP)

Project Site:
Haynes Generating Station
Long Beach, CA

Under Contract with:
AECOM

September 2021

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List of Tables

Appendices

List of Acronyms and Abbreviations

ASI	Application Screening Index
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
CAAQS	California Ambient Air Quality Standards
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCGS	Combined Cycle Generating System
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DEMIN	Demineralization
DNQ	Did Not Quantify
DOORS	Diesel Off-Road Online Reporting System
DPM	Diesel Particulate Matter
GHG	Greenhouse Gas
GLC	Ground Level Concentration
HFC	Hydrofluorocarbon
HHDT	Heavy-Heavy Duty Diesel Truck
HIA	Acute Hazard Index
HIC	Chronic Hazard Index
HIC-8	8-Hour Chronic Hazard Index
hp	Horsepower
HRA	Health Risk Assessment
HRSG	Heat Recovery System Generator
LADWP	Los Angeles Department of Water and Power
LBWD	City of Long Beach Water Department
LDA	Light Duty Automobile
LDT	Light Duty Truck
LST	Localized Significance Threshold
LTS	Less than Significant
LTSM	Less than Significant with Mitigation Incorporated
MDL	Method Detection Limit
MGD	Million Gallons per Day
MHDT	Medium-Heavy Duty Diesel Truck
MICR	Maximum Individual Cancer Risk
MT	Metric Ton

MW	Megawatt
MWh	Megawatt-Hour
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
O_3	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
OTC	Once-Through Cooling
PERP	Portable Equipment Registration Program
PFC	Perfluorocarbon
PM_{10}	Particulate Matter less than 10 Microns
$PM_{2.5}$	Particulate Matter less than 2.5 Microns
PMI	Point of Maximum Impact
PSI	Pollutant Screening Index
REL	Reference Exposure Level
RL	Reporting Level
RMP	Risk Management Policy
RO	Reverse Osmosis
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SF_6	Sulfur Hexafluoride
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	Sulfur Dioxide
SO_x	Oxides of Sulfur
SR	State Route
SRA	Source-Receptor Area
STG	Steam Turbine Generator
TAC	Toxic Air Contaminant
T-BACT	Toxics Best Available Control Technology
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WRP	Water Reclamation Plant

Air Quality, Greenhouse Gas, and Health Risk Studies for Haynes Generating Station Unit 8 Cooling Tower

1.0 PROJECT DESCRIPTION

The Los Angeles Department of Water and Power (LADWP) proposes to implement the Haynes Generating Station (Haynes) Unit 8 Recycled Water Cooling System Retrofit Project (also referred to herein as the Project or proposed project), which would modify the Haynes Generation Unit 8 condenser cooling system by installing a wet cooling system consisting of a mechanical-draft counter-flow cooling tower. The construction of the proposed project is scheduled to begin in late 2024, and primary facilities construction would be substantially complete by mid-2026. The cooling tower would become operational by mid-2027, after a commissioning phase.

1.1 Facility Background

The Haynes Generating Station is a natural gas-fired steam electric generating facility located at 6801 East 2nd Street in the City of Long Beach, County of Los Angeles, owned and operated by LADWP. Haynes currently operates two conventional steam generating units (Unit 1 and Unit 2); one combined cycle generation system consisting on two gas turbine generators (Units 9 and 10) that utilizes a heat recovery steam generator (HRSG) to capture waste heat generated by two gas combustion turbine units to drive a single common steam turbine generator (STG, Unit 8); and one simple cycle generation system consisting of six separate combustion turbine generators (Units 11 through 16) using an air cooled heat exchanger for cooling. The station operates an ocean-water intake channel that provides condenser cooling water to Units 1, 2, and 8.

Haynes is a fully developed industrial property, consisting of approximately 130 acres, the majority of which is located within Long Beach city limits. Approximately 7.5 acres in the northeast corner of Haynes are located in the City of Seal Beach, County of Orange. Most of the eastern station boundary is also the boundary between Los Angeles and Orange Counties, as well as the boundary between Long Beach and Seal Beach. The proposed cooling tower and auxiliary facilities would be located entirely within the Long Beach portions of the property. The Haynes property is designated for industrial use in the Long Beach Southeast Area Specific Plan and industrial light use in the Seal Beach General Plan, Planning Area 3.

Uses surrounding Haynes consist primarily of industrial, commercial, and residential functions, including the Leisure World Seal Beach residential retirement community along the entire eastern boundary of Haynes, separated from Haynes by the Orange County Flood Control Channel; light industrial functions (including offices, research and development, and manufacturing) in the Boeing Integrated Defense Systems Specific Plan Area (Seal Beach) to the southeast; the Island Village residential community to the south, across 2nd Street; the Los Cerritos Wetlands Complex properties in the historical Seal Beach Oil Field to the southwest; the Alamitos Generating Station (an electrical generating station operated by AES Corporation) along the entire western boundary, across the San Gabriel River channel; and residential areas and open space recreation to the north, across State Route (SR) 22.

1.2 Proposed Project Description

The proposed cooling tower system would utilize cooling process water that would pass water through the condenser of the to dissipate heat from the Unit 8 exhaust steam. This process water would be continually recycled through the condenser. However, because the temperature of the cooling process water would increase as it passes through the condenser and absorbs heat from the condensing steam, it would first need to be re-cooled before being cycled back through the condenser.

A cooling tower uses an open circuit in which the water is exposed to the air and cooled predominantly through the process of evaporation, whereby sensible and latent heat is transferred to the surrounding air, where the primary mechanism to induce evaporation is by distributing the water across the fill material surfaces. While a relatively small portion of the cooling water would be lost to the air as water vapor, the evaporative process (latent heat transfer) would provide significant cooling for the remaining water stream, allowing it to be repeatedly cycled through the condenser to meet the cooling demand of the STG.

The cooling tower to be installed at Haynes under the proposed project would be a mechanical draft tower, in which fans are used to assist in circulating air up through the tower to dissipate heat in the cooling process water. Because of the fans, the mechanical draft towers would require more energy than the current once-through cooling (OTC) system, but assuming full capacity operations, the net reduction in power output from the combined cycle generating system (CCGS) to operate the fans would be about 3.7 megawatts (MW), approximately 1.5% of the net generation capacity of the STG (Unit 8, 250 MW) as “parasitic load.” The fans would be located at the top of the tower, inducing airflow upward through the tower and inward at the base of the tower. This is known as a counterflow induced (mechanical) draft cooling tower. The lower side walls of the tower would consist of baffles, which would help direct airflow and provide protection from the elements.

Cooling process water exiting the generator condenser unit at an increased temperature (due to the transfer of heat from the STG exhaust steam) would be pumped to an upper level in the cooling tower and delivered to a manifold and nozzle system. The nozzles would evenly distribute the water over the surface of a structure known as the cooling fill, which would occupy the horizontal cross section of the interior of the tower. Due to the force of gravity, the water would drip down the fill in a thin film in a direction counter to the upward movement of the airflow through the tower.

The total maximum loss of process water from the cooling tower system would be approximately 4.1 million gallons per day (MGD) from evaporation, drift, and blowdown. This total is based on 24 hours of full capacity operation of the CCGS. Since the CCGS usually operates at considerably less than full capacity across a 24-hour period, average daily losses would be substantially lower. Based on projected annual operations for the CCGS, the average daily losses are estimated at 1 to 2 MGD.

Because of the prevailing weather conditions and marine influence around Haynes, it is projected that a visible plume may occur only about 9% of the time on an annual basis, primarily during nighttime hours in winter months. However, the proposed project would incorporate a plume abatement system that mixes cooler, dryer outside air with the exiting warmer, moister air in the upper levels of the tower, thereby reducing the likelihood of condensation in the atmosphere and resulting in the elimination of most visible plumes.

In addition, high-efficiency drift eliminators, considered Best Available Control Technology (BACT), are required for all cooling towers. State-of-the-art drift eliminators would be installed with an accepted efficiency of 0.0005% for non-contact process cooling water throughput.

The process water lost through evaporation, drift, and blowdown must be continually replaced with makeup water. The makeup water would not only ensure the required volume of water is available to maximize system efficiency, but it would also maintain water quality by replacing the higher-concentration blowdown water with lower-concentration makeup water that has not yet been subject to the evaporation process, which leads to higher concentrations of minerals and other impurities.

It is anticipated that recycled water from the Long Beach Water Reclamation Plant (WRP) would be utilized as the primary source of makeup water for the cooling tower. In addition to recycled water, it is LADWP's goal, to the extent feasible, to utilize industrial wastewater generated by various processes at Haynes for the proposed cooling tower's makeup water. A maximum of approximately 1.7 MGD of industrial wastewater is generated under current operations. Actual wastewater generation is intermittent and generally substantially less than this maximum. In addition, certain wastewater streams, such as the reject generated from reverse osmosis processes and blowdown from the steam-boiler generation units (Units 1 and 2), as well as the blowdown from the future operations of the cooling tower itself, could not be utilized for makeup water. The reusable wastewater would consist predominantly of demineralized blowdown water from the Units 9 and 10 HRSGs, which would provide a portion of the makeup water required for the proposed Haynes cooling tower.

Although it is anticipated that combination of recycled water from the Long Beach WRP and industrial wastewater from Haynes would normally fulfill the need for cooling tower makeup water, potable water would also be available as a backup supply in the event that volumes from the other identified sources were insufficient, depending on the available supply versus the demand of the cooling tower at a given time. The potable water would be provided by the municipal supplier, Long Beach Water (LBW). Based on supply and demand at a given time, the requirement for makeup water may be met by any combination of these various sources. However, using 100% recycled water due to its trace metals content is the most conservative case for the risk assessment element of the air quality impact analysis.

1.3 Project Phases

The planned construction would occur throughout a 30-month period from December 2024 through May 2027. Preliminarily, construction would occur in seven phases, as described below:

- Phase 1: Site Preparation and Earthwork – would involve use of a grader, backhoe loader, wheel loader, vibratory roller, compactor, excavators, and dump trucks to remove substructures from previous facilities excavation, filling, and compaction;
- Phase 2: Foundations and Piles – would involve use of a drill rig, backhoe loader, excavator, compactor, concrete pump truck, cranes, and dump trucks to install a poured concrete pile foundation system cast around reinforced steel (rebar);
- Phase 3: Cooling Tower and Auxiliary Equipment- would involve use of a hydraulic crane, wheel loader, articulated aerial lift, and welders to erect a steel frame for each tower cell and install interior components, pumping devices, drift eliminators, and plume abatement;

- Phase 4: Makeup Water Storage Tank, Wastewater and Stormwater Holding Tanks – would involve use of a hydraulic crane, wheel loader, concrete pump truck, excavator, and welders to construct tanks build of either pre-stressed tensioned concrete or welded steel;
- Phase 5: Water Infrastructure – would involves use of an excavator, backhoe loader, trencher, welder, and vibratory roller to install makeup water and wastewater pipeline infrastructure;
- Phase 6: Outage, Tie-Ins, and Commissioning – would involve minor equipment used to start-up and adjust the cooling system under full operating conditions final site cleanup, and any necessary repaving; and
- Phase 7: Demolition of Aboveground OTC Pipelines – would involve the use of a backhoe loader, wheel loader, hydraulic crane, and articulated aerial lift to remove portions of the OTC aboveground pipelines and appurtenant equipment.

2.0 AIR QUALITY IMPACTS ANALYSES

A project's construction phase produces many types of emissions, but particulate emissions [particulate matter less than 10 microns (PM_{10}), including particulate matter less than 2.5 microns ($PM_{2.5}$)] in fugitive dust and diesel engine exhaust are typically the pollutants of greatest concern for such a project. Fugitive dust emissions can result from a variety of construction activities, including excavation, grading, demolition, vehicle travel on paved and unpaved surfaces, and vehicle exhaust. The use of diesel-fueled construction equipment emits PM_{10}, ozone (O_3) precursors oxides of nitrogen (NO_x) and volatile organic compounds (VOCs), carbon monoxide (CO), small amounts of sulfur oxides (SO_x), and diesel particulate matter (DPM, as PM_{10}). Construction-related emissions can cause increases in localized concentrations of PM_{10}, as well as affect compliance with ambient air quality standards on a regional basis. Particulate emissions from construction activities can lead to adverse health effects and nuisance concerns such as reduced visibility and soiling of exposed surfaces.

The term "project operations" refers to the full range of activities that can or may generate criteria pollutants (NO_x, VOC, CO, SO_x, PM_{10}, $PM_{2.5}$), greenhouse gas (GHG), or toxic air contaminant (TAC) emissions when the project is functioning in its intended use. For residential, commercial, retail, and recreational land use projects, motor vehicles traveling to and from the project site represent the primary source of operational air pollutant emissions. For industrial projects and some commercial projects, equipment operation and manufacturing processes, i.e., permitted stationary sources, can be of greatest concern from an emissions standpoint.

2.1 Environmental Settings

Air pollution problems in the South Coast Air Basin (SCAB) are a consequence of the combination of emissions from the nation's second largest urban area, meteorological conditions adverse to the dispersion of those emissions, and mountainous terrain surrounding the SCAB that traps pollutants as they are pushed inland with the sea breeze. The average wind speed for Los Angeles is the lowest of the nation's 10 largest urban areas. In addition, the summertime daily maximum mixing heights in southern California are the lowest, on average, due to strong temperature inversions in the lower atmosphere that effectively trap pollutants near the surface. Southern California also has abundant sunshine, which drives the photochemical reactions that form pollutants such as O_3 and a significant portion of $PM_{2.5}$.

In the SCAB, high concentrations of O_3 are normally recorded during the late spring and summer months, when more intense sunlight drives enhanced photochemical reactions. Elevated PM_{10} and $PM_{2.5}$ concentrations can occur in the SCAB throughout the year but occur most frequently in fall and winter. Although there are some changes in emissions by day of the week and season, the observed variations in pollutant concentrations are primarily the result of seasonal differences in weather conditions.

The SCAB is designated nonattainment for the 1-hour and 8-hour state O_3 standards, the 8-hour federal O_3 standard, the 24-hour state PM_{10} standard, and the state and federal annual $PM_{2.5}$ standards. The Los Angeles County portion of the SCAB is also designated a nonattainment area for the federal lead standard on the basis of source-specific monitoring at two impacted industrial locations as determined by the United States Environmental Protection Agency (EPA) using 2007-2009 data. However, all air monitoring stations in the SCAB, including the near-source monitoring in Los Angeles County, have remained below the lead National Ambient Air Quality Standards

(NAAQS) for the period from 2012 through 2015. In June 2013, the EPA approved re-designation of the SCAB as an attainment area for the federal 24-hour PM_{10} standard. The SCAB also continues to be in attainment of the carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) NAAQS (SCAQMD 2017a, 2018).

2.2 Regulatory Setting

2.2.1 South Coast Air Quality Management District

The Project would be implemented in the SCAB under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). A few SCAQMD rules may potentially apply to project construction, which are summarized below. The project is not expected to require the use of any construction equipment that would require a permit from the SCAQMD.

2.2.1.1 Rule 219 – Equipment Not Requiring a Written Permit Pursuant to Regulation II

The purpose of this rule is to identify equipment, processes, or operations that emit small amounts of air contaminants that shall not require written permits, unless such equipment, process or operation is subject to subdivision (s) – Exceptions. In addition, exemption from written permit requirements in this rule is only applicable if the equipment, process, or operation is in compliance with subdivision (t) of the rule.

Under paragraph (d)(3)(B) of the rule, written permits are not required for "Industrial cooling towers located in a chemical plant, refinery or other industrial facility, provided a filing pursuant to Rule 222 is submitted to the Executive Officer". The proposed cooling tower would qualify for this exemption under Rule 219.

2.2.1.2 Rule 222 – Filing Requirements for Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II

The purpose of this rule is to provide an alternative to written permits. This rule requires owners/operators of specified emission sources to submit information regarding the source, including, but not limited to 1) a description of the source; 2) data necessary to estimate emissions from the source; and 3) information to determine whether the equipment is operating in compliance with applicable District, state and federal rules and regulations.

As a Rule 219 exempt source, the cooling tower would qualify for Rule 222 registration under the definition "Industrial water cooling towers not used for evaporative cooling of process water or not used for evaporative cooling of water from barometric jets or from barometric condensers and in which no chromium compounds are contained, located in a chemical plant, refinery or other industrial facility."

2.2.1.3 Rule 401 – Visible Emissions

This rule prohibits the discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than 3 minutes in any 1 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 as described in subparagraph (b)(1)(A) of this rule.

2.2.1.4 Rule 402 – Nuisance

This rule prohibits the 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.

2.2.1.5 Rule 403 – Fugitive Dust

The purpose of this rule is 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. The provisions of this rule shall apply to any activity or man-made condition capable of generating fugitive dust.

The rule has a number of provisions; the most important of these is that a project that has the potential to emit fugitive dust is required to implement dust control measures such as watering and wind fences to minimize the generation and dispersion of fugitive dust. Dust that is tracked out onto a paved public road should be swept up regularly.

2.2.1.6 Rule 1113 – Architectural Coatings

This rule is applicable to any person who supplies, sells, markets, offers for sale, or manufactures any architectural coating that is intended to be field applied within the District to stationary structures or their appurtenances, and to fields and lawns; as well as any person who applies, stores at a worksite, or solicits the application of any architectural coating within the District. The purpose of this rule is to limit the VOC content of architectural coatings used in the District.

The rule limits the VOC content of architectural coatings; the allowable VOC content depends on the specific substrate and type of coating to be applied. Generally, coatings applied to structural components following installation, including valves, piping, and building elements (e.g., walls, doors), are considered architectural applications.

2.2.2 California Air Resources Board Requirements

2.2.2.1 Portable Equipment Registration Program

The project is expected to require portable diesel-fueled equipment, such as a small generator and light plants. If these devices are more than 50 horsepower (hp), the equipment is required to be registered with the California Air Resources Board (CARB) through the Portable Equipment Registration Program (PERP) and labeled accordingly. Alternatively, the equipment would require a permit from the SCAQMD. Equipment that is less than 50 hp does not require a permit or PERP registration. A crane that uses a dedicated engine to power the lifting activities may require PERP registration; however, if the crane has only one engine that both drives the vehicle wheels and operates the lifting apparatus, PERP is not required.

2.2.2.2 DOORS Program

Off-road heavy equipment (e.g., excavators, graders) would require registration and labeling under the Diesel Off-Road Online Reporting System (DOORS) program.

2.3 CEQA Significance Criteria

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains the Environmental Checklist Form comprising a series of questions intended to encourage thoughtful assessment of impacts. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

c) Expose sensitive receptors to substantial pollutant concentrations?

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

The Environmental Checklist Form Air Quality questions are addressed in Section 2.9.

In order to evaluate the questions in the air quality and GHG emissions sections of the checklist, quantitative significance criteria established by the local air quality agency, such as the SCAQMD, may be relied upon to make significance determinations based on mass emissions of criteria pollutants and GHGs, as determined in this report.

CEQA significance thresholds address the impacts of construction and operational emissions on local and regional air quality. Thresholds are also provided for other potential impacts related to project construction and operation, such as odors and TACs. The SCAQMD quantitative significance thresholds shown in Table 2-1 are used to evaluate project emissions impacts (SCAQMD 2019).

Table 2-1: SCAQMD CEQA Thresholds of Significance

Pollutant	Project Construction	Project Operation
ROG (VOC)	75 lbs/day	55 lbs/day
NO_x	100 lbs/day	55 lbs/day
CO	550 lbs/day	550 lbs/day
SO_x	150 lbs/day	150 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day
24-hour $PM_{2.5}$ Increment	10.4 µg/m3	2.5 µg/m3
24-hour PM_{10} Increment	10.4 µg/m3	2.5 µg/m3
Annual PM_{10} Increment	1.0 µg/m^3 annual average	
1-hour NO_2 Increment	0.18 ppm (state)	
Annual NO_2 Increment	0.03 ppm (state) and 0.0534 ppm (federal)	
1-hour SO_2 Increment	0.25 ppm (state) and 0.075 ppm (federal – 99th percentile)	
24-hour SO_2 Increment	0.04 ppm (state)	
24-hour Sulfate Increment	25 µg/m^3 (state)	
1-hour CO Increment	20 ppm (state) and 35 ppm (federal)	
8-hour CO Increment	9.0 ppm (state/federal)	
	Maximum Incremental Cancer Risk ≥10 in one million	

Pollutant	Project Construction	Project Operation
TACs (including carcinogens and non-carcinogens)	Cancer Burden >0.5 excess cancer cases (in areas ≥1 in one million)	
	Chronic and Acute Hazard Index ≥1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to Rule 402	
GHGs	10,000 MT/yr CO_2e for industrial facilities	

Source: SCAQMD 2019.

Note:

CO_2e = carbon dioxide equivalent

2.4 Construction Emissions Methodology

The construction emissions analysis was performed using the California Emissions Estimator Model® (CalEEMod) version 2016.3.2, the official statewide land use computer model designed to provide a uniform platform for estimating potential criteria pollutant and GHG emissions associated with construction of land use projects under CEQA. The model quantifies direct emissions from construction, including off-road equipment and on-road vehicle use. The mobile source emission factors used in the model include the AB 1493 standards of 2002 (Pavley) and Low Carbon Fuel Standards. The model also identifies regulatory measures and mitigation measures to reduce criteria pollutant and GHG emissions and calculates the benefits achieved from the selected measures. CalEEMod was developed by the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the SCAQMD, the Bay Area Air Quality Management District (BAAQMD), the San Joaquin Valley Air Pollution Control District (SJVAPCD), and other California air districts. Default land use data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) were provided by the various California air districts to account for local requirements and conditions.

The following information and assumptions were used in developing the emissions estimates for the Project using CalEEMod:

- Some project parameters were defined by LADWP, while others were determined using Google Earth measurement tools or approximated using the site plan drawings;
- Default or derived construction equipment hp ratings and load factors contained in CalEEMod were applied to all phases of the Project; and
- The default equipment performance parameters from CalEEMod for each construction phase are representative of actual construction equipment used during construction.

The Project is expected to require approximately 30 months (2½ years) of planned work activities in aggregate, comprising seven defined construction phases, as outlined below. Based on the project description and information determined using Google Earth, land use data for CalEEMod input is shown in Table 2-2.

Table 2-2: Land Use Data for CalEEMod Input – Haynes

Project Element	Land Use Type	Land Use Subtype	Disturbed Acreage	Footprint Square Feet	Urbanization
Cooling Tower	Industrial	General Heavy Industry	0.57	25,000	Urban

Sources: LADWP 2021, CalEEMod Version 2016.3.2.

2.5 Construction Schedule

The planned construction schedule used in this analysis assumes 5 working days per week throughout a 30-month period from December 2024 through May 2027. Construction would occur in seven phases, six of which have one or more months of overlap; however, to calculate emissions using CalEEMod, each construction phase was modeled discretely, then overlapping phase results were added together to obtain daily maxima for paired phases. Total emissions accumulate across all phases. Phases and any schedule overlaps are as follows:

- Phases 1 and 2 in June and July 2025 (2 months);
- Phases 2 and 3 in August thru October 2025 (3 months);
- Phases 3 and 4 in November 2025 thru April 2026 (6 months);
- Phase 5 in 2026 (overlaps with no other phase); and
- Phases 6 and 7 in December 2026 thru February 2027 (3 months).

Construction phases used in CalEEMod, along with the duration and number of estimated working days used in the construction air impact analysis, is summarized in Table 2-3.

Table 2-3: Construction Schedule and Working Days (5 days/week)

Construction Phase	CalEEMod Phase Type	Start Date	End Date	Number of Months	Number of Working Days
Site Preparation and Earthwork	Site Preparation	December 2024	July 2025	8	168
Foundation and Piles	Grading	June 2025	October 2025	5	107
Cooling Tower and Auxiliary Equipment	Building Construction	August 2025	April 2026	9	188
Makeup Water and Wastewater Tanks	Building Construction	November 2025	April 2026	6	123
Water Infrastructure	Pipelines Infrastructure	May 2026	August 2026	4	83
Outage, Tie-ins, and Commissioning	Construction	November 2026	May 2027	7	148
Demo OTC Pipeline	Demolition	December 2026	February 2027	3	58

2.6 Construction Emissions Analysis

2.6.1 Criteria Mass Emissions

Construction emissions predicted by CalEEMod were compared to determine the maximum daily (peak) emissions. Predicted peak ROG, NO_x, CO, and SO_x emissions occur between November 2025 and April 2026 with the overlap of Phases 3 and 4. Peak PM_{10} and $PM_{2.5}$ emissions occur in June and July 2025 with the overlap of Phases 1 and 2. Peak criteria pollutant emissions are summarized in Table 2-4, compared to the SCAQMD significance thresholds in Table 2-1. The CalEEMod output is provided in Appendix A.

Table 2-4: Construction Emissions Summary and Significance Evaluation

Criteria Pollutants	Peak Emissions (lbs/day)	Threshold (lbs/day)	Significance
ROG (VOC)	4.7	75	LTS
NO_x	36.0	100	LTS
CO	43.0	550	LTS
SO_x	0.1	150	LTS
Total PM_{10}	2.7	150	LTS
Total $PM_{2.5}$	1.5	55	LTS

Sources: Applicant 2021, SCAQMD 2019, CalEEMod version 2016.3.2.

Notes:

Total PM_{10}/$PM_{2.5}$ comprises fugitive dust plus engine exhaust.

LTS: less than significant

As shown in Tables 2-4 and 2-5, mass emissions of criteria pollutants from construction are below applicable SCAQMD significance thresholds.

PROJECTED IMPACT: Less Than Significant

MITIGATION: None required

2.6.2 Localized Significance Thresholds

The SCAQMD's Localized Significance Threshold (LST) methodology (SCAQMD 2008a) was used to evaluate the impacts of NO_x, CO, PM_{10}, and $PM_{2.5}$ emissions associated with project construction activities. Introduced in 2003, the LST methodology was revised in 2008 to include the $PM_{2.5}$ significance threshold methodology and update the LST mass rate lookup tables for the new 1-hour NO_2 standard.

For determining localized air quality impacts, the LST methodology provides mass emissions rate lookup tables for projects up to 5 acres in size. Thus, the tabulated LSTs can be used for this project. The tabulated LSTs represent the maximum mass emissions from a project that will not cause or contribute to an exceedance of California or national ambient air quality standards (CAAQS or NAAQS) for the above pollutants and were developed based on ambient concentrations of these pollutants for each source-receptor area (SRA) in the SCAB (SCAQMD 2008a).

The active Project site area is approximately 2 acres overall in SRA Zone 4 – South Coastal Los Angeles County. Thus, the 2-acre category screening lookup tables were used to evaluate NO_x, CO, PM_{10}, and $PM_{2.5}$ impacts on nearby receptors. The nearest residential receptor is approximately 950 feet (290 meters) away from the cooling tower area of the site. To ensure impacts are not underestimated, the impact evaluation was performed using the closest distance within the SCAQMD LST tables of 200 meters for construction. LST results are shown in Table 2-5.

Table 2-5: Construction Localized Significance Threshold Evaluation

Criteria Pollutants	Peak Emissions (lb/day)	Threshold (lb/day)	Percent of Threshold	Result
NO_x	36.0	106	34%	Pass
CO	43.0	2,869	2%	Pass
Total PM_{10}	2.7	70	4%	Pass
Total $PM_{2.5}$	1.5	30	5%	Pass

Sources: SCAQMD 2008a, CalEEMod Version 2016.3.2.

Note: Source-receptor area – South Coastal LA County – Zone 4; 2-acre area, 200 meters to receptor.

The LST results provided in Table 2-5 show that on-site emissions from construction would meet the LST passing criteria at the nearest receptors (200 meters).

PROJECTED IMPACT: Less Than Significant

MITIGATION: None required

2.6.3 Construction Health Risk Assessment

DPM emissions, as TACs, are generated from the diesel-fueled construction equipment, in particular during the most intensive construction phases: phase 1 site preparation and phase 2 foundation work. As planned, these two phases would last 11 months in combination and would overlap for only 2 months in June and July 2025.

All engine-driven equipment would operate intermittently and only when needed, generally not more than a few hours at a time on some days, or about 25-30% overall equipment utilization during the course of the seven construction phases. A Tier 3 Health Risk Assessment (HRA) was performed to determine the health risk impacts of project construction at nearby receptors (SCAQMD 2017b).

2.6.3.1 Air Dispersion Modeling Methodology

The air dispersion modeling was performed using the EPA program AERSCREEN (version 21112). AERSCREEN is the EPA-recommended screening model based on AERMOD. The model provides a characterizing source-receptor configuration by calculating a Gaussian plume to predict ambient concentrations at defined receptor distances. The model generates a three-dimensional concentration field from a source under fixed meteorological conditions [wind speed (m/s), wind direction (degrees), and temperature (°K)], and mass emission rates (g/s). AERSCREEN provides 1-hour ground level concentrations in units of micrograms per cubic meter (μg/m^3) at distance increments of 25 meters on a polar coordinate system.

Local dispersion modeling parameters (minimum and maximum temperatures, surface albedo, Bowen ratio, and surface roughness length) were configured in AERSCREEN to be consistent with other projects within the SCAB. The dispersion modeling was performed using AERSCREEN's default meteorological data, which was designed by the EPA to be conservative and thus health-protective.

AERSCREEN was run with a one gram per second (1 g/s) unit emission rate to obtain the X/Q values in units of (μg/m^3)/(g/s), as necessary for the health risk calculations described below. Because cancer risk and chronic non-cancer hazards from DPM emissions are the standard health impacts evaluated for construction, the hourly ground level concentrations predicted by AERSCREEN were multiplied by 0.1 to obtain annual average ground level concentrations (EPA 2021a, 2021b, 1992).

2.6.3.2 Screening HRA Modeling Methodology

Cancer risk and non-cancer chronic hazard index (HIC) calculations were performed using screening HRA assumptions that include Office of Environmental Health Hazard Assessment (OEHHA) (2015) methodologies for exposure periods consistent with the designated land use and cancer risk calculations using the Risk Management Policy (RMP) Derived Method. The only exposure pathway evaluated was inhalation of DPM, as DPM is not a multipathway pollutant. Cancer risk and HIC were estimated for the entire construction schedule as the exposure period for predicted concentrations at the specific distances of receptors from the project site. The ground level concentration input used the annual average concentration of DPM (µg/m^3) was determined by multiplying X/Q [(µg/m^3)/(g/s)] times the annual average emission rate (g/s). The non-cancer acute hazard index (HIA) was not calculated because DPM does not have a published acute Reference Exposure Level (REL) (EPA 2021a, 2021b, OEHHA 2015, SCAQMD 2017b).

2.6.4 Significance Criteria/Results

The SCAQMD has established the following significance criteria for emissions of TACs, including carcinogens and non-carcinogens (SCAQMD 2019):

- Maximum Individual Cancer Risk (MICR) ≥10 in one million;
- Cancer Burden >0.5 excess cancer cases (in areas ≥1 in one million); and
- HIC and HIA ≥1.0 (project increment).

TAC emissions are limited to DPM from engine exhaust emitted during on-site construction activities during the construction period. For the conservative case, i.e., lowermost age bins (third trimester, 0-2 years, 2-5 years), Table 2-6 presents the results of the construction HRA.

Table 2-6: Construction Tier 3 HRA Results – Conservative Case

Scenario	Maximum Modeled 1-Hour X/Q (µg/m^3)/(g/s)	Maximum Annual X/Q Concentration (µg/m^3)/(g/s)	Annual Emissions (g/s)	Maximum Annual DPM Concentration (µg/m^3)	Cancer Risk (in one million)	Cancer Risk Exposure Duration (years)	Chronic Hazard Index
Fenceline (250 m)	54.11	5.41	4.11E-03	0.02226	7.94	2.5	0.0045
Resident (280 m)	47.81	4.78	4.11E-03	0.01967	7.02	2.5	0.0039
Worker AES (340 m)	37.47	3.75	4.11E-03	0.01542	3.98	25	0.0031

Sources: EPA 2021a, EPA 2021b, EPA 1992, OEHHA 2015, SCAQMD 2017b.

2.6.5 Discussion/Conclusion

As shown in Table 2-6, all cumulative cancer risk values for the conservative lowermost age bins are less than the 10 in one million threshold, and chronic non-cancer risks are below the unity threshold (1.0). Because the residential area is a retirement community

(Leisure World), the lowermost age bin conservative case is unlikely, and actual impacts would be less.

PROJECTED IMPACT: Less Than Significant

MITIGATION: None required

2.7 Operational Emissions

2.7.1 Criteria Mass Emissions

Particulate matter emission would result from operation of the proposed cooling tower. Daily mass emissions were estimated based on the maximum concentration of total dissolved solids (TDS) in cooling tower water allowable to maintain operational integrity. This level is 5,000 mg/L (ppmw). This is a highly conservative assumption because the TDS concentrations in the actual source water would be considerably lower. As discussed above, the cooling tower would use make-up water from various sources, including recycled water, industrial wastewater (predominantly demineralized blowdown water from the heat recovery steam generators of Generation Units 9 and 10), and potable water. Of these sources, the recycled water is anticipated to have the highest level of TDS, which is expected to range from 600 mg/L to 700 mg/L (maximum supplied concentration). The cooling tower would also be equipped with 0.0005% drift eliminators as BACT. Per SCAQMD methodology, computed emissions of PM_{10} and $PM_{2.5}$ are summarized in Table 2-7, which compares maximum cooling tower emissions to the SCAQMD significance thresholds shown in Table 2-1 (SCAQMD 2006).

Table 2-7: Operational Emissions Summary and Significance Evaluation

Criteria Pollutants	Maximum Potential Emissions (lbs/day)	Threshold (lbs/day)	Significance
Total PM_{10}	34	150	LTS
Total $PM_{2.5}$	20	55	LTS

Sources: Applicant 2021, SCAQMD 2019, SCAQMD 2006.

Notes:

PTE for 5,000 ppmw maximum TDS and 0.0005% drift fraction (BACT).

TDS expected to average approximately 3,000 ppmw (20 lb/day PM_{10}; 12 lb/day $PM_{2.5}$)

LTS: less than significant

2.7.2 Operational Screening Health Risk Assessment

An operational HRA is required if TAC emissions from the operation of the cooling towers exceeds the screening emission levels. The cooling tower would use the following water treatment agents for pH control, corrosion control, and biological growth control: sodium hypochlorite, sulfuric acid, and TriACT, which consists of a mixture of amines (monoethanolamide, methoxypropylamine, and cyclohexylamine).

The nearest residential receptor is more than 100 meters (330 feet) from the cooling tower, which is the furthest source-receptor distance in the SCAQMD Tier 1 Screening Emissions Levels lookup tables (SCAQMD 2017b). Since the actual source-receptor distance is greater than 250 meters (fenceline), these evaluations are objectively conservative because concentrations would be more dilute than the screening table limits.

2.7.2.1 Water Treatment Agents TAC Emissions

TAC emissions are limited to the emissions from the water treatment agents in the cooling tower. The calculated maximum cooling water flow rate is 84,096 million gallons per year if the cooling tower operated continuously, which is a highly conservative assumption.

The water treatment agents used on-site and daily and maximum annual usage proposed by the facility are summarized in Table 2-8. Maximum amounts are used for conservatism in the risk assessment. Thus, if maxima do not cause and exceedance of risk thresholds, neither would average operating conditions.

Table 2-8: Water Treatment Agents – Maxima

Water Treatment Agents	Peak Daily Usage (gal/day)	Maximum Annual Usage (gal/year)
Sodium Hypochlorite	505	184,325
Sulfuric Acid	505	184,325
Tri-ACT	38	13,870

The treatment agents, chemical compositions, and amounts used (pounds per year) are summarized in Table 2-9.

Table 2-9: Chemical TACs in Water Treatment Agents – Maxima

Water Treatment Agents	Composition Chemicals	TAC (Yes/No)	Specific Gravity	Density (lbs/gal)	Composition (wt. %)	Maximum Annual Usage (lbs/year)
Sodium Hypochlorite	Sodium Hypochlorite	No	1.17	9.76	16%	287,950
	Sodium Hydroxide	Yes			1%	17,997
Sulfuric Acid	Sulfuric Acid	Yes	1.1	9.18	5%	84,601
Tri-ACT	Monoethanolamine	No	–	8.2	60%	68,240
	Methoxypropylamine	No			60%	68,240
	Cyclohexylamine	No			30%	34,120

Source: LADWP 2021.

The TAC emissions were conservatively estimated using Equations 1 and 2:

$$TAC\ Emissions\ \left(\frac{lb}{hr}\right) = \frac{\left[TAC\ Chemical\ \left(\frac{lb}{year}\right)\right]}{Cooling\ Water\ \left(\frac{lb}{year}\right)} \times PM\ emissions\ \left(\frac{lb}{day}\right) \times \left(\frac{day}{24\ hr}\right) \quad \text{(Eq. 1)}$$

$$TAC\ Emissions\ \left(\frac{lb}{year}\right) = \frac{\left[TAC\ Chemical\ \left(\frac{lb}{year}\right)\right]}{Cooling\ Water\ \left(\frac{lb}{year}\right)} \times PM\ emissions\ \left(\frac{lb}{year}\right) \quad \text{(Eq. 2)}$$

The TAC emissions are summarized in Table 2-10.

Table 2-10: Chemical TAC Emissions – Maxima

Chemicals	Hourly Emissions (lb/hr)	Annual Emissions (lb/year)
Sodium Hydroxide	3.08E-08	2.70E-04
Sulfuric Acid	1.45E-07	1.27E-03

Source: LADWP 2021.

2.7.2.2 Significance Criteria/Results

SCAQMD Rule 1401 establishes methodologies and thresholds for evaluating air toxics emissions impacts based on a tiered approach, i.e., Tiers 1, 2, 3, and 4 procedures (SCAQMD 2017b). The Tier 1 screening level involves a look-up table (Attachment N, Table 1.0 of the methodology document) in which equipment emissions are compared to the screening level. The screening levels are pollutant emission thresholds which are not expected to produce an MICR greater than 1 in one million nor a hazard index greater than 1.0. The screening levels are based on the distance to the nearest receptor. The nearest receptor is more than 100 meters (330 feet). Exceedances of these screening levels indicate that a screening HRA is required. The screening levels and the emissions comparison are summarized in Table 2-11 and show that emissions are 5 to 6 orders-of-magnitude below thresholds. An HRA for water treatment chemicals is not needed because emissions are negligible.

Table 2-11: Water Treatment Emissions Screening Level Results – Maxima

Chemical TACs	Annual Emissions (lbs/year)	Hourly Emissions (lbs/hr)	Annual Pollutant Screening Level (lbs/year)	Hourly Pollutant Screening Level (lbs/hr)	Exceeded? (Yes/No)
Sodium Hydroxide	2.70E-04	3.08E-08	–	1.10E-02	No
Sulfuric Acid	1.27E-03	1.45E-07	3.01E+02	1.66E-01	No

Source: LADWP 2021, SCAQMD 2017b.

2.7.2.3 Recycled Water Impurities TAC Emissions

The cooling tower would use make-up water from various sources, i.e., combinations of recycled water, industrial wastewater (predominantly demineralized blowdown water from the Units 9 and 10 HRGSs, and potable water. In particular, the use of recycled water from the Long Beach WRP in the cooling tower would introduce trace levels of metals, inorganics, and organics into the system.

The recycled water quality report for 2020 (LADWP 2021L) was used as the basis for identifying trace metallic, inorganic, and organic compounds that could be emitted from the proposed cooling tower. The water quality report presented results for chemicals that were detected and quantified above the reporting level (RL), as well as chemicals that were above the laboratory method detection limit (MDL) but below the RL and thus could not be quantified (i.e., did not have a measured concentration value). Chemicals that were detected but not quantified were labeled in the water quality report as "DNQ Est. Conc" and assigned an estimated concentration that was between the MDL and the RL. These "did not quantify" (DNQ) compounds were not used in the risk analysis because they lacked a measured value.

Ten (10) Rule 1401 TAC compounds occur in recycled water above their respective RLs, in parts per billion by weight (ppbw), as micrograms per liter (µg/L). These trace compounds would be entrained in liquid drift droplets emanating from the top of the cooling tower during Unit 8 operation[1]. The conservative assumption for assessing water source risk is that 100% recycled water would be used in the cooling tower, and the quantifiable trace constituents at or above RL would provide a basis for determining TAC emissions from the tower. Table 2-12 presents the SCAQMD Rule 1401 Tier 1 application screening index (ASI) calculation for the computed amounts of trace compounds (maxima) and corresponding pollutant standard indices (PSIs), and cumulatively compares these amounts to the Rule 1401 Tier 1 ASI threshold of 1 (unity) for annual or hourly emission rates (LADWP 2021L, SCAQMD 2017b). Detailed spreadsheets are provided in Appendix B.

Table 2-12: Rule 1401 Tier 1 Application Screening Index Calculation

TAC Code	Reportable Compounds	Average Annual Emission Rate (lbs/yr)	Max Hourly Emission Rate (lbs/hr)	Cancer/ Chronic Pollutant Screening Level (lbs/yr)	Acute Pollutant Screening Level (lbs/hr)	Cancer/ Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
A11	Arsenic and Compounds (Inorganic)	1.10E-02	1.25E-06	3.81E-03	2.76E-04	2.87E+00	4.54E-03
C23	Copper and Compounds	6.75E-03	7.73E-07	–	1.38E-01	–	5.60E-06
M3	Mercury and Compounds (Inorganic)	9.45E-06	1.08E-09	2.34E+00	8.28E-04	4.04E-06	1.31E-06
N12	Nickel and Compounds	4.30E-03	4.93E-07	4.88E-01	2.76E-04	8.82E-03	1.79E-03
A9	Ammonia	1.26E+01	1.44E-03	6.02E+04	4.42E+00	2.09E-04	3.26E-04
D12	1,4-Dioxane (1,4-Diethylene Dioxide)	4.90E-03	5.61E-07	1.65E+01	4.14E+00	2.97E-04	1.35E-07
C11	Chloroform	2.83E-02	3.24E-06	2.34E+01	2.07E-01	1.21E-03	1.57E-05
F1	Fluorides	2.31E+00	2.65E-04	6.86E+02	3.31E-01	3.37E-03	8.00E-04
N4	n-Nitrosodimethylamine	3.18E-04	3.65E-08	2.78E-02	–	1.15E-02	–
T3	Toluene	2.97E-03	3.40E-07	9.03E+04	5.11E+01	3.29E-08	6.66E-09
Total Application Screening Index (ASI)						**2.90E+00**	**7.48E-03**
Results						**Fail**	**Pass**

Sources: LADWP 2021L, SCAQMD 2017b, SCAQMD Risk Tool V1.103.

Under Rule 1401, the following requirements must be met (SCAQMD 2017b):

- The cumulative increase from all TACs emitted from a single piece of equipment shall not cause the MICR to exceed 1 in one million (10^{-6}) if Best Available Control Technology for Toxics (T-BACT) is not used, or 10 in one million (10^{-5}) if T-BACT is used;
- The cumulative cancer burden from all TACs emitted from a single piece of equipment (increase in cancer cases in the population) shall not exceed 0.5; and
- Neither the HIC, the 8-hour chronic hazard index (HIC-8), nor the HIA from all TACs emitted from a single piece of equipment shall exceed 1.0 for any target organ system, or an alternate hazard index level deemed to be safe.

Because the Rule 1401 Tier 1 ASI calculation results shown in Table 2-12 exceed the annual threshold of 1 (fail), a Rule 1401 Tier 2 screening analysis was performed for MICR

[1] Drift fraction 0.0005% for high-efficiency drift eliminators as BACT.

at the nearest receptor, as well as HIA, HIC, and HIC-8. The MICR results shown in Table 2-13 and hazard index results shown in Table 2-14 indicate passing scores for all parameters, i.e., MICR less than 1 in one million (BACT), HIA less than 1, HIC less than 1, and HIC-8 less than 1 (LADWP 2021L, SCAQMD 2017b, SCAQMD 2019).

Table 2-13: Rule 1401 Tier 2 MICR Summary

TAC Code	Reportable Compounds	Residential	Commercial
A11	Arsenic and Compounds (Inorganic)	2.21E-07	8.46E-09
C23	Copper and Compounds	0.00E+00	0.00E+00
M3	Mercury and Compounds (Inorganic)	0.00E+00	0.00E+00
N12	Nickel and Compounds	6.77E-10	5.58E-11
A9	Ammonia	0.00E+00	0.00E+00
D12	1,4-Dioxane (1,4-Diethylene Dioxide)	2.28E-11	1.88E-12
C11	Chloroform	9.30E-11	7.67E-12
F1	Fluorides	0.00E+00	0.00E+00
N4	n-Nitrosodimethylamine	8.80E-10	7.26E-11
T3	Toluene	0.00E+00	0.00E+00
Total MICR		**2.22E-07**	**8.60E-09**
Results		**Pass**	**Pass**

Sources: LADWP 2021L, SCAQMD 2017b, SCAQMD Risk Tool V1.103.

Table 2-14: Rule 1401 Tier 2 Hazard Index Summary

Target Organs	Acute (HIA)	Chronic (HIC)	8-Hour Chronic (HIC)	Acute (Pass/Fail)	Chronic (Pass/Fail)	8-Hour Chronic (Pass/Fail)
Alimentary system (liver) – AL	0.00E+00	2.45E-08	0.00E+00	**Pass**	**Pass**	**Pass**
Bones and teeth – BN	–	2.59E-04	0.00E+00	**Pass**	**Pass**	**Pass**
Cardiovascular system – CV	1.49E-04	1.64E-02	1.86E-04	**Pass**	**Pass**	**Pass**
Developmental – DEV	1.49E-04	1.65E-02	1.86E-04	**Pass**	**Pass**	**Pass**
Endocrine system – END	–	0.00E+00	0.00E+00	**Pass**	**Pass**	**Pass**
Eye	3.68E-05	0.00E+00	0.00E+00	**Pass**	**Pass**	**Pass**
Hematopoietic system – HEM	0.00E+00	7.84E-05	0.00E+00	**Pass**	**Pass**	**Pass**
Immune system – IMM	5.84E-05	0.00E+00	1.83E-05	**Pass**	**Pass**	**Pass**
Kidney – KID	–	3.35E-07	4.02E-08	**Pass**	**Pass**	**Pass**
Nervous system – NS	1.49E-04	1.64E-02	1.86E-04	**Pass**	**Pass**	**Pass**
Reproductive system – REP	1.49E-04	1.65E-02	1.86E-04	**Pass**	**Pass**	**Pass**
Respiratory system – RESP	3.75E-05	1.67E-02	2.05E-04	**Pass**	**Pass**	**Pass**
Skin	0.00E+00	1.64E-02	1.86E-04	**Pass**	**Pass**	**Pass**

Sources: LADWP 2021L, SCAQMD 2017b, SCAQMD Risk Tool V1.103.

2.7.2.4 Discussion/Conclusion

Emissions from the use of cooling tower water treatment agents and recycled/reclaimed water are less than the SCAQMD Rule 1401 Tier 1 or Tier 2 screening thresholds, as applicable. Thus, a Tier 3 or Tier 4 HRA with dispersion modeling is not required. Use of Long Beach Blended Zone potable water as make-up water would result in more dilution of trace metals because potable water contains less trace metals. For example (for corresponding analytes), recycled water contains 3.13 µg/L arsenic while potable water contains up to 2.5 µg/L, which is 20% less. Recycled water contains 360 µg/L boron while potable water contains about 130 µg/L, which is 64% less. Thus, use of potable water would not substantively change the results of the Tier 1 or Tier 2 analyses shown in Tables 2-12, 2-13, and 2-14 (LADWP 2021L, LBW 2021).

Other water sources for the cooling tower may include HRSG blowdown water. The supply source of HRSG water is the potable system. For use in the HRSG, potable water first goes through reverse osmosis (RO) and demineralization (DEMIN) treatment, so it is initially much purer than potable water, i.e., very low TDS and nearly neutral pH. While HRSG water does go through several steam-condensation cycles of concentration, its specified quality (to protect the steam turbine) is maintained by blowdown and replenishment with RO/DEMIN water. This means that it is purer than recycled/reclaimed water, with a lower TAC content leading to fewer TAC emissions, and thus suitable for use as cooling tower makeup water.

PROJECTED IMPACT: Less Than Significant

MITIGATION: None required

2.8 Environmental Checklist Form – Air Quality

Appendix G of the CEQA Guidelines contains the Environmental Checklist Form comprising a series of questions intended to encourage thoughtful assessment of impacts. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

The proposed project is located in the coastal zone of the SCAB within the jurisdiction of the SCAQMD. The SCAB is designated nonattainment for the 1-hour and 8-hour state O_3 standards, the 8-hour federal O_3 standard, the 24-hour state PM_{10} standard, and the state and federal annual $PM_{2.5}$ standards. The Los Angeles County portion of the SCAB is also designated a nonattainment area for the federal lead standard on the basis of source-specific monitoring at two impacted industrial locations as determined by the United States Environmental Protection Agency (U.S. EPA) using 2007-2009 data. However, all air monitoring stations in the SCAB, including the near-source monitoring in Los Angeles County, have remained below the lead National Ambient Air Quality Standards (NAAQS) for the period from 2012 through 2015. In June 2013, the EPA approved re-designation of the SCAB as an attainment area for the federal 24-hour PM_{10} standard. The SCAB also continues to be in attainment of the carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) NAAQS (SCAQMD 2017a, 2018).

Due to the nonattainment status of the identified pollutants, the SCAQMD is required by the Clean Air Act (CAA) to adopt and periodically update its *Air Quality Management Plan* (AQMP) to meet federal requirements and/or to incorporate the latest technical information. State and federal planning requirements include developing control strategies, attainment demonstrations, reasonable further progress, and maintenance plans. The AQMP is the SCAQMD's contribution to the State Implementation Plan (SIP), and each iteration of the AQMP is an update of the previous AQMP. The most recently adopted plan for SCAQMD is the 2016 AQMP, and this plan is a regional and multi-agency effort produced with collaboration between the SCAQMD, CARB, the Southern California Association of Governments (SCAG), and the EPA. Each successive AQMP incorporates the latest scientific and technical information and planning assumptions, including the latest applicable growth assumptions, Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), and updated emission inventory methodologies for various source categories (SCAQMD 2017a).

Project elements would comply with applicable SCAQMD and CARB rules and regulations during construction and operation (e.g., vehicle emission standards, equipment registration, fuel specifications, visible emissions, nuisance, fugitive dust control, etc.). These rules and regulations are adopted as part of the SIP and submitted by CARB to the EPA for approval under the CAA. The potential for air pollutant emissions from fuel combustion would primarily occur during construction. The duration of the construction program is approximately 30 months, depending on weather and other factors, and would utilize diesel-powered off-road equipment and on-road vehicles. Workers would commute in personal vehicles, mainly gasoline powered. Construction emissions would be temporary and permanently cease upon completion of work. Per compliance criteria, the construction of the cooling tower would not conflict with or obstruct implementation of the AQMP.

Under paragraph (d)(3)(B) of Rule 219, written permits are not required for "Industrial cooling towers located in a chemical plant, refinery or other industrial facility, provided a filing pursuant to Rule 222 is submitted to the Executive Officer." The proposed cooling tower would operate in compliance with these SCAQMD rules and thus not conflict with or obstruct implementation of the AQMP.

PROJECTED IMPACT: Less Than Significant

MITIGATION: None required

b) *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?*

Emissions from mobile sources associated with the project would primarily occur during the construction of the cooling tower and related facilities. The construction program is 30 months as planned. Since the site is already graded and flat, no heavy earthmoving would be performed with large equipment, which often causes higher emissions of NO_x and PM_{10}. The limited amounts of construction equipment and vehicles indicate that project related criteria pollutant emissions from fuel combustion would not exceed SCAQMD significance thresholds; these emissions would be temporary and permanently cease upon completion of work. Operation of the cooling tower would utilize BACT, i.e., high-efficiency drift eliminators with a specified 0.0005% drift fraction. The cooling tower would be Rule 219 exempt and emissions of PM_{10} and $PM_{2.5}$ would not exceed SCAQMD significance thresholds. Thus, the project would not cause a cumulatively considerable net increase in emissions of any criteria air pollutants over the long term.

PROJECTED IMPACT: Less Than Significant

MITIGATION: None required

c) *Expose sensitive receptors to substantial pollutant concentrations?*

As documented in the screening risk assessments above, the proposed project would not expose sensitive receptors to substantial pollutant concentrations during construction or operation. The project occurs in moderate proximity to residences, with the closest residence approximately 950 feet (290 meters) from the main construction zone (i.e., cooling tower footprint). Due to the limited amounts of equipment and vehicles used for construction, the project would not exceed the SCAQMD's Localized Significance Threshold (LST) criteria. Thus, project construction would not cause or contribute to an exceedance of state or national ambient air quality standards, which are established by CARB and the EPA to protect public health. Furthermore, the screening-level health risk analyses have shown that SCAQMD health risk thresholds would not be exceeded by project construction or operation. The proposed cooling tower would qualify for exemption under Rule 219 because the SCAQMD considers that cooling towers emit relatively small amounts of air contaminants due to the aqueous nature of the process. Thus, sensitive receptors would not be exposed to substantial pollutant concentrations.

PROJECTED IMPACT: Less Than Significant

MITIGATION: None required

d) *Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?*

No odorous materials would be used during construction or operation. The required use of CARB specification ultra-low sulfur diesel fuel in off-road equipment (e.g., backhoes, generators) and on-road vehicles (e.g., heavier trucks) would prevent substantial emissions of sulfur-containing odorous gases (e.g., sulfur dioxide, hydrogen sulfide, etc.). Construction contractors will be required to comply with SCAQMD Rule 402 (Nuisance) which states that "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." Also, since none of the water treatment agents documented above are odorous, and recycled water has had nearly all odorous compounds removed by the treatment process, no nuisance from cooling tower operation is expected. The project would not result in odors or nuisance emissions adversely affecting a substantial number of people.

PROJECTED IMPACT: Less Than Significant

MITIGATION: None required

3.0 GREENHOUSE GAS EMISSIONS

3.1 Environmental Setting

Changes in global climate patterns have been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, recently attributed to accumulation of GHG emissions in the atmosphere. GHGs trap heat in the atmosphere, which in turn heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities. The emission of GHGs through the combustion of fossil fuels (i.e., fuels containing carbon), in conjunction with other human activities, appears to be closely associated with global warming. State law defines GHGs to include the following: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The most common GHG that results from human activity is CO_2, followed by CH_4 and N_2O.

GHGs and other global warming pollutants are perceived as global in their impacts and increasing emissions anywhere in the world contributes to climate change anywhere in the world. However, a study conducted on the health impacts of CO_2 "domes" that form over urban areas concludes that they can cause increases in local temperatures and local criteria pollutants, which have adverse health effects.

The analysis of GHG emissions differs from analysis of criteria pollutants. For criteria pollutants, significance thresholds are based on daily emissions because attainment or nonattainment is primarily based on daily exceedances of applicable ambient air quality standards. Further, several ambient air quality standards are based on relatively short-term exposure effects to human health (e.g., 1-hour and 8-hour standards). Since the half-life of CO_2 is approximately 100 years, for example, the effects of GHGs occur over a longer term, which means they affect the global climate over a relatively long timeframe. As a result, the SCAQMD's current position is to evaluate the effects of GHGs over a longer timeframe than a single day (e.g., annual emissions). GHG emissions are typically considered to be cumulative impacts because they contribute to global climate change.

3.2 Regulatory

Because cooling towers are not a combustion source, there are no source-specific rules or regulations related to GHG emissions that would impact operation of the proposed project. As identified above, the cooling tower would qualify for permit exemption under Rule 219(d)(3)(B).

3.3 GHG Emissions

GHGs – primarily CO_2, CH_4, and N_2O, collectively reported as carbon dioxide equivalents (CO_2e)[2] – are directly emitted from stationary source combustion of natural gas in equipment such as water heaters, boilers, process heaters, and furnaces. GHGs are also emitted from mobile sources such as on-road vehicles and off-road construction equipment burning fuels such as gasoline, diesel, biodiesel, propane, or natural gas (compressed or liquefied). Indirect GHG emissions result from electric power generated elsewhere (i.e., power plants) used to operate process equipment, lighting, and utilities at a facility. Also included in GHG quantification is electric power used to pump the water supply (e.g., aqueducts, wells, pipelines) and disposal and decomposition of municipal waste

[2] CO_2e has been adopted as the standard unit of measure to which other GHGs are converted based on their various levels of global warming potential.

in landfills (CARB 2017). Using CalEEMod, direct on-site and off-site GHG emissions were estimated for Project construction.

3.4 Significance Criteria/Results

On December 5, 2008, the SCAQMD adopted an interim CEQA GHG significance threshold for projects where the SCAQMD is the lead agency (SCAQMD 2008b). Other agencies may also adopt this guidance.

For industrial projects (stationary sources), this interim threshold is set at 10,000 metric tons (MT) CO_2e per year. Projects with incremental increases below this threshold will not be cumulatively considerable.

Table 3-1 compares maximum annual construction GHG emissions to the SCAQMD industrial significance threshold. Off-site traffic emissions (i.e., worker commuting, truck transport) are included in these emissions estimates. Table 3-2 shows total construction project GHG emissions amortized over a 30-year period, which is the SCAQMD recommended timeframe for quantifying construction emissions.

Table 3-1: Construction GHG Emissions and Significance Evaluation – Maxima

GHGs	Maximum Annual Emissions (MT/yr)	Threshold (MT/yr)	Significance
CO_2	506	–	–
CH_4	0.11	–	–
N_2O	0.00	–	–
CO_2e	509	10,000	LTS

Sources: SCAQMD 2019, CalEEMod Version 2016.3.2.

Table 3-2: Construction GHG Emissions and Significance Evaluation – 30-Year

GHGs	Amortized Annual Emissions (MT/yr)	Threshold (MT/yr)	Significance
CO_2	59.1	–	–
CH_4	0.015	–	–
N_2O	0.000	–	–
CO_2e	59.5	10,000	LTS

Sources: SCAQMD 2019, CalEEMod Version 2016.3.2.

Note:

LTS: less than significant

3.5 Environmental Checklist Form – Greenhouse Gas

Appendix G of the CEQA Guidelines contains the Environmental Checklist Form comprising a series of questions intended to encourage thoughtful assessment of impacts. Would the project:

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

Cooling towers do not emit GHGs (i.e., CO_2, CH_4, N_2O) during operation. Since the parasitic load of tower operations would be imposed on steam turbine Unit 8, there would be no effect on GHG emissions from gas turbine Units 9 and 10. As shown in Tables 3-1 and 3-2, construction GHG emissions, whether maximum annual or amortized annual, are substantially below the SCAQMD significance threshold for industrial projects. Thus, the project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

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

Units 8, 9, and 10 are a high-efficiency CCGS with low GHG emissions on a pound per megawatt-hour (lb CO_2e/MWh) basis compared to other types of fossil-fuel generating resources, i.e., simple-cycle gas turbine, gas-fired steam turbine, coal-fired steam turbine, or diesel engine generators. In order for renewable energy sources to be practicable, the use of gas-fired generation is necessary for times when renewables are not available, such as at night (solar), and calm or light wind conditions (wind). The project would allow Unit 8 to provide a renewables "backstop" to cover interruptions in renewables generation. Thus, the project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases (e.g., California's 2017 Climate Change Scoping Plan, CARB 2017) because it would perform a supporting role in renewable energy development that enables GHG reductions.

<ins>PROJECTED IMPACT</ins>: Less Than Significant

<ins>MITIGATION:</ins> None required

4.0 PROJECT ENERGY EVALUATION

4.1 Regulatory

California's energy code is designed to reduce wasteful and unnecessary energy consumption in new construction and refurbishment projects. The California Energy Commission (CEC) updates the Building Energy Efficiency Standards (Title 24, Parts 6 and 11) every three years. The 2019 standards improved on the 2016 standards and went into effect on January 1, 2020. In new construction, standards require designed-in energy conservation features such as high-efficiency lighting and high-efficiency electric motors (CEC 2019).

4.2 Project Construction Fuel Consumption

CalEEMod calculates mass emissions of GHGs, including CO_2, from off-road and on-road mobile sources associated with project construction. For construction, CalEEMod aggregates mobile source CO_2 emissions into four broad categories (typical fuel types assumed):

- Off-road equipment [diesel (Tiers 1-4)];
- Hauling [heavy-heavy duty diesel trucks (HHDT)];
- Vendor [medium-heavy and heavy-heavy duty diesel trucks (MHDT, HHDT)]; and
- Worker [light duty gasoline automobiles and trucks (LDA, LDT1, LDT2)].

For each category, diesel and gasoline fuel consumption can be estimated (back calculated) using 2020 Climate Registry [Code of Federal Regulations (CFR) Title 40, Part 98, Subpart C] emission factors for those fuels (TCR 2020):

- Diesel Fuel Oil No. 2: 10.21 kg CO_2 per gallon [22.51 lbs CO_2 per gallon]; and
- Motor Gasoline: 8.78 kg CO_2 per gallon [19.36 lbs CO_2 per gallon].

Using the CalEEMod annual emissions results (MT CO_2) for the four mobile source categories (off-road, hauling, vendor, worker) and the corresponding CO_2 emission factors, Table 4-1 shows estimated fuel consumption during project construction.

Table 4-1: Estimated Construction Fuel Consumption – CalEEMod Basis

Mobile Sources	Types	Fuels	MT CO_2	CO_2 Emission Factor (kg/gal)	Fuel Consumption (gallons)
Off-Road	Tiers 1-4	Diesel	1,581	10.21	154,800
Hauling	HHDT	Diesel	0	10.21	0
Vendor	MHDT, HHDT	Diesel	99	10.21	9,700
Worker	LDA, LDT1, LDT2	Gasoline	93	8.78	10,600
Totals			**1,773**	–	**175,100**

Sources: LADWP 2021, CalEEMod version 2016.3.2, TCR 2020, 40 CFR 98 Subpart C.

As shown in Table 4-1, based on CalEEMod, project construction could consume approximately 175,000 gallons of liquid fuels.

4.3 Project Operation Energy Consumption

Based on technical data provided by LADWP, Table 4-2 shows estimated electric power usage for continuous operation of the Unit 8 Cooling Tower.

Table 4-2: Estimated Operation Electric Power – Unit 8 Net Parasitic Load[1]

Input Power (kW)	Operation (hrs/yr)	Consumption (MWh/yr)
8,300	8,760	72,708

Source: LADWP 2021.

[1] Compared to OTC operations the cooling tower replaces.

As shown in Table 4-2, project operation could consume approximately 72,708 megawatt-hours (MWh) of electric power annually as net parasitic load on Unit 8.

4.4 Environmental Checklist Form – Energy

Appendix G of the CEQA Guidelines contains the Environmental Checklist Form comprising a series of questions intended to encourage thoughtful assessment of impacts. Would the project:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

During the course of project construction, it is estimated that current age-weighted fleet-average off-road equipment and on-road vehicles would consume approximately 175,000 gallons of liquid fuels (Table 4-1). As explained in (b) below, the construction project would allow the Haynes CCGS to provide a renewables "backstop" and remain operational for its full design life. As shown in Table 4-2, cooling tower operation could result in utilization of approximately 72,708 MWh of electric power annually (maximum). This would be considered part of the parasitic (auxiliary) load for Unit 8 and would decrease the net output available for distribution (sales) to the grid by a small amount. Unit 8 is nominally rated at 250 MW, and historically operates in combination with Units 9 and 10 at about 45% annual capacity factor[3], providing about 985,500 MWh annually to LADWP customers. At 45% capacity factor, the cooling tower would use about 32,719 MWh, which represents about 3.32% of Unit 8's total output, which is a small penalty. Thus, the project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

In California, renewable solar and wind generation have grown exponentially in recent years. From 2010 to 2017, solar and wind generation increased by about 40,000 gigawatt-hours per year (GWh/year). Self-generation also grew substantially, with installed rooftop solar increasing from about 2,000 megawatts (MW) in 2014 to about 5,800 MW in 2017 (CARB 2017).

[3] Based on 6-year average (2015-2020)

The Haynes CCGS is a high-efficiency gas-fired combined-cycle generating unit essential for providing LADWP grid reliability and stability during renewable energy transient conditions. In order for renewable energy sources to be practicable, the use of “backstop” generation is necessary for times when renewables are not available, such as at night (solar), and calm or light wind conditions (wind). The project would allow Unit 8 to provide a renewables “backstop” and remain operational for its full design life. Thus, the project would not conflict with or obstruct a state or local plan (e.g., California’s 2017 Climate Change Scoping Plan, CARB 2017) for renewable energy or energy efficiency.

PROJECTED IMPACT: Less Than Significant

MITIGATION: None required

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APPENDIX A – CALEEMOD OUTPUTS

Haynes LADWP

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	25.00	1000sqft	0.57	25,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2029
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MWhr)	1227.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Based on Client Construction Plan

Off-road Equipment - Construction Data from Client

Off-road Equipment - Based on Construction Data

Off-road Equipment - Construction Data

Off-road Equipment - Construction Plans

Off-road Equipment - Construction Plans

Off-road Equipment - Construction Plans

Off-road Equipment - Construction Plans

Trips and VMT - Construction Plans

Demolition -

Grading - Construction Plans

Consumer Products - NO Operations

Area Coating - No Operation

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	0
tblAreaCoating	Area_EF_Nonresidential_Interior	100	0
tblConstructionPhase	NumDays	100.00	234.00
tblConstructionPhase	NumDays	100.00	181.00
tblConstructionPhase	NumDays	100.00	121.00
tblConstructionPhase	NumDays	10.00	91.00
tblConstructionPhase	NumDays	2.00	122.00
tblConstructionPhase	NumDays	5.00	214.00
tblConstructionPhase	NumDays	1.00	242.00
tblConsumerProducts	ROG_EF	1.98E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	3.542E-08
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	5.152E-10
tblGrading	AcresOfGrading	30.25	87.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	UsageHours	8.00	2.00

tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	6.00	19.00
tblTripsAndVMT	HaulingTripNumber	297.00	0.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	4.00	8.00
tblTripsAndVMT	VendorTripNumber	4.00	7.00
tblTripsAndVMT	VendorTripNumber	4.00	7.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	WorkerTripNumber	28.00	24.00
tblTripsAndVMT	WorkerTripNumber	30.00	18.00
tblTripsAndVMT	WorkerTripNumber	11.00	14.00
tblTripsAndVMT	WorkerTripNumber	11.00	18.00
tblTripsAndVMT	WorkerTripNumber	11.00	32.00
tblTripsAndVMT	WorkerTripNumber	18.00	17.00
tblTripsAndVMT	WorkerTripNumber	23.00	10.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.0141	0.1254	0.1944	3.4000e-004	0.0496	5.3800e-003	0.0550	5.9100e-003	4.9700e-003	0.0109	0.0000	29.6859	29.6859	8.1200e-003	0.0000	29.8890
2025	0.1661	1.4418	2.3404	4.3900e-003	0.1012	0.0574	0.1586	0.0242	0.0532	0.0774	0.0000	385.9235	385.9235	0.1050	0.0000	388.5474
2026	0.1810	1.4539	1.7625	3.8800e-003	0.0591	0.0539	0.1130	0.0245	0.0509	0.0755	0.0000	331.5149	331.5149	0.0760	0.0000	333.4149
2027	0.3865	2.9832	3.5820	6.1300e-003	0.0325	0.1143	0.1467	8.7600e-003	0.1083	0.1171	0.0000	505.8773	505.8773	0.1098	0.0000	508.6213
2028	0.1911	1.6941	2.0419	3.3700e-003	0.0367	0.0846	0.1213	9.8600e-003	0.0783	0.0881	0.0000	293.4335	293.4335	0.0772	0.0000	295.3636
2029	0.1092	1.0659	1.6464	2.5800e-003	0.0439	0.0428	0.0867	8.0300e-003	0.0397	0.0478	0.0000	226.7500	226.7500	0.0623	0.0000	228.3074
Maximum	**0.3865**	**2.9832**	**3.5820**	**6.1300e-003**	**0.1012**	**0.1143**	**0.1586**	**0.0245**	**0.1083**	**0.1171**	**0.0000**	**505.8773**	**505.8773**	**0.1098**	**0.0000**	**508.6213**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.0141	0.1254	0.1944	3.4000e-004	0.0496	5.3800e-003	0.0550	5.9100e-003	4.9700e-003	0.0109	0.0000	29.6859	29.6859	8.1200e-003	0.0000	29.8889
2025	0.1661	1.4418	2.3404	4.3900e-003	0.1012	0.0574	0.1586	0.0242	0.0532	0.0774	0.0000	385.9231	385.9231	0.1050	0.0000	388.5470
2026	0.1810	1.4539	1.7625	3.8800e-003	0.0591	0.0539	0.1130	0.0245	0.0509	0.0755	0.0000	331.5146	331.5146	0.0760	0.0000	333.4146
2027	0.3865	2.9831	3.5820	6.1300e-003	0.0325	0.1143	0.1467	8.7600e-003	0.1083	0.1171	0.0000	505.8768	505.8768	0.1098	0.0000	508.6207
2028	0.1911	1.6941	2.0419	3.3700e-003	0.0367	0.0846	0.1213	9.8600e-003	0.0783	0.0881	0.0000	293.4332	293.4332	0.0772	0.0000	295.3633
2029	0.1092	1.0659	1.6464	2.5800e-003	0.0439	0.0428	0.0867	8.0300e-003	0.0397	0.0478	0.0000	226.7497	226.7497	0.0623	0.0000	228.3072

Maximum	0.3865	2.9831	3.5820	6.1300e-003	0.1012	0.1143	0.1586	0.0245	0.1083	0.1171	0.0000	505.8768	505.8768	0.1098	0.0000	508.6207

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	12-2-2024	3-1-2025	0.3840	0.3840
2	3-2-2025	6-1-2025	0.3801	0.3801
3	6-2-2025	9-1-2025	0.3799	0.3799
4	9-2-2025	12-1-2025	0.4218	0.4218
5	12-2-2025	3-1-2026	0.5241	0.5241
6	3-2-2026	6-1-2026	0.4592	0.4592
7	6-2-2026	9-1-2026	0.3554	0.3554
8	9-2-2026	12-1-2026	0.3517	0.3517
9	12-2-2026	3-1-2027	0.3477	0.3477
10	3-2-2027	6-1-2027	0.8742	0.8742
11	6-2-2027	9-1-2027	0.9834	0.9834
12	9-2-2027	12-1-2027	0.9694	0.9694
13	12-2-2027	3-1-2028	0.9198	0.9198
14	3-2-2028	6-1-2028	0.7695	0.7695
15	6-2-2028	9-1-2028	0.2153	0.2153
16	9-2-2028	12-1-2028	0.2131	0.2131
17	12-2-2028	3-1-2029	0.2107	0.2107
18	3-2-2029	6-1-2029	0.6931	0.6931
19	6-2-2029	9-1-2029	0.3344	0.3344
		Highest	0.9834	0.9834

2.2 Overall Operational

<u>Unmitigated Operational</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.0000e-005	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.2000e-004	6.2000e-004	0.0000	0.0000	6.6000e-004
Energy	2.8200e-003	0.0256	0.0215	1.5000e-004		1.9500e-003	1.9500e-003		1.9500e-003	1.9500e-003	0.0000	145.5407	145.5407	3.3100e-003	1.0900e-003	145.9472
Mobile	9.2500e-003	0.0477	0.1357	6.3000e-004	0.0630	4.1000e-004	0.0634	0.0169	3.8000e-004	0.0173	0.0000	58.4745	58.4745	2.4400e-003	0.0000	58.5356
Waste						0.0000	0.0000		0.0000	0.0000	6.2927	0.0000	6.2927	0.3719	0.0000	15.5900
Water						0.0000	0.0000		0.0000	0.0000	1.8341	41.9268	43.7609	0.1894	4.6500e-003	49.8818
Total	**0.0121**	**0.0733**	**0.1576**	**7.8000e-004**	**0.0630**	**2.3600e-003**	**0.0654**	**0.0169**	**2.3300e-003**	**0.0192**	**8.1268**	**245.9426**	**254.0694**	**0.5670**	**5.7400e-003**	**269.9552**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.0000e-005	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.2000e-004	6.2000e-004	0.0000	0.0000	6.6000e-004
Energy	2.8200e-003	0.0256	0.0215	1.5000e-004		1.9500e-003	1.9500e-003		1.9500e-003	1.9500e-003	0.0000	145.5407	145.5407	3.3100e-003	1.0900e-003	145.9472
Mobile	9.2500e-003	0.0477	0.1357	6.3000e-004	0.0630	4.1000e-004	0.0634	0.0169	3.8000e-004	0.0173	0.0000	58.4745	58.4745	2.4400e-003	0.0000	58.5356
Waste						0.0000	0.0000		0.0000	0.0000	6.2927	0.0000	6.2927	0.3719	0.0000	15.5900
Water						0.0000	0.0000		0.0000	0.0000	1.8341	41.9268	43.7609	0.1894	4.6500e-003	49.8818
Total	**0.0121**	**0.0733**	**0.1576**	**7.8000e-004**	**0.0630**	**2.3600e-003**	**0.0654**	**0.0169**	**2.3300e-003**	**0.0192**	**8.1268**	**245.9426**	**254.0694**	**0.5670**	**5.7400e-003**	**269.9552**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	1. Site Preparation and Earthwork	Site Preparation	12/2/2024	11/4/2025	5	242	
2	2. Foundation Work/Piles	Grading	11/5/2025	4/23/2026	5	122	
3	3. Cooling Tower and Auxiliary Equipment	Building Construction	4/24/2026	3/17/2027	5	234	
4	4. Makeup Water Tank & Wastewater Tank	Building Construction	3/18/2027	11/25/2027	5	181	
5	5. Recycled, Makeup Water, Wastewater, and Stormwater	Building Construction	11/26/2027	5/12/2028	5	121	
6	6. Outage Tie-ins, and Commissioning	Paving	5/15/2028	3/8/2029	5	214	
7	7. Demo OTC Pipeline	Demolition	3/9/2029	7/13/2029	5	91	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
1. Site Preparation and Earthwork	Dumpers/Tenders	2	6.00	16	0.38
1. Site Preparation and Earthwork	Excavators	2	8.00	158	0.38
1. Site Preparation and Earthwork	Graders	1	2.00	187	0.41
1. Site Preparation and Earthwork	Plate Compactors	1	2.00	8	0.43
1. Site Preparation and Earthwork	Rollers	1	2.00	80	0.38
1. Site Preparation and Earthwork	Tractors/Loaders/Backhoes	4	8.00	97	0.37
2. Foundation Work/Piles	Bore/Drill Rigs	2	8.00	221	0.50

2. Foundation Work/Piles	Concrete/Industrial Saws	1	8.00	81	0.73
2. Foundation Work/Piles	Cranes	2	3.00	231	0.29
2. Foundation Work/Piles	Excavators	2	8.00	158	0.38
2. Foundation Work/Piles	Other Construction Equipment	1	4.00	172	0.42
2. Foundation Work/Piles	Plate Compactors	2	4.00	8	0.43
2. Foundation Work/Piles	Rubber Tired Dozers	1	1.00	247	0.40
2. Foundation Work/Piles	Tractors/Loaders/Backhoes	1	4.00	97	0.37
3. Cooling Tower and Auxiliary Equipment	Aerial Lifts	1	3.00	63	0.31
3. Cooling Tower and Auxiliary Equipment	Cranes	1	6.00	231	0.29
3. Cooling Tower and Auxiliary Equipment	Forklifts	2	6.00	89	0.20
3. Cooling Tower and Auxiliary Equipment	Tractors/Loaders/Backhoes	1	4.00	97	0.37
3. Cooling Tower and Auxiliary Equipment	Tractors/Loaders/Backhoes	0	0.00	97	0.37
3. Cooling Tower and Auxiliary Equipment	Welders	3	9.00	46	0.45
4. Makeup Water Tank & Wastewater Tank	Cranes	2	6.00	231	0.29
4. Makeup Water Tank & Wastewater Tank	Forklifts	2	6.00	89	0.20
4. Makeup Water Tank & Wastewater Tank	Other Construction Equipment	1	4.00	172	0.42
4. Makeup Water Tank & Wastewater Tank	Tractors/Loaders/Backhoes	3	12.00	97	0.37
4. Makeup Water Tank & Wastewater Tank	Welders	5	15.00	46	0.45
5. Recycled, Makeup Water, Wastewater, and Stormwater	Cement and Mortar Mixers	0	0.00	9	0.56
5. Recycled, Makeup Water, Wastewater, and Stormwater	Cranes	1	4.00	231	0.29
5. Recycled, Makeup Water, Wastewater, and Stormwater	Excavators	1	4.00	158	0.38
5. Recycled, Makeup Water, Wastewater, and Stormwater	Forklifts	2	6.00	89	0.20
5. Recycled, Makeup Water, Wastewater, and Stormwater	Rollers	2	4.00	80	0.38
5. Recycled, Makeup Water, Wastewater, and Stormwater	Tractors/Loaders/Backhoes	2	8.00	97	0.37
5. Recycled, Makeup Water, Wastewater, and Stormwater	Trenchers	3	12.00	78	0.50
5. Recycled, Makeup Water, Wastewater, and Stormwater	Welders	2	12.00	46	0.45
6. Outage Tie-ins, and Commissioning	Aerial Lifts	1	2.00	63	0.31
6. Outage Tie-ins, and Commissioning	Air Compressors	0	0.00	78	0.48
6. Outage Tie-ins, and Commissioning	Cement and Mortar Mixers	0	0.00	9	0.56
6. Outage Tie-ins, and Commissioning	Cranes	1	2.00	231	0.29

6. Outage Tie-ins, and Commissioning	Pavers	1	7.00	130	0.42
6. Outage Tie-ins, and Commissioning	Rollers	1	7.00	80	0.38
6. Outage Tie-ins, and Commissioning	Tractors/Loaders/Backhoes	3	4.00	97	0.37
7. Demo OTC Pipeline	Aerial Lifts	1	2.00	63	0.31
7. Demo OTC Pipeline	Concrete/Industrial Saws	1	8.00	81	0.73
7. Demo OTC Pipeline	Cranes	1	2.00	231	0.29
7. Demo OTC Pipeline	Rubber Tired Dozers	1	1.00	247	0.40
7. Demo OTC Pipeline	Tractors/Loaders/Backhoes	5	19.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
1. Site Preparation and Earthwork	11	24.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
2. Foundation Work/Piles	12	18.00	9.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
3. Cooling Tower and Auxiliary Equipment	8	14.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
4. Makeup Water Tank & Wastewater Tank	13	18.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
5. Recycled, Makeup Water, Wastewater	13	32.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
6. Outage Tie-ins, and Commissioning	7	17.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
7. Demo OTC Pipeline	9	10.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 1. Site Preparation and Earthwork - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					0.0461	0.0000	0.0461	4.9800e-003	0.0000	4.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0130	0.1186	0.1846	2.9000e-004		5.3500e-003	5.3500e-003		4.9500e-003	4.9500e-003	0.0000	25.2598	25.2598	7.9500e-003	0.0000	25.4587
Total	**0.0130**	**0.1186**	**0.1846**	**2.9000e-004**	**0.0461**	**5.3500e-003**	**0.0515**	**4.9800e-003**	**4.9500e-003**	**9.9300e-003**	**0.0000**	**25.2598**	**25.2598**	**7.9500e-003**	**0.0000**	**25.4587**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	6.2100e-003	1.9400e-003	2.0000e-005	5.5000e-004	1.0000e-005	5.6000e-004	1.6000e-004	1.0000e-005	1.7000e-004	0.0000	2.0745	2.0745	1.1000e-004	0.0000	2.0773
Worker	9.5000e-004	6.6000e-004	7.8800e-003	3.0000e-005	2.8900e-003	2.0000e-005	2.9200e-003	7.7000e-004	2.0000e-005	7.9000e-004	0.0000	2.3516	2.3516	6.0000e-005	0.0000	2.3530
Total	**1.1400e-003**	**6.8700e-003**	**9.8200e-003**	**5.0000e-005**	**3.4400e-003**	**3.0000e-005**	**3.4800e-003**	**9.3000e-004**	**3.0000e-005**	**9.6000e-004**	**0.0000**	**4.4261**	**4.4261**	**1.7000e-004**	**0.0000**	**4.4303**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0461	0.0000	0.0461	4.9800e-003	0.0000	4.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0130	0.1186	0.1846	2.9000e-004		5.3500e-003	5.3500e-003		4.9500e-003	4.9500e-003	0.0000	25.2598	25.2598	7.9500e-003	0.0000	25.4587
Total	**0.0130**	**0.1186**	**0.1846**	**2.9000e-004**	**0.0461**	**5.3500e-003**	**0.0515**	**4.9800e-003**	**4.9500e-003**	**9.9300e-003**	**0.0000**	**25.2598**	**25.2598**	**7.9500e-003**	**0.0000**	**25.4587**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	6.2100e-003	1.9400e-003	2.0000e-005	5.5000e-004	1.0000e-005	5.6000e-004	1.6000e-004	1.0000e-005	1.7000e-004	0.0000	2.0745	2.0745	1.1000e-004	0.0000	2.0773
Worker	9.5000e-004	6.6000e-004	7.8800e-003	3.0000e-005	2.8900e-003	2.0000e-005	2.9200e-003	7.7000e-004	2.0000e-005	7.9000e-004	0.0000	2.3516	2.3516	6.0000e-005	0.0000	2.3530
Total	**1.1400e-003**	**6.8700e-003**	**9.8200e-003**	**5.0000e-005**	**3.4400e-003**	**3.0000e-005**	**3.4800e-003**	**9.3000e-004**	**3.0000e-005**	**9.6000e-004**	**0.0000**	**4.4261**	**4.4261**	**1.7000e-004**	**0.0000**	**4.4303**

3.2 1. Site Preparation and Earthwork - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0461	0.0000	0.0461	4.9800e-003	0.0000	4.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1204	1.0745	1.8399	2.9000e-003		0.0452	0.0452		0.0418	0.0418	0.0000	252.7195	252.7195	0.0796	0.0000	254.7088
Total	**0.1204**	**1.0745**	**1.8399**	**2.9000e-003**	**0.0461**	**0.0452**	**0.0913**	**4.9800e-003**	**0.0418**	**0.0468**	**0.0000**	**252.7195**	**252.7195**	**0.0796**	**0.0000**	**254.7088**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8100e-003	0.0616	0.0189	2.1000e-004	5.5400e-003	7.0000e-005	5.6100e-003	1.6000e-003	7.0000e-005	1.6700e-003	0.0000	20.6320	20.6320	1.1000e-003	0.0000	20.6596
Worker	9.0200e-003	6.0300e-003	0.0731	2.5000e-004	0.0289	2.2000e-004	0.0292	7.6800e-003	2.0000e-004	7.8800e-003	0.0000	22.6049	22.6049	5.2000e-004	0.0000	22.6180
Total	**0.0108**	**0.0676**	**0.0920**	**4.6000e-004**	**0.0345**	**2.9000e-004**	**0.0348**	**9.2800e-003**	**2.7000e-004**	**9.5500e-003**	**0.0000**	**43.2370**	**43.2370**	**1.6200e-003**	**0.0000**	**43.2776**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Fugitive Dust					0.0461	0.0000	0.0461	4.9800e-003	0.0000	4.9800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1204	1.0745	1.8399	2.9000e-003		0.0452	0.0452		0.0418	0.0418	0.0000	252.7192	252.7192	0.0796	0.0000	254.7085
Total	**0.1204**	**1.0745**	**1.8399**	**2.9000e-003**	**0.0461**	**0.0452**	**0.0913**	**4.9800e-003**	**0.0418**	**0.0468**	**0.0000**	**252.7192**	**252.7192**	**0.0796**	**0.0000**	**254.7085**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	1.8100e-003	0.0616	0.0189	2.1000e-004	5.5400e-003	7.0000e-005	5.6100e-003	1.6000e-003	7.0000e-005	1.6700e-003	0.0000	20.6320	20.6320	1.1000e-003	0.0000	20.6596
Worker	9.0200e-003	6.0300e-003	0.0731	2.5000e-004	0.0289	2.2000e-004	0.0292	7.6800e-003	2.0000e-004	7.8800e-003	0.0000	22.6049	22.6049	5.2000e-004	0.0000	22.6180
Total	**0.0108**	**0.0676**	**0.0920**	**4.6000e-004**	**0.0345**	**2.9000e-004**	**0.0348**	**9.2800e-003**	**2.7000e-004**	**9.5500e-003**	**0.0000**	**43.2370**	**43.2370**	**1.6200e-003**	**0.0000**	**43.2776**

3.3 2. Foundation Work/Piles - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0154	0.0000	0.0154	8.4800e-003	0.0000	8.4800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0332	0.2859	0.3944	9.4000e-004		0.0119	0.0119		0.0111	0.0111	0.0000	82.4818	82.4818	0.0235	0.0000	83.0682
Total	**0.0332**	**0.2859**	**0.3944**	**9.4000e-004**	**0.0154**	**0.0119**	**0.0273**	**8.4800e-003**	**0.0111**	**0.0196**	**0.0000**	**82.4818**	**82.4818**	**0.0235**	**0.0000**	**83.0682**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.8000e-004	0.0129	3.9600e-003	4.0000e-005	1.1600e-003	1.0000e-005	1.1800e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	4.3257	4.3257	2.3000e-004	0.0000	4.3315
Worker	1.2600e-003	8.4000e-004	0.0102	3.0000e-005	4.0400e-003	3.0000e-005	4.0700e-003	1.0700e-003	3.0000e-005	1.1000e-003	0.0000	3.1596	3.1596	7.0000e-005	0.0000	3.1614
Total	**1.6400e-003**	**0.0138**	**0.0142**	**7.0000e-005**	**5.2000e-003**	**4.0000e-005**	**5.2500e-003**	**1.4100e-003**	**4.0000e-005**	**1.4500e-003**	**0.0000**	**7.4852**	**7.4852**	**3.0000e-004**	**0.0000**	**7.4929**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0154	0.0000	0.0154	8.4800e-003	0.0000	8.4800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0332	0.2859	0.3944	9.4000e-004		0.0119	0.0119		0.0111	0.0111	0.0000	82.4817	82.4817	0.0235	0.0000	83.0681
Total	**0.0332**	**0.2859**	**0.3944**	**9.4000e-004**	**0.0154**	**0.0119**	**0.0273**	**8.4800e-003**	**0.0111**	**0.0196**	**0.0000**	**82.4817**	**82.4817**	**0.0235**	**0.0000**	**83.0681**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.8000e-004	0.0129	3.9600e-003	4.0000e-005	1.1600e-003	1.0000e-005	1.1800e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	4.3257	4.3257	2.3000e-004	0.0000	4.3315
Worker	1.2600e-003	8.4000e-004	0.0102	3.0000e-005	4.0400e-003	3.0000e-005	4.0700e-003	1.0700e-003	3.0000e-005	1.1000e-003	0.0000	3.1596	3.1596	7.0000e-005	0.0000	3.1614
Total	**1.6400e-003**	**0.0138**	**0.0142**	**7.0000e-005**	**5.2000e-003**	**4.0000e-005**	**5.2500e-003**	**1.4100e-003**	**4.0000e-005**	**1.4500e-003**	**0.0000**	**7.4852**	**7.4852**	**3.0000e-004**	**0.0000**	**7.4929**

3.3 2. Foundation Work/Piles - 2026

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Fugitive Dust					0.0305	0.0000	0.0305	0.0168	0.0000	0.0168	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0656	0.5649	0.7791	1.8700e-003		0.0235	0.0235		0.0220	0.0220	0.0000	162.9518	162.9518	0.0463	0.0000	164.1103
Total	**0.0656**	**0.5649**	**0.7791**	**1.8700e-003**	**0.0305**	**0.0235**	**0.0540**	**0.0168**	**0.0220**	**0.0387**	**0.0000**	**162.9518**	**162.9518**	**0.0463**	**0.0000**	**164.1103**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.3000e-004	0.0253	7.6600e-003	9.0000e-005	2.3000e-003	3.0000e-005	2.3200e-003	6.6000e-004	3.0000e-005	6.9000e-004	0.0000	8.5009	8.5009	4.5000e-004	0.0000	8.5122
Worker	2.3800e-003	1.5300e-003	0.0189	7.0000e-005	7.9900e-003	6.0000e-005	8.0500e-003	2.1200e-003	5.0000e-005	2.1700e-003	0.0000	6.0252	6.0252	1.3000e-004	0.0000	6.0285
Total	**3.1100e-003**	**0.0268**	**0.0265**	**1.6000e-004**	**0.0103**	**9.0000e-005**	**0.0104**	**2.7800e-003**	**8.0000e-005**	**2.8600e-003**	**0.0000**	**14.5262**	**14.5262**	**5.8000e-004**	**0.0000**	**14.5407**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Fugitive Dust					0.0305	0.0000	0.0305	0.0168	0.0000	0.0168	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Off-Road	0.0656	0.5649	0.7791	1.8700e-003		0.0235	0.0235		0.0220	0.0220	0.0000	162.9516	162.9516	0.0463	0.0000	164.1101
Total	**0.0656**	**0.5649**	**0.7791**	**1.8700e-003**	**0.0305**	**0.0235**	**0.0540**	**0.0168**	**0.0220**	**0.0387**	**0.0000**	**162.9516**	**162.9516**	**0.0463**	**0.0000**	**164.1101**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.3000e-004	0.0253	7.6600e-003	9.0000e-005	2.3000e-003	3.0000e-005	2.3200e-003	6.6000e-004	3.0000e-005	6.9000e-004	0.0000	8.5009	8.5009	4.5000e-004	0.0000	8.5122
Worker	2.3800e-003	1.5300e-003	0.0189	7.0000e-005	7.9900e-003	6.0000e-005	8.0500e-003	2.1200e-003	5.0000e-005	2.1700e-003	0.0000	6.0252	6.0252	1.3000e-004	0.0000	6.0285
Total	**3.1100e-003**	**0.0268**	**0.0265**	**1.6000e-004**	**0.0103**	**9.0000e-005**	**0.0104**	**2.7800e-003**	**8.0000e-005**	**2.8600e-003**	**0.0000**	**14.5262**	**14.5262**	**5.8000e-004**	**0.0000**	**14.5407**

3.4 3. Cooling Tower and Auxiliary Equipment - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1067	0.8096	0.9091	1.5700e-003		0.0302	0.0302		0.0287	0.0287	0.0000	126.8310	126.8310	0.0280	0.0000	127.5300
Total	**0.1067**	**0.8096**	**0.9091**	**1.5700e-003**		**0.0302**	**0.0302**		**0.0287**	**0.0287**	**0.0000**	**126.8310**	**126.8310**	**0.0280**	**0.0000**	**127.5300**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4500e-003	0.0499	0.0151	1.7000e-004	4.5400e-003	6.0000e-005	4.5900e-003	1.3100e-003	5.0000e-005	1.3600e-003	0.0000	16.7920	16.7920	8.9000e-004	0.0000	16.8142
Worker	4.1100e-003	2.6500e-003	0.0326	1.2000e-004	0.0138	1.0000e-004	0.0139	3.6700e-003	9.0000e-005	3.7600e-003	0.0000	10.4140	10.4140	2.3000e-004	0.0000	10.4197
Total	**5.5600e-003**	**0.0526**	**0.0477**	**2.9000e-004**	**0.0184**	**1.6000e-004**	**0.0185**	**4.9800e-003**	**1.4000e-004**	**5.1200e-003**	**0.0000**	**27.2060**	**27.2060**	**1.1200e-003**	**0.0000**	**27.2339**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1067	0.8096	0.9091	1.5700e-003		0.0302	0.0302		0.0287	0.0287	0.0000	126.8308	126.8308	0.0280	0.0000	127.5299
Total	**0.1067**	**0.8096**	**0.9091**	**1.5700e-003**		**0.0302**	**0.0302**		**0.0287**	**0.0287**	**0.0000**	**126.8308**	**126.8308**	**0.0280**	**0.0000**	**127.5299**

Mitigated Construction Off-Site

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

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4500e-003	0.0499	0.0151	1.7000e-004	4.5400e-003	6.0000e-005	4.5900e-003	1.3100e-003	5.0000e-005	1.3600e-003	0.0000	16.7920	16.7920	8.9000e-004	0.0000	16.8142
Worker	4.1100e-003	2.6500e-003	0.0326	1.2000e-004	0.0138	1.0000e-004	0.0139	3.6700e-003	9.0000e-005	3.7600e-003	0.0000	10.4140	10.4140	2.3000e-004	0.0000	10.4197
Total	**5.5600e-003**	**0.0526**	**0.0477**	**2.9000e-004**	**0.0184**	**1.6000e-004**	**0.0185**	**4.9800e-003**	**1.4000e-004**	**5.1200e-003**	**0.0000**	**27.2060**	**27.2060**	**1.1200e-003**	**0.0000**	**27.2339**

3.4 3. Cooling Tower and Auxiliary Equipment - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0320	0.2429	0.2727	4.7000e-004		9.0500e-003	9.0500e-003		8.6200e-003	8.6200e-003	0.0000	38.0493	38.0493	8.3900e-003	0.0000	38.2590
Total	**0.0320**	**0.2429**	**0.2727**	**4.7000e-004**		**9.0500e-003**	**9.0500e-003**		**8.6200e-003**	**8.6200e-003**	**0.0000**	**38.0493**	**38.0493**	**8.3900e-003**	**0.0000**	**38.2590**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.3000e-004	0.0148	4.4600e-003	5.0000e-005	1.3600e-003	2.0000e-005	1.3800e-003	3.9000e-004	2.0000e-005	4.1000e-004	0.0000	5.0137	5.0137	2.6000e-004	0.0000	5.0203

Worker	1.1800e-003	7.3000e-004	9.1700e-003	3.0000e-005	4.1400e-003	3.0000e-005	4.1700e-003	1.1000e-003	3.0000e-005	1.1300e-003	0.0000	3.0246	3.0246	6.0000e-005	0.0000	3.0262
Total	**1.6100e-003**	**0.0156**	**0.0136**	**8.0000e-005**	**5.5000e-003**	**5.0000e-005**	**5.5500e-003**	**1.4900e-003**	**5.0000e-005**	**1.5400e-003**	**0.0000**	**8.0383**	**8.0383**	**3.2000e-004**	**0.0000**	**8.0465**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0320	0.2429	0.2727	4.7000e-004		9.0500e-003	9.0500e-003		8.6200e-003	8.6200e-003	0.0000	38.0493	38.0493	8.3900e-003	0.0000	38.2590
Total	**0.0320**	**0.2429**	**0.2727**	**4.7000e-004**		**9.0500e-003**	**9.0500e-003**		**8.6200e-003**	**8.6200e-003**	**0.0000**	**38.0493**	**38.0493**	**8.3900e-003**	**0.0000**	**38.2590**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.3000e-004	0.0148	4.4600e-003	5.0000e-005	1.3600e-003	2.0000e-005	1.3800e-003	3.9000e-004	2.0000e-005	4.1000e-004	0.0000	5.0137	5.0137	2.6000e-004	0.0000	5.0203
Worker	1.1800e-003	7.3000e-004	9.1700e-003	3.0000e-005	4.1400e-003	3.0000e-005	4.1700e-003	1.1000e-003	3.0000e-005	1.1300e-003	0.0000	3.0246	3.0246	6.0000e-005	0.0000	3.0262
Total	**1.6100e-003**	**0.0156**	**0.0136**	**8.0000e-005**	**5.5000e-003**	**5.0000e-005**	**5.5500e-003**	**1.4900e-003**	**5.0000e-005**	**1.5400e-003**	**0.0000**	**8.0383**	**8.0383**	**3.2000e-004**	**0.0000**	**8.0465**

3.5 4. Makeup Water Tank & Wastewater Tank - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3081	2.3485	2.8798	4.7100e-003		0.0874	0.0874		0.0832	0.0832	0.0000	382.9116	382.9116	0.0874	0.0000	385.0958
Total	**0.3081**	**2.3485**	**2.8798**	**4.7100e-003**		**0.0874**	**0.0874**		**0.0832**	**0.0832**	**0.0000**	**382.9116**	**382.9116**	**0.0874**	**0.0000**	**385.0958**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2500e-003	0.0435	0.0131	1.5000e-004	3.9900e-003	5.0000e-005	4.0400e-003	1.1500e-003	5.0000e-005	1.2000e-003	0.0000	14.7046	14.7046	7.7000e-004	0.0000	14.7238
Worker	5.0800e-003	3.1600e-003	0.0395	1.4000e-004	0.0179	1.2000e-004	0.0180	4.7400e-003	1.1000e-004	4.8500e-003	0.0000	13.0347	13.0347	2.7000e-004	0.0000	13.0414
Total	**6.3300e-003**	**0.0467**	**0.0526**	**2.9000e-004**	**0.0218**	**1.7000e-004**	**0.0220**	**5.8900e-003**	**1.6000e-004**	**6.0500e-003**	**0.0000**	**27.7392**	**27.7392**	**1.0400e-003**	**0.0000**	**27.7653**

Mitigated Construction On-Site

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

Category	tons/yr										MT/yr					
Off-Road	0.3081	2.3485	2.8798	4.7100e-003		0.0874	0.0874		0.0832	0.0832	0.0000	382.9111	382.9111	0.0874	0.0000	385.0953
Total	**0.3081**	**2.3485**	**2.8798**	**4.7100e-003**		**0.0874**	**0.0874**		**0.0832**	**0.0832**	**0.0000**	**382.9111**	**382.9111**	**0.0874**	**0.0000**	**385.0953**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2500e-003	0.0435	0.0131	1.5000e-004	3.9900e-003	5.0000e-005	4.0400e-003	1.1500e-003	5.0000e-005	1.2000e-003	0.0000	14.7046	14.7046	7.7000e-004	0.0000	14.7238
Worker	5.0800e-003	3.1600e-003	0.0395	1.4000e-004	0.0179	1.2000e-004	0.0180	4.7400e-003	1.1000e-004	4.8500e-003	0.0000	13.0347	13.0347	2.7000e-004	0.0000	13.0414
Total	**6.3300e-003**	**0.0467**	**0.0526**	**2.9000e-004**	**0.0218**	**1.7000e-004**	**0.0220**	**5.8900e-003**	**1.6000e-004**	**6.0500e-003**	**0.0000**	**27.7392**	**27.7392**	**1.0400e-003**	**0.0000**	**27.7653**

3.6 5. Recycled, Makeup Water, Wastewater, and Stormwater -

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0370	0.3225	0.3512	5.1000e-004		0.0175	0.0175		0.0163	0.0163	0.0000	43.6980	43.6980	0.0125	0.0000	44.0094
Total	**0.0370**	**0.3225**	**0.3512**	**5.1000e-004**		**0.0175**	**0.0175**		**0.0163**	**0.0163**	**0.0000**	**43.6980**	**43.6980**	**0.0125**	**0.0000**	**44.0094**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8000e-004	6.2500e-003	1.8800e-003	2.0000e-005	5.7000e-004	1.0000e-005	5.8000e-004	1.7000e-004	1.0000e-005	1.7000e-004	0.0000	2.1123	2.1123	1.1000e-004	0.0000	2.1150
Worker	1.3000e-003	8.1000e-004	0.0101	4.0000e-005	4.5600e-003	3.0000e-005	4.5900e-003	1.2100e-003	3.0000e-005	1.2400e-003	0.0000	3.3287	3.3287	7.0000e-005	0.0000	3.3304
Total	**1.4800e-003**	**7.0600e-003**	**0.0120**	**6.0000e-005**	**5.1300e-003**	**4.0000e-005**	**5.1700e-003**	**1.3800e-003**	**4.0000e-005**	**1.4100e-003**	**0.0000**	**5.4409**	**5.4409**	**1.8000e-004**	**0.0000**	**5.4454**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0370	0.3225	0.3512	5.1000e-004		0.0175	0.0175		0.0163	0.0163	0.0000	43.6979	43.6979	0.0125	0.0000	44.0093
Total	**0.0370**	**0.3225**	**0.3512**	**5.1000e-004**		**0.0175**	**0.0175**		**0.0163**	**0.0163**	**0.0000**	**43.6979**	**43.6979**	**0.0125**	**0.0000**	**44.0093**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8000e-004	6.2500e-003	1.8800e-003	2.0000e-005	5.7000e-004	1.0000e-005	5.8000e-004	1.7000e-004	1.0000e-005	1.7000e-004	0.0000	2.1123	2.1123	1.1000e-004	0.0000	2.1150
Worker	1.3000e-003	8.1000e-004	0.0101	4.0000e-005	4.5600e-003	3.0000e-005	4.5900e-003	1.2100e-003	3.0000e-005	1.2400e-003	0.0000	3.3287	3.3287	7.0000e-005	0.0000	3.3304
Total	**1.4800e-003**	**7.0600e-003**	**0.0120**	**6.0000e-005**	**5.1300e-003**	**4.0000e-005**	**5.1700e-003**	**1.3800e-003**	**4.0000e-005**	**1.4100e-003**	**0.0000**	**5.4409**	**5.4409**	**1.8000e-004**	**0.0000**	**5.4454**

3.6 5. Recycled, Makeup Water, Wastewater, and Stormwater -

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1351	1.1783	1.2834	1.8800e-003		0.0641	0.0641		0.0594	0.0594	0.0000	159.6656	159.6656	0.0455	0.0000	160.8034
Total	**0.1351**	**1.1783**	**1.2834**	**1.8800e-003**		**0.0641**	**0.0641**		**0.0594**	**0.0594**	**0.0000**	**159.6656**	**159.6656**	**0.0455**	**0.0000**	**160.8034**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4000e-004	0.0227	6.7800e-003	8.0000e-005	2.0900e-003	3.0000e-005	2.1200e-003	6.0000e-004	2.0000e-005	6.3000e-004	0.0000	7.6864	7.6864	4.0000e-004	0.0000	7.6964
Worker	4.5000e-003	2.7300e-003	0.0347	1.3000e-004	0.0167	1.1000e-004	0.0168	4.4200e-003	1.0000e-004	4.5200e-003	0.0000	11.8078	11.8078	2.3000e-004	0.0000	11.8136
Total	**5.1400e-003**	**0.0254**	**0.0415**	**2.1000e-004**	**0.0188**	**1.4000e-004**	**0.0189**	**5.0200e-003**	**1.2000e-004**	**5.1500e-003**	**0.0000**	**19.4942**	**19.4942**	**6.3000e-004**	**0.0000**	**19.5100**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1351	1.1783	1.2834	1.8800e-003		0.0641	0.0641		0.0594	0.0594	0.0000	159.6654	159.6654	0.0455	0.0000	160.8032
Total	**0.1351**	**1.1783**	**1.2834**	**1.8800e-003**		**0.0641**	**0.0641**		**0.0594**	**0.0594**	**0.0000**	**159.6654**	**159.6654**	**0.0455**	**0.0000**	**160.8032**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4000e-004	0.0227	6.7800e-003	8.0000e-005	2.0900e-003	3.0000e-005	2.1200e-003	6.0000e-004	2.0000e-005	6.3000e-004	0.0000	7.6864	7.6864	4.0000e-004	0.0000	7.6964
Worker	4.5000e-003	2.7300e-003	0.0347	1.3000e-004	0.0167	1.1000e-004	0.0168	4.4200e-003	1.0000e-004	4.5200e-003	0.0000	11.8078	11.8078	2.3000e-004	0.0000	11.8136

Total	5.1400e-003	0.0254	0.0415	2.1000e-004	0.0188	1.4000e-004	0.0189	5.0200e-003	1.2000e-004	5.1500e-003	0.0000	19.4942	19.4942	6.3000e-004	0.0000	19.5100

3.7 6. Outage Tie-ins, and Commissioning - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0459	0.4597	0.6766	1.0700e-003		0.0203	0.0203		0.0186	0.0186	0.0000	93.8430	93.8430	0.0304	0.0000	94.6017
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0459**	**0.4597**	**0.6766**	**1.0700e-003**		**0.0203**	**0.0203**		**0.0186**	**0.0186**	**0.0000**	**93.8430**	**93.8430**	**0.0304**	**0.0000**	**94.6017**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-004	0.0281	8.4100e-003	1.0000e-004	2.6000e-003	3.0000e-005	2.6300e-003	7.5000e-004	3.0000e-005	7.8000e-004	0.0000	9.5357	9.5357	4.9000e-004	0.0000	9.5481
Worker	4.1500e-003	2.5200e-003	0.0320	1.2000e-004	0.0154	1.0000e-004	0.0155	4.0800e-003	9.0000e-005	4.1700e-003	0.0000	10.8950	10.8950	2.2000e-004	0.0000	10.9004
Total	**4.9500e-003**	**0.0306**	**0.0404**	**2.2000e-004**	**0.0180**	**1.3000e-004**	**0.0181**	**4.8300e-003**	**1.2000e-004**	**4.9500e-003**	**0.0000**	**20.4308**	**20.4308**	**7.1000e-004**	**0.0000**	**20.4485**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0459	0.4597	0.6766	1.0700e-003		0.0203	0.0203		0.0186	0.0186	0.0000	93.8429	93.8429	0.0304	0.0000	94.6016
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0459**	**0.4597**	**0.6766**	**1.0700e-003**		**0.0203**	**0.0203**		**0.0186**	**0.0186**	**0.0000**	**93.8429**	**93.8429**	**0.0304**	**0.0000**	**94.6016**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-004	0.0281	8.4100e-003	1.0000e-004	2.6000e-003	3.0000e-005	2.6300e-003	7.5000e-004	3.0000e-005	7.8000e-004	0.0000	9.5357	9.5357	4.9000e-004	0.0000	9.5481
Worker	4.1500e-003	2.5200e-003	0.0320	1.2000e-004	0.0154	1.0000e-004	0.0155	4.0800e-003	9.0000e-005	4.1700e-003	0.0000	10.8950	10.8950	2.2000e-004	0.0000	10.9004
Total	**4.9500e-003**	**0.0306**	**0.0404**	**2.2000e-004**	**0.0180**	**1.3000e-004**	**0.0181**	**4.8300e-003**	**1.2000e-004**	**4.9500e-003**	**0.0000**	**20.4308**	**20.4308**	**7.1000e-004**	**0.0000**	**20.4485**

3.7 6. Outage Tie-ins, and Commissioning - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	0.0136	0.1365	0.2009	3.2000e-004		6.0100e-003	6.0100e-003		5.5300e-003	5.5300e-003	0.0000	27.8685	27.8685	9.0100e-003	0.0000	28.0939
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0136**	**0.1365**	**0.2009**	**3.2000e-004**		**6.0100e-003**	**6.0100e-003**		**5.5300e-003**	**5.5300e-003**	**0.0000**	**27.8685**	**27.8685**	**9.0100e-003**	**0.0000**	**28.0939**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3000e-004	8.2800e-003	2.4600e-003	3.0000e-005	7.7000e-004	1.0000e-005	7.8000e-004	2.2000e-004	1.0000e-005	2.3000e-004	0.0000	2.8215	2.8215	1.5000e-004	0.0000	2.8251
Worker	1.1600e-003	6.9000e-004	8.9100e-003	3.0000e-005	4.5600e-003	3.0000e-005	4.5900e-003	1.2100e-003	2.0000e-005	1.2400e-003	0.0000	3.1487	3.1487	6.0000e-005	0.0000	3.1501
Total	**1.3900e-003**	**8.9700e-003**	**0.0114**	**6.0000e-005**	**5.3300e-003**	**4.0000e-005**	**5.3700e-003**	**1.4300e-003**	**3.0000e-005**	**1.4700e-003**	**0.0000**	**5.9702**	**5.9702**	**2.1000e-004**	**0.0000**	**5.9752**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0136	0.1365	0.2009	3.2000e-004		6.0100e-003	6.0100e-003		5.5300e-003	5.5300e-003	0.0000	27.8685	27.8685	9.0100e-003	0.0000	28.0938
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0136**	**0.1365**	**0.2009**	**3.2000e-004**		**6.0100e-003**	**6.0100e-003**		**5.5300e-003**	**5.5300e-003**	**0.0000**	**27.8685**	**27.8685**	**9.0100e-003**	**0.0000**	**28.0938**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3000e-004	8.2800e-003	2.4600e-003	3.0000e-005	7.7000e-004	1.0000e-005	7.8000e-004	2.2000e-004	1.0000e-005	2.3000e-004	0.0000	2.8215	2.8215	1.5000e-004	0.0000	2.8251
Worker	1.1600e-003	6.9000e-004	8.9100e-003	3.0000e-005	4.5600e-003	3.0000e-005	4.5900e-003	1.2100e-003	2.0000e-005	1.2400e-003	0.0000	3.1487	3.1487	6.0000e-005	0.0000	3.1501
Total	**1.3900e-003**	**8.9700e-003**	**0.0114**	**6.0000e-005**	**5.3300e-003**	**4.0000e-005**	**5.3700e-003**	**1.4300e-003**	**3.0000e-005**	**1.4700e-003**	**0.0000**	**5.9702**	**5.9702**	**2.1000e-004**	**0.0000**	**5.9752**

3.8 7. Demo OTC Pipeline - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0321	0.0000	0.0321	4.8600e-003	0.0000	4.8600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0925	0.9043	1.4198	2.1000e-003		0.0367	0.0367		0.0341	0.0341	0.0000	184.2317	184.2317	0.0528	0.0000	185.5504
Total	**0.0925**	**0.9043**	**1.4198**	**2.1000e-003**	**0.0321**	**0.0367**	**0.0688**	**4.8600e-003**	**0.0341**	**0.0390**	**0.0000**	**184.2317**	**184.2317**	**0.0528**	**0.0000**	**185.5504**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.3000e-004	0.0154	4.5800e-003	5.0000e-005	1.4300e-003	2.0000e-005	1.4500e-003	4.1000e-004	2.0000e-005	4.3000e-004	0.0000	5.2399	5.2399	2.7000e-004	0.0000	5.2467
Worker	1.2700e-003	7.5000e-004	9.7300e-003	4.0000e-005	4.9900e-003	3.0000e-005	5.0200e-003	1.3200e-003	3.0000e-005	1.3500e-003	0.0000	3.4397	3.4397	6.0000e-005	0.0000	3.4413
Total	**1.7000e-003**	**0.0161**	**0.0143**	**9.0000e-005**	**6.4200e-003**	**5.0000e-005**	**6.4700e-003**	**1.7300e-003**	**5.0000e-005**	**1.7800e-003**	**0.0000**	**8.6796**	**8.6796**	**3.3000e-004**	**0.0000**	**8.6880**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0321	0.0000	0.0321	4.8600e-003	0.0000	4.8600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0925	0.9043	1.4198	2.1000e-003		0.0367	0.0367		0.0341	0.0341	0.0000	184.2314	184.2314	0.0528	0.0000	185.5501
Total	**0.0925**	**0.9043**	**1.4198**	**2.1000e-003**	**0.0321**	**0.0367**	**0.0688**	**4.8600e-003**	**0.0341**	**0.0390**	**0.0000**	**184.2314**	**184.2314**	**0.0528**	**0.0000**	**185.5501**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Vendor	4.3000e-004	0.0154	4.5800e-003	5.0000e-005	1.4300e-003	2.0000e-005	1.4500e-003	4.1000e-004	2.0000e-005	4.3000e-004	0.0000	5.2399	5.2399	2.7000e-004	0.0000	5.2467
Worker	1.2700e-003	7.5000e-004	9.7300e-003	4.0000e-005	4.9900e-003	3.0000e-005	5.0200e-003	1.3200e-003	3.0000e-005	1.3500e-003	0.0000	3.4397	3.4397	6.0000e-005	0.0000	3.4413
Total	**1.7000e-003**	**0.0161**	**0.0143**	**9.0000e-005**	**6.4200e-003**	**5.0000e-005**	**6.4700e-003**	**1.7300e-003**	**5.0000e-005**	**1.7800e-003**	**0.0000**	**8.6796**	**8.6796**	**3.3000e-004**	**0.0000**	**8.6880**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.2500e-003	0.0477	0.1357	6.3000e-004	0.0630	4.1000e-004	0.0634	0.0169	3.8000e-004	0.0173	0.0000	58.4745	58.4745	2.4400e-003	0.0000	58.5356
Unmitigated	9.2500e-003	0.0477	0.1357	6.3000e-004	0.0630	4.1000e-004	0.0634	0.0169	3.8000e-004	0.0173	0.0000	58.4745	58.4745	2.4400e-003	0.0000	58.5356

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	37.50	37.50	37.50	166,060	166,060
Total	37.50	37.50	37.50	166,060	166,060

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.542570	0.044139	0.210405	0.116125	0.013871	0.006349	0.021293	0.034040	0.002625	0.001760	0.005291	0.000716	0.000815

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	117.6581	117.6581	2.7800e-003	5.7000e-004	117.8989
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	117.6581	117.6581	2.7800e-003	5.7000e-004	117.8989
NaturalGas Mitigated	2.8200e-003	0.0256	0.0215	1.5000e-004		1.9500e-003	1.9500e-003		1.9500e-003	1.9500e-003	0.0000	27.8826	27.8826	5.3000e-004	5.1000e-004	28.0483
NaturalGas Unmitigated	2.8200e-003	0.0256	0.0215	1.5000e-004		1.9500e-003	1.9500e-003		1.9500e-003	1.9500e-003	0.0000	27.8826	27.8826	5.3000e-004	5.1000e-004	28.0483

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	522500	2.8200e-003	0.0256	0.0215	1.5000e-004		1.9500e-003	1.9500e-003		1.9500e-003	1.9500e-003	0.0000	27.8826	27.8826	5.3000e-004	5.1000e-004	28.0483

Total		**2.8200e-003**	**0.0256**	**0.0215**	**1.5000e-004**		**1.9500e-003**	**1.9500e-003**		**1.9500e-003**	**1.9500e-003**	**0.0000**	**27.8826**	**27.8826**	**5.3000e-004**	**5.1000e-004**	**28.0483**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Heavy Industry	522500	2.8200e-003	0.0256	0.0215	1.5000e-004		1.9500e-003	1.9500e-003		1.9500e-003	1.9500e-003	0.0000	27.8826	27.8826	5.3000e-004	5.1000e-004	28.0483
Total		**2.8200e-003**	**0.0256**	**0.0215**	**1.5000e-004**		**1.9500e-003**	**1.9500e-003**		**1.9500e-003**	**1.9500e-003**	**0.0000**	**27.8826**	**27.8826**	**5.3000e-004**	**5.1000e-004**	**28.0483**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	211250	117.6581	2.7800e-003	5.7000e-004	117.8989
Total		**117.6581**	**2.7800e-003**	**5.7000e-004**	**117.8989**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Heavy Industry	211250	117.6581	2.7800e-003	5.7000e-004	117.8989
Total		**117.6581**	**2.7800e-003**	**5.7000e-004**	**117.8989**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.0000e-005	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.2000e-004	6.2000e-004	0.0000	0.0000	6.6000e-004
Unmitigated	3.0000e-005	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.2000e-004	6.2000e-004	0.0000	0.0000	6.6000e-004

6.2 Area by SubCategory

Unmitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.2000e-004	6.2000e-004	0.0000	0.0000	6.6000e-004
Total	**3.0000e-005**	**0.0000**	**3.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**6.2000e-004**	**6.2000e-004**	**0.0000**	**0.0000**	**6.6000e-004**

Mitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.2000e-004	6.2000e-004	0.0000	0.0000	6.6000e-004
Total	**3.0000e-005**	**0.0000**	**3.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**6.2000e-004**	**6.2000e-004**	**0.0000**	**0.0000**	**6.6000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

Category	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	43.7609	0.1894	4.6500e-003	49.8818
Unmitigated	43.7609	0.1894	4.6500e-003	49.8818

7.2 Water by Land Use

Unmitigated

Land Use	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
	Mgal	MT/yr			
General Heavy Industry	5.78125 / 0	43.7609	0.1894	4.6500e-003	49.8818
Total		**43.7609**	**0.1894**	**4.6500e-003**	**49.8818**

Mitigated

Land Use	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
	Mgal	MT/yr			
General Heavy Industry	5.78125 / 0	43.7609	0.1894	4.6500e-003	49.8818
Total		**43.7609**	**0.1894**	**4.6500e-003**	**49.8818**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	6.2927	0.3719	0.0000	15.5900
Unmitigated	6.2927	0.3719	0.0000	15.5900

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	31	6.2927	0.3719	0.0000	15.5900
Total		**6.2927**	**0.3719**	**0.0000**	**15.5900**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Heavy Industry	31	6.2927	0.3719	0.0000	15.5900
Total		**6.2927**	**0.3719**	**0.0000**	**15.5900**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Haynes LADWP

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	25.00	1000sqft	0.57	25,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2029
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MWhr)	1227.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Based on Client Construction Plan

Off-road Equipment - Construction Data from Client

Off-road Equipment - Based on Construction Data

Off-road Equipment - Construction Data

Off-road Equipment - Construction Plans

Off-road Equipment - Construction Plans

Off-road Equipment - Construction Plans

Off-road Equipment - Construction Plans

Trips and VMT - Construction Plans

Demolition -

Grading - Construction Plans

Consumer Products - NO Operations

Area Coating - No Operation

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	0
tblAreaCoating	Area_EF_Nonresidential_Interior	100	0
tblConstructionPhase	NumDays	100.00	234.00
tblConstructionPhase	NumDays	100.00	181.00
tblConstructionPhase	NumDays	100.00	121.00
tblConstructionPhase	NumDays	10.00	91.00
tblConstructionPhase	NumDays	2.00	122.00
tblConstructionPhase	NumDays	5.00	214.00
tblConstructionPhase	NumDays	1.00	242.00
tblConsumerProducts	ROG_EF	1.98E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	3.542E-08
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	5.152E-10
tblGrading	AcresOfGrading	30.25	87.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	UsageHours	8.00	2.00

tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	6.00	19.00
tblTripsAndVMT	HaulingTripNumber	297.00	0.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	4.00	8.00
tblTripsAndVMT	VendorTripNumber	4.00	7.00
tblTripsAndVMT	VendorTripNumber	4.00	7.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	WorkerTripNumber	28.00	24.00
tblTripsAndVMT	WorkerTripNumber	30.00	18.00
tblTripsAndVMT	WorkerTripNumber	11.00	14.00
tblTripsAndVMT	WorkerTripNumber	11.00	18.00
tblTripsAndVMT	WorkerTripNumber	11.00	32.00
tblTripsAndVMT	WorkerTripNumber	18.00	17.00
tblTripsAndVMT	WorkerTripNumber	23.00	10.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	1.2836	11.3894	17.7120	0.0308	0.7007	0.4889	1.1896	0.1271	0.4521	0.5792	0.0000	2,987.7232	2,987.7232	0.8140	0.0000	3,008.0726
2025	1.6984	14.6068	19.9543	0.0501	1.0116	0.5827	1.5943	0.4837	0.5444	1.0281	0.0000	4,847.8689	4,847.8689	1.2775	0.0000	4,879.8059
2026	1.6952	14.5982	19.9160	0.0500	1.0116	0.5827	1.5943	0.4837	0.5443	1.0280	0.0000	4,840.4513	4,840.4513	1.2770	0.0000	4,872.3755
2027	3.4731	26.4565	32.4270	0.0554	0.4025	1.3515	1.7540	0.1078	1.2532	1.3610	0.0000	5,010.9244	5,010.9244	1.0768	0.0000	5,037.8440
2028	2.9508	25.3292	27.9381	0.0440	0.4025	1.3513	1.7538	0.1078	1.2530	1.3608	0.0000	4,171.9093	4,171.9093	1.0709	0.0000	4,198.6825
2029	2.0687	20.2235	31.5294	0.0483	0.8493	0.8084	1.6576	0.1457	0.7512	0.8968	0.0000	4,678.7318	4,678.7318	1.2859	0.0000	4,710.8799
Maximum	**3.4731**	**26.4565**	**32.4270**	**0.0554**	**1.0116**	**1.3515**	**1.7540**	**0.4837**	**1.2532**	**1.3610**	**0.0000**	**5,010.9244**	**5,010.9244**	**1.2859**	**0.0000**	**5,037.8440**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	1.2836	11.3894	17.7120	0.0308	0.7007	0.4889	1.1896	0.1271	0.4521	0.5792	0.0000	2,987.7232	2,987.7232	0.8140	0.0000	3,008.0726
2025	1.6984	14.6068	19.9543	0.0501	1.0116	0.5827	1.5943	0.4837	0.5444	1.0281	0.0000	4,847.8689	4,847.8689	1.2775	0.0000	4,879.8059
2026	1.6952	14.5982	19.9160	0.0500	1.0116	0.5827	1.5943	0.4837	0.5443	1.0280	0.0000	4,840.4513	4,840.4513	1.2770	0.0000	4,872.3754
2027	3.4731	26.4565	32.4270	0.0554	0.4025	1.3515	1.7540	0.1078	1.2532	1.3610	0.0000	5,010.9243	5,010.9243	1.0768	0.0000	5,037.8440
2028	2.9508	25.3292	27.9381	0.0440	0.4025	1.3513	1.7538	0.1078	1.2530	1.3608	0.0000	4,171.9093	4,171.9093	1.0709	0.0000	4,198.6825
2029	2.0687	20.2235	31.5294	0.0483	0.8493	0.8084	1.6576	0.1457	0.7512	0.8968	0.0000	4,678.7318	4,678.7318	1.2859	0.0000	4,710.8799

Maximum	**3.4731**	**26.4565**	**32.4270**	**0.0554**	**1.0116**	**1.3515**	**1.7540**	**0.4837**	**1.2532**	**1.3610**	**0.0000**	**5,010.9243**	**5,010.9243**	**1.2859**	**0.0000**	**5,037.8440**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003
Energy	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134
Mobile	0.0534	0.2518	0.7806	3.5800e-003	0.3530	2.2700e-003	0.3553	0.0944	2.1100e-003	0.0965		366.2111	366.2111	0.0149		366.5831
Total	**0.0690**	**0.3922**	**0.9010**	**4.4200e-003**	**0.3530**	**0.0130**	**0.3659**	**0.0944**	**0.0128**	**0.1072**		**534.6291**	**534.6291**	**0.0181**	**3.0900e-003**	**536.0023**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003
Energy	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134
Mobile	0.0534	0.2518	0.7806	3.5800e-003	0.3530	2.2700e-003	0.3553	0.0944	2.1100e-003	0.0965		366.2111	366.2111	0.0149		366.5831

Total	0.0690	0.3922	0.9010	4.4200e-003	0.3530	0.0130	0.3659	0.0944	0.0128	0.1072		534.6291	534.6291	0.0181	3.0900e-003	536.0023

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	1. Site Preparation and Earthwork	Site Preparation	12/2/2024	11/4/2025	5	242	
2	2. Foundation Work/Piles	Grading	11/5/2025	4/23/2026	5	122	
3	3. Cooling Tower and Auxiliary Equipment	Building Construction	4/24/2026	3/17/2027	5	234	
4	4. Makeup Water Tank & Wastewater Tank	Building Construction	3/18/2027	11/25/2027	5	181	
5	5. Recycled, Makeup Water, Wastewater, and Stormwater	Building Construction	11/26/2027	5/12/2028	5	121	
6	6. Outage Tie-ins, and Commissioning	Paving	5/15/2028	3/8/2029	5	214	
7	7. Demo OTC Pipeline	Demolition	3/9/2029	7/13/2029	5	91	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
1. Site Preparation and Earthwork	Dumpers/Tenders	2	6.00	16	0.38
1. Site Preparation and Earthwork	Excavators	2	8.00	158	0.38
1. Site Preparation and Earthwork	Graders	1	2.00	187	0.41
1. Site Preparation and Earthwork	Plate Compactors	1	2.00	8	0.43
1. Site Preparation and Earthwork	Rollers	1	2.00	80	0.38

1. Site Preparation and Earthwork	Tractors/Loaders/Backhoes	4	8.00	97	0.37
2. Foundation Work/Piles	Bore/Drill Rigs	2	8.00	221	0.50
2. Foundation Work/Piles	Concrete/Industrial Saws	1	8.00	81	0.73
2. Foundation Work/Piles	Cranes	2	3.00	231	0.29
2. Foundation Work/Piles	Excavators	2	8.00	158	0.38
2. Foundation Work/Piles	Other Construction Equipment	1	4.00	172	0.42
2. Foundation Work/Piles	Plate Compactors	2	4.00	8	0.43
2. Foundation Work/Piles	Rubber Tired Dozers	1	1.00	247	0.40
2. Foundation Work/Piles	Tractors/Loaders/Backhoes	1	4.00	97	0.37
3. Cooling Tower and Auxiliary Equipment	Aerial Lifts	1	3.00	63	0.31
3. Cooling Tower and Auxiliary Equipment	Cranes	1	6.00	231	0.29
3. Cooling Tower and Auxiliary Equipment	Forklifts	2	6.00	89	0.20
3. Cooling Tower and Auxiliary Equipment	Tractors/Loaders/Backhoes	1	4.00	97	0.37
3. Cooling Tower and Auxiliary Equipment	Tractors/Loaders/Backhoes	0	0.00	97	0.37
3. Cooling Tower and Auxiliary Equipment	Welders	3	9.00	46	0.45
4. Makeup Water Tank & Wastewater Tank	Cranes	2	6.00	231	0.29
4. Makeup Water Tank & Wastewater Tank	Forklifts	2	6.00	89	0.20
4. Makeup Water Tank & Wastewater Tank	Other Construction Equipment	1	4.00	172	0.42
4. Makeup Water Tank & Wastewater Tank	Tractors/Loaders/Backhoes	3	12.00	97	0.37
4. Makeup Water Tank & Wastewater Tank	Welders	5	15.00	46	0.45
5. Recycled, Makeup Water, Wastewater, and Stormwater	Cement and Mortar Mixers	0	0.00	9	0.56
5. Recycled, Makeup Water, Wastewater, and Stormwater	Cranes	1	4.00	231	0.29
5. Recycled, Makeup Water, Wastewater, and Stormwater	Excavators	1	4.00	158	0.38
5. Recycled, Makeup Water, Wastewater, and Stormwater	Forklifts	2	6.00	89	0.20
5. Recycled, Makeup Water, Wastewater, and Stormwater	Rollers	2	4.00	80	0.38
5. Recycled, Makeup Water, Wastewater, and Stormwater	Tractors/Loaders/Backhoes	2	8.00	97	0.37
5. Recycled, Makeup Water, Wastewater, and Stormwater	Trenchers	3	12.00	78	0.50
5. Recycled, Makeup Water, Wastewater, and Stormwater	Welders	2	12.00	46	0.45
6. Outage Tie-ins, and Commissioning	Aerial Lifts	1	2.00	63	0.31
6. Outage Tie-ins, and Commissioning	Air Compressors	0	0.00	78	0.48

6. Outage Tie-ins, and Commissioning	Cement and Mortar Mixers	0	0.00	9	0.56
6. Outage Tie-ins, and Commissioning	Cranes	1	2.00	231	0.29
6. Outage Tie-ins, and Commissioning	Pavers	1	7.00	130	0.42
6. Outage Tie-ins, and Commissioning	Rollers	1	7.00	80	0.38
6. Outage Tie-ins, and Commissioning	Tractors/Loaders/Backhoes	3	4.00	97	0.37
7. Demo OTC Pipeline	Aerial Lifts	1	2.00	63	0.31
7. Demo OTC Pipeline	Concrete/Industrial Saws	1	8.00	81	0.73
7. Demo OTC Pipeline	Cranes	1	2.00	231	0.29
7. Demo OTC Pipeline	Rubber Tired Dozers	1	1.00	247	0.40
7. Demo OTC Pipeline	Tractors/Loaders/Backhoes	5	19.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
1. Site Preparation and Earthwork	11	24.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
2. Foundation Work/Piles	12	18.00	9.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
3. Cooling Tower and Auxiliary Equipment	8	14.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
4. Makeup Water Tank & Wastewater Tank	13	18.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
5. Recycled, Makeup Water, Wastewater	13	32.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
6. Outage Tie-ins, and Commissioning	7	17.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
7. Demo OTC Pipeline	9	10.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 1. Site Preparation and Earthwork - 2024

Unmitigated Construction On-Site

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

Category	lb/day										lb/day					
Fugitive Dust					0.3813	0.0000	0.3813	0.0412	0.0000	0.0412			0.0000			0.0000
Off-Road	1.1815	10.7783	16.7781	0.0264		0.4863	0.4863		0.4496	0.4496		2,531.2913	2,531.2913	0.7970		2,551.2170
Total	**1.1815**	**10.7783**	**16.7781**	**0.0264**	**0.3813**	**0.4863**	**0.8675**	**0.0412**	**0.4496**	**0.4908**		**2,531.2913**	**2,531.2913**	**0.7970**		**2,551.2170**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0165	0.5583	0.1682	1.9600e-003	0.0512	6.4000e-004	0.0519	0.0148	6.1000e-004	0.0154		210.2691	210.2691	0.0109		210.5423
Worker	0.0856	0.0527	0.7657	2.4700e-003	0.2683	2.0100e-003	0.2703	0.0711	1.8500e-003	0.0730		246.1628	246.1628	6.0200e-003		246.3133
Total	**0.1021**	**0.6110**	**0.9339**	**4.4300e-003**	**0.3195**	**2.6500e-003**	**0.3221**	**0.0859**	**2.4600e-003**	**0.0884**		**456.4319**	**456.4319**	**0.0170**		**456.8556**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3813	0.0000	0.3813	0.0412	0.0000	0.0412			0.0000			0.0000
Off-Road	1.1815	10.7783	16.7781	0.0264		0.4863	0.4863		0.4496	0.4496	0.0000	2,531.2913	2,531.2913	0.7970		2,551.2170

Total	**1.1815**	**10.7783**	**16.7781**	**0.0264**	**0.3813**	**0.4863**	**0.8675**	**0.0412**	**0.4496**	**0.4908**	**0.0000**	**2,531.2913**	**2,531.2913**	**0.7970**		**2,551.2170**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0165	0.5583	0.1682	1.9600e-003	0.0512	6.4000e-004	0.0519	0.0148	6.1000e-004	0.0154		210.2691	210.2691	0.0109		210.5423
Worker	0.0856	0.0527	0.7657	2.4700e-003	0.2683	2.0100e-003	0.2703	0.0711	1.8500e-003	0.0730		246.1628	246.1628	6.0200e-003		246.3133
Total	**0.1021**	**0.6110**	**0.9339**	**4.4300e-003**	**0.3195**	**2.6500e-003**	**0.3221**	**0.0859**	**2.4600e-003**	**0.0884**		**456.4319**	**456.4319**	**0.0170**		**456.8556**

3.2 1. Site Preparation and Earthwork - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3813	0.0000	0.3813	0.0412	0.0000	0.0412			0.0000			0.0000
Off-Road	1.0950	9.7682	16.7265	0.0264		0.4105	0.4105		0.3799	0.3799		2,532.5049	2,532.5049	0.7974		2,552.4404
Total	**1.0950**	**9.7682**	**16.7265**	**0.0264**	**0.3813**	**0.4105**	**0.7917**	**0.0412**	**0.3799**	**0.4211**		**2,532.5049**	**2,532.5049**	**0.7974**		**2,552.4404**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0161	0.5536	0.1639	1.9500e-003	0.0512	6.3000e-004	0.0519	0.0148	6.0000e-004	0.0154		209.1106	209.1106	0.0108		209.3799
Worker	0.0813	0.0482	0.7111	2.3700e-003	0.2683	1.9700e-003	0.2702	0.0711	1.8100e-003	0.0730		236.6244	236.6244	5.4900e-003		236.7617
Total	**0.0974**	**0.6018**	**0.8750**	**4.3200e-003**	**0.3195**	**2.6000e-003**	**0.3221**	**0.0859**	**2.4100e-003**	**0.0883**		**445.7349**	**445.7349**	**0.0163**		**446.1416**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3813	0.0000	0.3813	0.0412	0.0000	0.0412			0.0000			0.0000
Off-Road	1.0950	9.7682	16.7265	0.0264		0.4105	0.4105		0.3799	0.3799	0.0000	2,532.5049	2,532.5049	0.7974		2,552.4404
Total	**1.0950**	**9.7682**	**16.7265**	**0.0264**	**0.3813**	**0.4105**	**0.7917**	**0.0412**	**0.3799**	**0.4211**	**0.0000**	**2,532.5049**	**2,532.5049**	**0.7974**		**2,552.4404**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0161	0.5536	0.1639	1.9500e-003	0.0512	6.3000e-004	0.0519	0.0148	6.0000e-004	0.0154		209.1106	209.1106	0.0108		209.3799
Worker	0.0813	0.0482	0.7111	2.3700e-003	0.2683	1.9700e-003	0.2702	0.0711	1.8100e-003	0.0730		236.6244	236.6244	5.4900e-003		236.7617
Total	**0.0974**	**0.6018**	**0.8750**	**4.3200e-003**	**0.3195**	**2.6000e-003**	**0.3221**	**0.0859**	**2.4100e-003**	**0.0883**		**445.7349**	**445.7349**	**0.0163**		**446.1416**

3.3 2. Foundation Work/Piles - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	1.6193	13.9479	19.2366	0.0461		0.5806	0.5806		0.5423	0.5423		4,435.1513	4,435.1513	1.2612		4,466.6822
Total	**1.6193**	**13.9479**	**19.2366**	**0.0461**	**0.7528**	**0.5806**	**1.3333**	**0.4138**	**0.5423**	**0.9561**		**4,435.1513**	**4,435.1513**	**1.2612**		**4,466.6822**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0181	0.6228	0.1844	2.1900e-003	0.0576	7.1000e-004	0.0583	0.0166	6.8000e-004	0.0173		235.2494	235.2494	0.0121		235.5524
Worker	0.0610	0.0362	0.5333	1.7800e-003	0.2012	1.4800e-003	0.2027	0.0534	1.3600e-003	0.0547		177.4683	177.4683	4.1200e-003		177.5713

Total	**0.0791**	**0.6589**	**0.7177**	**3.9700e-003**	**0.2588**	**2.1900e-003**	**0.2610**	**0.0700**	**2.0400e-003**	**0.0720**		**412.7177**	**412.7177**	**0.0162**		**413.1237**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	1.6193	13.9479	19.2366	0.0461		0.5806	0.5806		0.5423	0.5423	0.0000	4,435.1513	4,435.1513	1.2612		4,466.6822
Total	**1.6193**	**13.9479**	**19.2366**	**0.0461**	**0.7528**	**0.5806**	**1.3333**	**0.4138**	**0.5423**	**0.9561**	**0.0000**	**4,435.1513**	**4,435.1513**	**1.2612**		**4,466.6822**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0181	0.6228	0.1844	2.1900e-003	0.0576	7.1000e-004	0.0583	0.0166	6.8000e-004	0.0173		235.2494	235.2494	0.0121		235.5524
Worker	0.0610	0.0362	0.5333	1.7800e-003	0.2012	1.4800e-003	0.2027	0.0534	1.3600e-003	0.0547		177.4683	177.4683	4.1200e-003		177.5713
Total	**0.0791**	**0.6589**	**0.7177**	**3.9700e-003**	**0.2588**	**2.1900e-003**	**0.2610**	**0.0700**	**2.0400e-003**	**0.0720**		**412.7177**	**412.7177**	**0.0162**		**413.1237**

3.3 2. Foundation Work/Piles - 2026

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	1.6193	13.9479	19.2366	0.0461		0.5806	0.5806		0.5423	0.5423		4,435.1513	4,435.1513	1.2612		4,466.6822
Total	**1.6193**	**13.9479**	**19.2366**	**0.0461**	**0.7528**	**0.5806**	**1.3333**	**0.4138**	**0.5423**	**0.9561**		**4,435.1513**	**4,435.1513**	**1.2612**		**4,466.6822**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0177	0.6170	0.1807	2.1800e-003	0.0576	6.9000e-004	0.0583	0.0166	6.6000e-004	0.0173		233.9977	233.9977	0.0120		234.2965
Worker	0.0582	0.0333	0.4987	1.7200e-003	0.2012	1.4300e-003	0.2026	0.0534	1.3100e-003	0.0547		171.3023	171.3023	3.7800e-003		171.3968
Total	**0.0759**	**0.6503**	**0.6794**	**3.9000e-003**	**0.2588**	**2.1200e-003**	**0.2609**	**0.0700**	**1.9700e-003**	**0.0719**		**405.3001**	**405.3001**	**0.0157**		**405.6932**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					

Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	1.6193	13.9479	19.2366	0.0461		0.5806	0.5806		0.5423	0.5423	0.0000	4,435.1513	4,435.1513	1.2612		4,466.6822
Total	**1.6193**	**13.9479**	**19.2366**	**0.0461**	**0.7528**	**0.5806**	**1.3333**	**0.4138**	**0.5423**	**0.9561**	**0.0000**	**4,435.1513**	**4,435.1513**	**1.2612**		**4,466.6822**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0177	0.6170	0.1807	2.1800e-003	0.0576	6.9000e-004	0.0583	0.0166	6.6000e-004	0.0173		233.9977	233.9977	0.0120		234.2965
Worker	0.0582	0.0333	0.4987	1.7200e-003	0.2012	1.4300e-003	0.2026	0.0534	1.3100e-003	0.0547		171.3023	171.3023	3.7800e-003		171.3968
Total	**0.0759**	**0.6503**	**0.6794**	**3.9000e-003**	**0.2588**	**2.1200e-003**	**0.2609**	**0.0700**	**1.9700e-003**	**0.0719**		**405.3001**	**405.3001**	**0.0157**		**405.6932**

3.4 3. Cooling Tower and Auxiliary Equipment - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1855	8.9959	10.1012	0.0174		0.3351	0.3351		0.3194	0.3194		1,553.4136	1,553.4136	0.3425		1,561.9754
Total	**1.1855**	**8.9959**	**10.1012**	**0.0174**		**0.3351**	**0.3351**		**0.3194**	**0.3194**		**1,553.4136**	**1,553.4136**	**0.3425**		**1,561.9754**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0157	0.5484	0.1606	1.9400e-003	0.0512	6.2000e-004	0.0518	0.0148	5.9000e-004	0.0153		207.9980	207.9980	0.0106		208.2635
Worker	0.0453	0.0259	0.3879	1.3400e-003	0.1565	1.1100e-003	0.1576	0.0415	1.0200e-003	0.0425		133.2352	133.2352	2.9400e-003		133.3086
Total	**0.0610**	**0.5744**	**0.5485**	**3.2800e-003**	**0.2077**	**1.7300e-003**	**0.2094**	**0.0563**	**1.6100e-003**	**0.0579**		**341.2331**	**341.2331**	**0.0136**		**341.5721**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1855	8.9959	10.1012	0.0174		0.3351	0.3351		0.3194	0.3194	0.0000	1,553.4136	1,553.4136	0.3425		1,561.9754
Total	**1.1855**	**8.9959**	**10.1012**	**0.0174**		**0.3351**	**0.3351**		**0.3194**	**0.3194**	**0.0000**	**1,553.4136**	**1,553.4136**	**0.3425**		**1,561.9754**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0157	0.5484	0.1606	1.9400e-003	0.0512	6.2000e-004	0.0518	0.0148	5.9000e-004	0.0153		207.9980	207.9980	0.0106		208.2635
Worker	0.0453	0.0259	0.3879	1.3400e-003	0.1565	1.1100e-003	0.1576	0.0415	1.0200e-003	0.0425		133.2352	133.2352	2.9400e-003		133.3086
Total	**0.0610**	**0.5744**	**0.5485**	**3.2800e-003**	**0.2077**	**1.7300e-003**	**0.2094**	**0.0563**	**1.6100e-003**	**0.0579**		**341.2331**	**341.2331**	**0.0136**		**341.5721**

3.4 3. Cooling Tower and Auxiliary Equipment - 2027

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	1.1855	8.9959	10.1012	0.0174		0.3351	0.3351		0.3194	0.3194		1,553.4136	1,553.4136	0.3425		1,561.9754
Total	**1.1855**	**8.9959**	**10.1012**	**0.0174**		**0.3351**	**0.3351**		**0.3194**	**0.3194**		**1,553.4136**	**1,553.4136**	**0.3425**		**1,561.9754**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Vendor	0.0154	0.5435	0.1579	1.9300e-003	0.0512	6.1000e-004	0.0518	0.0148	5.8000e-004	0.0153		207.0025	207.0025	0.0105		207.2642
Worker	0.0431	0.0239	0.3638	1.2900e-003	0.1565	1.0500e-003	0.1575	0.0415	9.6000e-004	0.0425		128.9898	128.9898	2.7000e-003		129.0573
Total	**0.0586**	**0.5674**	**0.5217**	**3.2200e-003**	**0.2077**	**1.6600e-003**	**0.2094**	**0.0563**	**1.5400e-003**	**0.0578**		**335.9923**	**335.9923**	**0.0132**		**336.3215**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1855	8.9959	10.1012	0.0174		0.3351	0.3351		0.3194	0.3194	0.0000	1,553.4136	1,553.4136	0.3425		1,561.9754
Total	**1.1855**	**8.9959**	**10.1012**	**0.0174**		**0.3351**	**0.3351**		**0.3194**	**0.3194**	**0.0000**	**1,553.4136**	**1,553.4136**	**0.3425**		**1,561.9754**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0154	0.5435	0.1579	1.9300e-003	0.0512	6.1000e-004	0.0518	0.0148	5.8000e-004	0.0153		207.0025	207.0025	0.0105		207.2642
Worker	0.0431	0.0239	0.3638	1.2900e-003	0.1565	1.0500e-003	0.1575	0.0415	9.6000e-004	0.0425		128.9898	128.9898	2.7000e-003		129.0573
Total	**0.0586**	**0.5674**	**0.5217**	**3.2200e-003**	**0.2077**	**1.6600e-003**	**0.2094**	**0.0563**	**1.5400e-003**	**0.0578**		**335.9923**	**335.9923**	**0.0132**		**336.3215**

3.5 4. Makeup Water Tank & Wastewater Tank - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.4041	25.9501	31.8211	0.0520		0.9659	0.9659		0.9193	0.9193		4,663.9531	4,663.9531	1.0642		4,690.5570
Total	**3.4041**	**25.9501**	**31.8211**	**0.0520**		**0.9659**	**0.9659**		**0.9193**	**0.9193**		**4,663.9531**	**4,663.9531**	**1.0642**		**4,690.5570**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0135	0.4756	0.1382	1.6900e-003	0.0448	5.3000e-004	0.0454	0.0129	5.1000e-004	0.0134		181.1272	181.1272	9.1600e-003		181.3562
Worker	0.0555	0.0307	0.4677	1.6600e-003	0.2012	1.3500e-003	0.2026	0.0534	1.2400e-003	0.0546		165.8441	165.8441	3.4700e-003		165.9308
Total	**0.0690**	**0.5063**	**0.6059**	**3.3500e-003**	**0.2460**	**1.8800e-003**	**0.2479**	**0.0663**	**1.7500e-003**	**0.0680**		**346.9713**	**346.9713**	**0.0126**		**347.2870**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.4041	25.9501	31.8211	0.0520		0.9659	0.9659		0.9193	0.9193	0.0000	4,663.9531	4,663.9531	1.0642		4,690.5570
Total	**3.4041**	**25.9501**	**31.8211**	**0.0520**		**0.9659**	**0.9659**		**0.9193**	**0.9193**	**0.0000**	**4,663.9531**	**4,663.9531**	**1.0642**		**4,690.5570**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0135	0.4756	0.1382	1.6900e-003	0.0448	5.3000e-004	0.0454	0.0129	5.1000e-004	0.0134		181.1272	181.1272	9.1600e-003		181.3562
Worker	0.0555	0.0307	0.4677	1.6600e-003	0.2012	1.3500e-003	0.2026	0.0534	1.2400e-003	0.0546		165.8441	165.8441	3.4700e-003		165.9308
Total	**0.0690**	**0.5063**	**0.6059**	**3.3500e-003**	**0.2460**	**1.8800e-003**	**0.2479**	**0.0663**	**1.7500e-003**	**0.0680**		**346.9713**	**346.9713**	**0.0126**		**347.2870**

3.6 5. Recycled, Makeup Water, Wastewater, and Stormwater -

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8439	24.8067	27.0185	0.0395		1.3486	1.3486		1.2505	1.2505		3,705.2882	3,705.2882	1.0562		3,731.6932

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Total	**2.8439**	**24.8067**	**27.0185**	**0.0395**		**1.3486**	**1.3486**		**1.2505**	**1.2505**		**3,705.2882**	**3,705.2882**	**1.0562**		**3,731.6932**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0135	0.4756	0.1382	1.6900e-003	0.0448	5.3000e-004	0.0454	0.0129	5.1000e-004	0.0134		181.1272	181.1272	9.1600e-003		181.3562
Worker	0.0986	0.0547	0.8315	2.9600e-003	0.3577	2.4000e-003	0.3601	0.0949	2.2100e-003	0.0971		294.8339	294.8339	6.1700e-003		294.9880
Total	**0.1121**	**0.5302**	**0.9697**	**4.6500e-003**	**0.4025**	**2.9300e-003**	**0.4054**	**0.1078**	**2.7200e-003**	**0.1105**		**475.9611**	**475.9611**	**0.0153**		**476.3443**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8439	24.8067	27.0185	0.0395		1.3486	1.3486		1.2505	1.2505	0.0000	3,705.2882	3,705.2882	1.0562		3,731.6932
Total	**2.8439**	**24.8067**	**27.0185**	**0.0395**		**1.3486**	**1.3486**		**1.2505**	**1.2505**	**0.0000**	**3,705.2882**	**3,705.2882**	**1.0562**		**3,731.6932**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0135	0.4756	0.1382	1.6900e-003	0.0448	5.3000e-004	0.0454	0.0129	5.1000e-004	0.0134		181.1272	181.1272	9.1600e-003		181.3562
Worker	0.0986	0.0547	0.8315	2.9600e-003	0.3577	2.4000e-003	0.3601	0.0949	2.2100e-003	0.0971		294.8339	294.8339	6.1700e-003		294.9880
Total	**0.1121**	**0.5302**	**0.9697**	**4.6500e-003**	**0.4025**	**2.9300e-003**	**0.4054**	**0.1078**	**2.7200e-003**	**0.1105**		**475.9611**	**475.9611**	**0.0153**		**476.3443**

3.6 5. Recycled, Makeup Water, Wastewater, and Stormwater -

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8439	24.8067	27.0185	0.0395		1.3486	1.3486		1.2505	1.2505		3,705.2882	3,705.2882	1.0562		3,731.6932
Total	**2.8439**	**24.8067**	**27.0185**	**0.0395**		**1.3486**	**1.3486**		**1.2505**	**1.2505**		**3,705.2882**	**3,705.2882**	**1.0562**		**3,731.6932**

Unmitigated Construction Off-Site

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

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0133	0.4719	0.1363	1.6800e-003	0.0448	5.2000e-004	0.0453	0.0129	5.0000e-004	0.0134		180.3792	180.3792	9.0400e-003		180.6052
Worker	0.0936	0.0505	0.7833	2.8700e-003	0.3577	2.2200e-003	0.3599	0.0949	2.0500e-003	0.0969		286.2419	286.2419	5.6900e-003		286.3842
Total	**0.1069**	**0.5225**	**0.9196**	**4.5500e-003**	**0.4025**	**2.7400e-003**	**0.4053**	**0.1078**	**2.5500e-003**	**0.1103**		**466.6211**	**466.6211**	**0.0147**		**466.9893**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8439	24.8067	27.0185	0.0395		1.3486	1.3486		1.2505	1.2505	0.0000	3,705.2882	3,705.2882	1.0562		3,731.6932
Total	**2.8439**	**24.8067**	**27.0185**	**0.0395**		**1.3486**	**1.3486**		**1.2505**	**1.2505**	**0.0000**	**3,705.2882**	**3,705.2882**	**1.0562**		**3,731.6932**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0133	0.4719	0.1363	1.6800e-003	0.0448	5.2000e-004	0.0453	0.0129	5.0000e-004	0.0134		180.3792	180.3792	9.0400e-003		180.6052

Worker	0.0936	0.0505	0.7833	2.8700e-003	0.3577	2.2200e-003	0.3599	0.0949	2.0500e-003	0.0969		286.2419	286.2419	5.6900e-003		286.3842
Total	**0.1069**	**0.5225**	**0.9196**	**4.5500e-003**	**0.4025**	**2.7400e-003**	**0.4053**	**0.1078**	**2.5500e-003**	**0.1103**		**466.6211**	**466.6211**	**0.0147**		**466.9893**

3.7 6. Outage Tie-ins, and Commissioning - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5568	5.5726	8.2010	0.0130		0.2454	0.2454		0.2258	0.2258		1,253.8686	1,253.8686	0.4055		1,264.0068
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5568**	**5.5726**	**8.2010**	**0.0130**		**0.2454**	**0.2454**		**0.2258**	**0.2258**		**1,253.8686**	**1,253.8686**	**0.4055**		**1,264.0068**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.4800e-003	0.3371	0.0974	1.2000e-003	0.0320	3.7000e-004	0.0324	9.2200e-003	3.6000e-004	9.5700e-003		128.8423	128.8423	6.4500e-003		129.0037
Worker	0.0497	0.0268	0.4161	1.5200e-003	0.1900	1.1800e-003	0.1912	0.0504	1.0900e-003	0.0515		152.0660	152.0660	3.0200e-003		152.1416
Total	**0.0592**	**0.3639**	**0.5135**	**2.7200e-003**	**0.2220**	**1.5500e-003**	**0.2236**	**0.0596**	**1.4500e-003**	**0.0611**		**280.9083**	**280.9083**	**9.4700e-003**		**281.1453**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	0.5568	5.5726	8.2010	0.0130		0.2454	0.2454		0.2258	0.2258	0.0000	1,253.8686	1,253.8686	0.4055		1,264.0068
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5568**	**5.5726**	**8.2010**	**0.0130**		**0.2454**	**0.2454**		**0.2258**	**0.2258**	**0.0000**	**1,253.8686**	**1,253.8686**	**0.4055**		**1,264.0068**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.4800e-003	0.3371	0.0974	1.2000e-003	0.0320	3.7000e-004	0.0324	9.2200e-003	3.6000e-004	9.5700e-003		128.8423	128.8423	6.4500e-003		129.0037
Worker	0.0497	0.0268	0.4161	1.5200e-003	0.1900	1.1800e-003	0.1912	0.0504	1.0900e-003	0.0515		152.0660	152.0660	3.0200e-003		152.1416
Total	**0.0592**	**0.3639**	**0.5135**	**2.7200e-003**	**0.2220**	**1.5500e-003**	**0.2236**	**0.0596**	**1.4500e-003**	**0.0611**		**280.9083**	**280.9083**	**9.4700e-003**		**281.1453**

3.7 6. Outage Tie-ins, and Commissioning - 2029

Unmitigated Construction On-Site

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

Category	lb/day										lb/day					
Off-Road	0.5568	5.5726	8.2010	0.0130		0.2454	0.2454		0.2258	0.2258		1,253.8686	1,253.8686	0.4055		1,264.0068
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5568**	**5.5726**	**8.2010**	**0.0130**		**0.2454**	**0.2454**		**0.2258**	**0.2258**		**1,253.8686**	**1,253.8686**	**0.4055**		**1,264.0068**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.3300e-003	0.3345	0.0961	1.1900e-003	0.0320	3.7000e-004	0.0324	9.2200e-003	3.5000e-004	9.5700e-003		128.3680	128.3680	6.3800e-003		128.5275
Worker	0.0467	0.0247	0.3904	1.4800e-003	0.1900	1.1000e-003	0.1911	0.0504	1.0100e-003	0.0514		147.9905	147.9905	2.7700e-003		148.0599
Total	**0.0560**	**0.3592**	**0.4865**	**2.6700e-003**	**0.2220**	**1.4700e-003**	**0.2235**	**0.0596**	**1.3600e-003**	**0.0610**		**276.3586**	**276.3586**	**9.1500e-003**		**276.5873**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5568	5.5726	8.2010	0.0130		0.2454	0.2454		0.2258	0.2258	0.0000	1,253.8686	1,253.8686	0.4055		1,264.0068
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Total	0.5568	5.5726	8.2010	0.0130		0.2454	0.2454		0.2258	0.2258	0.0000	1,253.8686	1,253.8686	0.4055		1,264.0068

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.3300e-003	0.3345	0.0961	1.1900e-003	0.0320	3.7000e-004	0.0324	9.2200e-003	3.5000e-004	9.5700e-003		128.3680	128.3680	6.3800e-003		128.5275
Worker	0.0467	0.0247	0.3904	1.4800e-003	0.1900	1.1000e-003	0.1911	0.0504	1.0100e-003	0.0514		147.9905	147.9905	2.7700e-003		148.0599
Total	**0.0560**	**0.3592**	**0.4865**	**2.6700e-003**	**0.2220**	**1.4700e-003**	**0.2235**	**0.0596**	**1.3600e-003**	**0.0610**		**276.3586**	**276.3586**	**9.1500e-003**		**276.5873**

3.8 7. Demo OTC Pipeline - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7055	0.0000	0.7055	0.1068	0.0000	0.1068			0.0000			0.0000
Off-Road	2.0319	19.8745	31.2037	0.0462		0.8074	0.8074		0.7502	0.7502		4,463.3105	4,463.3105	1.2779		4,495.2584
Total	**2.0319**	**19.8745**	**31.2037**	**0.0462**	**0.7055**	**0.8074**	**1.5128**	**0.1068**	**0.7502**	**0.8570**		**4,463.3105**	**4,463.3105**	**1.2779**		**4,495.2584**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.3300e-003	0.3345	0.0961	1.1900e-003	0.0320	3.7000e-004	0.0324	9.2200e-003	3.5000e-004	9.5700e-003		128.3680	128.3680	6.3800e-003		128.5275
Worker	0.0275	0.0145	0.2296	8.7000e-004	0.1118	6.5000e-004	0.1124	0.0296	5.9000e-004	0.0302		87.0533	87.0533	1.6300e-003		87.0940
Total	**0.0368**	**0.3490**	**0.3258**	**2.0600e-003**	**0.1438**	**1.0200e-003**	**0.1448**	**0.0389**	**9.4000e-004**	**0.0398**		**215.4213**	**215.4213**	**8.0100e-003**		**215.6215**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7055	0.0000	0.7055	0.1068	0.0000	0.1068			0.0000			0.0000
Off-Road	2.0319	19.8745	31.2037	0.0462		0.8074	0.8074		0.7502	0.7502	0.0000	4,463.3105	4,463.3105	1.2779		4,495.2584
Total	**2.0319**	**19.8745**	**31.2037**	**0.0462**	**0.7055**	**0.8074**	**1.5128**	**0.1068**	**0.7502**	**0.8570**	**0.0000**	**4,463.3105**	**4,463.3105**	**1.2779**		**4,495.2584**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.3300e-003	0.3345	0.0961	1.1900e-003	0.0320	3.7000e-004	0.0324	9.2200e-003	3.5000e-004	9.5700e-003		128.3680	128.3680	6.3800e-003		128.5275
Worker	0.0275	0.0145	0.2296	8.7000e-004	0.1118	6.5000e-004	0.1124	0.0296	5.9000e-004	0.0302		87.0533	87.0533	1.6300e-003		87.0940
Total	**0.0368**	**0.3490**	**0.3258**	**2.0600e-003**	**0.1438**	**1.0200e-003**	**0.1448**	**0.0389**	**9.4000e-004**	**0.0398**		**215.4213**	**215.4213**	**8.0100e-003**		**215.6215**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0534	0.2518	0.7806	3.5800e-003	0.3530	2.2700e-003	0.3553	0.0944	2.1100e-003	0.0965		366.2111	366.2111	0.0149		366.5831
Unmitigated	0.0534	0.2518	0.7806	3.5800e-003	0.3530	2.2700e-003	0.3553	0.0944	2.1100e-003	0.0965		366.2111	366.2111	0.0149		366.5831

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	37.50	37.50	37.50	166,060	166,060
Total	37.50	37.50	37.50	166,060	166,060

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by

General Heavy Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.542570	0.044139	0.210405	0.116125	0.013871	0.006349	0.021293	0.034040	0.002625	0.001760	0.005291	0.000716	0.000815

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134
NaturalGas Unmitigated	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	1431.51	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134

Total		**0.0154**	**0.1403**	**0.1179**	**8.4000e-004**		**0.0107**	**0.0107**		**0.0107**	**0.0107**		**168.4126**	**168.4126**	**3.2300e-003**	**3.0900e-003**	**169.4134**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	1.43151	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134
Total		**0.0154**	**0.1403**	**0.1179**	**8.4000e-004**		**0.0107**	**0.0107**		**0.0107**	**0.0107**		**168.4126**	**168.4126**	**3.2300e-003**	**3.0900e-003**	**169.4134**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003
Unmitigated	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003
Total	**2.3000e-004**	**2.0000e-005**	**2.5500e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**5.4700e-003**	**5.4700e-003**	**1.0000e-005**		**5.8300e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003
Total	**2.3000e-004**	**2.0000e-005**	**2.5500e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**5.4700e-003**	**5.4700e-003**	**1.0000e-005**		**5.8300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Haynes LADWP

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	25.00	1000sqft	0.57	25,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	8			**Operational Year**	2029
Utility Company	Los Angeles Department of Water & Power				
CO2 Intensity (lb/MWhr)	1227.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Based on Client Construction Plan

Off-road Equipment - Construction Data from Client

Off-road Equipment - Based on Construction Data

Off-road Equipment - Construction Data

Off-road Equipment - Construction Plans

Off-road Equipment - Construction Plans

Off-road Equipment - Construction Plans

Off-road Equipment - Construction Plans

Trips and VMT - Construction Plans

Demolition -

Grading - Construction Plans

Consumer Products - NO Operations

Area Coating - No Operation

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	0
tblAreaCoating	Area_EF_Nonresidential_Interior	100	0
tblConstructionPhase	NumDays	100.00	234.00
tblConstructionPhase	NumDays	100.00	181.00
tblConstructionPhase	NumDays	100.00	121.00
tblConstructionPhase	NumDays	10.00	91.00
tblConstructionPhase	NumDays	2.00	122.00
tblConstructionPhase	NumDays	5.00	214.00
tblConstructionPhase	NumDays	1.00	242.00
tblConsumerProducts	ROG_EF	1.98E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	3.542E-08
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	5.152E-10
tblGrading	AcresOfGrading	30.25	87.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	UsageHours	8.00	2.00

tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	4.00	6.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	6.00	19.00
tblTripsAndVMT	HaulingTripNumber	297.00	0.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	4.00	8.00
tblTripsAndVMT	VendorTripNumber	4.00	7.00
tblTripsAndVMT	VendorTripNumber	4.00	7.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	WorkerTripNumber	28.00	24.00
tblTripsAndVMT	WorkerTripNumber	30.00	18.00
tblTripsAndVMT	WorkerTripNumber	11.00	14.00
tblTripsAndVMT	WorkerTripNumber	11.00	18.00
tblTripsAndVMT	WorkerTripNumber	11.00	32.00
tblTripsAndVMT	WorkerTripNumber	18.00	17.00
tblTripsAndVMT	WorkerTripNumber	23.00	10.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	1.2950	11.3925	17.6579	0.0306	0.7007	0.4889	1.1897	0.1271	0.4521	0.5792	0.0000	2,967.6807	2,967.6807	0.8142	0.0000	2,988.0361
2025	1.7070	14.6079	19.9222	0.0499	1.0116	0.5828	1.5944	0.4837	0.5444	1.0281	0.0000	4,831.2031	4,831.2031	1.2779	0.0000	4,863.1504
2026	1.7036	14.5990	19.8862	0.0498	1.0116	0.5827	1.5943	0.4837	0.5443	1.0281	0.0000	4,824.2152	4,824.2152	1.2774	0.0000	4,856.1496
2027	3.4811	26.4576	32.3959	0.0553	0.4025	1.3515	1.7540	0.1078	1.2532	1.3610	0.0000	4,996.4347	4,996.4347	1.0771	0.0000	5,023.3610
2028	2.9642	25.3325	27.8769	0.0438	0.4025	1.3513	1.7538	0.1078	1.2531	1.3608	0.0000	4,150.4287	4,150.4287	1.0710	0.0000	4,177.2045
2029	2.0729	20.2236	31.5162	0.0482	0.8493	0.8084	1.6577	0.1457	0.7512	0.8968	0.0000	4,670.2602	4,670.2602	1.2862	0.0000	4,702.4139
Maximum	**3.4811**	**26.4576**	**32.3959**	**0.0553**	**1.0116**	**1.3515**	**1.7540**	**0.4837**	**1.2532**	**1.3610**	**0.0000**	**4,996.4347**	**4,996.4347**	**1.2862**	**0.0000**	**5,023.3610**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	1.2950	11.3925	17.6579	0.0306	0.7007	0.4889	1.1897	0.1271	0.4521	0.5792	0.0000	2,967.6807	2,967.6807	0.8142	0.0000	2,988.0361
2025	1.7070	14.6079	19.9222	0.0499	1.0116	0.5828	1.5944	0.4837	0.5444	1.0281	0.0000	4,831.2031	4,831.2031	1.2779	0.0000	4,863.1504
2026	1.7036	14.5990	19.8862	0.0498	1.0116	0.5827	1.5943	0.4837	0.5443	1.0281	0.0000	4,824.2152	4,824.2152	1.2774	0.0000	4,856.1496
2027	3.4811	26.4576	32.3959	0.0553	0.4025	1.3515	1.7540	0.1078	1.2532	1.3610	0.0000	4,996.4347	4,996.4347	1.0771	0.0000	5,023.3610
2028	2.9642	25.3325	27.8769	0.0438	0.4025	1.3513	1.7538	0.1078	1.2531	1.3608	0.0000	4,150.4287	4,150.4287	1.0710	0.0000	4,177.2045
2029	2.0729	20.2236	31.5162	0.0482	0.8493	0.8084	1.6577	0.1457	0.7512	0.8968	0.0000	4,670.2602	4,670.2602	1.2862	0.0000	4,702.4139
Maximum	**3.4811**	**26.4576**	**32.3959**	**0.0553**	**1.0116**	**1.3515**	**1.7540**	**0.4837**	**1.2532**	**1.3610**	**0.0000**	**4,996.4347**	**4,996.4347**	**1.2862**	**0.0000**	**5,023.3610**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003
Energy	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134
Mobile	0.0518	0.2575	0.7336	3.4200e-003	0.3530	2.2800e-003	0.3553	0.0944	2.1200e-003	0.0965		349.5858	349.5858	0.0149		349.9569
Total	**0.0675**	**0.3978**	**0.8540**	**4.2600e-003**	**0.3530**	**0.0130**	**0.3660**	**0.0944**	**0.0128**	**0.1072**		**518.0038**	**518.0038**	**0.0181**	**3.0900e-003**	**519.3761**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003
Energy	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134
Mobile	0.0518	0.2575	0.7336	3.4200e-003	0.3530	2.2800e-003	0.3553	0.0944	2.1200e-003	0.0965		349.5858	349.5858	0.0149		349.9569
Total	**0.0675**	**0.3978**	**0.8540**	**4.2600e-003**	**0.3530**	**0.0130**	**0.3660**	**0.0944**	**0.0128**	**0.1072**		**518.0038**	**518.0038**	**0.0181**	**3.0900e-003**	**519.3761**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	1. Site Preparation and Earthwork	Site Preparation	12/2/2024	11/4/2025	5	242	
2	2. Foundation Work/Piles	Grading	11/5/2025	4/23/2026	5	122	
3	3. Cooling Tower and Auxiliary Equipment	Building Construction	4/24/2026	3/17/2027	5	234	
4	4. Makeup Water Tank & Wastewater Tank	Building Construction	3/18/2027	11/25/2027	5	181	
5	5. Recycled, Makeup Water, Wastewater, and Stormwater	Building Construction	11/26/2027	5/12/2028	5	121	
6	6. Outage Tie-ins, and Commissioning	Paving	5/15/2028	3/8/2029	5	214	
7	7. Demo OTC Pipeline	Demolition	3/9/2029	7/13/2029	5	91	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
1. Site Preparation and Earthwork	Dumpers/Tenders	2	6.00	16	0.38
1. Site Preparation and Earthwork	Excavators	2	8.00	158	0.38
1. Site Preparation and Earthwork	Graders	1	2.00	187	0.41
1. Site Preparation and Earthwork	Plate Compactors	1	2.00	8	0.43
1. Site Preparation and Earthwork	Rollers	1	2.00	80	0.38
1. Site Preparation and Earthwork	Tractors/Loaders/Backhoes	4	8.00	97	0.37
2. Foundation Work/Piles	Bore/Drill Rigs	2	8.00	221	0.50
2. Foundation Work/Piles	Concrete/Industrial Saws	1	8.00	81	0.73
2. Foundation Work/Piles	Cranes	2	3.00	231	0.29
2. Foundation Work/Piles	Excavators	2	8.00	158	0.38
2. Foundation Work/Piles	Other Construction Equipment	1	4.00	172	0.42

2. Foundation Work/Piles	Plate Compactors	2	4.00	8	0.43
2. Foundation Work/Piles	Rubber Tired Dozers	1	1.00	247	0.40
2. Foundation Work/Piles	Tractors/Loaders/Backhoes	1	4.00	97	0.37
3. Cooling Tower and Auxiliary Equipment	Aerial Lifts	1	3.00	63	0.31
3. Cooling Tower and Auxiliary Equipment	Cranes	1	6.00	231	0.29
3. Cooling Tower and Auxiliary Equipment	Forklifts	2	6.00	89	0.20
3. Cooling Tower and Auxiliary Equipment	Tractors/Loaders/Backhoes	1	4.00	97	0.37
3. Cooling Tower and Auxiliary Equipment	Tractors/Loaders/Backhoes	0	0.00	97	0.37
3. Cooling Tower and Auxiliary Equipment	Welders	3	9.00	46	0.45
4. Makeup Water Tank & Wastewater Tank	Cranes	2	6.00	231	0.29
4. Makeup Water Tank & Wastewater Tank	Forklifts	2	6.00	89	0.20
4. Makeup Water Tank & Wastewater Tank	Other Construction Equipment	1	4.00	172	0.42
4. Makeup Water Tank & Wastewater Tank	Tractors/Loaders/Backhoes	3	12.00	97	0.37
4. Makeup Water Tank & Wastewater Tank	Welders	5	15.00	46	0.45
5. Recycled, Makeup Water, Wastewater, and Stormwater	Cement and Mortar Mixers	0	0.00	9	0.56
5. Recycled, Makeup Water, Wastewater, and Stormwater	Cranes	1	4.00	231	0.29
5. Recycled, Makeup Water, Wastewater, and Stormwater	Excavators	1	4.00	158	0.38
5. Recycled, Makeup Water, Wastewater, and Stormwater	Forklifts	2	6.00	89	0.20
5. Recycled, Makeup Water, Wastewater, and Stormwater	Rollers	2	4.00	80	0.38
5. Recycled, Makeup Water, Wastewater, and Stormwater	Tractors/Loaders/Backhoes	2	8.00	97	0.37
5. Recycled, Makeup Water, Wastewater, and Stormwater	Trenchers	3	12.00	78	0.50
5. Recycled, Makeup Water, Wastewater, and Stormwater	Welders	2	12.00	46	0.45
6. Outage Tie-ins, and Commissioning	Aerial Lifts	1	2.00	63	0.31
6. Outage Tie-ins, and Commissioning	Air Compressors	0	0.00	78	0.48
6. Outage Tie-ins, and Commissioning	Cement and Mortar Mixers	0	0.00	9	0.56
6. Outage Tie-ins, and Commissioning	Cranes	1	2.00	231	0.29
6. Outage Tie-ins, and Commissioning	Pavers	1	7.00	130	0.42
6. Outage Tie-ins, and Commissioning	Rollers	1	7.00	80	0.38
6. Outage Tie-ins, and Commissioning	Tractors/Loaders/Backhoes	3	4.00	97	0.37
7. Demo OTC Pipeline	Aerial Lifts	1	2.00	63	0.31

7. Demo OTC Pipeline	Concrete/Industrial Saws	1	8.00	81	0.73
7. Demo OTC Pipeline	Cranes	1	2.00	231	0.29
7. Demo OTC Pipeline	Rubber Tired Dozers	1	1.00	247	0.40
7. Demo OTC Pipeline	Tractors/Loaders/Backhoes	5	19.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
1. Site Preparation and Earthwork	11	24.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
2. Foundation Work/Piles	12	18.00	9.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
3. Cooling Tower and Auxiliary Equipment	8	14.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
4. Makeup Water Tank & Wastewater Tank	13	18.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
5. Recycled, Makeup Water, Wastewater	13	32.00	7.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
6. Outage Tie-ins, and Commissioning	7	17.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
7. Demo OTC Pipeline	9	10.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 1. Site Preparation and Earthwork - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3813	0.0000	0.3813	0.0412	0.0000	0.0412			0.0000			0.0000
Off-Road	1.1815	10.7783	16.7781	0.0264		0.4863	0.4863		0.4496	0.4496		2,531.2913	2,531.2913	0.7970		2,551.2170
Total	**1.1815**	**10.7783**	**16.7781**	**0.0264**	**0.3813**	**0.4863**	**0.8675**	**0.0412**	**0.4496**	**0.4908**		**2,531.2913**	**2,531.2913**	**0.7970**		**2,551.2170**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0174	0.5559	0.1832	1.9100e-003	0.0512	6.7000e-004	0.0519	0.0148	6.4000e-004	0.0154		204.5965	204.5965	0.0116		204.8852
Worker	0.0961	0.0583	0.6966	2.3200e-003	0.2683	2.0100e-003	0.2703	0.0711	1.8500e-003	0.0730		231.7929	231.7929	5.6400e-003		231.9339
Total	**0.1135**	**0.6142**	**0.8798**	**4.2300e-003**	**0.3195**	**2.6800e-003**	**0.3222**	**0.0859**	**2.4900e-003**	**0.0884**		**436.3894**	**436.3894**	**0.0172**		**436.8191**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3813	0.0000	0.3813	0.0412	0.0000	0.0412			0.0000			0.0000
Off-Road	1.1815	10.7783	16.7781	0.0264		0.4863	0.4863		0.4496	0.4496	0.0000	2,531.2913	2,531.2913	0.7970		2,551.2170
Total	**1.1815**	**10.7783**	**16.7781**	**0.0264**	**0.3813**	**0.4863**	**0.8675**	**0.0412**	**0.4496**	**0.4908**	**0.0000**	**2,531.2913**	**2,531.2913**	**0.7970**		**2,551.2170**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0174	0.5559	0.1832	1.9100e-003	0.0512	6.7000e-004	0.0519	0.0148	6.4000e-004	0.0154		204.5965	204.5965	0.0116		204.8852
Worker	0.0961	0.0583	0.6966	2.3200e-003	0.2683	2.0100e-003	0.2703	0.0711	1.8500e-003	0.0730		231.7929	231.7929	5.6400e-003		231.9339
Total	**0.1135**	**0.6142**	**0.8798**	**4.2300e-003**	**0.3195**	**2.6800e-003**	**0.3222**	**0.0859**	**2.4900e-003**	**0.0884**		**436.3894**	**436.3894**	**0.0172**		**436.8191**

3.2 1. Site Preparation and Earthwork - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3813	0.0000	0.3813	0.0412	0.0000	0.0412			0.0000			0.0000
Off-Road	1.0950	9.7682	16.7265	0.0264		0.4105	0.4105		0.3799	0.3799		2,532.5049	2,532.5049	0.7974		2,552.4404
Total	**1.0950**	**9.7682**	**16.7265**	**0.0264**	**0.3813**	**0.4105**	**0.7917**	**0.0412**	**0.3799**	**0.4211**		**2,532.5049**	**2,532.5049**	**0.7974**		**2,552.4404**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0169	0.5512	0.1785	1.9000e-003	0.0512	6.6000e-004	0.0519	0.0148	6.3000e-004	0.0154		203.4994	203.4994	0.0114		203.7838
Worker	0.0915	0.0533	0.6463	2.2300e-003	0.2683	1.9700e-003	0.2702	0.0711	1.8100e-003	0.0730		222.8200	222.8200	5.1400e-003		222.9486
Total	**0.1085**	**0.6045**	**0.8249**	**4.1300e-003**	**0.3195**	**2.6300e-003**	**0.3221**	**0.0859**	**2.4400e-003**	**0.0883**		**426.3194**	**426.3194**	**0.0165**		**426.7324**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					0.3813	0.0000	0.3813	0.0412	0.0000	0.0412			0.0000			0.0000
Off-Road	1.0950	9.7682	16.7265	0.0264		0.4105	0.4105		0.3799	0.3799	0.0000	2,532.5049	2,532.5049	0.7974		2,552.4404
Total	**1.0950**	**9.7682**	**16.7265**	**0.0264**	**0.3813**	**0.4105**	**0.7917**	**0.0412**	**0.3799**	**0.4211**	**0.0000**	**2,532.5049**	**2,532.5049**	**0.7974**		**2,552.4404**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0169	0.5512	0.1785	1.9000e-003	0.0512	6.6000e-004	0.0519	0.0148	6.3000e-004	0.0154		203.4994	203.4994	0.0114		203.7838
Worker	0.0915	0.0533	0.6463	2.2300e-003	0.2683	1.9700e-003	0.2702	0.0711	1.8100e-003	0.0730		222.8200	222.8200	5.1400e-003		222.9486
Total	**0.1085**	**0.6045**	**0.8249**	**4.1300e-003**	**0.3195**	**2.6300e-003**	**0.3221**	**0.0859**	**2.4400e-003**	**0.0883**		**426.3194**	**426.3194**	**0.0165**		**426.7324**

3.3 2. Foundation Work/Piles - 2025

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	1.6193	13.9479	19.2366	0.0461		0.5806	0.5806		0.5423	0.5423		4,435.1513	4,435.1513	1.2612		4,466.6822
Total	**1.6193**	**13.9479**	**19.2366**	**0.0461**	**0.7528**	**0.5806**	**1.3333**	**0.4138**	**0.5423**	**0.9561**		**4,435.1513**	**4,435.1513**	**1.2612**		**4,466.6822**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0190	0.6201	0.2008	2.1300e-003	0.0576	7.4000e-004	0.0584	0.0166	7.1000e-004	0.0173		228.9368	228.9368	0.0128		229.2568
Worker	0.0687	0.0400	0.4848	1.6800e-003	0.2012	1.4800e-003	0.2027	0.0534	1.3600e-003	0.0547		167.1150	167.1150	3.8600e-003		167.2114
Total	**0.0877**	**0.6601**	**0.6856**	**3.8100e-003**	**0.2588**	**2.2200e-003**	**0.2610**	**0.0700**	**2.0700e-003**	**0.0720**		**396.0519**	**396.0519**	**0.0167**		**396.4682**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	1.6193	13.9479	19.2366	0.0461		0.5806	0.5806		0.5423	0.5423	0.0000	4,435.1513	4,435.1513	1.2612		4,466.6822
Total	**1.6193**	**13.9479**	**19.2366**	**0.0461**	**0.7528**	**0.5806**	**1.3333**	**0.4138**	**0.5423**	**0.9561**	**0.0000**	**4,435.1513**	**4,435.1513**	**1.2612**		**4,466.6822**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0190	0.6201	0.2008	2.1300e-003	0.0576	7.4000e-004	0.0584	0.0166	7.1000e-004	0.0173		228.9368	228.9368	0.0128		229.2568
Worker	0.0687	0.0400	0.4848	1.6800e-003	0.2012	1.4800e-003	0.2027	0.0534	1.3600e-003	0.0547		167.1150	167.1150	3.8600e-003		167.2114
Total	**0.0877**	**0.6601**	**0.6856**	**3.8100e-003**	**0.2588**	**2.2200e-003**	**0.2610**	**0.0700**	**2.0700e-003**	**0.0720**		**396.0519**	**396.0519**	**0.0167**		**396.4682**

3.3 2. Foundation Work/Piles - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	1.6193	13.9479	19.2366	0.0461		0.5806	0.5806		0.5423	0.5423		4,435.1513	4,435.1513	1.2612		4,466.6822
Total	**1.6193**	**13.9479**	**19.2366**	**0.0461**	**0.7528**	**0.5806**	**1.3333**	**0.4138**	**0.5423**	**0.9561**		**4,435.1513**	**4,435.1513**	**1.2612**		**4,466.6822**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0186	0.6143	0.1968	2.1200e-003	0.0576	7.2000e-004	0.0584	0.0166	6.9000e-004	0.0173		227.7528	227.7528	0.0126		228.0679
Worker	0.0657	0.0368	0.4529	1.6200e-003	0.2012	1.4300e-003	0.2026	0.0534	1.3100e-003	0.0547		161.3111	161.3111	3.5300e-003		161.3995
Total	**0.0843**	**0.6512**	**0.6497**	**3.7400e-003**	**0.2588**	**2.1500e-003**	**0.2610**	**0.0700**	**2.0000e-003**	**0.0720**		**389.0639**	**389.0639**	**0.0161**		**389.4674**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	1.6193	13.9479	19.2366	0.0461		0.5806	0.5806		0.5423	0.5423	0.0000	4,435.1513	4,435.1513	1.2612		4,466.6822
Total	**1.6193**	**13.9479**	**19.2366**	**0.0461**	**0.7528**	**0.5806**	**1.3333**	**0.4138**	**0.5423**	**0.9561**	**0.0000**	**4,435.1513**	**4,435.1513**	**1.2612**		**4,466.6822**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0186	0.6143	0.1968	2.1200e-003	0.0576	7.2000e-004	0.0584	0.0166	6.9000e-004	0.0173		227.7528	227.7528	0.0126		228.0679
Worker	0.0657	0.0368	0.4529	1.6200e-003	0.2012	1.4300e-003	0.2026	0.0534	1.3100e-003	0.0547		161.3111	161.3111	3.5300e-003		161.3995
Total	**0.0843**	**0.6512**	**0.6497**	**3.7400e-003**	**0.2588**	**2.1500e-003**	**0.2610**	**0.0700**	**2.0000e-003**	**0.0720**		**389.0639**	**389.0639**	**0.0161**		**389.4674**

3.4 3. Cooling Tower and Auxiliary Equipment - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1855	8.9959	10.1012	0.0174		0.3351	0.3351		0.3194	0.3194		1,553.4136	1,553.4136	0.3425		1,561.9754
Total	**1.1855**	**8.9959**	**10.1012**	**0.0174**		**0.3351**	**0.3351**		**0.3194**	**0.3194**		**1,553.4136**	**1,553.4136**	**0.3425**		**1,561.9754**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0165	0.5461	0.1749	1.8900e-003	0.0512	6.4000e-004	0.0519	0.0148	6.1000e-004	0.0154		202.4469	202.4469	0.0112		202.7270
Worker	0.0511	0.0287	0.3522	1.2600e-003	0.1565	1.1100e-003	0.1576	0.0415	1.0200e-003	0.0425		125.4642	125.4642	2.7500e-003		125.5329
Total	**0.0677**	**0.5747**	**0.5271**	**3.1500e-003**	**0.2077**	**1.7500e-003**	**0.2095**	**0.0563**	**1.6300e-003**	**0.0579**		**327.9111**	**327.9111**	**0.0140**		**328.2600**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1855	8.9959	10.1012	0.0174		0.3351	0.3351		0.3194	0.3194	0.0000	1,553.4136	1,553.4136	0.3425		1,561.9754
Total	**1.1855**	**8.9959**	**10.1012**	**0.0174**		**0.3351**	**0.3351**		**0.3194**	**0.3194**	**0.0000**	**1,553.4136**	**1,553.4136**	**0.3425**		**1,561.9754**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0165	0.5461	0.1749	1.8900e-003	0.0512	6.4000e-004	0.0519	0.0148	6.1000e-004	0.0154		202.4469	202.4469	0.0112		202.7270
Worker	0.0511	0.0287	0.3522	1.2600e-003	0.1565	1.1100e-003	0.1576	0.0415	1.0200e-003	0.0425		125.4642	125.4642	2.7500e-003		125.5329
Total	**0.0677**	**0.5747**	**0.5271**	**3.1500e-003**	**0.2077**	**1.7500e-003**	**0.2095**	**0.0563**	**1.6300e-003**	**0.0579**		**327.9111**	**327.9111**	**0.0140**		**328.2600**

3.4 3. Cooling Tower and Auxiliary Equipment - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1855	8.9959	10.1012	0.0174		0.3351	0.3351		0.3194	0.3194		1,553.4136	1,553.4136	0.3425		1,561.9754
Total	**1.1855**	**8.9959**	**10.1012**	**0.0174**		**0.3351**	**0.3351**		**0.3194**	**0.3194**		**1,553.4136**	**1,553.4136**	**0.3425**		**1,561.9754**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0162	0.5411	0.1720	1.8800e-003	0.0512	6.3000e-004	0.0519	0.0148	6.0000e-004	0.0154		201.5003	201.5003	0.0110		201.7761
Worker	0.0489	0.0264	0.3300	1.2200e-003	0.1565	1.0500e-003	0.1575	0.0415	9.6000e-004	0.0425		121.4647	121.4647	2.5200e-003		121.5277
Total	**0.0651**	**0.5676**	**0.5020**	**3.1000e-003**	**0.2077**	**1.6800e-003**	**0.2094**	**0.0563**	**1.5600e-003**	**0.0578**		**322.9649**	**322.9649**	**0.0136**		**323.3038**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1855	8.9959	10.1012	0.0174		0.3351	0.3351		0.3194	0.3194	0.0000	1,553.4136	1,553.4136	0.3425		1,561.9754
Total	**1.1855**	**8.9959**	**10.1012**	**0.0174**		**0.3351**	**0.3351**		**0.3194**	**0.3194**	**0.0000**	**1,553.4136**	**1,553.4136**	**0.3425**		**1,561.9754**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0162	0.5411	0.1720	1.8800e-003	0.0512	6.3000e-004	0.0519	0.0148	6.0000e-004	0.0154		201.5003	201.5003	0.0110		201.7761
Worker	0.0489	0.0264	0.3300	1.2200e-003	0.1565	1.0500e-003	0.1575	0.0415	9.6000e-004	0.0425		121.4647	121.4647	2.5200e-003		121.5277
Total	**0.0651**	**0.5676**	**0.5020**	**3.1000e-003**	**0.2077**	**1.6800e-003**	**0.2094**	**0.0563**	**1.5600e-003**	**0.0578**		**322.9649**	**322.9649**	**0.0136**		**323.3038**

3.5 4. Makeup Water Tank & Wastewater Tank - 2027

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	3.4041	25.9501	31.8211	0.0520		0.9659	0.9659		0.9193	0.9193		4,663.9531	4,663.9531	1.0642		4,690.5570
Total	**3.4041**	**25.9501**	**31.8211**	**0.0520**		**0.9659**	**0.9659**		**0.9193**	**0.9193**		**4,663.9531**	**4,663.9531**	**1.0642**		**4,690.5570**

Unmitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0142	0.4735	0.1505	1.6400e-003	0.0448	5.5000e-004	0.0454	0.0129	5.2000e-004	0.0134		176.3127	176.3127	9.6500e-003		176.5541
Worker	0.0628	0.0340	0.4243	1.5700e-003	0.2012	1.3500e-003	0.2026	0.0534	1.2400e-003	0.0546		156.1689	156.1689	3.2400e-003		156.2499
Total	**0.0770**	**0.5075**	**0.5748**	**3.2100e-003**	**0.2460**	**1.9000e-003**	**0.2479**	**0.0663**	**1.7600e-003**	**0.0680**		**332.4816**	**332.4816**	**0.0129**		**332.8040**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	3.4041	25.9501	31.8211	0.0520		0.9659	0.9659		0.9193	0.9193	0.0000	4,663.9531	4,663.9531	1.0642		4,690.5570
Total	**3.4041**	**25.9501**	**31.8211**	**0.0520**		**0.9659**	**0.9659**		**0.9193**	**0.9193**	**0.0000**	**4,663.9531**	**4,663.9531**	**1.0642**		**4,690.5570**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0142	0.4735	0.1505	1.6400e-003	0.0448	5.5000e-004	0.0454	0.0129	5.2000e-004	0.0134		176.3127	176.3127	9.6500e-003		176.5541
Worker	0.0628	0.0340	0.4243	1.5700e-003	0.2012	1.3500e-003	0.2026	0.0534	1.2400e-003	0.0546		156.1689	156.1689	3.2400e-003		156.2499
Total	**0.0770**	**0.5075**	**0.5748**	**3.2100e-003**	**0.2460**	**1.9000e-003**	**0.2479**	**0.0663**	**1.7600e-003**	**0.0680**		**332.4816**	**332.4816**	**0.0129**		**332.8040**

3.6 5. Recycled, Makeup Water, Wastewater, and Stormwater -

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	2.8439	24.8067	27.0185	0.0395		1.3486	1.3486		1.2505	1.2505		3,705.2882	3,705.2882	1.0562		3,731.6932
Total	**2.8439**	**24.8067**	**27.0185**	**0.0395**		**1.3486**	**1.3486**		**1.2505**	**1.2505**		**3,705.2882**	**3,705.2882**	**1.0562**		**3,731.6932**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0142	0.4735	0.1505	1.6400e-003	0.0448	5.5000e-004	0.0454	0.0129	5.2000e-004	0.0134		176.3127	176.3127	9.6500e-003		176.5541
Worker	0.1117	0.0604	0.7543	2.7800e-003	0.3577	2.4000e-003	0.3601	0.0949	2.2100e-003	0.0971		277.6335	277.6335	5.7600e-003		277.7776
Total	**0.1259**	**0.5339**	**0.9048**	**4.4200e-003**	**0.4025**	**2.9500e-003**	**0.4055**	**0.1078**	**2.7300e-003**	**0.1105**		**453.9463**	**453.9463**	**0.0154**		**454.3317**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8439	24.8067	27.0185	0.0395		1.3486	1.3486		1.2505	1.2505	0.0000	3,705.2882	3,705.2882	1.0562		3,731.6932
Total	**2.8439**	**24.8067**	**27.0185**	**0.0395**		**1.3486**	**1.3486**		**1.2505**	**1.2505**	**0.0000**	**3,705.2882**	**3,705.2882**	**1.0562**		**3,731.6932**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0142	0.4735	0.1505	1.6400e-003	0.0448	5.5000e-004	0.0454	0.0129	5.2000e-004	0.0134		176.3127	176.3127	9.6500e-003		176.5541
Worker	0.1117	0.0604	0.7543	2.7800e-003	0.3577	2.4000e-003	0.3601	0.0949	2.2100e-003	0.0971		277.6335	277.6335	5.7600e-003		277.7776
Total	**0.1259**	**0.5339**	**0.9048**	**4.4200e-003**	**0.4025**	**2.9500e-003**	**0.4055**	**0.1078**	**2.7300e-003**	**0.1105**		**453.9463**	**453.9463**	**0.0154**		**454.3317**

3.6 5. Recycled, Makeup Water, Wastewater, and Stormwater -

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8439	24.8067	27.0185	0.0395		1.3486	1.3486		1.2505	1.2505		3,705.2882	3,705.2882	1.0562		3,731.6932
Total	**2.8439**	**24.8067**	**27.0185**	**0.0395**		**1.3486**	**1.3486**		**1.2505**	**1.2505**		**3,705.2882**	**3,705.2882**	**1.0562**		**3,731.6932**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0139	0.4699	0.1485	1.6300e-003	0.0448	5.4000e-004	0.0454	0.0129	5.1000e-004	0.0134		175.6060	175.6060	9.5200e-003		175.8439
Worker	0.1063	0.0558	0.7099	2.7000e-003	0.3577	2.2200e-003	0.3599	0.0949	2.0500e-003	0.0969		269.5345	269.5345	5.3200e-003		269.6674
Total	**0.1203**	**0.5257**	**0.8584**	**4.3300e-003**	**0.4025**	**2.7600e-003**	**0.4053**	**0.1078**	**2.5600e-003**	**0.1103**		**445.1405**	**445.1405**	**0.0148**		**445.5113**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8439	24.8067	27.0185	0.0395		1.3486	1.3486		1.2505	1.2505	0.0000	3,705.2882	3,705.2882	1.0562		3,731.6932
Total	**2.8439**	**24.8067**	**27.0185**	**0.0395**		**1.3486**	**1.3486**		**1.2505**	**1.2505**	**0.0000**	**3,705.2882**	**3,705.2882**	**1.0562**		**3,731.6932**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0139	0.4699	0.1485	1.6300e-003	0.0448	5.4000e-004	0.0454	0.0129	5.1000e-004	0.0134		175.6060	175.6060	9.5200e-003		175.8439
Worker	0.1063	0.0558	0.7099	2.7000e-003	0.3577	2.2200e-003	0.3599	0.0949	2.0500e-003	0.0969		269.5345	269.5345	5.3200e-003		269.6674
Total	**0.1203**	**0.5257**	**0.8584**	**4.3300e-003**	**0.4025**	**2.7600e-003**	**0.4053**	**0.1078**	**2.5600e-003**	**0.1103**		**445.1405**	**445.1405**	**0.0148**		**445.5113**

3.7 6. Outage Tie-ins, and Commissioning - 2028

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Off-Road	0.5568	5.5726	8.2010	0.0130		0.2454	0.2454		0.2258	0.2258		1,253.8686	1,253.8686	0.4055		1,264.0068
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5568**	**5.5726**	**8.2010**	**0.0130**		**0.2454**	**0.2454**		**0.2258**	**0.2258**		**1,253.8686**	**1,253.8686**	**0.4055**		**1,264.0068**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.9500e-003	0.3356	0.1061	1.1700e-003	0.0320	3.8000e-004	0.0324	9.2200e-003	3.7000e-004	9.5900e-003		125.4329	125.4329	6.8000e-003		125.6028
Worker	0.0565	0.0297	0.3771	1.4400e-003	0.1900	1.1800e-003	0.1912	0.0504	1.0900e-003	0.0515		143.1902	143.1902	2.8300e-003		143.2608
Total	**0.0664**	**0.3653**	**0.4832**	**2.6100e-003**	**0.2220**	**1.5600e-003**	**0.2236**	**0.0596**	**1.4600e-003**	**0.0611**		**268.6231**	**268.6231**	**9.6300e-003**		**268.8636**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5568	5.5726	8.2010	0.0130		0.2454	0.2454		0.2258	0.2258	0.0000	1,253.8686	1,253.8686	0.4055		1,264.0068
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5568**	**5.5726**	**8.2010**	**0.0130**		**0.2454**	**0.2454**		**0.2258**	**0.2258**	**0.0000**	**1,253.8686**	**1,253.8686**	**0.4055**		**1,264.0068**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.9500e-003	0.3356	0.1061	1.1700e-003	0.0320	3.8000e-004	0.0324	9.2200e-003	3.7000e-004	9.5900e-003		125.4329	125.4329	6.8000e-003		125.6028
Worker	0.0565	0.0297	0.3771	1.4400e-003	0.1900	1.1800e-003	0.1912	0.0504	1.0900e-003	0.0515		143.1902	143.1902	2.8300e-003		143.2608
Total	**0.0664**	**0.3653**	**0.4832**	**2.6100e-003**	**0.2220**	**1.5600e-003**	**0.2236**	**0.0596**	**1.4600e-003**	**0.0611**		**268.6231**	**268.6231**	**9.6300e-003**		**268.8636**

3.7 6. Outage Tie-ins, and Commissioning - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5568	5.5726	8.2010	0.0130		0.2454	0.2454		0.2258	0.2258		1,253.8686	1,253.8686	0.4055		1,264.0068
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5568**	**5.5726**	**8.2010**	**0.0130**		**0.2454**	**0.2454**		**0.2258**	**0.2258**		**1,253.8686**	**1,253.8686**	**0.4055**		**1,264.0068**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.7900e-003	0.3330	0.1047	1.1600e-003	0.0320	3.8000e-004	0.0324	9.2200e-003	3.6000e-004	9.5800e-003		124.9821	124.9821	6.7100e-003		125.1498
Worker	0.0532	0.0273	0.3534	1.4000e-003	0.1900	1.1000e-003	0.1911	0.0504	1.0100e-003	0.0514		139.3449	139.3449	2.5900e-003		139.4096
Total	**0.0630**	**0.3603**	**0.4581**	**2.5600e-003**	**0.2220**	**1.4800e-003**	**0.2235**	**0.0596**	**1.3700e-003**	**0.0610**		**264.3270**	**264.3270**	**9.3000e-003**		**264.5595**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5568	5.5726	8.2010	0.0130		0.2454	0.2454		0.2258	0.2258	0.0000	1,253.8686	1,253.8686	0.4055		1,264.0068
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.5568**	**5.5726**	**8.2010**	**0.0130**		**0.2454**	**0.2454**		**0.2258**	**0.2258**	**0.0000**	**1,253.8686**	**1,253.8686**	**0.4055**		**1,264.0068**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.7900e-003	0.3330	0.1047	1.1600e-003	0.0320	3.8000e-004	0.0324	9.2200e-003	3.6000e-004	9.5800e-003		124.9821	124.9821	6.7100e-003		125.1498
Worker	0.0532	0.0273	0.3534	1.4000e-003	0.1900	1.1000e-003	0.1911	0.0504	1.0100e-003	0.0514		139.3449	139.3449	2.5900e-003		139.4096
Total	**0.0630**	**0.3603**	**0.4581**	**2.5600e-003**	**0.2220**	**1.4800e-003**	**0.2235**	**0.0596**	**1.3700e-003**	**0.0610**		**264.3270**	**264.3270**	**9.3000e-003**		**264.5595**

3.8 7. Demo OTC Pipeline - 2029

Unmitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Fugitive Dust					0.7055	0.0000	0.7055	0.1068	0.0000	0.1068			0.0000			0.0000
Off-Road	2.0319	19.8745	31.2037	0.0462		0.8074	0.8074		0.7502	0.7502		4,463.3105	4,463.3105	1.2779		4,495.2584
Total	**2.0319**	**19.8745**	**31.2037**	**0.0462**	**0.7055**	**0.8074**	**1.5128**	**0.1068**	**0.7502**	**0.8570**		**4,463.3105**	**4,463.3105**	**1.2779**		**4,495.2584**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.7900e-003	0.3330	0.1047	1.1600e-003	0.0320	3.8000e-004	0.0324	9.2200e-003	3.6000e-004	9.5800e-003		124.9821	124.9821	6.7100e-003		125.1498
Worker	0.0313	0.0160	0.2079	8.2000e-004	0.1118	6.5000e-004	0.1124	0.0296	5.9000e-004	0.0302		81.9676	81.9676	1.5200e-003		82.0057
Total	**0.0411**	**0.3491**	**0.3126**	**1.9800e-003**	**0.1438**	**1.0300e-003**	**0.1448**	**0.0389**	**9.5000e-004**	**0.0398**		**206.9497**	**206.9497**	**8.2300e-003**		**207.1555**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7055	0.0000	0.7055	0.1068	0.0000	0.1068			0.0000			0.0000
Off-Road	2.0319	19.8745	31.2037	0.0462		0.8074	0.8074		0.7502	0.7502	0.0000	4,463.3105	4,463.3105	1.2779		4,495.2584
Total	**2.0319**	**19.8745**	**31.2037**	**0.0462**	**0.7055**	**0.8074**	**1.5128**	**0.1068**	**0.7502**	**0.8570**	**0.0000**	**4,463.3105**	**4,463.3105**	**1.2779**		**4,495.2584**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.7900e-003	0.3330	0.1047	1.1600e-003	0.0320	3.8000e-004	0.0324	9.2200e-003	3.6000e-004	9.5800e-003		124.9821	124.9821	6.7100e-003		125.1498
Worker	0.0313	0.0160	0.2079	8.2000e-004	0.1118	6.5000e-004	0.1124	0.0296	5.9000e-004	0.0302		81.9676	81.9676	1.5200e-003		82.0057
Total	**0.0411**	**0.3491**	**0.3126**	**1.9800e-003**	**0.1438**	**1.0300e-003**	**0.1448**	**0.0389**	**9.5000e-004**	**0.0398**		**206.9497**	**206.9497**	**8.2300e-003**		**207.1555**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0518	0.2575	0.7336	3.4200e-003	0.3530	2.2800e-003	0.3553	0.0944	2.1200e-003	0.0965		349.5858	349.5858	0.0149		349.9569
Unmitigated	0.0518	0.2575	0.7336	3.4200e-003	0.3530	2.2800e-003	0.3553	0.0944	2.1200e-003	0.0965		349.5858	349.5858	0.0149		349.9569

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Heavy Industry	37.50	37.50	37.50	166,060	166,060
Total	37.50	37.50	37.50	166,060	166,060

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Heavy Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Heavy Industry	0.542570	0.044139	0.210405	0.116125	0.013871	0.006349	0.021293	0.034040	0.002625	0.001760	0.005291	0.000716	0.000815

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134
NaturalGas Unmitigated	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	1431.51	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134
Total		**0.0154**	**0.1403**	**0.1179**	**8.4000e-004**		**0.0107**	**0.0107**		**0.0107**	**0.0107**		**168.4126**	**168.4126**	**3.2300e-003**	**3.0900e-003**	**169.4134**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Heavy Industry	1.43151	0.0154	0.1403	0.1179	8.4000e-004		0.0107	0.0107		0.0107	0.0107		168.4126	168.4126	3.2300e-003	3.0900e-003	169.4134
Total		**0.0154**	**0.1403**	**0.1179**	**8.4000e-004**		**0.0107**	**0.0107**		**0.0107**	**0.0107**		**168.4126**	**168.4126**	**3.2300e-003**	**3.0900e-003**	**169.4134**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003
Unmitigated	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003
Total	**2.3000e-004**	**2.0000e-005**	**2.5500e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**5.4700e-003**	**5.4700e-003**	**1.0000e-005**		**5.8300e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.3000e-004	2.0000e-005	2.5500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		5.4700e-003	5.4700e-003	1.0000e-005		5.8300e-003
Total	**2.3000e-004**	**2.0000e-005**	**2.5500e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**5.4700e-003**	**5.4700e-003**	**1.0000e-005**		**5.8300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B – CONSTRUCTION AND OPERATION HRA FILES

AERSCREEN Outputs

Supplemental Spreadsheets

Yorke ENGINEERING, LLC
www.YorkeEngr.com

AERSCREEN HRA Modeling
Haynes Cooling Tower Construction Scenario

Scenario	Maximum Modeled 1-Hour X/Q (μg/m3)/(g/s)	Maximum Annual X/Q Concentration (μg/m3)/(g/s)	Annual Emissions (g/s)	Maximum Annual DPM Concentration (μg/m3)	Cancer Risk (in a million)	Cancer Risk Exposure Duration (years)	Chronic Hazard Index
Fenceline (250 m)	54.11	5.41	4.11E-03	0.02226	7.94	2.5	0.0045
Resident (280 m)	47.81	4.78	4.11E-03	0.01967	7.02	2.5	0.0039
Worker AES (340 m)	37.47	3.75	4.11E-03	0.01542	3.98	25	0.0031

Emissions

Annual emissions	285.796	lb/yr
Annual emissions	4.114E-03	g/s

AERSCREEN was run with one volume source
AERSCREEN parameters

Release Height (m)	3
Length of Side (m)	185
Sigma Y - Width of Plume/4.3	43.02
Sigma Z - Top of Plume Height/4.3	1.1628
Minimum wind speed (m/s)	0.5
Min temperature (K)	257
Max temperature (K)	317

Urban dry surface characteristics

Maximum and minimum temperatures were from the CARB HARP website for AERSCREEN temperature input data from Long Beach station. https://www.arb.ca.gov/toxics/harp/screenmetfiles.htm

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DPM Cancer Risk and Chronic Hazard Index Calculation
Haynes Cooling Tower Construction Scenario - Fenceline

Residential Inhalation Dose - Equation 5.4.1.1 parameters

0.02226 Cair= Maximum Annual GLC Concentration of DPM (µg/m3)
1 A= Inhalation absorption factor (unitless) - default = 1
0.96 EF= Exposure frequency (unitless), days/365 days - default = 350 days/365 days in a year for a resident

Inhalation Cancer Risk - Equation 8.2.4 A & B parameters

1.1 CPF= Inhalation cancer potency factor (mg/kg-day-1) for DPM
70 AT= Averaging time for lifetime cancer risk (years)

Age Range	Daily Breathing Rate {BR/BW} (L/kg-day)	Daily inhalation dose (DOSEair) (mg/kg-day)	Age Sensitivity Factor (ASF)	Exposure Duration (ED) (yr)	Fraction of Time at Home (FAH)	Residential inhalation cancer risk by Age Range
Third trimester	361	7.72E-06	10	0.25	1	3.03E-07
0 to <2 yrs	1090	2.33E-05	10	2	1	7.32E-06
2 to <5 yrs	631	1.35E-05	3	0.5	1	3.18E-07

{BR/BW} = Daily Breathing rate normalized to body weight (L/kg bodyweight -day) - from OEHHA Table 5.7
Per SCAQMD guidance breathing rate is based on the “RMP using the Derived Method.” Specifically, it uses the 95th percentile rate for age groups less than 2 years old and the 80th percentile rate for age groups that are greater than or equal to 2 years old.
DOSEair= Daily inhalation dose (mg/kg-day) - Calculated with Eq. 5.4.1.1
ASF= Age sensitivity factor for a specified age group (unitless)
ED= Exposure duration for a specified age group (years)
FAH= Fraction of time spent at home (unitless). Set to 1 for <=16 years old to ensure school impacts are not underestimated.

Cancer Risk Exposure Duration (years)	Cancer Risk (in a million)
2.5	7.94

Chronic Hazard Index
0.0045

Chronic Hazard Index = Annual Average Concentration (µg/m3)/Chronic REL (µg/m3)
5 Chronic Inhalation Reference Exposure Level (REL) (µg/m3)

Worker Cancer Risk

Offsite Worker (MEIW) Inhalation Dose - Equation 5.4.1.2 A parameters

4.2 WAF = Worker air concentration adjustment factor (unitless) (from Table 5.10)
WAF based on consrtuction schedule of 8 hours per day, 5 days per week
0.68 EF = 250 days / 365 days. Equivalent to working 5 days/week, 50 weeks/year

Age Range	8-Hour Breathing Rate 95th Percentile {BR/BW} (L/kg-day)	Daily inhalation dose (DOSEair) (mg/kg-day)	Age Sensitivity Factor (ASF)	Exposure Duration (ED) (yr)	Worker inhalation cancer risk	Worker Cancer Risk (in a million)
16 to <70 yrs	230	1.46E-05	1	25	5.75E-06	5.75

{BR/BW} = Daily Breathing rate normalized to body weight (L/kg bodyweight -day) - OEHHA 8-hour 95th percentile (Table 5.8)

Source:
Office of Environmental Health Hazard Assessment (OEHHA). Feb 2015. Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments.
https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf

OEHHA HRA Equations

A. Equation 5.4.1.1: $\boxed{\text{Dose-air} = C_{air} \times \{BR/BW\} \times A \times EF \times 10^{-6}}$

1. Dose-air = Dose through inhalation (mg/kg/d)
2. C_{air} = Concentration in air ($\mu g/m^3$)
3. {BR/BW} = Daily Breathing rate normalized to body weight (L/kg body weight - day)
4. A = Inhalation absorption factor (unitless)
5. EF = Exposure frequency (unitless), days/365 days
6. 10^{-6} = Micrograms to milligrams conversion, liters to cubic meters conversion

a: Recommended default values for EQ 5.4.1.1:

1. {BR/BW} = Daily breathing rates by age groupings, see As supplemental information, the assessor may wish to evaluate the inhalation dose by using the mean point estimates in Table 5.6 to provide a range of breathing rates for cancer risk assessment to the risk manager.
2. Table (point estimates) and Table 5.7 (parametric model distributions for Tier III stochastic risk assessment). For Tier 1 residential estimates, use 95th percentile breathing rates in Table 5.6.
3. A = 1
4. EF = 0.96 (350 days/365 days in a year for a resident)

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A. Equation 8.2.4 A: $\boxed{RISK_{inh\text{-}res} = DOSE_{air} \times CPF \times ASF \times ED/AT \times FAH}$

7. RISK inh-res = Residential inhalation cancer risk
8. DOSEair = Daily inhalation dose (mg/kg-day)
9. CPF = Inhalation cancer potency factor ($mg/kg\text{-}day^{-1}$)
10. ASF = Age sensitivity factor for a specified age group (unitless)
11. ED = Exposure duration (in years) for a specified age group
12. AT = Averaging time for lifetime cancer risk (years)
13. FAH = Fraction of time spent at home (unitless)

a: Recommended default values for EQ 8.2.4 A:

5. DOSEair = Calculated for each age group from Eq. 5.4.1
6. CPF = Substance-specific (see Table 7.1)
7. ASF = See Section 8.2.1
8. ED = 0.25 years for 3rd trimester, 2 years for 0<2, 7 years for 2<9, 14 years for 2<16, 14 years for 16<30, 54 years for 16-70
9. AT = 70 years*
10. FAH = See Table 8.4

*Although AT actually sums to 70.25 years when the 3rd trimester (0.25 years) is included, OEHHA recommends rounding AT = 70 years (and rounding residential exposure durations at 9- and 30-years rather than 9.25- and 30.25-years) to simplify the calculation without causing a significant adjustment. Note that the dose for the 3rd trimester is based on the breathing rate of pregnant women using the

A. Equation 5.4.1.2 A: $\boxed{\text{Dose-air} = (C_{air} \times WAF) \times \{BR/BW\} \times A \times EF \times 10^{-6}}$

1. Dose-air = Dose through inhalation (mg/kg/d)
2. C_{air} = Annual average concentration in air ($\mu g/m^3$)
3. WAF = Worker air concentration adjustment factor (unitless)
4. {BR/BW} = Eight-hour breathing rate normalized to body weight (L/kg body weight - day)
5. A = Inhalation absorption factor (unitless)
6. EF = Exposure frequency (unitless), days/365 days)
7. 10^{-6} = Micrograms to milligrams conversion, Liters to cubic meters conversion

a: Recommended default values for EQ 5.4.1.2 A:

1. WAF = See EQ. 5.4.1.2 B for formula to calculate WAF, or App. M for refined post-processing modeling to calculate WAF.
2. {BR/BW} = For workers, use age16-70 year, 95th percentile, moderate intensity 8-hour point estimate breathing rates (see Table 5.8). No worker breathing rate distributions exist for stochastic risk assessment.
3. A = 1
4. EF = 0.68 (250 days / 365 days). Equivalent to working 5 days/week, 50 weeks/year.

B. Equation 8.2.4 B: $\boxed{RISK_{inh\text{-}work} = DOSE_{air} \times CPF \times ASF \times ED/AT}$

1. RISK inh-work = Worker inhalation cancer risk

a: Recommended default values for EQ 8.2.4 B:

1. DOSEair = Calculated for workers in Eq. 5.4.1.2
2. CPF = Substance specific (see Table 7.1)
3. ASF = 1 for working age 16-70 yrs (See Section 8.2.1)
4. ED = 25 years
5. AT = 70 yrs for lifetime cancer risk

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DPM Cancer Risk and Chronic Hazard Index Calculation
Haynes Cooling Tower Construction Scenario -Resident

Residential Inhalation Dose - Equation 5.4.1.1 parameters

0.01967 Cair= Maximum Annual GLC Concentration of DPM (µg/m3)
1 A= Inhalation absorption factor (unitless) - default = 1
0.96 EF= Exposure frequency (unitless), days/365 days - default = 350 days/365 days in a year for a resident

Inhalation Cancer Risk - Equation 8.2.4 A & B parameters

1.1 CPF= Inhalation cancer potency factor (mg/kg-day-1) for DPM
70 AT= Averaging time for lifetime cancer risk (years)

Age Range	Daily Breathing Rate {BR/BW} (L/kg-day)	Daily inhalation dose (DOSEair) (mg/kg-day)	Age Sensitivity Factor (ASF)	Exposure Duration (ED) (yr)	Fraction of Time at Home (FAH)	Residential inhalation cancer risk by Age Range
Third trimester	361	6.82E-06	10	0.25	1	2.68E-07
0 to <2 yrs	1090	2.06E-05	10	2	1	6.47E-06
2 to <5 yrs	631	1.19E-05	3	0.5	1	2.81E-07

{BR/BW} = Daily Breathing rate normalized to body weight (L/kg bodyweight -day) - from OEHHA Table 5.7
Per SCAQMD guidance breathing rate is based on the "RMP using the Derived Method." Specifically, it uses the 95th percentile rate for age groups less than 2 years old and the 80th percentile rate for age groups that are greater than or equal to 2 years old.
DOSEair= Daily inhalation dose (mg/kg-day) - Calculated with Eq. 5.4.1.1
ASF= Age sensitivity factor for a specified age group (unitless)
ED= Exposure duration for a specified age group (years)
FAH= Fraction of time spent at home (unitless). Set to 1 for <=16 years old to ensure school impacts are not underestimated.

Cancer Risk Exposure Duration (years)	Cancer Risk (in a million)
2.5	7.02

Chronic Hazard Index
0.0039

Chronic Hazard Index = Annual Average Concentration (µg/m3)/Chronic REL (µg/m3)
5 Chronic Inhalation Reference Exposure Level (REL) (µg/m3)

Worker Cancer Risk

Offsite Worker (MEIW) Inhalation Dose - Equation 5.4.1.2 A parameters

4.2 WAF = Worker air concentration adjustment factor (unitless) (from Table 5.10)
WAF based on consrtuction schedule of 8 hours per day, 5 days per week
0.68 EF = 250 days / 365 days. Equivalent to working 5 days/week, 50 weeks/year

Age Range	8-Hour Breathing Rate 95th Percentile {BR/BW} (L/kg-day)	Daily inhalation dose (DOSEair) (mg/kg-day)	Age Sensitivity Factor (ASF)	Exposure Duration (ED) (yr)	Worker inhalation cancer risk	Worker Cancer Risk (in a million)
16 to <70 yrs	230	1.29E-05	1	25	5.08E-06	5.08

{BR/BW} = Daily Breathing rate normalized to body weight (L/kg bodyweight -day) - OEHHA 8-hour 95th percentile (Table 5.8)

Source:
Office of Environmental Health Hazard Assessment (OEHHA). Feb 2015. Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments.
https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf

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DPM Cancer Risk and Chronic Hazard Index Calculation
Haynes Cooling Tower Construction Scenario - Worker

Residential Inhalation Dose - Equation 5.4.1.1 parameters

0.01542 Cair= Maximum Annual GLC Concentration of DPM (µg/m3)
1 A= Inhalation absorption factor (unitless) - default = 1
0.96 EF= Exposure frequency (unitless), days/365 days - default = 350 days/365 days in a year for a resident

Inhalation Cancer Risk - Equation 8.2.4 A & B parameters

1.1 CPF= Inhalation cancer potency factor (mg/kg-day-1) for DPM
70 AT= Averaging time for lifetime cancer risk (years)

Age Range	Daily Breathing Rate {BR/BW} (L/kg-day)	Daily inhalation dose (DOSEair) (mg/kg-day)	Age Sensitivity Factor (ASF)	Exposure Duration (ED) (yr)	Fraction of Time at Home (FAH)	Residential inhalation cancer risk by Age Range
Third trimester	361	5.34E-06	10	0.25	1	2.10E-07
0 to <2 yrs	1090	1.61E-05	10	2	1	5.07E-06
2 to <5 yrs	631	9.34E-06	3	0.5	1	2.20E-07

{BR/BW} = Daily Breathing rate normalized to body weight (L/kg bodyweight -day) - from OEHHA Table 5.7
Per SCAQMD guidance breathing rate is based on the "RMP using the Derived Method." Specifically, it uses the 95th percentile rate for age groups less than 2 years old and the 80th percentile rate for age groups that are greater than or equal to 2 years old.
DOSEair= Daily inhalation dose (mg/kg-day) - Calculated with Eq. 5.4.1.1
ASF= Age sensitivity factor for a specified age group (unitless)
ED= Exposure duration for a specified age group (years)
FAH= Fraction of time spent at home (unitless). Set to 1 for <=16 years old to ensure school impacts are not underestimated.

Cancer Risk Exposure Duration (years)	Cancer Risk (in a million)
2.5	5.50

Chronic Hazard Index
0.0031

Chronic Hazard Index = Annual Average Concentration (µg/m3)/Chronic REL (µg/m3)
5 Chronic Inhalation Reference Exposure Level (REL) (µg/m3)

Worker Cancer Risk

Offsite Worker (MEIW) Inhalation Dose - Equation 5.4.1.2 A parameters

4.2 WAF = Worker air concentration adjustment factor (unitless) (from Table 5.10)
WAF based on consrtuction schedule of 8 hours per day, 5 days per week
0.68 EF = 250 days / 365 days. Equivalent to working 5 days/week, 50 weeks/year

Age Range	8-Hour Breathing Rate 95th Percentile {BR/BW} (L/kg-day)	Daily inhalation dose (DOSEair) (mg/kg-day)	Age Sensitivity Factor (ASF)	Exposure Duration (ED) (yr)	Worker inhalation cancer risk	Worker Cancer Risk (in a million)
16 to <70 yrs	230	1.01E-05	1	25	3.98E-06	3.98

{BR/BW} = Daily Breathing rate normalized to body weight (L/kg bodyweight -day) - OEHHA 8-hour 95th percentile (Table 5.8)

Source:
Office of Environmental Health Hazard Assessment (OEHHA). Feb 2015. Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments.
https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf

AERSCREEN Output File

Max 1-Hour Concentration [µg/m³]	Distance [n	Elevation [ı	Season/Mc	Surface Roı	Date	Heat Flux ['
5.41E+01	250	0	Annual	0-360	10010312	1.91
4.88E+01	275	0	Annual	0-360	10010312	1.91
4.78E+01	280	0	Annual	0-360	10010312	1.91
4.40E+01	300	0	Annual	0-360	10010312	1.91
3.98E+01	325	0	Annual	0-360	10010312	1.91
3.75E+01	340	0	Annual	0-360	10010312	1.91
3.60E+01	350	0	Annual	0-360	10010312	1.91
3.27E+01	375	0	Annual	0-360	10010312	1.91
3.00E+01	400	0	Annual	0-360	10010312	1.91
2.77E+01	425	0	Annual	0-360	10010312	1.91
2.57E+01	450	0	Annual	0-360	10010312	1.91
2.39E+01	475	0	Annual	0-360	10010312	1.91
2.23E+01	500	0	Annual	0-360	10010312	1.91
2.08E+01	525	0	Annual	0-360	10010312	1.91
1.96E+01	550	0	Annual	0-360	10010312	1.91
1.84E+01	575	0	Annual	0-360	10010312	1.91
1.73E+01	600	0	Annual	0-360	10010312	1.91
1.64E+01	625	0	Annual	0-360	10010312	1.91
1.55E+01	650	0	Annual	0-360	10010312	1.91
1.47E+01	675	0	Annual	0-360	10010312	1.91
1.40E+01	700	0	Annual	0-360	10010312	1.91
1.33E+01	725	0	Annual	0-360	10010312	1.91
1.27E+01	750	0	Annual	0-360	10010312	1.91
1.21E+01	775	0	Annual	0-360	10010312	1.91
1.16E+01	800	0	Annual	0-360	10010312	1.91
1.11E+01	825	0	Annual	0-360	10010312	1.91
1.07E+01	850	0	Annual	0-360	10010312	1.91
1.03E+01	875	0	Annual	0-360	10010312	1.91
9.88E+00	900	0	Annual	0-360	10010312	1.91
9.52E+00	925	0	Annual	0-360	10010312	1.91
9.18E+00	950	0	Annual	0-360	10010312	1.91
8.87E+00	975	0	Annual	0-360	10010312	1.91
8.58E+00	1000	0	Annual	0-360	10010312	1.91
8.31E+00	1025	0	Annual	0-360	10010312	1.91
8.05E+00	1050	0	Annual	0-360	10010312	1.91
7.81E+00	1075	0	Annual	0-360	10010312	1.91
7.59E+00	1100	0	Annual	0-360	10010312	1.91
7.38E+00	1125	0	Annual	0-360	10010312	1.91
7.19E+00	1150	0	Annual	0-360	10010312	1.91
7.01E+00	1175	0	Annual	0-360	10010312	1.91
6.84E+00	1200	0	Annual	0-360	10010312	1.91
6.67E+00	1225	0	Annual	0-360	10010312	1.91
6.52E+00	1250	0	Annual	0-360	10010312	1.91
6.38E+00	1275	0	Annual	0-360	10010312	1.91
6.25E+00	1300	0	Annual	0-360	10010312	1.91

6.12E+00	1325	0	Annual	0-360	10010312	1.91
6.00E+00	1350	0	Annual	0-360	10010312	1.91
5.89E+00	1375	0	Annual	0-360	10010312	1.91
5.78E+00	1400	0	Annual	0-360	10010312	1.91
5.68E+00	1425	0	Annual	0-360	10010312	1.91
5.58E+00	1450	0	Annual	0-360	10010312	1.91
5.49E+00	1475	0	Annual	0-360	10010312	1.91
5.41E+00	1500	0	Annual	0-360	10010312	1.91
5.32E+00	1525	0	Annual	0-360	10010312	1.91
5.25E+00	1550	0	Annual	0-360	10010312	1.91
5.17E+00	1575	0	Annual	0-360	10010312	1.91
5.10E+00	1600	0	Annual	0-360	10010312	1.91
5.03E+00	1625	0	Annual	0-360	10010312	1.91
4.97E+00	1650	0	Annual	0-360	10010312	1.91
4.91E+00	1675	0	Annual	0-360	10010312	1.91
4.85E+00	1700	0	Annual	0-360	10010312	1.91
4.79E+00	1725	0	Annual	0-360	10010312	1.91
4.73E+00	1750	0	Annual	0-360	10010312	1.91
4.68E+00	1775	0	Annual	0-360	10010312	1.91
4.63E+00	1800	0	Annual	0-360	10010312	1.91
4.58E+00	1825	0	Annual	0-360	10010312	1.91
4.53E+00	1850	0	Annual	0-360	10010312	1.91
4.49E+00	1875	0	Annual	0-360	10010312	1.91
4.44E+00	1900	0	Annual	0-360	10010312	1.91
4.40E+00	1925	0	Annual	0-360	10010312	1.91
4.36E+00	1950	0	Annual	0-360	10010312	1.91
4.31E+00	1975	0	Annual	0-360	10010312	1.91
4.27E+00	2000	0	Annual	0-360	10010312	1.91
4.23E+00	2025	0	Annual	0-360	10010312	1.91
4.19E+00	2050	0	Annual	0-360	10010312	1.91
4.15E+00	2075	0	Annual	0-360	10010312	1.91
4.12E+00	2100	0	Annual	0-360	10010312	1.91
4.08E+00	2125	0	Annual	0-360	10010312	1.91
4.05E+00	2150	0	Annual	0-360	10010312	1.91
4.01E+00	2175	0	Annual	0-360	10010312	1.91
3.98E+00	2200	0	Annual	0-360	10010312	1.91
3.94E+00	2225	0	Annual	0-360	10010312	1.91
3.91E+00	2250	0	Annual	0-360	10010312	1.91
3.88E+00	2275	0	Annual	0-360	10010312	1.91
3.85E+00	2300	0	Annual	0-360	10010312	1.91
3.82E+00	2325	0	Annual	0-360	10010312	1.91
3.79E+00	2350	0	Annual	0-360	10010312	1.91
3.76E+00	2375	0	Annual	0-360	10010312	1.91
3.73E+00	2400	0	Annual	0-360	10010312	1.91
3.71E+00	2425	0	Annual	0-360	10010312	1.91
3.68E+00	2450	0	Annual	0-360	10010312	1.91
3.65E+00	2475	0	Annual	0-360	10010312	1.91

3.63E+00	2500	0	Annual	0-360	10010312	1.91
3.60E+00	2525	0	Annual	0-360	10010312	1.91
3.58E+00	2550	0	Annual	0-360	10010312	1.91
3.55E+00	2575	0	Annual	0-360	10010312	1.91
3.53E+00	2600	0	Annual	0-360	10010312	1.91
3.50E+00	2625	0	Annual	0-360	10010312	1.91
3.48E+00	2650	0	Annual	0-360	10010312	1.91
3.45E+00	2675	0	Annual	0-360	10010312	1.91
3.43E+00	2700	0	Annual	0-360	10010312	1.91
3.41E+00	2725	0	Annual	0-360	10010312	1.91
3.39E+00	2750	0	Annual	0-360	10010312	1.91
3.36E+00	2775	0	Annual	0-360	10010312	1.91
3.34E+00	2800	0	Annual	0-360	10010312	1.91
3.32E+00	2825	0	Annual	0-360	10010312	1.91
3.30E+00	2850	0	Annual	0-360	10010312	1.91
3.28E+00	2875	0	Annual	0-360	10010312	1.91
3.26E+00	2900	0	Annual	0-360	10010312	1.91
3.24E+00	2925	0	Annual	0-360	10010312	1.91
3.22E+00	2950	0	Annual	0-360	10010312	1.91
3.20E+00	2975	0	Annual	0-360	10010312	1.91
3.18E+00	3000	0	Annual	0-360	10010312	1.91
3.16E+00	3025	0	Annual	0-360	10010312	1.91
3.14E+00	3050	0	Annual	0-360	10010312	1.91
3.12E+00	3075	0	Annual	0-360	10010312	1.91
3.10E+00	3100	0	Annual	0-360	10010312	1.91
3.09E+00	3125	0	Annual	0-360	10010312	1.91
3.07E+00	3150	0	Annual	0-360	10010312	1.91
3.05E+00	3175	0	Annual	0-360	10010312	1.91
3.03E+00	3200	0	Annual	0-360	10010312	1.91
3.02E+00	3225	0	Annual	0-360	10010312	1.91
3.00E+00	3250	0	Annual	0-360	10010312	1.91
2.98E+00	3275	0	Annual	0-360	10010312	1.91
2.96E+00	3300	0	Annual	0-360	10010312	1.91
2.95E+00	3325	0	Annual	0-360	10010312	1.91
2.93E+00	3350	0	Annual	0-360	10010312	1.91
2.92E+00	3375	0	Annual	0-360	10010312	1.91
2.90E+00	3400	0	Annual	0-360	10010312	1.91
2.88E+00	3425	0	Annual	0-360	10010312	1.91
2.87E+00	3450	0	Annual	0-360	10010312	1.91
2.85E+00	3475	0	Annual	0-360	10010312	1.91
2.84E+00	3500	0	Annual	0-360	10010312	1.91
2.82E+00	3525	0	Annual	0-360	10010312	1.91
2.81E+00	3550	0	Annual	0-360	10010312	1.91
2.79E+00	3575	0	Annual	0-360	10010312	1.91
2.78E+00	3600	0	Annual	0-360	10010312	1.91
2.77E+00	3625	0	Annual	0-360	10010312	1.91
2.75E+00	3650	0	Annual	0-360	10010312	1.91

2.74E+00	3675	0	Annual	0-360	10010312	1.91
2.72E+00	3700	0	Annual	0-360	10010312	1.91
2.71E+00	3725	0	Annual	0-360	10010312	1.91
2.70E+00	3750	0	Annual	0-360	10010312	1.91
2.68E+00	3775	0	Annual	0-360	10010312	1.91
2.67E+00	3800	0	Annual	0-360	10010312	1.91
2.66E+00	3825	0	Annual	0-360	10010312	1.91
2.64E+00	3850	0	Annual	0-360	10010312	1.91
2.63E+00	3875	0	Annual	0-360	10010312	1.91
2.62E+00	3900	0	Annual	0-360	10010312	1.91
2.61E+00	3925	0	Annual	0-360	10010312	1.91
2.59E+00	3950	0	Annual	0-360	10010312	1.91
2.58E+00	3975	0	Annual	0-360	10010312	1.91
2.57E+00	4000	0	Annual	0-360	10010312	1.91
2.56E+00	4025	0	Annual	0-360	10010312	1.91
2.55E+00	4050	0	Annual	0-360	10010312	1.91
2.53E+00	4075	0	Annual	0-360	10010312	1.91
2.52E+00	4100	0	Annual	0-360	10010312	1.91
2.51E+00	4125	0	Annual	0-360	10010312	1.91
2.50E+00	4150	0	Annual	0-360	10010312	1.91
2.49E+00	4175	0	Annual	0-360	10010312	1.91
2.48E+00	4200	0	Annual	0-360	10010312	1.91
2.47E+00	4225	0	Annual	0-360	10010312	1.91
2.46E+00	4250	0	Annual	0-360	10010312	1.91
2.44E+00	4275	0	Annual	0-360	10010312	1.91
2.43E+00	4300	0	Annual	0-360	10010312	1.91
2.42E+00	4325	0	Annual	0-360	10010312	1.91
2.41E+00	4350	0	Annual	0-360	10010312	1.91
2.40E+00	4375	0	Annual	0-360	10010312	1.91
2.39E+00	4400	0	Annual	0-360	10010312	1.91
2.38E+00	4425	0	Annual	0-360	10010312	1.91
2.37E+00	4450	0	Annual	0-360	10010312	1.91
2.36E+00	4475	0	Annual	0-360	10010312	1.91
2.35E+00	4500	0	Annual	0-360	10010312	1.91
2.34E+00	4525	0	Annual	0-360	10010312	1.91
2.33E+00	4550	0	Annual	0-360	10010312	1.91
2.32E+00	4575	0	Annual	0-360	10010312	1.91
2.31E+00	4600	0	Annual	0-360	10010312	1.91
2.30E+00	4625	0	Annual	0-360	10010312	1.91
2.29E+00	4650	0	Annual	0-360	10010312	1.91
2.28E+00	4675	0	Annual	0-360	10010312	1.91
2.28E+00	4700	0	Annual	0-360	10010312	1.91
2.27E+00	4725	0	Annual	0-360	10010312	1.91
2.26E+00	4750	0	Annual	0-360	10010312	1.91
2.25E+00	4775	0	Annual	0-360	10010312	1.91
2.24E+00	4800	0	Annual	0-360	10010312	1.91
2.23E+00	4825	0	Annual	0-360	10010312	1.91

2.22E+00	4850	0	Annual	0-360	10010312	1.91
2.21E+00	4875	0	Annual	0-360	10010312	1.91
2.20E+00	4900	0	Annual	0-360	10010312	1.91
2.20E+00	4925	0	Annual	0-360	10010312	1.91
2.19E+00	4950	0	Annual	0-360	10010312	1.91
2.18E+00	4975	0	Annual	0-360	10010312	1.91
2.17E+00	5000	0	Annual	0-360	10010312	1.91
2.15E+00	5050	0	Annual	0-360	10010312	1.91
2.14E+00	5100	0	Annual	0-360	10010312	1.91
2.12E+00	5150	0	Annual	0-360	10010312	1.91
2.11E+00	5200	0	Annual	0-360	10010312	1.91
2.09E+00	5250	0	Annual	0-360	10010312	1.91
2.08E+00	5300	0	Annual	0-360	10010312	1.91
2.06E+00	5350	0	Annual	0-360	10010312	1.91
2.05E+00	5400	0	Annual	0-360	10010312	1.91
2.03E+00	5450	0	Annual	0-360	10010312	1.91
2.02E+00	5500	0	Annual	0-360	10010312	1.91
2.00E+00	5550	0	Annual	0-360	10010312	1.91
1.99E+00	5600	0	Annual	0-360	10010312	1.91
1.97E+00	5650	0	Annual	0-360	10010312	1.91
1.96E+00	5700	0	Annual	0-360	10010312	1.91
1.95E+00	5750	0	Annual	0-360	10010312	1.91
1.94E+00	5800	0	Annual	0-360	10010312	1.91
1.92E+00	5850	0	Annual	0-360	10010312	1.91
1.91E+00	5900	0	Annual	0-360	10010312	1.91
1.90E+00	5950	0	Annual	0-360	10010312	1.91
1.88E+00	6000	0	Annual	0-360	10010312	1.91
1.87E+00	6050	0	Annual	0-360	10010312	1.91
1.86E+00	6100	0	Annual	0-360	10010312	1.91
1.85E+00	6150	0	Annual	0-360	10010312	1.91
1.84E+00	6200	0	Annual	0-360	10010312	1.91
1.83E+00	6250	0	Annual	0-360	10010312	1.91
1.81E+00	6300	0	Annual	0-360	10010312	1.91
1.80E+00	6350	0	Annual	0-360	10010312	1.91
1.79E+00	6400	0	Annual	0-360	10010312	1.91
1.78E+00	6450	0	Annual	0-360	10010312	1.91
1.77E+00	6500	0	Annual	0-360	10010312	1.91
1.76E+00	6550	0	Annual	0-360	10010312	1.91
1.75E+00	6600	0	Annual	0-360	10010312	1.91
1.74E+00	6650	0	Annual	0-360	10010312	1.91
1.73E+00	6700	0	Annual	0-360	10010312	1.91
1.72E+00	6750	0	Annual	0-360	10010312	1.91
1.71E+00	6800	0	Annual	0-360	10010312	1.91
1.70E+00	6850	0	Annual	0-360	10010312	1.91
1.69E+00	6900	0	Annual	0-360	10010312	1.91
1.68E+00	6950	0	Annual	0-360	10010312	1.91
1.67E+00	7000	0	Annual	0-360	10010312	1.91

1.66E+00	7050	0	Annual	0-360	10010312	1.91
1.65E+00	7100	0	Annual	0-360	10010312	1.91
1.64E+00	7150	0	Annual	0-360	10010312	1.91
1.63E+00	7200	0	Annual	0-360	10010312	1.91
1.62E+00	7250	0	Annual	0-360	10010312	1.91
1.61E+00	7300	0	Annual	0-360	10010312	1.91
1.60E+00	7350	0	Annual	0-360	10010312	1.91
1.60E+00	7400	0	Annual	0-360	10010312	1.91
1.59E+00	7450	0	Annual	0-360	10010312	1.91
1.58E+00	7500	0	Annual	0-360	10010312	1.91
1.57E+00	7550	0	Annual	0-360	10010312	1.91
1.56E+00	7600	0	Annual	0-360	10010312	1.91
1.55E+00	7650	0	Annual	0-360	10010312	1.91
1.55E+00	7700	0	Annual	0-360	10010312	1.91
1.54E+00	7750	0	Annual	0-360	10010312	1.91
1.53E+00	7800	0	Annual	0-360	10010312	1.91
1.52E+00	7850	0	Annual	0-360	10010312	1.91
1.51E+00	7900	0	Annual	0-360	10010312	1.91
1.51E+00	7950	0	Annual	0-360	10010312	1.91
1.50E+00	8000	0	Annual	0-360	10010312	1.91
1.49E+00	8050	0	Annual	0-360	10010312	1.91
1.48E+00	8100	0	Annual	0-360	10010312	1.91
1.48E+00	8150	0	Annual	0-360	10010312	1.91
1.47E+00	8200	0	Annual	0-360	10010312	1.91
1.46E+00	8250	0	Annual	0-360	10010312	1.91
1.45E+00	8300	0	Annual	0-360	10010312	1.91
1.45E+00	8350	0	Annual	0-360	10010312	1.91
1.44E+00	8400	0	Annual	0-360	10010312	1.91
1.43E+00	8450	0	Annual	0-360	10010312	1.91
1.43E+00	8500	0	Annual	0-360	10010312	1.91
1.42E+00	8550	0	Annual	0-360	10010312	1.91
1.41E+00	8600	0	Annual	0-360	10010312	1.91
1.41E+00	8650	0	Annual	0-360	10010312	1.91
1.40E+00	8700	0	Annual	0-360	10010312	1.91
1.39E+00	8750	0	Annual	0-360	10010312	1.91
1.39E+00	8800	0	Annual	0-360	10010312	1.91
1.38E+00	8850	0	Annual	0-360	10010312	1.91
1.37E+00	8900	0	Annual	0-360	10010312	1.91
1.37E+00	8950	0	Annual	0-360	10010312	1.91
1.36E+00	9000	0	Annual	0-360	10010312	1.91
1.35E+00	9050	0	Annual	0-360	10010312	1.91
1.35E+00	9100	0	Annual	0-360	10010312	1.91
1.34E+00	9150	0	Annual	0-360	10010312	1.91
1.34E+00	9200	0	Annual	0-360	10010312	1.91
1.33E+00	9250	0	Annual	0-360	10010312	1.91
1.32E+00	9300	0	Annual	0-360	10010312	1.91
1.32E+00	9350	0	Annual	0-360	10010312	1.91

1.31E+00	9400	0	Annual	0-360	10010312	1.91
1.31E+00	9450	0	Annual	0-360	10010312	1.91
1.30E+00	9500	0	Annual	0-360	10010312	1.91
1.30E+00	9550	0	Annual	0-360	10010312	1.91
1.29E+00	9600	0	Annual	0-360	10010312	1.91
1.28E+00	9650	0	Annual	0-360	10010312	1.91
1.28E+00	9700	0	Annual	0-360	10010312	1.91
1.27E+00	9750	0	Annual	0-360	10010312	1.91
1.27E+00	9800	0	Annual	0-360	10010312	1.91
1.26E+00	9850	0	Annual	0-360	10010312	1.91
1.26E+00	9900	0	Annual	0-360	10010312	1.91
1.25E+00	9950	0	Annual	0-360	10010312	1.91
1.25E+00	10000	0	Annual	0-360	10010312	1.91

Friction Vel	Convective	Lapse Rate	Convective	Mechanica	Monin-Obu	Surface Ro	Bowen Rat	Albedo
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21

0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21

0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
0.105	0.3	0.02	447	78	-47.9	1	3	0.21
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Wind Spee	Anemomet	Temperatu	Height of Temperature [m]
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0.5	10	257	2

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Haynes Cooling Tower PM Emission Summary

Haynes Cooling Tower

Circulation Rate (gpm)	160,000	max
Unit Annual Operating Time (hours)	8,760	

Annual Total Throughput (mmgal/day) = Circulation Rate (gpm) x 60 minutes/hour x Annual Operating Time (hours) x 1e-6 / 365
Cooling tower is assumed to operate whenever the Unit operates. Unit operating hours taken from Rule 218 reports or logs.

Annual Total Throughput (mmgal)	84,096
Annual Total Throughput (mmgal/day)	230.40

Water Density (lb/gal)	8.34	
Drift Loss (%)	**0.0005%**	
TDS (ppmw)	3,000	*Based on previous samples*

Drift Loss provided in Haynes Project Description

Annual PM Emissions (lb/yr) = Circulation Rate (gpm) x Water Density (lb/gal) x Drift Loss (%) x TDS (ppmw) x 1e-6 x 60 minutes/hour x Unit Annual Operating Time (hours)

Annual PM Emissions (lb/year)	10,520

Daily Emissions (lb/day)	29

Chemical	Peak Daily Usage (gal/day)	Maximum Annual Usage (gal/year)	Chemical of Concern	Composition (wt%)	Amount Used (lb/year)
Sodium Hypochlorite	505	184,325	Sodium Hypochlorite	16%	287,950
			Sodium Hydroxide	1%	17,997
Sulfuric Acid	505	184,325	Sulfuric Acid	5%	84,601
Tri- ACT	38	13,870	Monoethanolamine	60%	68,240
			Methoxypropylamine	60%	68,240
			Cyclohexylamine	30%	34,120

Chemical Name	Composition	wt%	Specific Gravity	Density (lb/gal)
Sodium Hypochlorite	Hypochlorous Acid, Sodium Salt	20%	1.17	9.76
	Sodium Hydroxide	5%		
Sulfuric Acid	Sulfuric acid	5%	1.1	9.18
Tri ACT	Monoethanolamine	60%	--	8.2
	Methoxypropylamine	60%		
	Cyclohexylamine	30%		

Cooling Water	8.41E+10	gallons/year
	7.02E+11	lbs/year

Distance to nearest receptor	>100

Cleaners	Chemicals	TAC (Yes/No)	% Cooling Tower Flow Rate	Annual Emissions (lb/year)	Daily Emissions (lb/day)	Hourly Emissions (lb/hr)	Annual Pollutant Screening Level	Hourly Pollutant Screening Level	Exceeds Threshold (Yes/No)
Sodium Hypochlorite	Sodium Hypochlorite	No	4.10E-07	4.32E-03	1.18E-05	4.93E-07	N/A	N/A	N/A
	Sodium Hydroxide	Yes	2.56E-08	2.70E-04	7.39E-07	3.08E-08	N/A	1.10E-02	No
Sulfuric Acid	Sulfuric Acid	Yes	1.21E-07	1.27E-03	3.47E-06	1.45E-07	3.01E+02	1.66E-01	No
Tri- ACT	Monoethanolamine	No	9.72E-08	1.02E-03	2.80E-06	1.17E-07	N/A	N/A	N/A
	Methoxypropylamine	No	9.72E-08	1.02E-03	2.80E-06	1.17E-07	N/A	N/A	N/A
	Cyclohexylamine	No	4.86E-08	5.11E-04	1.40E-06	5.84E-08	N/A	N/A	N/A

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Haynes Cooling Tower PM Emission Summary

Haynes Cooling Tower

Circulation Rate (gpm)	160,000	160,000	*max 146,000 gpm + 10%*
Unit Annual Operating Time (hours)	8,760	8,760	

Annual Total Throughput (mmgal/day) = Circulation Rate (gpm) x 60 minutes/hour x Annual Operating Time (hours) x 1e-6 / 365
Cooling tower is assumed to operate whenever the Unit operates. Unit operating hours taken from Rule 218 reports or logs.

Annual Total Throughput (mmgal)	84,096	84,096
Annual Total Throughput (mmgal/day)	230.40	230.40

Water Density (lb/gal)	8.34	8.34
Drift Loss (%)	**0.0005%**	**0.0005%**
TDS (ppmw)	5,000	3,000
	Maximum tolerable by system 5,000 ppmw TDS for PTE	*Based on previous samples at VGS 2,989 ppmw TDS*

Drift Loss provided in Haynes Project Description
Annual PM Emissions (lb/yr) = Circulation Rate (gpm) x Water Density (lb/gal) x Drift Loss (%) x TDS (ppmw) x 1e-6 x 60 minutes/hour x Unit Annual Operating Time (hours)

Annual PM Emissions (lb/year)	17,534	10,520
Daily PM Emissions (lb/day)	48.0	28.8
Annual PM Emissions (tons/year)	8.77	5.26

PM10 Fraction of Total PM	70%	33.6	20.2	lbs/day
PM2.5 Fraction of PM10	60%			
PM2.5 Fraction of Total PM	42%	20.2	12.1	lbs/day

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Long Beach Water Reclamation Plant - Recycled Water Monitoring Results - 2020 Maxima - Rule 1401 Tier 1									
Recycled Water Analyte	**R1401 TAC Code**	**Water Conc. (µg/L)**	**Water Concentration (lbs/mmgal)**	**Annual Drift Emission Rate (lbs/yr)**	**Hourly Drift Emission Rate (lbs/hr)**	**Annual Rule 1401 Att. N (lbs/yr)**	**Hourly Rule 1401 Att. N (lbs/hr)**	**Annual Pollutant Screening Index**	**Hourly Pollutant Screening Index**
Arsenic	A11	3.13	2.61E-02	1.10E-02	1.25E-06	3.81E-03	2.76E-04	2.88E+00	4.54E-03
Copper	C23	1.93	1.61E-02	6.77E-03	7.73E-07	—	1.38E-01	—	5.60E-06
Mercury	M3	0.0027	2.25E-05	9.47E-06	1.08E-09	2.34E+00	8.28E-04	4.05E-06	1.31E-06
Nickel	N12	1.23	1.03E-02	4.32E-03	4.93E-07	4.88E-01	2.76E-04	8.84E-03	1.79E-03
Ammonia as Nitrogen	A9	3,600	3.00E+01	1.26E+01	1.44E-03	6.02E+04	4.42E+00	2.10E-04	3.26E-04
1,4-Dioxane	D12	1.40	1.17E-02	4.91E-03	5.61E-07	1.65E+01	4.14E+00	2.98E-04	1.35E-07
Chloroform	C11	8.10	6.76E-02	2.84E-02	3.24E-06	2.34E+01	2.07E-01	1.21E-03	1.57E-05
Fluoride	F1	661	5.52E+00	2.32E+00	2.65E-04	6.86E+02	3.31E-01	3.38E-03	8.00E-04
n-Nitrosodimethylamine (NDMA)	N4	0.091	7.59E-04	3.19E-04	3.65E-08	2.78E-02	—	1.15E-02	—
Toluene	T3	0.85	7.09E-03	2.98E-03	3.40E-07	9.03E+04	5.11E+01	3.30E-08	6.66E-09
Source: LADWP 2021L, SCAQMD 2017b							**Total ASI**	**2.908**	**0.0075**
							Threshold	**1**	**1**
							Pass/Fail	**Fail**	**Pass**

Recirculation Rate	160,000	gal/min
Conversion	60	min/hr
Drift Fraction (DF)	0.0005%	
Drift Loss (hourly)	**4.80E-05**	**mmgal/hr**
Conversion	8,760	hrs/yr
Drift Loss (annual)	**4.20E-01**	**mmgal/yr**

Rule 1401 Risk Assessment Program

Implements SCAQMD Risk Assessment Procedures Version 8.1 & Attachment
For applications deemed complete on or after October 1, 2017

Boiler	Crematory	Spray I
Lean Burn ICE	Rich Burn ICE	Gas St
Diesel ICE	Pressure Washer	Oth
Emissions	Tier 1 Report	Tier 2 I

Fac Name: LADWP Haynes A/N: 0

TAC Code	Compound	Emission Rate (lbs/hr)	Molecular Weight	R1 - Uncontrolled (lbs/hr)	Efficiency Factor (Fraction range 0-1)	R2-Controlled (lbs/hr)
A11	Arsenic and Compounds (Inorganic)	1.25E-06	74.92	1.25E-06	0.00000	1.25382E-06
C23	Copper and Compounds	7.73E-07	63.55	7.73E-07	0.00000	7.73122E-07
M3	Mercury and Compounds (Inorganic)	1.08E-09	200.59	1.08E-09	0.00000	1.08157E-09
N12	Nickel and Compounds	4.93E-07	58.71	4.93E-07	0.00000	4.92715E-07
A9	Ammonia	1.44E-03	17.03	1.44E-03	0.00000	0.001442093
D12	1,4-Dioxane (1,4-Diethylene Dioxide)	5.61E-07	88.1	5.61E-07	0.00000	5.60814E-07
C11	Chloroform	3.24E-06	119.38	3.24E-06	0.00000	3.24471E-06
F1	Flourides	2.65E-04	18.9984	2.65E-04	0.00000	0.000264784
N4	n-Nitrosodimethylamine	3.65E-08	74.08	3.65E-08	0.00000	3.64529E-08
T3	Toluene	3.40E-07	92.13	3.40E-07	0.00000	3.40494E-07

TIER 1 SCREENING RISK ASSESSMENT REPORT

(Procedure Version 8.1 & Package N, September 1, 2017)

Application deemed complete date: 9/21/2021

A/N , LADWP Haynes

Equipment Type	Other		No T-BACT
Nearest Receptor Distance (actual)	100	meters	
Receptor Distance (Table 1 Emission look up)	100	meters	

Tier 1 Results	
Cancer/Chronic ASI	**Acute ASI**
2.90E+00	7.48E-03
FAILED	PASSED

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission Rate (lbs/yr)	Max Hourly Emission Rate (lbs/hr)	Cancer/Chronic Pollutant Screening Level (lbs/yr) from Table 1	Acute Pollutant Screening Level (lbs/hr) from Table 1	Cancer/Chronic Pollutant Screening Index (PSI)	Acute Pollutant Screening Index (PSI)
Arsenic and Compounds (Inorganic)	1.10E-02	1.25E-06	3.81E-03	2.76E-04	2.87E+00	4.54E-03
Copper and Compounds	6.75E-03	7.73E-07		1.38E-01		5.60E-06
Mercury and Compounds (Inorganic)	9.45E-06	1.08E-09	2.34E+00	8.28E-04	4.04E-06	1.31E-06
Nickel and Compounds	4.30E-03	4.93E-07	4.88E-01	2.76E-04	8.82E-03	1.79E-03
Ammonia	1.26E+01	1.44E-03	6.02E+04	4.42E+00	2.09E-04	3.26E-04
1,4-Dioxane (1,4-Diethylene Dioxide)	4.90E-03	5.61E-07	1.65E+01	4.14E+00	2.97E-04	1.35E-07
Chloroform	2.83E-02	3.24E-06	2.34E+01	2.07E-01	1.21E-03	1.57E-05
Flourides	2.31E+00	2.65E-04	6.86E+02	3.31E-01	3.37E-03	8.00E-04
n-Nitrosodimethylamine	3.18E-04	3.65E-08	2.78E-02		1.15E-02	
Toluene	2.97E-03	3.40E-07	9.03E+04	5.11E+01	3.29E-08	6.66E-09
TOTAL (APPLICATION SCREENING INDEX)					**2.90E+00**	**7.48E-03**

EMISSIONS ARE ENTERED ON THE EMISSIONS WORKSHEET OR ON ONE OF EQUIPMENT WORKSHEETS

INPUT PARAMETERS ENTERED ON THE EMISSIONS SHEET ARE USED FOR TIERS 1 AND TIER 2 ANALYSES

TIER 2 SCREENING RISK ASSESSMENT REPORT

(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool V1.103

A/N: ______ **Fac:** LADWP Haynes **Application deemed complete date:** 9/21/2021

1. Stack Data

Equipment Type	Other	
Combustion Eff	0.0	
	No T-BACT	
Operation Schedule	24	hrs/day
	7	days/week
	52	weeks/year
Stack Height	50	ft
Distance to Residential	100	m
Distance to Commercial	100	m
Meteorological Station	Long Beach Airport	

2. Tier 2 Data

Dispersion Factors tables	Point Source
For Chronic X/Q	Table 6
For Acute X/Q max	Table 6.4

Dilution Factors

Receptor	X/Q (μg/m³)/(tons/yr)	X/Qmax (μg/m³)/(lbs/hr)
Residential	0.51	23.70
Commercial - Worker	0.51	23.70

Intake and Adjustment Factors

	Residential	Worker
Year of Exposure	30	
Combined Exposure Factor (CEF) - Table 4	677.40	55.86
Worker Adjustment Factor (WAF) - Table 5	1	1.00

A/N: ______________ Application deemed complete date: 09/21/21

3. Rule 1401 Compound Data

Compound	R1 - Uncontrolled (lbs/hr)	R2 - Controlled (lbs/hr)	CP $(mg/kg\text{-}day)^{-1}$	MP MICR Resident	MP MICR Worker	MP Chronic Resident	MP Chronic Worker	REL Chronic (µg/m³)	REL 8-hr Chronic (µg/m³)	REL Acute (µg/m³)	MWAF
Arsenic and Compounds (Inorganic)	1.25E-06	1.25E-06	1.20E+01	9.71	4.52	88.03	28.37	1.50E-02	1.50E-02	2.00E-01	1
Copper and Compounds	7.73E-07	7.73E-07		1.00	1.00	1.00	1.00			1.00E+02	1
Mercury and Compounds (Inorganic)	1.08E-09	1.08E-09		1.00	1.00	3.86	2.11	3.00E-02	6.00E-02	6.00E-01	1
Nickel and Compounds	4.93E-07	4.93E-07	9.10E-01	1.00	1.00	1.00	1.00	1.40E-02	6.00E-02	2.00E-01	1
Ammonia	1.44E-03	1.44E-03		1.00	1.00	1.00	1.00	2.00E+02		3.20E+03	1
1,4-Dioxane (1,4-Diethylene Dioxide)	5.61E-07	5.61E-07	2.70E-02	1.00	1.00	1.00	1.00	3.00E+03		3.00E+03	1
Chloroform	3.24E-06	3.24E-06	1.90E-02	1.00	1.00	1.00	1.00	3.00E+02		1.50E+02	1
Flourides	2.65E-04	2.65E-04		1.00	1.00	5.70	2.85	1.30E+01		2.40E+02	1
n-Nitrosodimethylamine	3.65E-08	3.65E-08	1.60E+01	1.00	1.00	1.00	1.00				1
Toluene	3.40E-07	3.40E-07		1.00	1.00	1.00	1.00	3.00E+02		3.70E+04	1

A/N: ____________ **Application deemed complete date:** 09/21/21

4. Emission Calculations

Compound	R1 (lbs/hr)	R2 (lbs/hr)	R1 (lbs/day)	R2 (lbs/day)	R2 (lbs/yr)	R2 (tons/yr)
Arsenic and Compounds (Inorganic)	1.25E-06	1.25E-06	3.01E-05	3.01E-05	1.10E-02	5.48E-06
Copper and Compounds	7.73E-07	7.73E-07	1.86E-05	1.86E-05	6.75E-03	3.38E-06
Mercury and Compounds (Inorganic)	1.08E-09	1.08E-09	2.60E-08	2.60E-08	9.45E-06	4.72E-09
Nickel and Compounds	4.93E-07	4.93E-07	1.18E-05	1.18E-05	4.30E-03	2.15E-06
Ammonia	1.44E-03	1.44E-03	3.46E-02	3.46E-02	1.26E+01	6.30E-03
1,4-Dioxane (1,4-Diethylene Dioxide)	5.61E-07	5.61E-07	1.35E-05	1.35E-05	4.90E-03	2.45E-06
Chloroform	3.24E-06	3.24E-06	7.79E-05	7.79E-05	2.83E-02	1.42E-05
Flourides	2.65E-04	2.65E-04	6.35E-03	6.35E-03	2.31E+00	1.16E-03
n-Nitrosodimethylamine	3.65E-08	3.65E-08	8.75E-07	8.75E-07	3.18E-04	1.59E-07
Toluene	3.40E-07	3.40E-07	8.17E-06	8.17E-06	2.97E-03	1.49E-06
Total	**1.71E-03**	**1.71E-03**	**4.11E-02**	**4.11E-02**	**1.50E+01**	**7.48E-03**

TIER 2 RESULTS

A/N: ____________ **Application deemed complete date:** 09/21/21

5a. MICR

MICR Resident = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) Resident * CEF Resident * MP Resident * 1e-6 * MWAF

MICR Worker = CP (mg/(kg-day))^-1 * Q (ton/yr) * (X/Q) Worker * CEF Worker* MP Worker* WAF Worker* 1e-6 * MWAF

Compound	Residential	Commercial
Arsenic and Compounds (Inorganic)	2.21E-07	8.46E-09
Copper and Compounds		
Mercury and Compounds (Inorganic)		
Nickel and Compounds	6.77E-10	5.58E-11
Ammonia		
1,4-Dioxane (1,4-Diethylene Dioxide)	2.28E-11	1.88E-12
Chloroform	9.30E-11	7.67E-12
Flourides		
n-Nitrosodimethylamine	8.80E-10	7.26E-11
Toluene		
Total	**2.22E-07**	**8.60E-09**
	PASS	**PASS**

5b. Is Cancer Burden Calculation Needed (MICR >1E-6)? **NO**

New X/Q at which $MICR_{70yr}$ is one-in-a-million [(µg/m³)/(tons/yr)]:
New Distance, interpolated from X/Q table using New X/Q (meter):
Zone Impact Area (km²):
Zone of Impact Population (7000 person/km²):
Cancer Burden:

6. Hazard Index Summary **A/N:** ______ **Application deemed complete date:** 09/21/21

HIA = [Q(lb/hr) * (X/Q)max * MWAF]/ Acute REL
HIC = [Q(ton/yr) * (X/Q) * MP * MWAF] / Chronic REL
HIC 8-hr= [Q(ton/yr) * (X/Q) * WAF * MWAF] / 8-hr Chronic REL

Target Organs	Acute	Chronic	8-hr Chronic	Acute Pass/Fail	Chronic Pass/Fail	8-hr Chronic Pass/Fail
Alimentary system (liver) - AL		2.45E-08		Pass	Pass	Pass
Bones and teeth - BN		2.59E-04		Pass	Pass	Pass
Cardiovascular system - CV	1.49E-04	1.64E-02	1.86E-04	Pass	Pass	Pass
Developmental - DEV	1.49E-04	1.65E-02	1.86E-04	Pass	Pass	Pass
Endocrine system - END				Pass	Pass	Pass
Eye	3.68E-05			Pass	Pass	Pass
Hematopoietic system - HEM		7.84E-05		Pass	Pass	Pass
Immune system - IMM	5.84E-05		1.83E-05	Pass	Pass	Pass
Kidney - KID		3.35E-07	4.02E-08	Pass	Pass	Pass
Nervous system - NS	1.49E-04	1.64E-02	1.86E-04	Pass	Pass	Pass
Reproductive system - REP	1.49E-04	1.65E-02	1.86E-04	Pass	Pass	Pass
Respiratory system - RESP	3.75E-05	1.67E-02	2.05E-04	Pass	Pass	Pass
Skin		1.64E-02	1.86E-04	Pass	Pass	Pass

6a. Hazard Index Acute - Resident

HIA = [Q(lb/hr) * (X/Q)max resident * MWAF] / Acute REL

	HIA - Residential									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Arsenic and Compounds (Inorganic)		1.49E-04	1.49E-04				1.49E-04	1.49E-04		
Copper and Compounds									1.83E-07	
Mercury and Compounds (Inorganic)			4.27E-08				4.27E-08	4.27E-08		
Nickel and Compounds						5.84E-05				
Ammonia				1.07E-05					1.07E-05	
1,4-Dioxane (1,4-Diethylene Dioxide)				4.43E-09					4.43E-09	
Chloroform			5.13E-07				5.13E-07	5.13E-07	5.13E-07	
Flourides				2.61E-05					2.61E-05	
n-Nitrosodimethylamine										
Toluene			2.18E-10	2.18E-10			2.18E-10	2.18E-10	2.18E-10	
Total		1.49E-04	1.49E-04	3.68E-05		5.84E-05	1.49E-04	1.49E-04	3.75E-05	

6a. Hazard Index Acute - Worker **A/N:** ______ **Application deemed complete date:** 09/21/21

HIA = [Q(lb/hr) * (X/Q)max Worker * MWAF] / Acute REL

	HIA - Commercial									
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Arsenic and Compounds (Inorganic)		1.49E-04	1.49E-04				1.49E-04	1.49E-04		
Copper and Compounds									1.83E-07	
Mercury and Compounds (Inorganic)			4.27E-08				4.27E-08	4.27E-08		
Nickel and Compounds						5.84E-05				
Ammonia				1.07E-05					1.07E-05	
1,4-Dioxane (1,4-Diethylene Dioxide)				4.43E-09					4.43E-09	
Chloroform			5.13E-07				5.13E-07	5.13E-07	5.13E-07	
Flourides				2.61E-05					2.61E-05	
n-Nitrosodimethylamine										
Toluene			2.18E-10	2.18E-10			2.18E-10	2.18E-10	2.18E-10	
Total		1.49E-04	1.49E-04	3.68E-05		5.84E-05	1.49E-04	1.49E-04	3.75E-05	

A/N: ____________ **Application deemed complete date:** 09/21/21

6b. Hazard Index Chronic - Resident

HIC = [Q(ton/yr) * (X/Q) Resident * MP Chronic Resident * MWAF] / Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic and Compounds (Inorganic)			1.64E-02	1.64E-02						1.64E-02	1.64E-02	1.64E-02	1.64E-02
Copper and Compounds													
Mercury and Compounds (Inorganic)				3.10E-07					3.10E-07	3.10E-07	3.10E-07		
Nickel and Compounds				7.84E-05			7.84E-05				7.84E-05	7.84E-05	
Ammonia												1.61E-05	
1,4-Dioxane (1,4-Diethylene Dioxide)	4.16E-10		4.16E-10						4.16E-10				
Chloroform	2.41E-08			2.41E-08					2.41E-08		2.41E-08		
Flourides		2.59E-04										2.59E-04	
n-Nitrosodimethylamine													
Toluene				2.53E-09						2.53E-09	2.53E-09	2.53E-09	
Total	2.45E-08	2.59E-04	1.64E-02	1.65E-02			7.84E-05		3.35E-07	1.64E-02	1.65E-02	1.67E-02	1.64E-02

A/N: ______________ **Application deemed complete date:** 09/21/21

6b. Hazard Index Chronic - Worker

HIC = [Q(ton/yr) * (X/Q) * MP Chronic Worker * MWAF] / Chronic REL

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic and Compounds (Inorganic)			5.28E-03	5.28E-03						5.28E-03	5.28E-03	5.28E-03	5.28E-03
Copper and Compounds													
Mercury and Compounds (Inorganic)				1.69E-07					1.69E-07	1.69E-07	1.69E-07		
Nickel and Compounds				7.84E-05			7.84E-05				7.84E-05	7.84E-05	
Ammonia												1.61E-05	
1,4-Dioxane (1,4-Diethylene Dioxide)	4.16E-10		4.16E-10						4.16E-10				
Chloroform	2.41E-08			2.41E-08					2.41E-08		2.41E-08		
Flourides		1.29E-04										1.29E-04	
n-Nitrosodimethylamine													
Toluene				2.53E-09						2.53E-09	2.53E-09	2.53E-09	
Total	2.45E-08	1.29E-04	5.28E-03	5.36E-03			7.84E-05		1.94E-07	5.28E-03	5.36E-03	5.51E-03	5.28E-03

6c. 8-hour Hazard Index Chronic - Resident **A/N:** ______________ **Application deemed complete date:** 09/21/21

HIC 8-hr = [Q(ton/yr) * (X/Q) Resident * WAF Resident * MWAF] / 8-hr Chronic REL

	HIC - Residential												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic and Compounds (Inorganic)			1.86E-04	1.86E-04						1.86E-04	1.86E-04	1.86E-04	1.86E-04
Copper and Compounds													
Mercury and Compounds (Inorganic)				4.02E-08					4.02E-08	4.02E-08	4.02E-08		
Nickel and Compounds								1.83E-05				1.83E-05	
Ammonia													
1,4-Dioxane (1,4-Diethylene Dioxide)													
Chloroform													
Flourides													
n-Nitrosodimethylamine													
Toluene													
Total			1.86E-04	1.86E-04				1.83E-05	4.02E-08	1.86E-04	1.86E-04	2.05E-04	1.86E-04

A/N: ______________ **Application deemed complete date:** 09/21/21

6c. 8-hour Hazard Index Chronic - Worker

HIC 8-hr = [Q(ton/yr) * (X/Q) Worker * WAF Worker * MWAF] / 8-hr Chronic REL

	HIC - Commercial												
Compound	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Arsenic and Compounds (Inorganic)			1.86E-04	1.86E-04						1.86E-04	1.86E-04	1.86E-04	1.86E-04
Copper and Compounds													
Mercury and Compounds (Inorganic)				4.02E-08					4.02E-08	4.02E-08	4.02E-08		
Nickel and Compounds								1.83E-05				1.83E-05	
Ammonia													
1,4-Dioxane (1,4-Diethylene Dioxide)													
Chloroform													
Flourides													
n-Nitrosodimethylamine													
Toluene													
Total			1.86E-04	1.86E-04				1.83E-05	4.02E-08	1.86E-04	1.86E-04	2.05E-04	1.86E-04

APPENDIX B

BIOLOGICAL RESOURCES REPORT

BIOLOGICAL RESOURCES REPORT

HAYNES GENERATING STATION UNIT 8 RECYCLED WATER COOLING SYSTEM RETROFIT PROJECT

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August 2021

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1. INTRODUCTION

The Los Angeles Department of Water and Power (LADWP) proposes to implement the Haynes Generating Station (Haynes) Unit 8 Recycled Water Cooling System Retrofit Project (referred to herein as the project or proposed project), which would modify the Haynes Generation Unit 8 cooling system by installing a wet cooling system consisting of a cooling tower. Based on a preliminary schedule, the construction of the proposed project is scheduled to begin in late 2024, and primary facilities construction would be substantially complete by mid-2026. The cooling tower would become operational by mid-2027, after a commissioning phase.

This memo summarizes the results of a site survey conducted by AECOM to document existing biological conditions at the project site and to assess potential impacts to biological resources from the construction and operation of the proposed project. This report includes the methods used to assess existing biological resources, the results of vegetation, wildlife, and habitat evaluation, the list of potential special-status species evaluated, and measures identified to avoid or minimize potential impacts to biological resources. This memo was prepared in support of a Mitigated Negative Declaration (MND) in compliance with the California Environmental Quality Act (CEQA) environmental review process.

2. PROJECT DESCRIPTION

2.1 Project Location and Setting

Haynes is one of four LADWP natural-gas generating stations located in the Los Angeles basin and one of three that are located along the coast, as shown in Figure 1. The proposed project would be sited within Haynes, located at 6801 East 2nd Street in the City of Long Beach, as indicated in Figure 2, which shows the vicinity of Haynes. Haynes is located immediately south of State Route (SR) 22 (Garden Grove Freeway) and approximately 1 mile east of SR-1 (Pacific Coast Highway). 2nd Street forms the southern boundary of the station. The San Gabriel River channel borders the west boundary of Haynes, and an Orange County Flood Control District (OCFCD) channel borders the eastern boundary.

Haynes is a fully developed industrial property, consisting of approximately 130 acres, the majority of which is located in the City of Long Beach, County of Los Angeles. Approximately 7.5 acres in the northeast corner of Haynes are located in the City of Seal Beach, County of Orange. The Haynes property is designated for industrial use in the Long Beach Southeast Area Specific Plan and industrial light use in the Seal Beach General Plan, Planning Area 3. The proposed cooling tower and ancillary facilities would be located entirely within the Long Beach portions of the property.

Uses surrounding Haynes consist primarily of industrial, commercial, and residential functions, including the Leisure World Seal Beach residential community along the entire eastern boundary of Haynes, separated from Haynes by the OCFCD channel; light industrial functions (including office, research and development, and manufacturing) in the Boeing Integrated Defense Systems Specific Plan Area (Seal Beach) to the southeast; the Island Village residential community to the south, across 2nd Street; the Los Cerritos Wetlands Complex properties in the historical Seal Beach Oil Field to the southwest; the Alamitos Generating Station (an electrical generating station operated by the AES Corporation) along the entire western boundary, across the San Gabriel River channel; and residential areas and open space recreation to the north, across SR-22.

2.2 Project Characteristics

Preliminarily, the proposed cooling tower would consist of nine cells, which would be arranged in a single row of nine cells oriented in a north-south direction. The entire tower would be approximately 50 feet wide, 500 feet long, and 60 feet tall. The tower would be sited in the central part of Haynes (see Figure 3) on a portion of the site previously occupied by Generation Units 5 and 6, which are currently undergoing demolition.

Other major facilities necessary to support the operation of the cooling tower are several types of aboveground water storage tanks. These include an approximately 7-million-gallon (MG) makeup water storage tank, which would supply the cooling tower to compensate for water lost primarily from evaporation during the cooling process. The makeup water tank would be aboveground and approximately 150 feet in diameter and 50 feet tall. It would be located on the eastern side of the Haynes property, roughly parallel with the cooling tower, at the site of a recently demolished fuel oil tank of similar size.

An approximately 3-MG tank to temporarily hold industrial wastewater would also be located in the area of the previously demolished fuel oil tank in the eastern part of Haynes. It would also be aboveground and would be approximately 100 feet in diameter and 50 feet tall. Two aboveground stormwater holding tanks, each approximately 1.5 MG in volume and approximately 70 feet in diameter and 50 feet tall, would also be constructed as part of the proposed project. One would be located adjacent to the above-mentioned makeup water holding tank, and one would be located adjacent to an existing stormwater detention basin in the northern part of the Haynes.

Various infrastructure improvements, including new and modified pipelines, both above and belowground, would also be installed as part of the project to interconnect the tower makeup water supply systems, industrial wastewater handling systems, and stormwater handling systems.

The proposed project facilities would all be located in areas of Haynes which have been highly disturbed from past facilities construction and operations, dating to as early as the early 1960s, when construction first began on the original generating station. This includes the site of the proposed cooling tower and adjacent support facilities, which are located on the site of steam-boiler Generation Units 5 and 6, which became operational in in 1966 and 1967, respectively, and which required extensive site preparation, including substantial grading and excavation for subterranean foundation systems. These generation units as well as surrounding support facilities have recently been removed as part of ongoing demolition activities at Haynes, which have required additional ground disturbance and grading activities. The makeup water, wastewater, and stormwater storage tanks would be located on the sites of large, since-demolished fuel oil tanks associated with the early operations at Haynes. The construction of these tanks and the surrounding spill containment basins likewise required extensive grading and excavation work. Some of these areas have since been redeveloped with modern generation units that replaced the original steam-boiler units and whose construction required additional site grading and excavation work. Proposed infrastructure improvements, including new and modified recycled water, wastewater, stormwater, and potable water pipelines, would also be located primarily in areas of Haynes that have been highly disturbed in relation to the construction of the original generation units and support facilities in the southern portion of Haynes or replacement generation units that, along with support facilities, encompass the central and northern portions of Haynes.

2.3 Project Construction

Project construction is anticipated to begin in late 2024 and would occur for approximately 2.5 years, ending in spring 2027. The majority of construction would be completed in less than 2 years, which would provide a contingency period to complete this construction to ensure that the tie-in and commissioning can be started and completed during the non-peak energy demand season. The tie-in and commissioning phase would begin in fall 2026 and be completed in spring 2027, a period of about 6 to 7 months.

The 2.5-year construction period would include site preparation and earthwork; foundation and pile installation; cooling tower and auxiliary equipment construction; makeup water, wastewater holding, and stormwater holding tanks erection; water infrastructure installation; final tie-ins to existing equipment and system commissioning; and demolition of certain existing aboveground structures. An estimated daily peak of about 26 pieces of construction equipment, 12 daily off-site truck round trips, and 33 on-site workers would be required. All required temporary administrative, staging, storage, and laydown areas related to project construction would be located within the existing Haynes property boundaries.

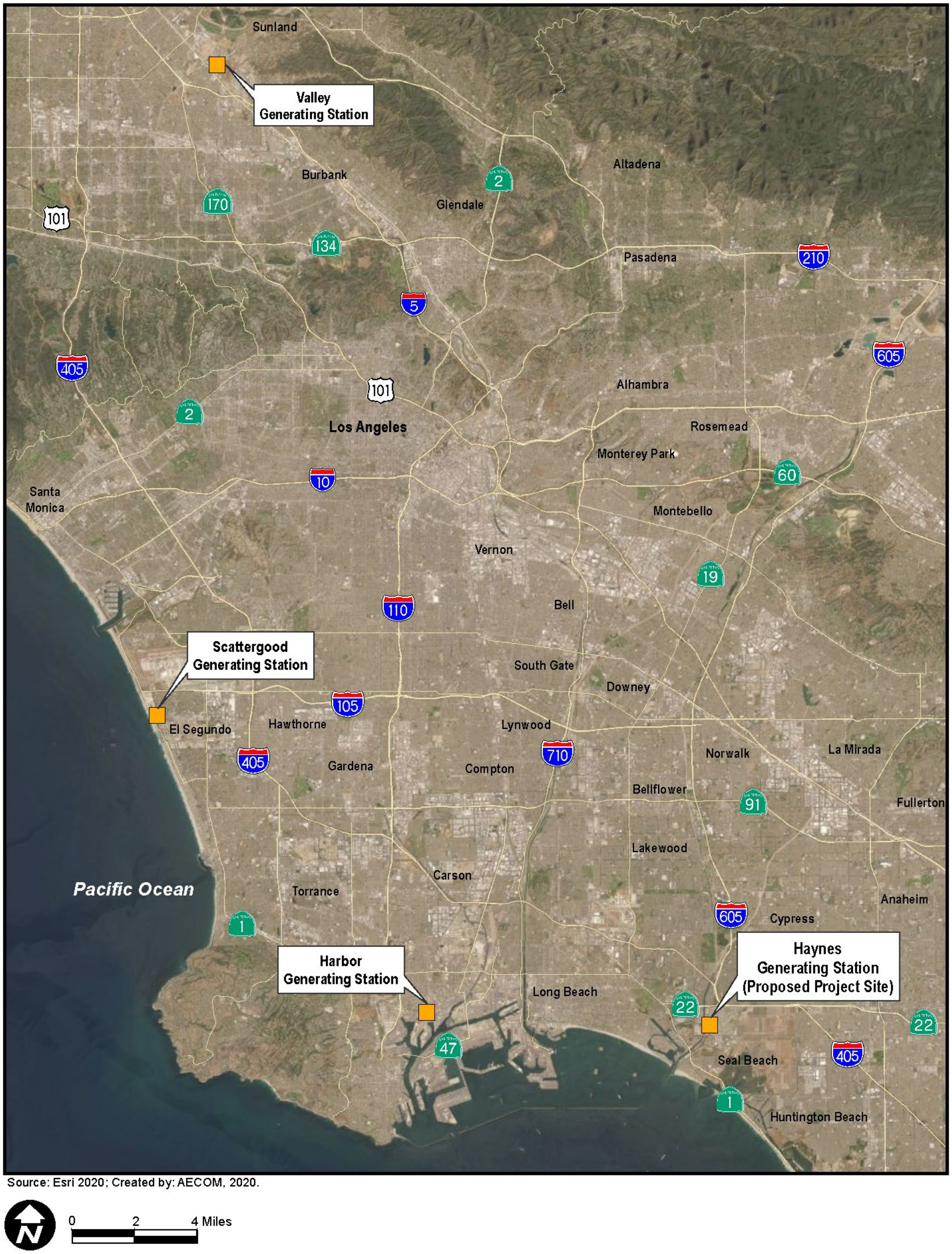

Figure 1 Regional Location Map

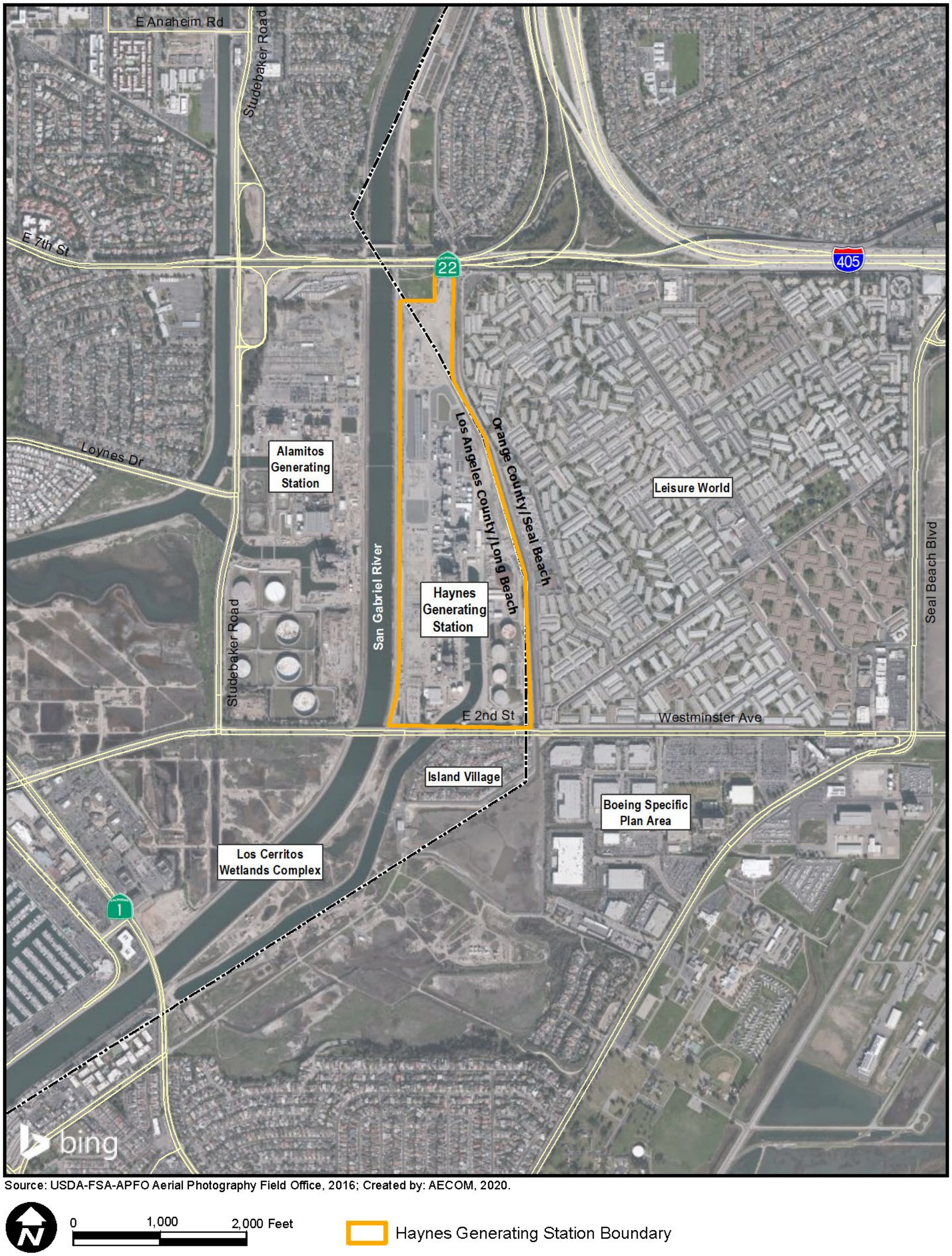

Figure 2 Vicinity Map

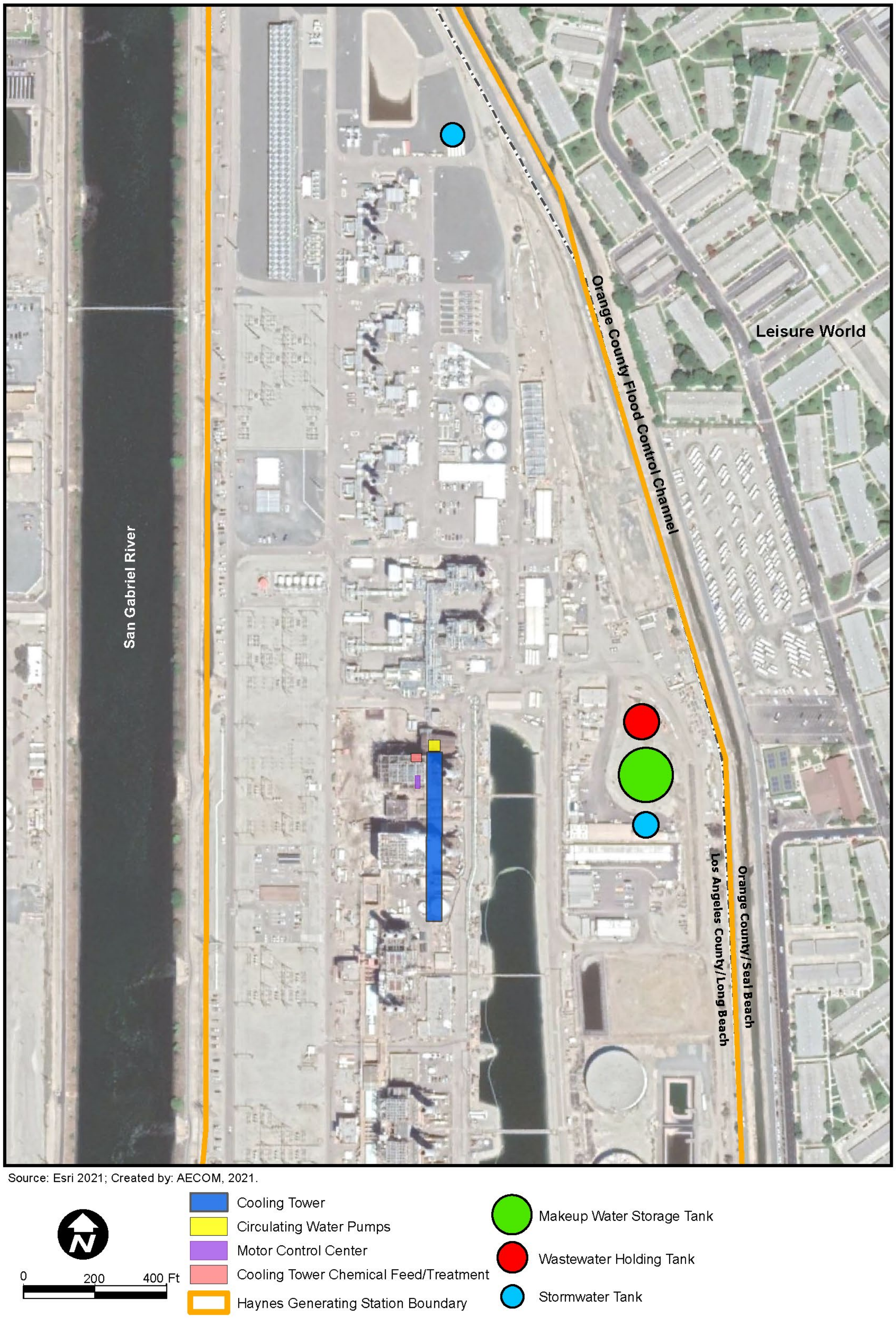

Figure 3 – Preliminary Site Plan

3. METHODS FOR ASSESSING BIOLOGICAL RESOURCES

3.1 Literature Search

A search of relevant regional databases for special-status biological resources in the vicinity of the project area was conducted prior to conducting the field survey. The project occurs in the southwest corner of the U.S. Geological Survey's Los Alamitos, California quadrangle. A search of the Los Alamitos quadrangle and the surrounding seven quadrangles (using the nine-quad search; bordered by the Pacific Ocean to the south), including South Gate, Whittier, La Habra, Long Beach, Anaheim, Seal Beach, and Newport Beach, was made of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB) (CDFW 2021a), the on-line Inventory of Rare and Endangered Plants of California maintained by the California Native Plant Society (CNPS) (2021), the U.S. Fish and Wildlife Service's (USFWS) online Information for Planning and Consultation (IPaC) environmental review (USFWS 2021), and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) California Species List Tool (NMFS 2016).

The area evaluated for biological resources includes the Haynes property and a 500-foot survey buffer, combined the Biological Survey Areas (BSA). A 500-foot buffer was evaluated in order to capture potential indirect effects to biological resources from implementation of the proposed project, such as elevated noise and dust levels and increased human activity within the BSA. A 500-foot survey buffer is standard for capturing potential indirect impacts from a project on biological resources. It is anticipated that indirect impacts beyond 500 feet are generally diffuse and would not significantly impact biological resources.

3.2 Field Survey

On January 11th, 2021, a field assessment of the Haynes property was conducted by AECOM biologist Arthur Popp to document existing biological resources that occur or have the potential to occur within the BSA. The survey focused on the project area within the Haynes property where the proposed cooling tower and water storage tanks would be constructed. Other areas within the Haynes property were reviewed by vehicle. The BSA surrounding the Haynes property is generally composed of developed areas. No direct survey of the buffer was conducted due to access and/or safety considerations; however, existing conditions in the buffer were observed in order to evaluate potential impacts of the project beyond the Haynes facility. The survey supported an evaluation of on-site biological resources and an evaluation of the potential for occurrence of special-status plant and wildlife species to occur in the BSA.

Plant species within the project site and wildlife species observed within the project site and surrounding area were recorded. Binoculars were utilized to scan for evidence of wildlife activity. Seasonal, species-specific botanical and wildlife surveys were not conducted as part of this evaluation. The field methods employed would not necessarily rule out the potential for some special-status species to occur on-site; however, based on the survey conducted and an assessment of on-site conditions, it is apparent that habitat is of very marginal quality to support special-status biological resources, and they are generally not expected on site.

It should be noted that the Haynes cooling water intake channel, located to the east of the proposed cooling tower site, contains beds of eelgrass (*Zostera marina*) habitat, both in that portion of the channel within the Haynes boundary (i.e., north of 2nd Street) and that portion south of 2nd Street. Eelgrass serves several important ecosystem functions, including preventing coastal erosion, serving as a spawning and nursery site for numerous species, and providing a foraging area for aquatic wildlife. Eelgrass is classified as a Habitat Area of Particular Concern by the National Marine Fisheries Service and is recognized as Essential Fish Habitat under the Magnuson-Stevens Fishery Conservation Management Act. In addition to eelgrass, three native marine alga species are known to exist in the channel, but none are considered special-status. Based on extensive surveys conducted in relation to other activities at Haynes (i.e., not in relation to the proposed cooling tower project and the associated biological assessment), the eelgrass habitat in the channel is known to support at least some individuals of 24 native invertebrate species and 12 native fish species, although many of these species were represented by only one individual noted during the surveys. Of these species, topsmelt (*Atherinops affinis*) is considered under both the Pacific Coast Groundfish Fishery Management Plan and the Coastal Pelagic Species Fishery Management Plan as an "ecosystem component" species. Although such species are not determined to be subject to overfishing or approaching an overfished condition and are not actively managed under these plans, they serve as an important food source for other fish. In addition, California spiny lobster (*Panulirus interruptus*) and kelp bass (*Paralabrax clathratus*) are managed species by the state under the California Spiny Lobster Fishery Management Plan and the Marine Life Management Act, respectively.

Adjacent to Haynes to the west, a population of federally-threatened green sea turtles (*Chelonia mydas*) is known to occur in the San Gabriel River, from the river mouth to approximately 3.5 miles upstream, attracted by warmer temperatures caused by OTC systems discharges into the river by Haynes and Alamitos Generating Station.

The proposed project components would be located entirely outside the Haynes cooling water intake channel and San Gabriel River in upland areas of the station. However, the potential exists during project construction to potentially impact the channel from potential polluted runoff, sedimentation and turbidity, and debris. Therefore, specific avoidance and minimization measures would be implemented, as outlined in Section 9 of this report, to protect the channel during project construction. Therefore, based on the location of project facilities, the assessment of existing biological resources at Haynes and potential impacts to those resources from the construction and operation of the proposed project contained in this report focuses on terrestrial species (including avian species that may forage in the channel and river) as opposed to the aquatic species present in the channel and river.

4. EXISTING CONDITIONS

The proposed project occurs entirely within the 130-acre Haynes property. Areas surrounding the project site can generally be described as primarily residential properties and commercial/light industrial uses serviced by a network of freeways, highways, and local roads. Because of the developed nature of the surroundings, the BSA consists primarily of paved areas. Some areas of landscaped ornamental vegetation are dispersed throughout the BSA, with most occurring in residential communities east and south of the Haynes. Photographs of the project site are included in Appendix A.

4.1 Vegetation Communities and Plants

Vegetation communities are assemblages of plant species that commonly coexist. The classification of vegetation communities is based on the life form of the dominant species within that community and the associated species. Only non-native ornamental tree and shrub species were documented on the Haynes property. No native terrestrial plant communities occur on-site or in the surrounding BSA. As a result, where in most instances, the Manual of California Vegetation, Second Edition (Sawyer et al. 2009) and/or Holland (1986) are utilized to classify vegetation communities, the vegetation and land cover types recorded on site do not fall within a vegetation classification indicated in these sources. A discussion of vegetation and land cover types within the BSA is provided below.

The Haynes property itself has been completely developed and is composed of power generation facilities, including support functions; paved, gravel, or bare ground surfaces; and the Haynes cooling water intake channel discussed above. Very little vegetation occurs within the station, and no vegetation occurs at the sites for the proposed cooling tower and water tanks (Photos 1-5, Appendix A). Small clumps of vegetation occur 250 feet north-northeast and 150 feet east of the proposed location for the water tanks, along the eastern-perimeter fence line of Haynes, where ironbark eucalyptus (*Eucalyptus sideroxylon*) and olive (*Olea europaea*) trees, with some ornamental non-native shrubs occur (Photo 4). Other vegetation occurs within Haynes at the entrance to the property and at the administration building at the southern end of Haynes, where Mexican fan palm (*Washingtonia robusta*), canary island date palm (*Phoenix canariensis*), and fig (*Ficus macrophylla*) trees occur in landscaped areas with non-native ornamental shrubs.

The surrounding BSA includes the San Gabriel River channel (Photo 6) and concrete-lined OCFCD channel (visible in Photo 4), and residential development further to the east and to the south, where ornamental trees and shrubs are incorporated into landscaping. An undeveloped area south of the Haynes property, between the intake channel and San Gabriel River channel, falls within the BSA. This strip of land consists of native and non-native grasses and other herbaceous species and areas of bare ground. A dirt access road and underground utilities are evident in this area.

4.2 Wildlife

Little terrestrial wildlife was observed onsite during the survey. A few Anna's hummingbird (*Calypte anna*) and house sparrow (*Passer domesticus*) were detected in the trees along the eastern fence line, and a snowy egret (*Egretta thula*) and American coot (*Fulica americana*) were observed at the intake channel. With the Haynes property occurring within proximity of Alamitos Bay and adjacent to the San Gabriel River channel and OCFCD channel, shorebirds common to the area, including gulls, terns, and herons, could be expected to fly over and occur within the Haynes property.

4.3 Wildlife Corridor

In the project site's urban context, 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 tracts or highways. Two types of wildlife migration corridors seen in urban settings are regional corridors, defined as those linking two or more large areas of natural open space, and local corridors, defined as those allowing resident wildlife to access critical resources (food, cover, and water) in a smaller area that might otherwise be isolated by urban development.

The Haynes property is a fully developed industrial property, and there are no vegetated corridors on-site that would allow for wildlife movement between green/open space areas that may provide more suitable opportunities for wildlife cover, resting, foraging, and nesting. Vegetation on site is very limited and provides little if any opportunities for nesting or foraging by local bird populations. Ornamental trees and shrubs within residential communities in the surrounding BSA may provide some opportunities for cover, resting, foraging, and nesting to localized bird populations; however, they do not provide functions as a significant local wildlife movement corridor.

Adjacent to the Haynes property, the San Gabriel River channel along the western perimeter (Photo 5, Appendix A) provides a movement corridor for aquatic animal species to move between ocean waters and upstream areas of the river channel, where foraging, resting, and cover opportunities exist for such species. A population of green turtles is known to occur in the San Gabriel River, from the river mouth to approximately 3.5 miles upstream. The river channel also serves as a foraging area for shore birds moving between Alamitos Bay and inland areas.

On the west side of the Haynes property, the OCFCD channel is concrete lined and generally has little discharge, providing little function as a wildlife movement corridor for aquatic and bird species. Some urbanized mammals, such as coyote, may utilize this channel to move between areas and provide escape cover.

5. SPECIAL-STATUS SPECIES

5.1 Special-Status Plant Species

Special-status plant species include those listed as Endangered, Threatened, Rare or those species proposed for listing by the US Fish and Wildlife Service (USFWS) under the federal Endangered Species Act (FESA), those listed by CDFW under the California Endangered Species Act (CESA), and the CNPS.[1,2,3] The CNPS inventory is sanctioned by the CDFW and essentially serves as the list of candidate plant species for state listing. CNPS's California Rare Plant Ranks (CRPR) 1B and 2 species are considered eligible for state listing as endangered or threatened.

Database Search Results

A total of 40 special-status plant species were identified from the Los Alamitos and surrounding seven quadrangles in the CNDDB (CDFW 2021a) and CNPS (2021), and from a search of IPac (USFWS 2021) for the project area, including seven federal and/or state-listed species:

- Ventura marsh milk-vetch (*Astragalus hornii* var. *hornii*), federal and state-listed endangered
- salt marsh bird's beak (*Chloropyron maritimum* ssp. *maritimum*), federal and state-listed endangered
- Laguna Beach dudleya (*Dudleya stolonifera*), federal and state-listed threatened
- San Diego button-celery (*Eryngium aristulatum* var. *parishii*), federal and state-listed endangered
- Gambel's water cress (*Nasturtium gambellii*), federal-listed endangered and state-listed threatened
- California Orcutt grass (*Orcuttia californica*), federal and state-listed endangered
- Lyon's pentachaeta (*Pentachaeta lyonia*), federal and state-listed endangered

The 40 special-status plant species identified during the most recent database reviews, their status, and habitat requirements are provided in Table A, Appendix B.

No special-status plant species were observed during the field survey and no records of special-status plant species were found during the database reviews to coincide with the BSA. Due to the developed nature of the BSA, natural habitats potentially suitable to support special-status plants are absent. Records of special-status plant species are primarily from native habitats 2-5 miles southeast of the BSA, in the vicinity of the Seal Beach National Wildlife Refuge and Bolsa Chica Ecological Reserve, respectively. Several CNDDB

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1 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).

2 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).

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

records of special-status plant species occur less than 1 mile south of the project site in the Los Cerritos Wetlands Complex, including a record of southern tarplant (*Centromadia parryi* ssp. *australis*; CRPR 1B.1) from 2014; a record of Coulter's goldfields (*Lasthenia gracilis* ssp. *coulteri*; CRPR 1B.1) from 2015; and a record of estuary seablite (*Suaeda esteroa*; CRPR 1B.2) from 2014. A CNDDB record of salt spring checkerbloom (*Sidalcea neomexicana*; CRPR 2B.2) from 1934 occurs approximately 0.5-mile northwest of the project site, just across the San Gabriel River channel; however, this area has since been developed, so the population has likely been extirpated.

No USFWS-designated critical habitat for any special-status plant species coincides with the BSA.

5.2 Special-Status Wildlife Species

Special-status wildlife species include those listed by the USFWS under FESA and by CDFW under CESA. USFWS officially lists species as either threatened, endangered, or as candidates for listing. 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 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 (2021b), and others are on a CDFW Watch List (WL) (CDFW 2021b). 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. Although CDFW 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 environmental review process.

CDFW further classifies some species under the following categories: "Fully Protected", "Protected birds" (CDFW Code §3511), "Protected mammals" (CDFW Code §4700), "Protected amphibians" (CDFW Code §5050 and Chapter 5, §41), "Protected reptiles" (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 only for scientific purposes by permit from CDFW (CDFW 2021b). CDFW Codes §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.

Database Search Results

A total of 57 special-status wildlife species were identified from a search of the Los Alamitos and surrounding seven quadrangles in the CNDDB (2021a) and NMFS databases (NMFS 2016), and from a search of IPaC (USFWS 2021) for the project vicinity, including 19 federal and/or state-listed wildlife species:

- tricolored blackbird (*Agelaius tricolor*), state-listed threatened

- Crotch bumble bee (*Bombus crotchii*), state candidate-endangered
- San Diego fairy shrimp (*Branchinecta sandiegonensis*), federal-listed endangered
- Swainson's hawk (*Buteo swainsoni*), state-listed threatened
- western snowy plover (*Charadrius alexandrinus nivosus*), federal-listed threatened
- green turtle (*Chelonia mydas*), federal-listed threatened
- western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), federal-listed threatened and state-listed endangered
- southwestern willow flycatcher (*Empidonax traillii extimus*), federal and state-listed endangered
- quino checkerspot butterfly (*Euphydryas editha quino*), federal-listed endangered
- California black rail (*Laterallus jamaicensis coturniculus*), state-listed threatened
- steelhead – southern California distinct population segment (DPS; *Oncorhynchus mykiss irideus pop. 10*), federal-listed endangered
- Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), state-listed endangered
- Pacific pocket mouse (*Perognathus longimembris pacificus*), federal-listed endangered
- coastal California gnatcatcher (*Polioptila californica californica*), federal-listed threatened
- light-footed Ridgway's rail (*Rallus obsoletus levipes*), federal and state-listed endangered
- bank swallow (*Riparia riparia*), state-listed threatened
- California least tern (*Sternula antillarum browni*), federal and state-listed endangered
- Riverside fairy shrimp (*Streptocephalus woottoni*), federal-listed endangered
- least Bell's vireo (*Vireo bellii pusillis*), federal and state-listed endangered

All 57 regional special-status wildlife species identified during the most recent database reviews, their status, and habitat requirements are provided in Table B, Appendix B.

No special-status wildlife species were detected during the field survey. Results of the database review indicated two CNDDB (2021a) records coincides with the BSA. A record of coast horned lizard (*Phrynosoma blainvillii*); CDFW SSC) from 1961 coincides with the northern portion of the Haynes property; this species is considered extirpated due to a lack of suable habitat for this species. A CNDDB record of burrowing owl *(Athene cunicularia*; CDFW SSC) from 1983 coincides with the far southeastern portion of the BSA, in the vicinity of the Island Village Community and the area east towards Seal Beach Boulevard. However, due to a lack of suitable habitat for this species, it is not expected to occur within the Haynes property. CNDDB records of special-status wildlife species are primarily from native habitats 3 miles north and 1.5 miles southeast of the BSA, in the vicinity of the El Dorado Nature Center and the Seal Beach National Wildlife Refuge; however, suitable habitat for special-status wildlife species is absent from the Haynes property. A CNDDB record of green turtle from 2014 occurs from approximately 1,000 feet upstream of the project site along the San Gabriel River channel and this species is known to currently occur within the river channel

Although the developed nature and lack of vegetation in the project site limits wildlife use, several special-status avian species known from coastal areas have been documented in the project vicinity although not identified during database searches for this report. During nesting bird surveys conducted in 2007 and 2009 in support of the Alamitos Bay Marina Rehabilitation Project, located approximately 1 mile southwest of the BSA, non-listed special-status bird species which were not identified during database searches were observed. The double-crested cormorant (*Phalacrocorax auritus*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), black-crowned night-heron (*Nycticorax nycticorax*), long-billed curlew (*Numenius americanus*), Caspian tern (*Hydroprogne caspia*), Foster's tern (*Sterna forsteri*), and elegant tern (*Thalasseus elegans*) were observed foraging in Alamitos Bay (LSA 2009). These species are colonial nesters known to nest along the coast and in proximity to bodies of water located further inland; however, only great blue heron was observed actually nesting in Alamitos Bay (LSA 2009). Limited eucalyptus trees, olive trees, and non-native ornamental shrub occur onsite; however, they lack the number, size and/or density to support nesting activity. Although American peregrine falcon (*Falco peregrinus anatum*; CDFW Fully Protected) has been known in the past to nest on site in inactive, abandoned generation units at Haynes that have since been demolished or are currently undergoing demolition, these species are not expected to nest within the project site but may occur across the BSA as migrating or foraging transients.

No USFWS-designated critical habitat for any special-status wildlife species coincides with the BSA.

6. SENSITIVE NATURAL COMMUNITIES

Sensitive natural communities are those that are designated as rare in the region by CDFW in the CNDDB, support special-status plant or wildlife species, or are aquatic communities such as wetlands, rivers, streams, and riparian areas that fall under regulatory jurisdiction of the U.S. Army Corps of Engineers (USACE), CDFW, and/or the Regional Water Quality Control Board (RWQCB). Regulations applicable to sensitive natural communities are discussed further in Section 8 of this memo report.

6.1 Sensitive Natural Vegetation Communities

Five sensitive vegetative communities were identified during a search of the CNDDB for the Los Alamitos and surrounding seven quadrangles, including the following:

- California Walnut Woodland
- Southern Coastal Salt Marsh
- Southern Cottonwood Willow Riparian Forest
- Southern Dune Scrub
- Southern Foredunes

These communities are known from inland mountain ranges and coastal areas, generally occurring 5-10 miles northeast and southeast of the BSA. One sensitive vegetative community, Southern Coastal Salt Marsh, is located approximately 0.5-mile east of the BSA; however, this community is separated from the BSA by the San Gabriel River channel and the Alamitos Generation Station and would not be affected by the proposed project. No USFWS-designated critical habitats that support federally- listed species or any other sensitive, protected, or managed communities or habitats were identified to coincide with the BSA during a review of IPaC.

7. APPLICABLE REGULATIONS

As referenced in some of the previous sections, several regulations and standards have been established by federal, state, and local agencies to protect and conserve biological resources. The descriptions below provide a brief overview of agency regulations that may be applicable to the resources that occur within the BSA of the project, and their respective requirements. The final determination of whether permits are required is made by the regulating agencies.

7.1 Federal Regulations and Standards

Federal Endangered Species Act (FESA)[4]

Enacted in 1973, FESA provides for the conservation of threatened and endangered species and their ecosystems. The FESA 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 FESA. "Take" under the FESA 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 with USFWS under Section 7 of the FESA would be required if the project had the potential to affect a federally-listed species that has been detected within or adjacent to the project.

No federally-listed species were detected on site during the field survey and the potential for the occurrence of such species is low due to the absence of suitable habitat; federally-listed bird species could occur as transients in flight across the BSA but are not expected to occur on site. As a result, impacts to species protected under FESA would not be expected, and formal consultation is not anticipated.

Migratory Bird Treaty Act (MBTA)[5]

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. 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 that would avoid or minimize effects on protected migratory birds, such as conducting pre-construction surveys and providing a construction monitor, if needed.

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 tidal and non-tidal 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

[4] U.S.C. Title 16, Chapter 35, Sections 1531-1544.

[5] U.S.C. Title 16, Chapter 7, Subchapter II, Sections 703-712.

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.

Waters of the U.S. in the form of the intake channel and San Gabriel River channel occur within and adjacent to the Haynes property; however, project implementation will not coincide with the intake channel or the river channel. As a result, permits in compliance with sections 404 and 401 of the CWA are not anticipated for the project.

Federal Coastal Zone Management Act – Federal Consistency Determinations

The Federal Coastal Zone Management Act (FCZMA) and the California Coastal Act (CCA) provide that any federal projects or activities, activities requiring a federal license or permit, or activities requiring any federal assistance to state or local governments be consistent to the maximum extent practicable with the California Coastal Zone Management Program (CCZMP).

7.2 State Regulations and Standards

California Environmental Quality Act

CEQA requires that biological resources be considered when assessing the environmental impacts resulting from proposed actions. CEQA does not specifically define what constitutes a "substantial adverse effect" on a biological resource. Instead, lead agencies are charged with determining what specifically should be considered an impact, consistent with applicable federal and state regulations regarding natural resources. This report has been prepared for project compliance with CEQA.

California Fish and Game Code (CFGC)

The CFGC regulates the taking or possession of birds, mammals, fish, amphibians, and reptiles, and includes the *California Endangered Species Act* (CESA) under Sections 2050-2115. Additionally, the CFGC regulates impacts to wetlands and waters of the State, and includes Lake and Streambed Alteration Agreement (LSAA) regulations under 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 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 were detected on site during the field survey, and the potential for the occurrence of such species is generally low due to the absence of suitable habitat; although, listed bird species could occur as foraging transients. With the implementation of avoidance and minimization measures, impacts to species protected under CESA would not be anticipated, and as a result, an incidental take permit under Section 2081 of the CFGC would not be required.

The cooling tower site does not coincide with wetlands or waters of the State. As a result, the potential issuance of a LSAA is not anticipated for the 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 (California Water Code [CWC] 13260[a]), (including wetlands and isolated waters) as defined by CWC Section 13050(e).

California Coastal Act (CCA)

In order to protect, maintain and where feasible, enhance and restore the overall quality of this ecosystem, the CCA requires that local government prepare a Local Coastal Program for those parts of the Coastal Zone within its jurisdiction.

The southern portion of Haynes, encompassing most of the proposed project facilities, falls within the Coastal Zone Boundary of the City of Long Beach Southeast Area Specific Plan. This zone includes all areas within Haynes outside the intake channel, which remains within the retained jurisdiction of the California Coastal Commission. However, LADWP is exempt from the building, zoning, and general plan regulations of the City of Long Beach pursuant to Government Code Section 53090, et seq. (*Lawler v. City of Redding*, 7 Cal.App.4th 778 [1992]). This exemption, including in relation to the Local Coastal Plan, was affirmed in 2002 by the City of Long Beach Planning and Building Department with the issuance of Categorical Exclusion CPCE 29-02 for a Local Coastal Development Permit for Haynes Generating Station.

7.3 Local Regulations and Standards

Other than the above mentioned Southeast Area Specific Plan, no local plans, regulations, or standards that protect biological resources were identified applicable to development at Haynes. The primary vegetation on site consists of perimeter trees and shrubs along the east property line, and there are no oak trees, heritage trees, or other unique tree specimens. Additionally, the project site is not part of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

8. 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, encroaching into wetlands or a stream, and the loss of individual species and/or their habitats.

- **Indirect**: As a result of project-related activities, biological resources may also be affected in a manner that is ancillary to direct physical impacts. Examples include elevated noise and dust levels, soil compaction, increased human activity, decreased water quality, and the introduction of invasive wildlife 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.

- **Temporary**: Any impacts considered to have reversible effects on biological resources can be viewed as temporary. Examples include the generation of fugitive dust during construction; or removing vegetation, and either allowing the natural vegetation to recolonize or actively revegetating the impact area. Surface disturbance that removes vegetation and disturbs the soil is considered a temporary but long-term impact because of slow natural recovery in arid ecosystems.

8.1 Construction

The anticipated impacts of project construction on biological resources are described below.

8.1.1 Vegetation

Development of the Haynes facility and surrounding BSA has completely removed native terrestrial habitats. Only small areas of non-native vegetation occur within Haynes, and none coincide with the proposed location for the project components. The surrounding BSA contains some landscape ornamental vegetation on residential properties, which will not be impacted by the project. As a result, direct impacts to vegetation would not occur.

Indirect impacts to vegetation inside and 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 beyond the project's footprint. However, since the project site is completely developed and already consists of modified surfaces, including structures and paved surfaces, and no natural vegetation communities occur in the BSA, indirect impacts to vegetation would not occur.

8.1.2 Special-Status Plant Species

Direct impacts to special-status plant species would occur if individual plants are damaged or destroyed from crushing or trampling during construction activities. However, no federal or State-listed plant species have been identified within the BSA, and special-status plants are not expected to occur in the BSA due to a lack of suitable habitat. As a result, direct impacts to special-status plants would not occur.

Indirect impacts to special-status plant species would be similar as described above in Section 8.1.1; however, suitable habitat for special-status plants is not present in the developed BSA. As a result, indirect impacts to special-status plants would not occur.

8.1.3 Sensitive Natural Communities

Implementation of the project would not result in direct impacts to any sensitive natural communities. As presented in Chapter 6, no sensitive natural communities or sensitive aquatic habitats under regulatory jurisdiction of USACE, CDFW, or RWQCB occur within the areas of direct project impacts. As a result, direct impacts to sensitive natural communities would not occur.

The San Gabriel River channel and the Haynes cooling water intake channel are aquatic features under regulatory jurisdiction of various federal and state agencies. Indirect impacts to these features and the protected and/or managed plant (i.e., eelgrass) or wildlife (i.e., green turtle) species within them related to runoff and erosion during construction could occur. However, with the implementation of avoidance and minimization measure BIO-1, regarding the control of runoff and erosion, indirect impacts to any sensitive natural community or aquatic habitat would not occur.

8.1.4 Wildlife

Ground disturbance activities could result in direct impacts to individual wildlife species, including crushing those with limited mobility or that occupy burrows within the construction zone, which could be crushed during project activities. Additionally, short-term indirect effects on wildlife, primarily common bird species (discussed further below), could occur due to noise disturbances, increased human activity, and vibrations caused by heavy equipment, which would cause wildlife to avoid the immediate construction area. Very little common non-avian wildlife was observed onsite. As a result, direct or indirect impacts to common non-avian wildlife are not anticipated to be significant.

Structures within Haynes and the limited on-site vegetation provide some potential nesting habitat for bird species. As a result, birds protected by the MBTA and CFGC could nest in and near the project. However, no structures suitable for nesting or vegetation would be removed under the project and as a result, direct impacts to nesting birds would not occur.

Project construction activities occurring during the nesting bird season could indirectly impact birds protected by the MBTA and CFGC as a result of construction noise, dust, increased human presence, and vibrations. These disturbances could result in increased nestling mortality due to nest abandonment or decreased feeding frequency; if they occurred, such impacts would be considered significant. However, by adhering to avoidance and minimization measure BIO-2, which stipulates pre-construction surveys, avoidance buffers around active nests, construction monitoring, and when needed, adaptive measures to avoid impacts to nesting birds during construction, indirect impacts to nesting birds protected under the MBTA and CFGC would be reduced to less than significant.

8.1.5 Special-Status Wildlife Species

Individual special-status wildlife species could be directly and indirectly affected during construction in the same manner as described above; however, no federal or State-listed wildlife species have been identified on site, and potentially suitable habitat for such species is absent from the project site and surrounding area. However, it is evident from the database review presented in Chapter 5.2, that a number of special-status avian species, particularly coast-line species, have been recorded in the vicinity. Although expected to only occur in flight across the BSA as transients, by adhering to measure BIO-2, indirect impacts to special-status birds that may occur on site would be avoided or minimized.

As discussed above, green sea turtles occur in the San Gabriel River. Project activities would occur within the developed upland portions of Haynes and as a result, no direct impacts to sea turtles are anticipated. Indirect impacts to sea turtles related to stormwater runoff and erosion control during construction could occur; however, by adhering to avoidance and minimization measure BIO-1, indirect impacts to special-status marine species would not occur.

8.1.6 Wildlife Movement Corridor

There are no terrestrial corridors within the project site. As a result, direct impacts to a regional or local wildlife movement corridor would not occur. Project construction activities (i.e., increased noise, human presence) could result in bird species avoiding the immediate project vicinity; however, such indirect effects would be temporary in nature, restricted to the project construction time period and would not interfere substantially with the movement of migratory birds.

The San Gabriel River channel adjacent to the site serves as a wildlife movement corridor and the adjacent OCFCD channel may also provide some movement opportunities. Project construction activities would occur within the developed project site and are not anticipated to directly impact wildlife movement within the San Gabriel River channel or the OCFCD channel.

8.2 Operation

Significant impacts to vegetation, special-status plant and wildlife species, sensitive terrestrial natural communities, and terrestrial wildlife movement during operations and routine maintenance of the project are not anticipated. The project site is located within the completely developed Haynes Generating Station, and these resources do not occur within the project site, and suitable habitat is absent.

9. AVOIDANCE AND MINIMIZATION MEASURES

BIO-1: Stormwater Pollution Prevention Plan and Erosion Control Plan

A Stormwater Pollution Prevention Plan (SWPPP) shall be prepared for project construction and operation in accordance with the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) requirements (State Water Resources Control Board Order 2009-0009-DWQ). A Qualified Stormwater Developer (QSD) shall develop the SWPPP, and a Qualified Stormwater Practitioner (QSP) shall implement best management practices (BMPs) as delineated in the SWPPP. The objectives of the SWPPP are to identify sources of pollution associated with construction activity and project operations that may affect the quality of stormwater runoff that could discharge from the site and to design and implement stormwater pollution prevention measures to reduce pollutants. Examples of BMPs include, but are not limited to, a spill prevention and control plan for the accidental release of petroleum or chemical substances during project construction and operation, and the use of barriers (e.g., straw wattles, catch basin inserts, sandbags) to divert and capture potentially polluted runoff during construction. The SWPPP shall include specific measures to prevent polluted runoff from entering the Haynes cooling water intake channel and the San Gabriel River channel.

An Erosion Control Plan shall be prepared to prevent or minimize the erosion, transport, and sedimentation of soil resulting from various processes and exposure of the ground surface during project construction. The Erosion Control Plan shall include specific protective measures to prevent sediment from entering the Haynes cooling water intake channel and the San Gabriel River channel. Examples of erosion control BMPs during construction include, but not be limited to:

- Minimizing the extent of surface disturbance at a given time and limiting the duration of exposure;
- Stabilizing and protecting disturbed areas, including soil stockpiles;
- Reducing runoff velocities; and
- Retaining any resultant sediment within the construction area and removing the sediment promptly.

Erosion control devices may include, but are not limited to, the following:

- Soil stabilizers such as binders, mattresses, or mulch;
- Silt fences;
- Gravel bag barriers;
- Diversion dikes and interceptor swales;
- Desilting basins; and
- Drainage inlet protection.

BIO-2. Pre-construction Surveys for Nesting Birds

If the initiation of project construction activities outside the nesting bird season (which generally occurs February 1 through September 1) is not practicable, the following measures shall be employed:

- A pre-construction nesting survey shall be conducted by a qualified biologist within 72 hours prior to the initiation of construction activities to determine whether active nests are present within or directly adjacent to the construction zone. In the event an active bird nest is detected, a qualified biologist shall monitor the nest to determine if a nest avoidance buffer zone is necessary to restrict construction activities in proximity to the nest to protect the nest from failing during construction. Any buffer zone shall be established in coordination with the qualified biologist, who shall take into account existing baseline conditions (e.g., topography, buffering buildings or other structures, etc.). In addition, observed avian response to disturbances related to existing station operations (e.g., noise and human activity) shall factor into the requirement for and size of a nest avoidance buffer.
- The qualified biologist shall monitor all such detected nests, including those with and without an established buffer, at least once per week to determine whether birds are being disturbed. If signs of disturbance or stress are observed, the qualified biologist shall implement adaptive measures to reduce disturbance. These measures could include increasing buffer distance, placing visual screens or sound dampening structures between the nest and construction activity, or temporarily halting construction activities until fledging is confirmed. The qualified biologist shall monitor each active nest until he/she determines that nestlings have fledged and dispersed or the nest is no longer active. Until such a determination is made, activities that might, in the opinion of the qualified biologist, disturb nesting activities shall be prohibited within the nest buffer zone.
- Should an active nest of any federal or State-listed bird species be detected during pre-construction monitoring or subsequent construction monitoring, construction activity in the immediate area shall not commence of shall cease if already underway, and the applicable federal and/or state agency (USFWS, CFDW) shall be notified. Work in other areas of the project site may continue until the active nests have been evaluated.

10. CONCLUSIONS

Based on the analysis presented above regarding anticipated effects of the project, significant impacts to special-status avian wildlife species protected under FESA and/or CESA and nesting birds protected under the MBTA and by CFGC could occur. Impacts could also occur to protected aquatic habitats. However, with implementation of the avoidance and minimization measures presented in Section 9 above, impacts would be less than significant. No other significant impacts to biological resources are anticipated.

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APPENDIX A
Site Photographs

Photo 1. South-facing view of demolition of Units 3 and 4.

Photo 2. Southeast-facing view of proposed location for the new cooling tower on other side of wall. Haynes Intake Channel in foreground with demolished Unit 4 and Unit 5 stacks in background.

Photo 3. South-facing view of bare ground area for the proposed makeup water, wastewater, and stormwater tanks.

Photo 4. North-facing view of limited vegetation that occurs along the Haynes property east perimeter fence line. The concrete OCFCD channel is visible at right.

Photo 5. North-facing view of northern portion of the Haynes.

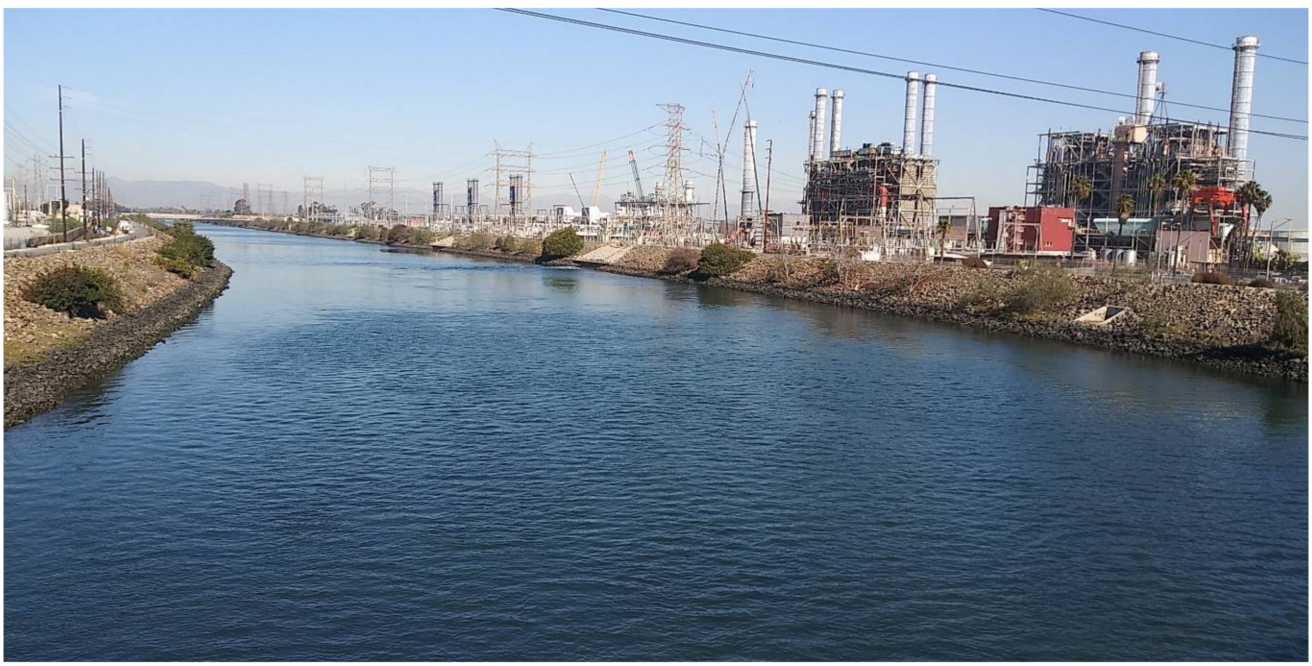

Photo 5. North-facing view from East 2nd Street Bridge
of the San Gabriel River with the Haynes property at right.

APPENDIX B

Regional Special-Status Plant Species, Sensitive Natural Communities, and Special-Status Wildlife Species Identified from Database Searches (CNDDB, CNPS, IPaC)

Table A – Regional Special-Status Plants and Natural Vegetation Communities
Table B – Regional Special-Status Wildlife

Table A. Regional Special-Status Plant and Natural Vegetation Communities

TABLE A. REGIONAL SPECIAL-STATUS PLANT SPECIES[1]		
Common Name ***Scientific Name***	**Status**	**General Habitat Description[3]**
Plants		
red sand-verbena *Abronia maritima*	Federal: None State: None CRPR: 4.2	Found in coastal dune habitats. Occurs between 0 and 100 meters (0 to 330 feet). Blooms February to November.
chaparral sand-verbena *Abronia villosa* var. *aurita*	Federal: None State: None CRPR: 1B.1	Found in sandy habitats, including chaparral, coastal scrub, and desert dunes. Occurs between 75 and 1,500 meters (250 to 5,250 feet). Blooms (January) March to September.
aphanisma *Aphanisma blitoides*	Federal: None State: None CRPR: 1B.2	Prefers sandy or gravelly soils in coastal bluff scrub, coastal dunes, and coastal scrub habitats. Occurs between 0 and 305 meters (0 to 1,000 feet). Blooms February to June.
Horn's milk-vetch *Astragalus hornii* var. *hornii*	Federal: None State: None CRPR: 1B.1	Prefers lake margins and alkaline areas in meadow and seep and playa habitats. Occurs between 60 and 850 meters (195 to 2,780 feet). Blooms May to October.
Ventura marsh milk-vetch *Astragalus pycnostachyus* var. *lanosissimus*	Federal: FE State: SE CRPR: 1B.1	Found in coastal dune, coastal scrub, and coastal salt or brackish marsh and swamp habitats. Occurs between 0 and 35 meters (0 to 115 feet). Blooms (June) August to October.
Coulter's saltbush *Atriplex coulteri*	Federal: None State: None CRPR: 1B.2	Often in alkaline or clay habitats of coastal bluff scrub, coastal dunes, coastal scrub and valley and foothill grasslands. Occurs between 0 and 460 meters (0 to 1,510 feet). Blooms March to October.
south coast saltscale *Atriplex pacifica*	Federal: None State: None CRPR: 1B.2	Found in alkali sink, coastal sage scrub, wetland-riparian playas, and coastal habitats. Occurs between 0 and 140 meters (0 to 460 feet). Blooms March to October.
Parish's brittlescale *Atriplex parishii*	Federal: None State: None CRPR: 1B.1	Found in alkaline chenopod scrub, playas, and vernal pool habitats. Occurs between 25 and 1,900 meters (80 to 6,230 feet). Blooms June to October.
Davidson's saltscale *Atriplex serenana* var. *davidsonii*	Federal: None State: None CRPR: 1B.2	Found in coastal bluff scrub and coastal scrub habitats. Prefers alkaline soils. Occurs between 10 and 200 meters (30 to 660 feet). Blooms April to October.
Catalina mariposa lily *Calochortus catalinae*	Federal: None State: None CRPR: 4.2	Found in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats. Occurs between 15 and 700 meters (50 to 2,300 feet). Blooms February to June.
Plummer's mariposa lily *Calochortus plummerae*	Federal: None State: None CRPR: 4.2	Prefers granitic or rocky areas in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland habitats. Occurs between 100 and 1,700 meters (330 to 5,580 feet). Blooms May to July.
intermediate mariposa lily *Calochortus weedii* var. *intermedius*	Federal: None State: None CRPR: 1B.2	Found in chaparral, chenopod scrub, cismontane woodland, coastal scrub, lower montane coniferous forest and valley and foothill grassland. Occurs between 30 and 1,500 meters (100 and 4,920 feet). Blooms April to June.

TABLE A. REGIONAL SPECIAL-STATUS PLANT SPECIES[1]		
Common Name ***Scientific Name***	**Status**	**General Habitat Description[3]**
lucky morning glory *Calystegia felix*	Federal: None State: None CRPR: 1B.1	Usually found in wetland and marsh habitats, occasionally in drier habitats, including meadows and seeps and riparian scrub. May inhabit areas with silty loam and alkaline soils. Occurs between 30 and 215 meters (95 to 700 feet). Blooms March to September.
Lewis' evening-primrose *Camissoniopsis lewisii*	Federal: None State: None CRPR: 3	Prefers sandy or clay soils in coastal bluff scrub, Cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland habitats. Occurs between 0 and 300 meters (0 to 985 feet). Blooms March to June.
southern tarplant *Centromadia parryi* ssp. *australis*	Federal: None State: None CRPR: 1B.1	Found in margins of marshes and swamps, valley and foothill grassland, and vernal pool habitats. Occurs between 0 and 480 meters (0 to 1,570 feet). Blooms May to November.
salt marsh bird's beak *Chloropyron maritimum* ssp. *maritimum*	Federal: FE State: SE CRPR: 1B.2	Found in coastal dunes and coastal salt marshes and swamps. Occurs between 0 and 30 meters (0 to 100 feet). Blooms May to October.
small-flowered morning-glory *Convolvulus simulans*	Federal: None State: None CRPR: 4.2	Prefers clay soils and serpentine seeps in chaparral, coastal scrub, and valley and foothill grassland habitats. Occurs between 30 and 700 meters (100 to 2,300 feet). Blooms March to July.
many-stemmed dudleya *Dudleya multicaulis*	Federal: None State: None CRPR: 1B.2	Found in chaparral, coastal scrub, and valley and foothill grassland habitats. Often found in clay soils. Occurs between 15 and 790 meters (50 to 2,520 feet). Blooms April to July.
Laguna Beach dudleya *Dudleya stolonifera*	Federal: FT State: ST CRPR: 1B.1	Prefers rocky soils in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats. Occurs between 10 and 260 meters (30 to 855 feet). Blooms May to July.
San Diego button-celery *Eryngium aristulatum* var. *parishii*	Federal: FE State: SE CRPR: 1B.1	Prefers mesic areas in coastal scrub, valley and foothill grassland, and vernal pool habitats. Occurs between 20 and 620 meters (65 to 2,035 feet). Blooms April to June.
Los Angeles sunflower *Helianthus nuttallii* ssp. *parishii*	Federal: None State: None CRPR: 1A	Found in coastal salt and freshwater marshes and swamps. Occurs between 9 and 1,525 meters (30 to 5,005 feet). Blooms August to October.
vernal barley *Hordeum intercedens*	Federal: None State: None CRPR: 3.2	Found in coastal dunes, coastal scrub, vernal pools, and in saline flats and depressions in valley and foothill grassland habitats. Occurs between 5 and 1,000 meters (15 to 3,280 feet). Blooms March to June.
decumbent goldenbush *Isocoma menziesii* var. *decumbens*	Federal: None State: None CRPR: 1B.2	Found in chaparral and coastal scrub habitats. Often found in sandy soils or disturbed areas. Occurs between 10 and 135 meters (30 to 445 feet). Blooms April to November.
Southern California black walnut *Juglans californica*	Federal: None State: None CRPR: 4.2	Found in alluvial sites in chaparral, cismontane woodland, coastal scrub, and riparian woodland habitats. Occurs between 50 and 900 meters (160 to 2,955 feet). Blooms March to August.
southwestern spiny rush *Juncus acutus* ssp. *leopoldii*	Federal: None State: None CRPR: 4.2	Found in mesic coastal dunes, alkaline meadows and seeps, and coastal salt marshes and swamps. Occurs between 0 and 900 meters (0 to 2,955 feet). Blooms (March) May to June.

TABLE A. REGIONAL SPECIAL-STATUS PLANT SPECIES[1]		
Common Name ***Scientific Name***	**Status**	**General Habitat Description[3]**
Coulter's goldfields *Lasthenia glabrata ssp. coulteri*	Federal: None State: None CRPR: 1B.1	Found in coastal salt marshes, playas, and vernal pools. Occurs between 0 and 1,220 meters (0 to 4,000 feet). Blooms February to June.
mud nama *Nama stenocarpa*	Federal: None State: None CRPR: 2B.2	Found in marshes and swamps, lake margins, and riverbanks. Occurs between 5 and 500 meters (15 to 1,640 feet). Blooms January to July.
Gambel's water cress *Nasturtium gambellii*	Federal: FE State: ST CRPR: 1B.1	Found in freshwater or brackish marshes and swamps. Occurs between 5 and 330 meters (15 to 1,085 feet). Blooms April to October.
prostrate vernal pool navarretia *Navarretia prostrata*	Federal: None State: None CRPR: 1B.1	Prefers mesic coastal scrub, meadows and seeps, alkaline valley and foothill grassland, and vernal pool habitats. Occurs between 15 and 1,210 meters (50 to 3,970 feet). Blooms April to July.
coast woolly-heads *Nemacaulis denudata* var. *denudata*	Federal: None State: None CRPR: 1B.2	Found in coastal dunes. Occurs between 0 and 100 meters (0 to 330 feet). Blooms April to September.
California Orcutt grass *Orcuttia californica*	Federal: FE State: SE CRPR: 1B.1	Found in vernal pools. Occurs between 15 and 660 meters (50 to 2,165 feet). Blooms April to August.
Lyon's pentachaeta *Pentachaeta lyonii*	Federal: FE State: SE CRPR: 1B.1	Prefers rocky, clay sites in chaparral, coastal scrub, and valley and foothill grassland habitats. Occurs between 30 and 690 meters (100 to 2,265 feet). Blooms February to August.
south coast branching phacelia *Phacelia ramosissima* var. *austrolitoralis*	Federal: None State: None CRPR: 3.2	Prefers sandy or rocky areas in chaparral, coastal dune, coastal scrub, and coastal salt marsh and swamp habitats. Occurs between 5 and 300 meters (15 to 985 feet). Blooms March to August.
Brand's star phacelia *Phacelia stellaris*	Federal: None State: None CRPR: 1B.1	Occurs in coastal dune and coastal scrub habitats. Occurs between 0 and 400 meters (0 to 1,320 feet). Blooms March to June.
Engelmann oak *Quercus engelmannii*	Federal: None State: None CRPR: 4.2	Found in chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland habitats. Occurs between 50 and 1,300 meters (164 to 4,265 feet). Blooms March to June.
Parish's gooseberry *Ribes divaricatum* var. *parishii*	Federal: None State: None CRPR: 1A	Inhabits riparian woodland habitats. Occurs between 65 and 300 meters (210 to 985 feet). Blooms February to April.
Sanford's arrowhead *Sagittaria sanfordii*	Federal: None State: None CRPR: 1B.2	Found in assorted shallow freshwater marshes and swamps. Occurs between 0 and 650 meters (0 to 2,135 feet). Blooms May to October (November).
salt spring checkerbloom *Sidalcea neomexicana*	Federal: None State: None CRPR: 2B.2	Prefers alkaline or mesic areas in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playa habitats. Occurs between 15 and 1,530 meters (45 to 5,020 feet). Blooms March to June.
estuary seablite *Suaeda esteroa*	Federal: None State: None CRPR: 1B.2	Found in coastal salt marshes and swamps. Occurs between 0 and 5 meters (0 to 20 feet). Blooms May to January.

TABLE A. REGIONAL SPECIAL-STATUS PLANT SPECIES[1]		
Common Name ***Scientific Name***	**Status**	**General Habitat Description[3]**
San Bernadino aster *Symphyotrichum defoliatum*	Federal: None State: None CRPR: 1B.2	Prefers sites near ditches, streams, and springs in coastal scrub, meadows and seeps, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland habitats. Occurs between 0 and 2,040 meters (5 to 6,690 feet). Blooms July to November.
Sensitive Natural Communities		
California Walnut Woodland		
Southern Coastal Salt Marsh		
Southern Cottonwood Willow Riparian Forest		
Southern Dune Scrub		
Southern Foredunes		

[1] Special-status species known from the CNDDB and CNPS to occur on the Los Alamitos, South Gate, Whittier, La Habra, Long Beach, Anaheim, Seal Beach, and Newport Beach quadrangles, and from the IPac for the Project area.

[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
- State
  - **ST** - State Threatened under the California Endangered Species Act
  - **SE** - State Endangered under the California Endangered Species Act
- CRPR
  - California Native Plant Society's 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
- Other
  - **NCCP:** Identified Species under the NCCP/HCP.

[4] General Habitat Descriptions from CNPS (2021).

Table B. Regional Special-Status Wildlife Species

TABLE B. REGIONAL SPECIAL-STATUS WILDLIFE SPECIES [1]		
Common Name ***Scientific Name*** [2]	**Status** [3]	**General Habitat Description** [4]
Invertebrates		
Crotch bumble bee *Bombus crotchii*	Federal: None State: CE Other: CNDDB	Occurs at relatively warm and dry sites, including the inner Coast Range of California and the margins of the Mojave Desert.
San Diego fairy shrimp *Branchinecta sandiegonensis*	Federal: FE State: None Other: CNDDB	Occurs in vernal pools between 5 and 30 centimeters in depth, between 10 and 20°C (50 to 68°F) in temperature. Found from coastal southern California to northwestern Baja California, Mexico.
sandy beach tiger beetle *Cicindela hirticollis gravida*	Federal: None State: None Other: CNDDB	Inhabits areas adjacent to non-brackish water along the coast of California from San Francisco bay to northern Mexico. Inhabits clean, dry, light-colored sand in the upper zone. Subterranean larvae prefer moist sand not affected by wave action.
western beach tiger beetle *Cicindela latesignata latesignata*	Federal: None State: None Other: CNDDB	Prefers sandy areas in coastal habitats. Found in Los Angeles, Orange, and San Diego counties.
senile tiger beetle *Cicindela senilis frosti*	Federal: None State: None Other: CNDDB	Inhabits coastal mud flats, salt flats, salt marshes, and inland alkali mud flats.
globose dune beetle *Coelus globosus*	Federal: None State: None Other: CNDDB	Found in coastal dune habitats.
Monarch – California overwintering population *Danaus plexippus* pop. 1	Federal: None State: None Other: CNDDB	Winter roosts occur along California coast from Mendocino County south to Baja California, Mexico. Roosts in wind-protected tree groves (eucalyptus, Monterey pine, Monterey cypress) with nectar and water sources nearby.
quino checkerspot butterfly *Euphydryas editha quino*	Federal: FE State: None Other: CNDDB	Lives in grasslands, coastal sage scrub, chamise chaparral, red shank chaparral, juniper woodland, and semi-desert scrub where native plantain is found. The butterfly's primary larval host plant is the native plantain.
San Gabriel chestnut *Glyptostoma gabrielense*	Federal: None State: None Other: CNDDB	Found in humid areas in rocky hills and mountains at low elevations.
western ridged mussel *Gonidea angulata*	Federal: None State: None Other: CNDDB	Found in streams, rivers, and lakes with substrates ranging from gravel to firm mud. Requires at least some silt, sand, or clay.
western tidal-flat tiger beetle *Habroscelimorpha gabbii*	Federal: None State: None Other: CNDDB	Found in salty coastal habitats including salt marshes, tidal flats and beaches. Range from Ventura, California to Baja California. Burrows into sand or soil.
wandering (=saltmarsh) skipper *Panoquina errans*	Federal: None State: None Other: CNDDB	Inhabits salt marshes and other wetland habitats; occasionally found in sand dunes. Requires saltgrass (*Distichlis spicata*) as larval food source.

TABLE B. REGIONAL SPECIAL-STATUS WILDLIFE SPECIES [1]		
Common Name ***Scientific Name*[2]**	**Status[3]**	**General Habitat Description[4]**
Riverside fairy shrimp *Streptocephalus woottoni*	Federal: FE State: None Other: CNDDB	Found in vernal pools of at least 30 centimeters in depth, from January through March. Found in Riverside and San Diego counties, as well as northern Baja California.
Dorothy's El Segundo Dune weevil *Trigonoscuta dorothea dorothea*	Federal: None State: None Other: CNDDB	Found in coastal sand dunes.
mimic tryonia (=California brackishwater snail) *Tryonia imitator*	Federal: None State: None Other: CNDDB	Prefers coarse brackish sediments at the mouths of creeks, streams and rivers of southern California.
Amphibians		
western spadefoot *Spea hammondii*	Federal: None State: None Other: SSC	Inhabits grassland, oak woodland, coastal sage scrub, and chaparral vegetation in washes, floodplains, alluvial fans, playas, and alkali flats.
Reptiles		
southern California legless lizard *Anniella stebbinsi*	Federal: None State: None Other: SSC	Occurs in moist warm loose soils in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Often under leaf litter or other surface objects.
orange-throated whiptail *Aspidoscelis hyperythra*	Federal: None State: None Other: WL	Inhabits washes, streams, terraces, and other sandy areas often where there are rocks and patches of brush and rocky hillsides. Frequent coastal chaparral, thornscrub and streamside growth.
coastal whiptail *Aspidoscelis tigris stejnegeri*	Federal: None State: None Other: SSC	Occurs in coastal sage scrub, chaparral, riparian areas, woodlands, and rocky areas.
green turtle *Chelonia mydas*	Federal: FT State: None Other: CNDDB	Mostly aquatic, living in the ocean and rarely coming onto land, although more prone to bask onshore than other sea turtles. Often found far out at sea, especially during migration to and from breeding sites.
western pond turtle *Emys marmorata*	Federal: None State: None Other: SSC	Occurs in aquatic water bodies including flowing rivers and streams, permanent lakes, ponds, reservoirs, settling ponds, marshes and other wetlands. Semi- permanent water bodies such as stock ponds, vernal pools and seasonal wetlands can also be utilized on a temporary basis.
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.
Fish		
steelhead – southern California DPS *Oncorhynchus mykiss irideus pop. 10*	Federal: FE State: None Other: CNDDB	Found in Pacific Ocean tributaries from Aleutian Islands in Alaska south to Southern California. Anadromous forms are known as steelhead, freshwater forms as rainbow trout.
Birds		
tricolored blackbird *Agelaius tricolor*	Federal: None State: ST Other: SSC	Inhabits annual grasslands, wet and dry vernal pools, seasonal wetlands. Frequently found in and around agricultural areas.

TABLE B. REGIONAL SPECIAL-STATUS WILDLIFE SPECIES [1]		
Common Name ***Scientific Name[2]***	**Status[3]**	**General Habitat Description[4]**
southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	Federal: None State: None Other: WL	Inhabits broken sage scrub and scrub-grassland habitats.
grasshopper sparrow *Ammodramus savannarum*	Federal: None State: None Other: SSC	Prefers moderately open grasslands with scattered shrubs such as California buckwheat and California sagebrush.
burrowing owl *Athene cunicularia*	Federal: None State: None Other: SSC	Occurs in expansive, nearly flat open areas, such as prairies, grasslands, agricultural fields, vacant lots. Small mammal burrows are required for roosting/nesting.
ferruginous hawk *Buteo regalis*	Federal: None State: None Other: WL	Inhabits arid grasslands and adjacent farmlands. Nests in isolated trees or on rock outcrops.
Swainson's hawk *Buteo swainsoni*	Federal: None State: ST Other: CNDDB	Nests in stands with few trees in juniper-sage flats and riparian areas. Utilizes adjacent grasslands, grain or alfalfa fields, or livestock pastures for foraging.
coastal cactus wren *Campylorhynchus brunneicapillus sandiegensis*	Federal: None State: None Other: SSC	Inhabits cactus scrub complexes that can include *Rhus* sp. Presence of cholla cactus is preferred, as well as large dense stands of cactus.
western snowy plover *Charadrius alexandrinus nivosus*	Federal: FT State: None Other: SSC	Inhabits coastal beaches, coastal dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Less common habitat includes dredged material disposal sites, salt pond levees, dry salt ponds, and river bars.
western yellow-billed cuckoo *Coccyzus americanus occidentalis*	Federal: FT State: SE Other: CNDDB	Breeds in low to moderate elevation native forests lining the rivers and streams of western United States. Prefers cottonwood-willow forests. Migrate to wintering grounds in South America.
yellow rail *Coturnicops noveboracensis*	Federal: None State: None Other: SSC	Inhabits sedge marshes and meadows with moist soil or shallow standing water.
white-tailed kite *Elanus leucurus*	Federal: None State: None Other: FP	Inhabits open grassy areas with scattered shrubs. Roosts in tall trees adjacent to open areas.
southwestern willow flycatcher *Empidonax traillii extimus*	Federal: FE State: SE Other: CNDDB	Inhabits riparian woodlands in southern California. Nests in extensive thickets of low, dense willows on edge of wet meadows, ponds, or backwaters, between 600 and 1,220 meters (2,000 to 8,000 feet). Dense willow thickets are required for nesting and roosting. Low, exposed branches are used for singing posts/hunting perches.
yellow-breasted chat *Icteria virens*	Federal: None State: None Other: SSC	Occurs in dense tangled brushy patches, hedgerows, and wood edges in open sunny areas and along riparian woodland ecotones.
California black rail *Laterallus jamaicensis coturniculus*	Federal: None State: ST Other: FP	Inhabits saline, brackish, and fresh emergent wetlands.

TABLE B. REGIONAL SPECIAL-STATUS WILDLIFE SPECIES [1]		
Common Name ***Scientific Name*[2]**	**Status[3]**	**General Habitat Description[4]**
osprey *Pandion haliaetus*	Federal: None State: None Other: WL	Generally breeds in northern California, though occasionally breeds along the southern Colorado River. Uncommon winter visitor along the coast of southern California. Requires rivers, lakes, reservoirs, bays, estuaries, or surf zones for foraging. Utilizes large trees, snags, and dead-topped trees in open forest habitats for cover and nesting.
Belding's savannah sparrow *Passerculus sandwichensis beldingi*	Federal: None State: SE Other: CNDDB	Inhabits southern coastal wetlands.
California brown pelican *Pelecanus occidentalis californicus*	Federal: Delisted State: Delisted Other: FP	Inhabits salt bays, beaches and oceans. Mostly over shallower waters, especially sheltered bays. May occasionally be found on inland freshwater lakes.
coastal California gnatcatcher *Polioptila californica californica*	Federal: FT State: None Other: SSC	Obligate, permanent resident of coastal sage scrub below 2.500 feet (760 meters) in southern California. Inhabits low, coastal sage scrub in arid washes, on mesas and slopes.
light-footed Ridgway's rail *Rallus obsoletus levipes*	Federal: FE State: SE Other: FP	Resident of coastal wetlands in southern California.
bank swallow *Riparia riparia*	Federal: None State: ST Other: CNDDB	Nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, and ocean to dig nesting hole.
black skimmer *Rynchops niger*	Federal: None State: None Other: SSC	Often found near coastal estuaries and river mouths in southern California. Occasionally observed inland, including along the Colorado River and in Riverside county. Summer resident at the Salton Sea; one population resides year-round at the south end of San Diego Bay.
yellow warbler *Setophaga petechia*	Federal: None State: None Other: SSC	Occupy riparian vegetation in close proximity to water along streams and in wet meadows. Associated with willow and cottonwoods.
California least tern *Sternula antillarum browni*	Federal: FE State: SE Other: FP	Nests colonially on beaches that are undisturbed, sparsely vegetated, and in coastal flat areas with loose, sandy substrate.
least Bell's vireo *Vireo bellii pusillus*	Federal: FE State: SE Other: CNDDB	Summer resident of southern California in low riparian habitat in vicinity of water or in dry river bottoms, below 610 meters (2,000 feet).
Mammals		
western mastiff bat *Eumops perotis californicus*	Federal: None State: None Other: SSC	Roosts in rock crevices, on cliff faces and also uses crevices in buildings and structures. Limited to roosts that allow at least 10 feet of free fall.

TABLE B. REGIONAL SPECIAL-STATUS WILDLIFE SPECIES [1]		
Common Name ***Scientific Name*** [2]	**Status** [3]	**General Habitat Description** [4]
silver-haired bat *Lasionycteris noctivagans*	Federal: None State: None Other: CNDDB	Occurs in coastal and montane coniferous forests, valley foothill woodlands, pinyon-juniper woodlands, and valley foothill and montane riparian habitats. Roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark.
hoary bat *Lasiurus cinereus*	Federal: None State: None Other: SSC	Occurs from sea level to 4,125 meters (13,200 feet). Males generally inhabit foothills, deserts, and mountains, while females inhabit lowlands and coastal valleys. Roosts in dense foliage of medium-large trees, preferring sites hidden from above with few branches below.
western yellow bat *Lasiurus xanthinus*	Federal: None State: None Other: SSC	Occurs below 610 meters (2,000 feet) in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts in trees and palms.
south coast marsh vole *Microtus californicus stephensi*	Federal: None State: None Other: SSC	Occurs in wetland habitats and associated grasslands along the coast.
pocketed free-tailed bat *Nyctinomops femorosaccus*	Federal: None State: None Other: SSC	Occurs in desert scrub and arid lowlands, not far from riparian areas. Roosts in small groups in rock crevices, caves and buildings.
big free-tailed bat *Nyctinomops macrotis*	Federal: None State: None Other: SSC	Occurs in low-lying arid hilly areas in Southern California to about 1,830 meters (6,000 feet). Roosts in crevices and cliffs, buildings, and cavities in trees.
Pacific pocket mouse *Perognathus longimembris pacificus*	Federal: FE State: None Other: SSC	Inhabits areas with fine-grained sandy substrates in coastal dunes, river alluvium, and coastal sage scrub habitats within 3 miles of the ocean.
southern California saltmarsh shrew *Sorex ornatus salicornicus*	Federal: None State: None Other: SSC	Occurs in coastal salt marshes, preferring those dominated by pickleweed and saltgrass.
American badger *Taxidea taxus*	Federal: None State: None Other: SSC	Occurs in dry, open stages of shrub, forest, and herbaceous habitats. Prefers areas with fine-textured or sandy soils for digging burrows.

[1] Special-status species known from the CNDDB and NMFS to occur on the Los Alamitos, South Gate, Whittier, La Habra, Long Beach, Anaheim, Seal Beach, and Newport Beach quadrangles, and from the IPac for the Project area.

[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
	FC – A Federal Candidate for listing under FESA
State	**SE** - State Endangered under California Endangered Species Act (CESA)
Other	**BEGE** – Federal Bald Eagle and Golden Eagle Protection Act
	FP – Designated Fully Protected by CDFW

SSC – Designated 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.

NCCP - Identified Species under the NCCP/HCP.

[4] General Habitat Descriptions from CDFW (2021).

APPENDIX C

CULTURAL RESOURCES ASSESSMENT TECHNICAL MEMORANDUM

AECOM
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Los Angeles, CA 90071
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Memorandum

To	Los Angeles Department of Water and Power
Subject	Haynes Generating Station Unit 8 Recycled Water Cooling System Retrofit Project Cultural Resources Assessment
From	Marc A. Beherec, Ph.D., RPA
Date	October 26, 2021

Attachment– DPR 523 Forms

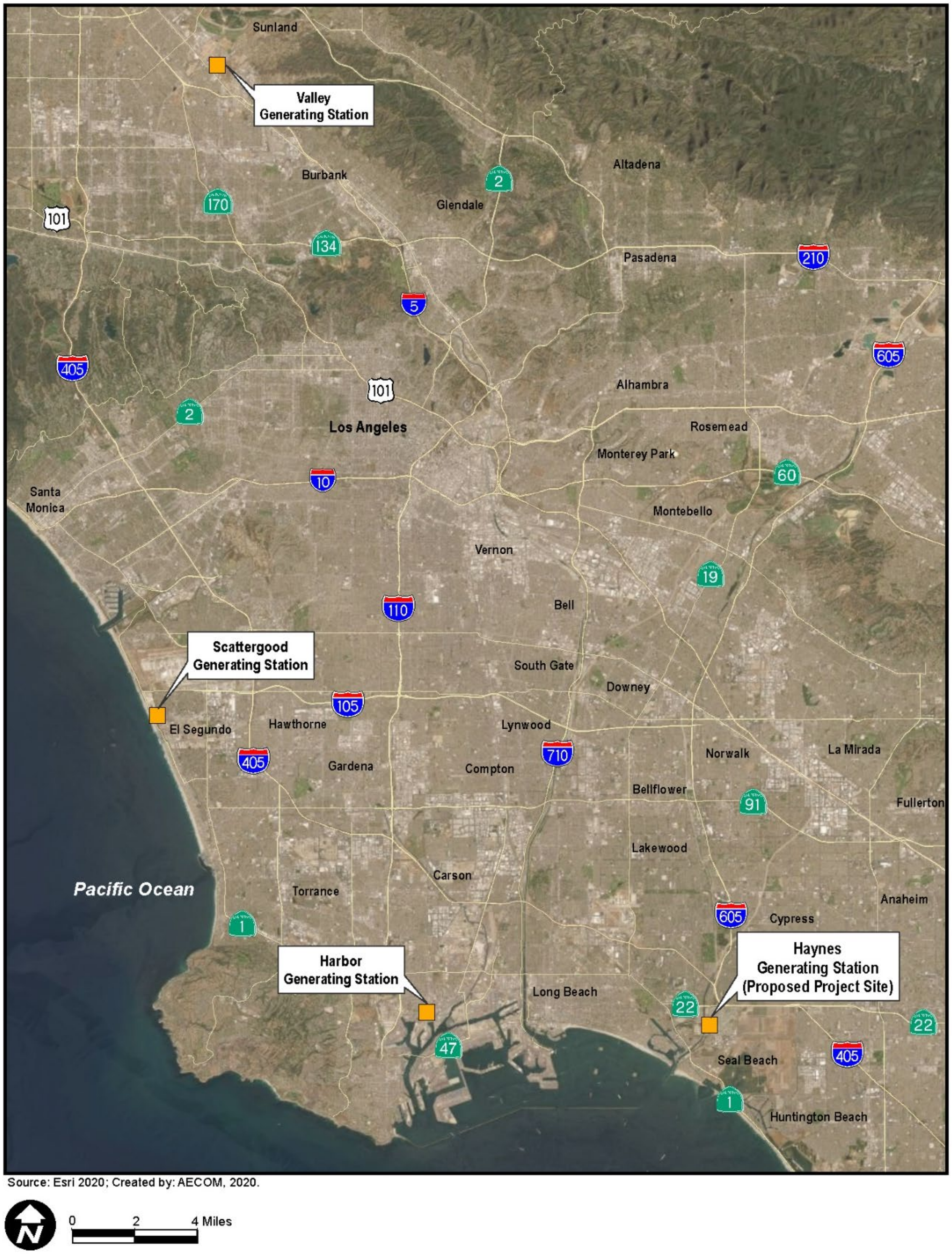
Introduction

This technical memorandum describes the potential impact to cultural and tribal cultural resources associated with the Haynes Generating Station Unit 8 Recycled Water Cooling System Retrofit Project (also referred to herein as the project or proposed project) located in the City of Long Beach in Los Angeles County, California (Figures 1 and 2). The project would modify the Haynes Generating Station (Haynes) Generation Unit 8 cooling system installing a wet cooling system consisting of a cooling tower.

The Haynes Generating Station was found ineligible for listing in the California Register of Historical Resources (CRHR) in 2017 (Murray et al. 2017). No cultural resources were identified within the project footprint. However, due to the elevated sensitivity of the project area for unknown buried cultural resources, it is recommended that archaeological and Native American monitors be present during ground-disturbing activities. As discussed in this memorandum, the proposed project would have no significant impacts related to cultural resources.

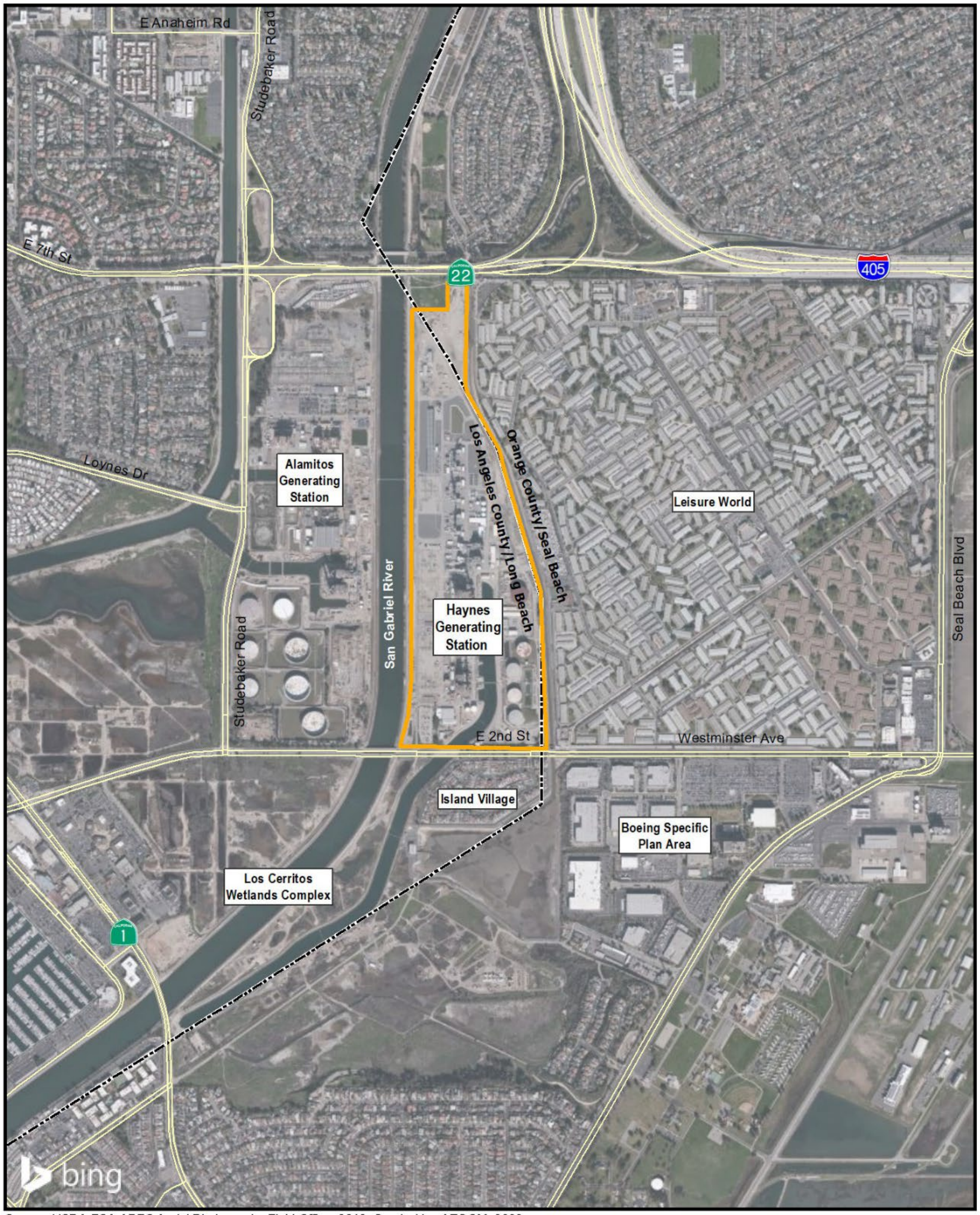
Proposed Project

The Los Angeles Department of Water and Power (LADWP) proposes to implement the proposed project, which would modify the Haynes Generation Unit 8 cooling system by installing a wet cooling system consisting of a cooling tower. The construction of the proposed project is scheduled to begin in late 2024, and primary facilities construction would be substantially complete by mid-2026. The cooling tower would become operational by mid-2027, after a commissioning phase.



Source: Esri 2020; Created by: AECOM, 2020.

Figure 1 Regional Location Map



Source: USDA-FSA-APFO Aerial Photography Field Office, 2016; Created by: AECOM, 2020.

0 1,000 2,000 Feet

Haynes Generating Station Boundary

Figure 2 Vicinity Map

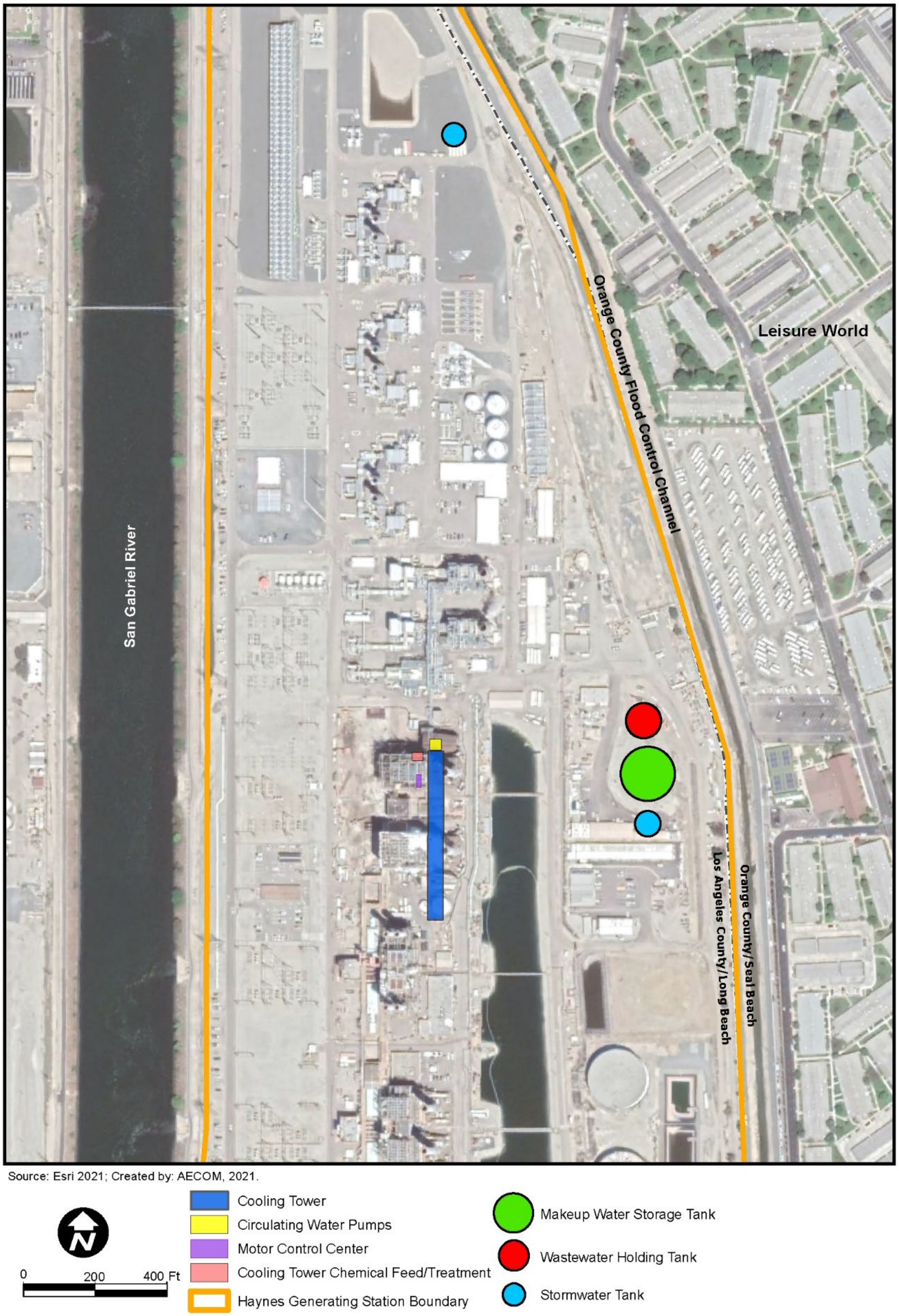


Figure 3 Preliminary Project Facilities Site Plan

Preliminarily, the proposed cooling tower would consist of nine cells, which would be arranged in a single row of nine cells oriented in a north-south direction. The entire tower would be approximately 50 feet wide, 500 feet long, and 60 feet tall. The tower would be sited in the central part of Haynes (see Figure 3) on a portion of the site previously occupied by Generation Units 5 and 6, which are currently undergoing demolition.

Other major facilities necessary to support the operation of the cooling tower are several types of aboveground water storage tanks. These include an approximately 7-million-gallon (MG) makeup water storage tank, which would supply the cooling tower to compensate for water lost primarily from evaporation during the cooling process. The makeup water tank would be aboveground and approximately 150 feet in diameter and 50 feet tall. It would be located on the eastern side of the Haynes property, roughly parallel with the cooling tower, at the site of a recently demolished fuel oil tank of similar size. Pipelines ranging from 12 to 18 inches in diameter, which may be partially underground and partially aboveground, would be installed linking the tank to the cooling tower.

An approximately 3-MG tank to temporarily hold industrial wastewater would also be located in the area of the previously demolished fuel oil tank in the eastern part of Haynes. It would also be aboveground and would be approximately 100 feet in diameter and 50 feet tall. Two aboveground stormwater holding tanks, each approximately 1.5-MG in volume and approximately 70 feet in diameter and 50 feet tall, would also be constructed as part of the proposed project. One would be located adjacent to the above mentioned makeup water holding tank, and one would be located adjacent to an existing stormwater detention basin in the northern part of the Haynes.

Various infrastructure improvements, including new and modified pipelines, both above and belowground, would also be installed as part of the project to interconnect the tower makeup water supply systems, industrial wastewater handling systems, and stormwater handling systems.

The proposed project facilities would all be located in areas of Haynes which have been highly disturbed from past facilities construction and operations, dating to as early as the early 1960s, when construction first began on the original generating station. This includes the site of the proposed cooling tower and adjacent support facilities, which are located on the site of steam-boiler Generation Units 5 and 6, which became operational in in 1966 and 1967, respectively, and which required extensive site preparation, including substantial grading and excavation for subterranean foundation systems. These generation units as well as surrounding support facilities have recently been removed as part of ongoing demolition activities at Haynes, which have required additional ground disturbance and grading activities. The makeup water, wastewater, and stormwater storage tanks would be located on the sites of large, since-demolished fuel oil tanks associated with the early operations at Haynes. The construction of these tanks and the surrounding spill containment basins likewise required extensive grading and excavation work. Some of these areas have since been redeveloped with modern generation units that replaced the original steam-boiler units and whose construction required additional site grading and excavation work. Proposed infrastructure improvements, including new and modified recycled water, wastewater, stormwater, and potable water pipelines, would also be located primarily in areas of Haynes that have been highly disturbed in relation to the construction of the original generation units and support facilities in the southern portion of Haynes or replacement generation units that, along with support facilities, encompass the central and northern portions of Haynes.

Cultural Setting

As a framework for discussing the types of cultural resources that might be encountered in the vicinity of the proposed project, the following section summarizes our current understanding of major prehistoric and historic developments in and around Los Angeles.

Prehistoric Overview

The earliest occupation of Southern California may be associated with the peoples who first colonized North America in the terminal Pleistocene and earliest Holocene (Arnold et al. 2004). These cultures are characterized by fluted points. Among Southern California's fluted points is a fluted obsidian point found in a stratified deposit beside an ancient lake bed in the mountains of eastern San Diego County (Kline and Kline 2007). Other fluted points have been reported at other locations in Santa Barbara and San Diego Counties (Rondeau 2009). Closest to the project area, the Farpoint Site (CA-LAN-451) in Malibu, Los Angeles County, has yielded a fluted point, and its excavator argues the site should be associated with the Clovis culture (Stickel 2008). Clovis is the earliest universally recognized material culture in North America, and dates to approximately 11,500 radiocarbon years before present (B.P.).

However, scholarly consensus holds that the earliest unambiguous evidence of human occupation in the Los Angeles area dates to at least 9000 B.P. and is associated with a period known as the Millingstone Cultural Horizon (Wallace 1955; Warren 1968). Millingstone populations established permanent settlements that were located primarily on the coast and in the vicinity of estuaries, lagoons, lakes, streams, and marshes where a variety of resources, including seeds, fish, shellfish, small mammals, and birds, were exploited. Early Millingstone occupations are typically identified by the presence of handstones (manos) and millingstones (metates), while those Millingstone occupations dating later than 5000 B.P. contain a mortar and pestle complex as well, signifying the exploitation of acorns in the region.

Although many aspects of Millingstone culture persisted, by 3500 B.P., a number of socioeconomic changes occurred (Erlandson 1994; Wallace 1955; Warren 1968). These changes are associated with the period known as the Intermediate Horizon (Wallace 1955). Increasing population size necessitated the intensified use of existing terrestrial and marine resources (Erlandson 1994). This was accomplished in part through use of new technological innovations such as the circular shell fishhook on the coast, and in inland areas through use of the mortar and pestle to process an important new vegetal food staple (acorns), and the dart and atlatl resulting in a more diverse hunting capability. Evidence for shifts in settlement patterns has been noted as well at a variety of locations at this time and is seen by many researchers as reflecting increasingly territorial and sedentary populations. The Intermediate Horizon marks a period in which specialization in labor emerged, trading networks became an increasingly important means by which both utilitarian and nonutilitarian materials were acquired, and travel routes were extended.

The Late Prehistoric period, spanning from approximately 1500 years B.P. to the Spanish mission era, is the period associated with the florescence of contemporary Native American groups. The group occupying the southern Channel Islands and adjacent mainland areas of Los Angeles and Orange Counties came to be known as the Gabrielino, after Mission San Gabriel. They are reported to have been second only to their Chumash neighbors in terms of population size, regional influence, and degree of sedentism (Bean and Smith 1978). The boundary between these two groups is commonly believed to be in the area by Topanga Canyon, with Chumash territory extending from Malibu up to the area of Paso Robles and the Gabrielino residing along the coastal stretches to the south. The Gabrielino are estimated to have numbered around 5,000 in the pre-contact period (Kroeber 1925). Narratives produced by early explorers indicate the existence of at least 40 Gabrielino villages, but as many as 100 may have existed prior to contact with Europeans (Bean and Smith 1978; McCawley 1996; Reid 1939 [1852]).

Prehistoric subsistence for the Gabrielino and Chumash consisted of hunting, fishing, and gathering. Small terrestrial game was hunted with deadfalls and rabbit drives, and by burning undergrowth, while larger game such as deer were hunted using bows and arrows. Fish were taken by hook and line, nets, traps, spears, and poison (Bean and Smith 1978; Reid 1939 [1852]). The primary plant resources were acorns gathered in the fall and processed with mortars and pestles, and various seeds that were harvested in late spring and summer and ground with manos and metates. The seeds included chia and other sages, various grasses, and islay or holly-leafed cherry (Reid 1939 [1852]).

Historic Overview

Spanish explorers made brief visits to Gabrielino territory in 1542 and 1602, and on both occasions the two groups exchanged trade items (McCawley 1996). Sustained contact with Europeans did not commence until the onset of the Spanish Period, which began in 1769 when Gaspar de Portola and a small Spanish contingent began their exploratory journey along the California coast from San Diego to Monterey.

Most Gabrielino villages are reported by early explorers to have been located along the coast and near the Los Angeles River, in the area north of downtown known as the Glendale Narrows, and those areas along the river's various outlets into the sea. One of the most prominent was the village of *Yangna*, in the vicinity of present-day downtown Los Angeles. At the time of Portola's visit, the village of *Yangna* is reported to have supported a population of at least 200 (Gumprecht 1999) and was later reported to have contained anywhere from 500 to 1,500 huts, implying an even greater population (Reid 1939 [1852]). Closer to the project area, the village of Puvungna (also spelled Puvunga) was located somewhere on the Rancho Los Alamitos, likely in the vicinity of today's Rancho Los Alamitos Historic Ranch and Gardens. The National Register of Historic Places (NRHP)-listed Puvunga Indian Village Historic District consists of discontinuous surviving archaeological sites that commemorate historic Puvungna, which are located on property owned by the City of Long Beach, California State University, Long Beach, and the United States Veterans Administration in southeast Long Beach.

By the early 1800s, the majority of the surviving Gabrielino population had entered the mission system, either at Mission San Gabriel, founded in 1771, or at Mission San Fernando Ray de Espana, established in 1797. Other Native Americans worked at *El Pueblo de la Reyna de Los Angeles,* a secular community founded by colonists in 1781. Over time, the missions became self-sufficient through farming and selling cattle hides, tallow, and various fruit crops to the nearby Pueblo (Paddison 1999; Wright 1992). Mission life was utilized by the Spanish in a time when Native American traditional trade and political alliances were failing, and epidemics and subsistence instabilities were increasing. This lifestyle change brought significant negative consequences for Gabrielino health and cultural integrity (Jackson 1999).

The growth of *El Pueblo de la Reyna de Los Angeles* continued after the Mexican empire gained independence and formed what would become the Mexican state of Alta California in 1821. The authority of the California missions gradually declined, culminating in their secularization in 1834. Although the Mexican government directed that each mission's lands, livestock, and equipment be divided among its converts, the majority of these holdings quickly fell into non-indigenous hands. Mission buildings were abandoned and quickly fell into decay. After two generations of dependence on the missions, Native Americans were suddenly disenfranchised. After secularization, "nearly all of the Gabrielinos went north while those of San Diego, San Luis, and San Juan overran this county, filling the Angeles and surrounding ranchos with more servants than were required" (Reid 1977 [1851]:104).

The project area is located on what was the Rancho Los Nietos, the largest and one of the earliest Spanish land grants in California. Governor Pedro Fages granted the property to Manuel Nieto, a former sergeant, in 1784. When Manuel Nieto died in 1804, the rancho was divided into five separate ranchos. The land within the project area became a part of Rancho Los Alamitos, the inheritance of Manuel's son Juan Jose. About 1806, Juan Jose built an adobe house on a hilltop near a spring southeast of the project area; this house, enlarged several times, still stands. In 1834, the younger Nieto sold the land to Governor Jose Figueroa. After Figueroa's death, it was sold to Abel Stearns, who took possession in 1842. After Stearns lost the land during the drought of 1866, Rancho Los Alamitos eventually came into the possession of the Bixby family, who ranged sheep on the property (Bixby Smith 1925; Jurmain et al. 2011; Kielbasa 1997; Robinson 1942; Salzer 1975).

Most of the work on the rancho, from the days of Manuel Nieto well into the American period, was performed by Native Americans, including both Gabrielinos and others who came to Los Angeles County in increasing numbers after the 1834 secularization of the missions. The Native Americans became vaqueros and workers in the service of the rancheros. Many Native Americans preferred the relative freedom of the ranchos, where they were not bound by the strict rules of the missions and did not have to convert to Christianity. For this reason, and because the missionaries believed the ranchos were encroaching on mission land, tension existed between the missions and the ranchos that lasted until secularization (Phillips 2010).

The first party of U.S. immigrants arrived in Los Angeles in 1841, although black market commerce had previously been conducted between Mexican California and residents of the United States and its territories. As the possibility of a takeover of California by the United States loomed large, the Mexican government increased the number of land grants in an effort to keep the land in the hands of upper-class *Californios* like the Domínguez, Lugo, and Sepúlveda families (Wilkman and Wilkman 2006:14–17). Governor Pío Pico and his predecessors made more than 600 rancho grants between 1833 and 1846, putting most of the state's lands into private ownership for the first time (Gumprecht 1999).

The United States took control of California after the Mexican–American War of 1846, and seized Monterey, San Francisco, San Diego, and Los Angeles (then the state capital) with little resistance. Local unrest soon bubbled to the surface, however, and Los Angeles slipped from U.S. control in 1847. Hostilities officially ended with the signing of the Treaty of Guadalupe Hidalgo in 1848, in which the United States agreed to pay Mexico $15 million for the conquered territory, which included California, Nevada, and Utah, and parts of Colorado, Arizona, New Mexico, and Wyoming. The conquered territory represented nearly half of Mexico's pre-1846 holdings. California joined the United States in 1850 as the 31st state (Wilkman and Wilkman 2006:15).

The discovery of gold in northern California led to an enormous influx of American citizens in the 1850s and 1860s, and these settlers rapidly displaced the old rancho families. In 1873, the U.S. government confirmed legal title to old Rancho ex-Mission San Fernando at 116,858.43 acres, the largest private land parcel in California. The Southern Pacific Railroad extended its line from San Francisco to Los Angeles in 1876, passing through the San Fernando Valley thanks to a new tunnel through Newhall Pass. Newcomers continued to pour into Los Angeles and the population nearly doubled between 1870 and 1880. The completion of the second transcontinental line, the Santa Fe, took place in 1886 causing a fare war, which drove fares to an unprecedented low. More settlers continued to head west and the demand for real estate skyrocketed. The city's population rose from 11,000 in 1880 to 50,000 by 1890 (Meyer 1981:45).

The City of Long Beach emerged out of the 1880s land boom. The first subdivision within what became Long Beach was conducted in 1882, and the American Colony was founded, initially with disappointing results. In 1887, the Long Beach Land and Water Company was organized, and the official map of Long Beach was filed on July 30, 1887. Over the course of the last quarter of the nineteenth century and into the twentieth century, the City of Long Beach followed much the same course of rapid development as the rest of Los Angeles County (Robinson 1942). In 1949, Governor Earl Warren signed Assembly Bill (AB) 8 establishing Los Angeles-Orange County State College; today the college has attained university status and is known as California State University, Long Beach.

The beginning of the twentieth century saw the florescence of a uniquely suburban metropolis, where a vast network of residential communities overshadowed city centers, where the single-family home was valued over the high-rise, and where private space took precedence over public space (Hawthorne 2006). This landscape demanded an innovative transportation solution, and Los Angeles embraced automobiles and freeways like no other city had. The first homemade car puttered down city streets in 1897. Seven years later, the first grand theft auto was reported by Los Angeles Police (Wilkman and Wilkman 2006:50). Inexpensive automobiles gained popularity in the 1920s, soon creating tremendous congestion in the centers of cities and necessitating alternate transportation routes. Dozens of freeways were constructed in the post-World War II years, radically altering the character of Los Angeles by simultaneously dividing local neighborhoods and connecting outlying communities.

Haynes Plant History

The site of Haynes was acquired by LADWP in 1957 for the purpose of constructing a steam-boiler electrical generating facility to replace the Seal Beach Steam Generating Plant, which had been operating in the area since the mid-1920s. Generation Units 1 and 2 at Haynes were placed into operation in 1962 and 1963, respectively; Units 3 and 4 were placed into operation in 1964 and 1965, respectively; and Units 5 and 6 were placed into operation in 1966 and 1967, respectively. Unit 7, a 2-megawatt diesel emergency backup power generator, was added in 1970.

The Haynes plant has been continuously operated since this time. Subsequent upgrades and modifications have resulted in the decommissioning of most of the 1960s units and the addition of new units in 2004 and 2013. Decommissioned Units 3, 4, 5, and 6, along with numerous ancillary facilities, have been or are currently being demolished.

Archival Research

A records search of the Haynes project area and a 0.5-mile radius was requested on January 5, 2021 from the South Central Coastal Information Center (SCCIC) of the a California Historical Resources Information System (CHRIS), housed at California State University, Fullerton. The results of that records search were received on February 18, 2021.

The records search included the Haynes plant and a 0.5-mile buffer. The research focused on the identification of previously recorded cultural resources within a 0.5-mile radius of the proposed project footprint. The archival research included review of previously recorded archaeological site records and reports, historic site and property inventories, and historic maps. Inventories of the NRHP, the CRHR, the California State Historic

Resources Inventory (HRI), California Historical Landmarks and Points of Interest, and local historical registers were also reviewed to identify cultural resources within a 0.5-mile radius of the project area.

Previous Cultural Resources Investigations Reports

A total of 27 previous cultural resources investigations documented at the SCCIC have been conducted within 0.5 mile of the project area (Table 1). Four of these studies overlapped the entire planned project area.

Table 1. Previous Investigations Conducted within 0.5 Mile of the Project Area

Report #	Author	Description	Date
LA-02114	McKenna, J.A.	Archaeological Investigations of the Proposed California Shores Property, Long Beach, California	1990
LA-05215	McKenna, J.A.	A Cultural Resources Investigation of the Proposed Long Beach Ocean Desalination Project, Long Beach, Los Angeles County, California	2001
LA-05890	Strudwick, I.H., W. McCawley, D.K.B. McLean, and B.L. Strum	Cultural Resource Survey of the Bixby Ranch Parcel Near Alamitos Bay, Los Angeles County, California	1996
LA-06107	Shepard, R.S.	Phase I Cultural Resources Assessment: Los Alamitos Pump Station Project in Long Beach, Los Angeles County, and Seal Beach, Orange County, California	2003
LA-06909*	Billat, S.	Jefferson: CA-8242 Cell Facility, 6801 East Second Street, Long Beach, CA, Los Angeles County	2003
LA-08487	Strudwick, I.H.	Cultural Resource Survey of the Alamitos Electrical Generating Station Fuel Oil Tank Farm, City of Long Beach, Los Angeles County, California	2004
LA-09210	Bonner, Wayne H.	Cultural Resources Records Search and Site Visit Results for T-Mobile Candidate LA23228B (M0-T2W) (SCE Studebaker Self Storage), 698 North Studebaker Road, Long Beach, Los Angeles County, California	2007
LA-12960*	McKenna, Jeanette A.	Cultural Resources Overview: The City of Long Beach Southeast Area Specific Plan, Los Angeles County, California	2016
OR-00493	Archaeological Associates Ltd.	Archaeological Survey Report: the Hellman Property in Seal Beach	1980
OR-00639	Scientific Resource Surveys Inc.	Archaeological Test Report on the Hellman Property Location in Seal Beach	1981
OR-01049	Redwine, Peter	Landing Hill	1958
OR-01272*	Stickel, G.E.	A Baseline Archaeological Study for the City of Seal Beach California	1991
OR-01581	Whitney-Desautels, N.A.	Cultural Resource Assessment of the Hellman Ranch, Seal Beach	1997
OR-01608	Stickel, G.E.	A Research Design and Investigation Program for Test Level Evaluations of Archaeological Sites Located on the Hellman Ranch, City of Seal Beach, California	1996
OR-01609	York, A.L., J.H. Cleland, and M. Baksh	A Research Design for the Evaluation of Archaeological Sites Within the Hellman Ranch Specific Plan Area	1997
OR-01610	Stickel, G.E.	An Archaeological Site Survey of the Hellman Ranch, City of Seal Beach, California	1996
OR-01643	York, A.L., J.H. Cleland, and M. Baksh	A Research Design for the Evaluation of Archaeological Sites Within the Hellman Ranch Specific Plan Area	1997
OR-01816	Stickel, G.E.	A Research Design and Investigation Program for Test Level Evaluations of Archaeological Sites Located on the Hellman Ranch, City of Seal Beach, California	1996
OR-01858	York, A.L., J.H. Cleland	A Research Design for the Evaluation of Archaeological Sites Within the Hellman Ranch Specific Plan Area	1997

Report #	Author	Description	Date
OR-01931	Davy, D.M	Archaeological Resources Protection Plan, Decommissioning of the Research, Testing, and Evaluation Area, Naval Weapons Stations, Seal Beach, Orange County, California	1997
OR-02033	Mason, R.D.	Research Design for Evaluation of Coastal Archaeological Sites in Northern Orange County, California	1987
OR-02774	Shepard, R.S.	Phase I Cultural Resources Assessment: Los Alamitos Pump Station Project in Long Beach, Los Angeles County, and Seal Beach, Orange County, California	2003
OR-03371	Ritchie, Michael	Determination of Effect State Route 22/West Orange County Connection	2000
OR-03391	York, Andrew L., James H. Cleland, Lorraine Willey, and Charlane Gross	Mitigation Plan for Significant Cultural Resource Discoveries, Hellman Ranch Specific Plan Area, Seal Beach, California	2003
OR-03402	Wlodarski, Robert J.	Results of a Records Search and Archaeological Reconnaissance for Royal Street Communications Site LA0663 (SCE Edison Park-Seal Beach)	2006
OR-03762	Ehringer, C.	Negative Archaeological Monitoring Report for the Hellman Ranch Tank Farm Replacement Project, City of Seal Beach, California	2009
OR-03828	Cleland, James, Andrew York, and Lorraine Willey	Piecing Together the Prehistory of Landing Hill: A Place Remembered	2007
OR-03870*	Mason, Roger	Historic Property Survey Report for the West Orange County Connection, Phase II – I-405/I-605 HOV Connector Project, Orange County, California	2009
OR-03890	Slauson, Dana	Historic Property Survey Report and Historic Property Survey Report – Reduced Build Alternative Addendum	2000
OR-04172	Chasteen, Carrie	Historic Property Survey Report, San Diego Freeway (I-405) Improvement Project, SR-73 to I-605, Orange and Lous Angeles Counties	2011
OR-04223	Flynn, Chris	Notification of Finding of No Adverse Effect with Standard Conditions for the Bridge Deck Maintenance and Sealing at 30 Locations Throughout Orange County, California	2011

*Indicates a study that overlaps the project area.

In addition to the reports reviewed at the SCCIC, LADWP provided AECOM with a *Cultural Resources Study for the Haynes Generating Station Units 3 through 6 Demolition Project* (Murray et al. 2017).

Previously Recorded Cultural Resources

The SCCIC records search identified 45 previously recorded cultural resources mapped within 0.5 mile of the project area (Table 2). Of the resources, 30 are historic buildings or structures, 13 are prehistoric archaeological sites, one is an archaeological site with both prehistoric and historic components, and one is a historic archaeological site. None of the resources are located within the project area itself.

One resource is located adjacent to the Haynes Generating Station. P-30-177074 is the Los Alamitos Flood Control Channel, constructed in 1958 in a relict bed of the San Gabriel River. The resource has been evaluated for and found not eligible for inclusion in the NRHP, CRHR, or Local register (Dice 2013).

In addition to the resources documented at the SCCIC, one resource, the Haynes Generating Station itself, was documented in 2017 in relation to the Units 3 through 6 demolition. The generating station was initially constructed in the 1960s, although later units were added in the twenty-first century. The entire station was evaluated and found ineligible for inclusion in the CRHR in 2017 (Murray et al. 2017).

Table 2. Previously Recorded Cultural Resource Sites within 0.5 Mile of the Project Area

Primary Number (P-)	Historic Name/Description	Time Period	Eligibility Evaluation
19-001821	CA-LAN-1821, shell midden	Prehistoric	Unevaluated
19-186880	Alamitos Generating Station Fuel Oil Tank Farm	1950s	Determined ineligible for NRHP by consensus through Section 106 process; determined ineligible for CRHR
19-186926	Los Alamitos Pump Station	1950	Unevaluated
30-000143	Very large midden including chipped stone, ground stone, shell, formal tools, shell beads, and effigy fragment	Prehistoric	Unevaluated
30-000263	Midden including shell and sparse groundstone	Prehistoric	Unevaluated
30-000264	Milling stones, hammerstones, pelican stone, cog stone, medicine tube, and human skeletal remains	Prehistoric	Unevaluated
30-000850	Sparse shell scatter	Prehistoric	Unevaluated
30-000851	Sparse shell scatter	Prehistoric	Unevaluated
30-001539	Shell scatter	Prehistoric	Unevaluated
30-001540	Shell scatter and possible midden deposit	Prehistoric	Unevaluated
30-001541	Shell scatter and possible midden deposit	Prehistoric	Unevaluated
30-001542	Historic refuse scatter and prehistoric buried shell midden	Prehistoric/historic	Unevaluated
30-001543	Refuse scatter	Historic	Unevaluated
30-001544	Shell midden with possible buried deposit	Prehistoric	Unevaluated
30-001545	Shell scatter	Prehistoric	Unevaluated
30-001546	Shell and lithic scatter	Prehistoric	Unevaluated
30-001644	Buried shell middens	Prehistoric	Unevaluated
30-177074*	Los Alamitos Channel	1958	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177292	13100 Oak Hills Drive, Seal Beach/Leisure World	1963	Appears eligible for CR and NRHP as a contributor to an eligible district through a survey evaluation.
30-177293	13040 Oak Hills Drive, Seal Beach/Leisure World	1965	Appears eligible for CR and NRHP as a contributor to an eligible district through a survey evaluation.
30-177294	1040 Foxburg Road, Seal Beach/Building 217/Leisure World	1962	Appears eligible for CR and NRHP as a contributor to an eligible district through a survey evaluation.
30-177295	136 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.

Primary Number (P-)	Historic Name/Description	Time Period	Eligibility Evaluation
30-177296	156 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177297	196 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177298	200 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177299	212 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177300	216 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177301	224 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177302	232 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177303	244 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177304	256 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177305	268 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177306	276 College Park Drive, Seal Beach	1965	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177349	12791 Martha Ann Drive, Los Alamitos	1959	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177350	12781 Martha Ann Drive, Los Alamitos	1959	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177351	12771 Martha Ann Drive, Los Alamitos	1959	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177352	12745 Martha Ann Drive, Los Alamitos	1959	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177353	12741 Martha Ann Drive, Los Alamitos	1959	Found ineligible for NR, CR or Local designation through survey evaluation.

Primary Number (P-)	Historic Name/Description	Time Period	Eligibility Evaluation
30-177354	12735 Martha Ann Drive, Los Alamitos	1960	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177355	12725 Martha Ann Drive, Los Alamitos	1959	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177356	12721 Martha Ann Drive, Los Alamitos	1959	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177357	12711 Martha Ann Drive, Los Alamitos	1961	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177358	12705 Martha Ann Drive, Los Alamitos	1959	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177359	12661 Martha Ann Drive, Los Alamitos	1960	Found ineligible for NR, CR or Local designation through survey evaluation.
30-177360	12641 Martha Ann Drive, Los Alamitos	1959	Found ineligible for NR, CR or Local designation through survey evaluation.
None*	Haynes Generating Station	1960s	Determined ineligible for CRHR

*Indicates a resource overlapping the project area.

Built Environment Resources Directory

Study of the California Office of Historic Preservation (OHP)'s Built Environment Resources Directory (BERD) focused on properties located within 0.5 mile of the project area that also faced streets bordering the project site. The HRI lists three historic resources meeting these criteria (Table 3). Two are single-family residences and one is a commercial structure; all three date to 1962. The three buildings are not eligible for inclusion in the NRHP.

Table 3. Properties on the OHP HRI Bordering Streets Facing the Project Area within 0.5 Mile of the Project Area

Primary Number (P-)	Historic Address	Time Period	Eligibility Evaluation
None	13800 Canoe Brook Drive, Seal Beach	1962	Determined ineligible for NRHP by consensus via the Section 106 process, not evaluated for CRHR or local register
None	13880 Canoe Brook Drive, Seal Beach	1962	Determined ineligible for NRHP by consensus via the Section 106 process, not evaluated for CRHR or local register
None	13930 Canoe Brook Drive, Seal Beach	1962	Determined ineligible for NRHP by consensus via the Section 106 process, not evaluated for CRHR or local register

California Historical Landmarks

California Historical Landmarks are buildings, structures, sites, or places that have been determined to have statewide historical interest. A search of the California Historical Landmarks list revealed no California Historic Landmarks within 0.5 mile of the project area.

City of Long Beach Historic Monuments
The City of Long Beach maintains a local register of historic monuments. There are no City of Long Beach Historic Monuments located within 0.5 mile of the project area.

Orange County Historical Monuments
A map of historical monuments prepared by the Orange County Historical Commission shows no historical monuments within 0.5 mile of the project area (Orange County Historical Commission 1989).

Historic Maps and Aerial Photographs

Relevant historic and ethnographic maps and aerial photographs at the SCCIC, online, and in AECOM's possession were consulted to understand past land use and disturbance and to identify possible locations of archaeological sensitivity within the project area. U.S. Geological Survey (USGS) topographic maps and historic aerials posted by Nationwide Environmental Title Research, LLC (NETR) were all consulted in this analysis.

Maps prepared by anthropologists or at the direction of local tribes were consulted. These include maps published by A.L. Kroeber and William McCawley (Kroeber 1925; McCawley 1996); *Tongva Villages: Gabrieleno-Fernandeno of the Los Angeles Basin,* prepared by Keepers of Indigenous Ways (Sutimiv-Pa'alat 2010); and *Kizh Tribal Territory (Gabrieleno Indian Lands),* prepared by archaeologist Gary Stickel for the Gabrieleno Band of Mission Indians-Kizh Nation (Flaherty 2016). The closest village shown on these maps to the project area is Puvungna, located on the former Rancho Los Alamitos in the vicinity of the San Gabriel River.

The project area is shown in the 1896, 1899, and 1902 Downey 1:62500 USGS topographic maps, where it appears as undeveloped estuary beside the San Gabriel River, which cuts through the future generating station property; the existing channel within the generating station property is this relict bed. On the 1925 Long Beach 1:24000 USGS topographic map, the Ports of Long Beach and Los Angeles have been partially constructed. The Los Alamitos Retarding Basin has been excavated south of the project area to drain the estuary. The bed of the San Gabriel River is located east of the project area, following the course of what is today the Orange County Flood Control District flood control channel. Two small structures appear near or in the generating station property.

On the 1942 and 1943 Downey 1:62500 USGS maps, the San Gabriel River has been channelized and is in its current location. Part of the former bed of the San Gabriel River still exists, beginning at the north end of the Haynes Generating Station property and flowing down its east side along what is today a flood control channel. Two structures are still located within the future generating station property, and a power line has been constructed parallel to the new bed of the San Gabriel River.

Aerial photographs dated 1952 and 1953 show the entire Haynes Generating Station location undeveloped. Infilled relict stream channels are visible. Portions of the generating station may be plowed, but no other human modifications are visible (NETR 2021).

Archaeological Survey

An archaeological field survey of the project area was conducted on January 11, 2021, by AECOM archaeologist Marc Beherec, Ph.D., RPA. Dr. Beherec meets the Secretary of the Interior's Professional Qualification Standards in Archaeology. The purpose of the survey was to identify and record cultural resources that are at least 45 years old and evaluate any discovered resources for historical significance based on criteria for listing in the CRHR.

The proposed cooling tower location is currently occupied by Units 3 through 6. These units have been or are in the process of demolition. The area is currently paved and built upon and otherwise an active construction area (Plate 1). As a result, it could not be accessed for this survey.

Plate 1: Proposed Cooling Tower Location.

Makeup Water Storage Tank and Wastewater Storage Tank Locations

The makeup water storage tank, wastewater holding tank, and one stormwater holding tank would be located east of the Haynes cooling water intake channel, along the eastern boundary of the Haynes Generating Station. Structures that occupied this location were recently demolished, leaving the ground surface visible but heavily disturbed (Plate 2). The location was walked over in 10-meter transects. Visibility was 100% due to the recent demolition. No resources were identified.

Plate 2: Proposed Makeup Water Storage Tank and Wastewater Storage Tank Locations

Stormwater Holding Tanks

The second, northern stormwater holding tank site is a graveled area adjacent to a stormwater detention basin. There was no visibility of the natural ground surface in this location.

The proposed course of the pipeline has not yet been determined. However, it is expected to partially pass beneath paved and developed areas of the plant adjacent to the surveyed locations, where a pedestrian survey would not yield useful information.

In the course of the field survey, no archaeological resources meeting the age criterion of 45 years or more were identified.

Recommendations

The following sections present recommendations for further action regarding archaeological resources, historical resources, and potential tribal cultural resources within the project area. These recommendations are based on information collected from archival research, which examined records kept at the SCCIC, local cultural resource listings, historic and ethnographic maps, contemporary archaeological literature, local prehistoric land use patterns and resource availability, and the results of the field survey. All of these investigations and resource documentation serve to inform the recommendations provided for cultural resources in the project area.

Archaeological Recommendations

As discussed above, the proposed project facilities would all be located in areas of Haynes which have been highly disturbed from past facilities construction and operations, dating to as early as the early 1960s, when construction first began on the original generating station. Nonetheless, based on the results of the archival research and field survey, there is moderate potential that archaeological resources could be encountered during ground-disturbing activities for the proposed project, especially in previously undisturbed areas. Haynes is located near the coast and within the area previously occupied by the San Gabriel River delta prior to the channelization of the river. This location would have been ideal for resource procurement of both marine and freshwater species. It is recommended that an archaeological monitor be present during ground-disturbing activities within native soils.

The on-site archaeological monitor shall work under the direction of a qualified archaeologist who meets the Secretary of the Interior's Professional Qualification Standards for Archaeology. In the event a previously unknown archaeological resource is unearthed during excavation activities, work shall be suspended within 50 feet of the find, and the discovery shall be evaluated by the qualified archaeologist. If disturbance to such a resource cannot be avoided, the qualified archaeologist shall develop an appropriate treatment plan for the resource in coordination with LADWP and in accordance with Public Resources Code Section 21083.2(i). If in the course of monitoring, the qualified archaeologist determines that the project site is so severely disturbed that there is little or no sensitivity for cultural resources, then monitoring may be reduced or eliminated at the discretion of the qualified archaeologist.

Architectural History Recommendations

The Haynes Generating Station was evaluated in 2017 and found not to be eligible for inclusion in the NRHP or the CRHR. Since that date, some original generation units have been demolished. The station is not considered a historical resource for the purposes of the California Environmental Quality Act. No further work is recommended.

Tribal Cultural Resource Recommendations

AB 52 consultation is being conducted by LADWP and will be documented separately. The AB 52 consultation process and outreach for the project has been initiated by LADWP. As of the date of this report, the Juaneño Band of Mission Indians, Acjachemen Nation, had requested consultation with LADWP regarding the proposed project. At the tribe's request, the records search data for the project, which includes previously recorded archaeological site records and reports for resources within Haynes and within a 0.5-mile radius of Haynes, has been provided. The following recommendations are made on the basis of the archaeological study reported in this document and supplemented with direction provided by LADWP's ongoing tribal consultation.

As previously discussed, the proposed project facilities would all be located in areas of Haynes which have been highly disturbed from past facilities construction and operations, dating to as early as the early 1960s, when construction first began on the original generating station. Nonetheless, based on archival research and the results of the field survey, it was determined that Haynes is located in the vicinity of Puvungna, an ancient Gabrielino-Tongva village, and it is considered moderately sensitive for archaeological resources that may be tribal cultural resources for the reasons stated above. Such resources, although currently unknown, may be inadvertently discovered during construction activities involving ground disturbance, especially in previously undisturbed areas.

It is therefore recommended that, a minimum of 45 days before the initiation of ground-disturbing construction activities, LADWP shall notify any Native American tribes that consulted on the project pursuant to California Assembly Bill 52 and provide an opportunity for qualified tribal representatives to participate in on-site monitoring. Any Native American representative who chooses to monitor construction activities shall have archaeological knowledge and the ability to represent the interests of the tribe during construction activities. The monitor shall be responsible for identifying potential resources; making initial notifications in the event of finds; requesting diversions of construction activity; and preparing daily monitoring notes and logs. These monitoring logs shall be made available to any Native American tribes consulting on the project.

If a previously unknown archaeological resource of potential Native American origin is encountered, work shall be suspended within 50 feet of the find, LADWP shall be notified, and LADWP shall contact a qualified archaeologist who meets the Secretary of the Interior's standards to evaluate the significance of and determine appropriate treatment for the resource.

All consulting Native American parties shall be contacted to apprise them of the findings and solicit any comments they may have regarding appropriate treatment and disposition of the resources. Their input shall be taken into account in the preparation of any required treatment plan for the resources prepared by the qualified archaeologist. The evaluation 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 the resource takes place.

If human remains are discovered, work in the immediate area 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 Native American Heritage Commission 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 site of the discovery only after consultation and treatment have been concluded. Work may continue on other parts of the project site while consultation and treatment are conducted at the affected site.

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Attachment
Department of Parks and Recreation (DPR) Forms

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 6Z

Other Listings
Review Code | Reviewer | Date

 *Resource Name or #: Haynes Steam Plant

P1. Other Identifier: Haynes Generating Station

***P2. Location:** ☐ Not for Publication ■ Unrestricted ***a. County:** Los Angeles
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Los Alamitos **Date:** 1966 PR 1981 **T** 12 S; **R** 5 W ; NW **¼ of** NW **¼ of Sec** 1 ; SB **B.M.**
c. Address: 6801 E Second Street City: Long Beach Zip: 90803
d. UTM: Zone: 11S; 398563.99mE/ 3736422.93mN (G.P.S.) Google Earth
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:
Property is bounded by State Route 22 to the north, the Orange County flood control channel to the east, East Second Street to the south, and the San Gabriel River to the west. The surveyed resources include all 1960s plant infrastructure between Second and Fourth Streets to the north and south and B and C Streets to the east and west.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
Major elements recorded and evaluated include the following components of the Haynes Steam Plant: Units 3, 4, 5, and 6; the generator deck that spans the area directly west of the units; the two associated control houses (B and C); associated GSU transformers; associated kV buildings; the polishing and contaminated condensate tanks; buildings and structures located on the west side of C Street (including the Butler storage shop, warehouse and maintenance building, and chemical storage canopy); and the fuel tank storage area on the eastern side of the circulating water intake channel (specifically Tanks D and E) (See Continuation Sheet).

***P3b. Resource Attributes:** (List attributes and codes) HP8. Industrial Building, HP9. Public Utility Building

***P4. Resources Present:** ■Building ■Structure ☐Object ■Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #) Overview of property, view to northeast, 11/21/16, IMG_5874

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1963-1967

***P7. Owner and Address:**
LADWP
111 N Hope Street, Rm 1044
Los Angeles, California 90012

***P8. Recorded by:** (Name, affiliation, and address)
Samantha Murray
Dudek
38 N Marengo Ave.
Pasadena, CA 91101

***P9. Date Recorded:** 11/21/2016

***P10. Survey Type:** Intensive

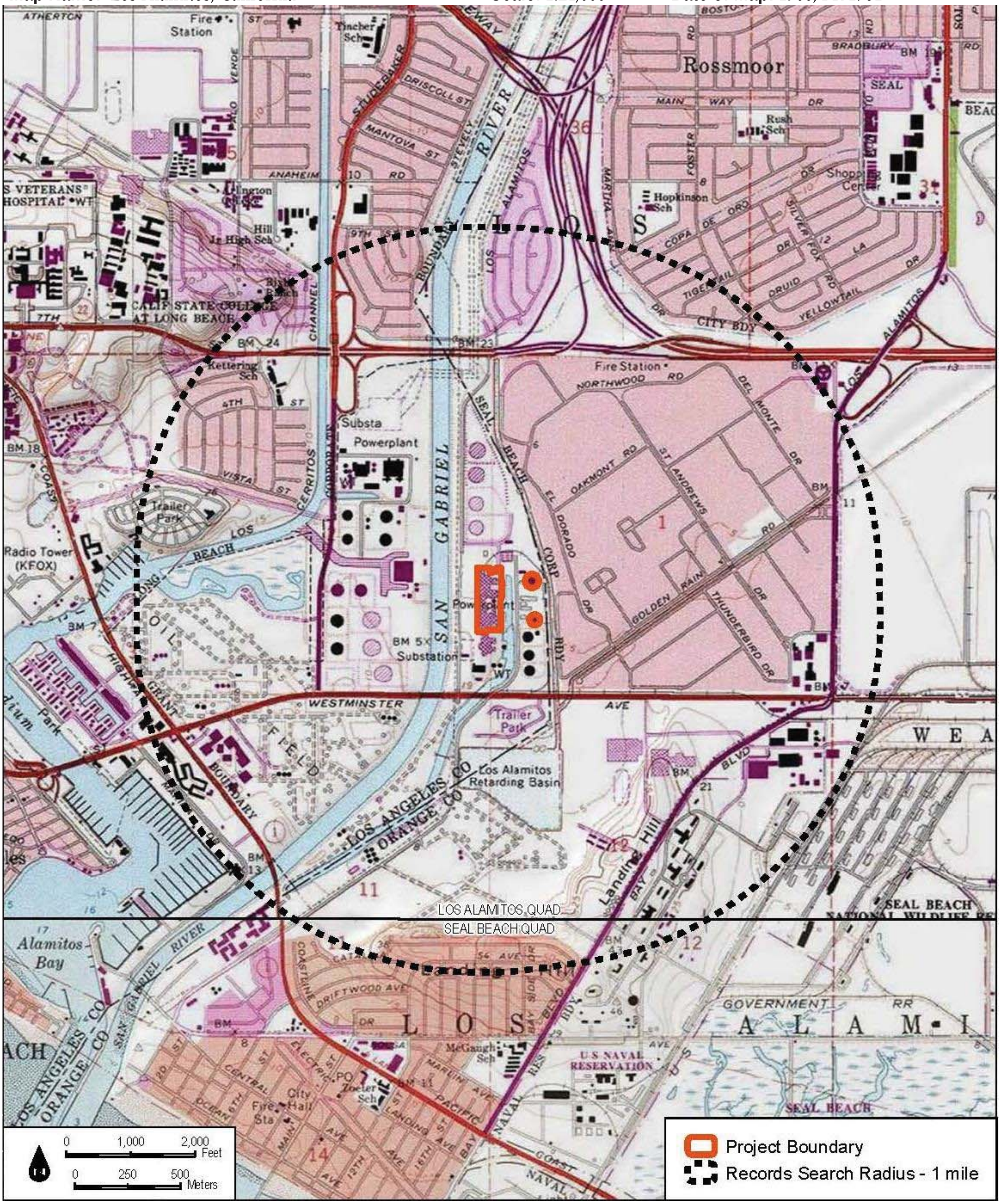
***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") *Cultural Resources Study for the Haynes Generating Station Units 3, 4, 5, and 6 Demolition Project, Los Angeles County, California*. Dudek 2017.

***Attachments:** ☐NONE ■Location Map ☐Sketch Map ■Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **LOCATION MAP**	Primary # HRI# Trinomial

Page 2 **of** 9 ***Resource Name or #:** Haynes Steam Plant

***Map Name:** Los Alamitos, California ***Scale:** 1:24,000 ***Date of Map:** 1966, PR 1981



Primary #
HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 6Z

***Resource Name or #** (Assigned by recorder) Haynes Steam Plant

B1. Historic Name: Haynes Steam Plant.
B2. Common Name: Haynes Generating Station
B3. Original Use: steam plant B4. Present Use: steam plant
***B5. Architectural Style:** industrial
***B6. Construction History:** (Construction date, alterations, and date of alterations) Constructed 1963-1967. See discussion of individual components for alterations (Continuation Sheet).

***B7. Moved?** ■No ☐Yes ☐Unknown **Date:** **Original Location:**
***B8. Related Features:**
B9a. Architect: b. Builder:
***B10. Significance: Theme:** **Area:**
Period of Significance: **Property Type:** **Applicable Criteria:** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Haynes Steam Plant

In 1956, it was reported that LADWP had begun preliminary work on two new plants: the $90 million, 625,000-kilowatt Scattergood Steam Plant at Hyperion and the $200 million, 1,300,000-kilowatt Haynes Steam Plant on the coast near Seal Beach (Figure 4). During the 1950s, LADWP was keeping a close eye on advancements in atomic power, with the goal of being fully capable of producing atomic electricity for the City of Los Angeles whenever it became economically feasible to do so (LAT 1956).

At the beginning of 1959, LADWP announced its plans to invest more than $75 million in new construction over the next year in order to meet the energy demands of a growing population. An estimated 42,700 new customers were expected to be added to its lines in just 1 year. One of the largest projects on LADWP's construction schedule was the new Scattergood steam electric generating plant located on the coast near Playa del Rey. Following closely on its heels were plans for a second steam plant (Haynes Steam Plant) located east of the former Long Beach city boundary along the San Gabriel River (LAT 1959a). The Haynes Steam Plant property was purchased by LADWP in 1957 as a replacement for the decommissioned Seal Beach Steam Plant, which was officially placed on cold standby from 1962–1966 and was demolished in 1967.

One of the first orders of business in the development of the Haynes Steam Plant was to review and select from bids to supply the plant with two giant turbine generators, each with a capacity of 230,000 kilowatts. Bids were received from three American companies (General Electric (GE), Westinghouse, and Allis-Chalmers Manufacturing Co.), three British companies, and one Swiss company. Much to the surprise and outrage of the American companies, LADWP awarded the contract, which worth more than $9 million, to Brown Boveri Corp. of Baden, Switzerland (Figure 5). LADWP stated that it wanted nothing more than to keep money in American companies, but the selection was based purely on the lowest bid, and Brown Boveri came in $5.5 million below the other submittals. This fact could not be ignored by LADWP out of obligation to its charter and rate payers (LAT 1959b).

The supercritical boilers for power generation of the original units at Haynes were manufactured by Babcock and Wilcox, who had supplied the world's first supercritical pressure coal-fired boiler in 1957 (**see Continuation Sheet**).

B11. Additional Resource Attributes: (List attributes and codes)
***B12. References:** See Continuation Sheet
B13. Remarks:
***B14. Evaluator:** Samantha Murray
***Date of Evaluation:** 11/21/16

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

***Resource Name or #** (Assigned by recorder) Haynes Steam Plant

***Recorded by:** Samantha Murray ***Date:** 11/21/16 ■ Continuation ☐ Update

P3a Description (Continued):

The following provides an overview of the buildings and structures surveyed as part of the proposed project, including a brief description of each component's function, and any known alterations. The recorded resources include all 1960s plant infrastructure proposed for demolition as part of the proposed project. This encompasses all portions of the plant between Second and Fourth Streets to the north and south and B and C Streets to the east and west.

Units 3 and 4 were operational by 1965 and were decommissioned in 2004. In 2005, LADWP repowered Units 3 and 4 with a 575 MW 2×1 combined-cycle power block using large-frame gas turbines (which became known as Units 8–10). This replacement was 40% more efficient and released 94% fewer emissions than the original Unit 3 and 4 boilers. Unit 3 connects to Unit 4 on its north elevation and both units are characterized by 250-foot-high steel stacks and hulking steel-frame structure.

GSU Transformer 3 was manufactured by Hitachi in the 1960s. It provides an important link between generating station Unit 3 and the transmission network. These transformers function to boost the high-capacity electricity produced by the generator and transmit it to the grid.

The Unit 3 4.1 kV building is a small, walk-in, metal-clad switchgear building manufactured by Siemens-Allis. The building functions to control, protect, and isolate electrical equipment through a combination of electrical disconnect switches or circuit breakers.

B Control Building controls the functions of Units 3 and 4. It was constructed c. 1964. The three-story building is square in plan with a flat roof structure, and is constructed from reinforced-concrete masonry. With the exception of the ground floor (which is painted concrete block), exterior walls are clad in painted Galbestos. The west elevation contains an exterior metal staircase with applied rectangular wall slabs, and an awning at the roof level. The building appears to be largely unaltered from its original design.

GSU Transformer 4 was manufactured in the 1960s. It provides an important link between generating station Unit 4 and the transmission network. These transformers function to boost the high-capacity electricity produced by the generator and transmit it to the grid.

The Unit 4 4.1 kV building is a small, walk-in, metal-clad switchgear building manufactured by Siemens-Allis. The building functions to control, protect, and isolate electrical equipment through a combination of electrical disconnect switches or circuit breakers.

Unit 5 was operational in 1966, with Unit 6 following shortly thereafter in 1967. In 2012, both units were decommissioned in place and replaced with six LMS 100 units (Units 11–16). Units 5 and 6 used fuel oil and natural gas and have opposed firing, supercritical, air preheated with oxygen content. The boiler units were manufactured by Babcock and Wilcox. Unlike Units 3 and 4, these units are not connected.

GSU Transformer 5 was manufactured by PROLEC GE, a joint venture between Mexican consortium Xignux and GE that started in Mexico in 1969. The GSU provides an important link between generating station Unit 5 and the transmission network. These transformers function to boost the high-capacity electricity produced by the generator and transmit it to the grid.

The Unit 5 4.1 KV building is a small, walk-in, metal-clad switchgear building with 12 terminals on both the west and east elevations. The building functions to control, protect, and isolate electrical equipment through a combination of electrical disconnect switches and circuit breakers.

GSU Transformer 6 was manufactured by Hitachi in the 1960s. It provides an important link between generating station Unit 6 and the transmission network. These transformers function to boost the high-capacity electricity produced by the generator and transmit it to the grid.

The Unit 6 4.1 KV building is a small, walk-in, metal-clad switchgear building with 12 terminals on both the east and west elevations. The building functions to control, protect, and isolate electrical equipment through a combination of electrical disconnect switches and circuit breakers.

Control House C is a three-story building, square in plan, constructed of structural steel and reinforced-concrete block. Unlike Control Buildings A and B, which are located at the southernmost portion of the units, the C building is located off the main access road between Units 5 and 6 and is largely obscured by pipes and other infrastructure.

The Polishing Condensate Tank was constructed c. 1965. This tank measures approximately 37 feet high and 48 feet in diameter, with a nominal capacity of 500,000 gallons. The tank was built by General American Transportation Corp. in Orem, Utah. The tank is used to produce high-purity water from recovered boiler condensate. The tank filters water condensed from steam to prevent chemical failure and deposit buildup that can lead to a loss of unit efficiency.

The Contaminated Condensate Tank was constructed c. 1965. The tank was built by General American Transportation Corp. in Orem, Utah. The tank holds contaminated water recovered from the Unit 8 boiler condensate.

This industrial metal canopy was constructed on site in the late 1960s. The canopy is situated on a concrete pad with concrete footers at the base of each supporting post. The canopy provides shelter and storage for pressurized chemical cylinders.

This prefabricated, corrugated-metal storage building is likely part of the second generation of Butler Buildings that date between 1948 and 1969. This type of structure is commonly seen in post-World War II industrial properties throughout the country The building was erected on the site during the late 1960s and features a front-gable roof and two large industrial doors on both the north and south elevations. Standard single-glazed doors are also located throughout. The building appears largely unaltered.

The Maintenance and Warehouse Building was constructed c. 1967. This building housed the maintenance foreman's office, lunch room, locker room, pipe and welding shop, electrical maintenance shop, machine shop, and storage areas. The building is L-shaped in plan with a concrete slab foundation, flat roof structure, and reinforced-concrete block walls. There is an addition to the southwest corner of the building that was constructed between 1972 and 1994. Other than this addition, the building appears largely unaltered from its original design and materials.

Tank D functioned as a fuel holding tank, and was originally constructed to store fuel oil for use during natural gas shortages. The tank has a fixed roof and has a diameter of 160 feet and a height of 56 feet. The tank is currently empty. In the late 1980s, a valve access project added stairways, platforms, foundations, and stands around tanks A–D.

Tank E functioned as a fuel holding tank, and was originally constructed to store fuel oil for use during natural gas shortages. The tank has a fixed roof and has a diameter of 200 feet and a height of 56 feet. The tank is currently empty. In the late 1980s, a valve access project added stairways, platforms, foundations, and stands around tanks A–D.

B10. Significance (Continued):

At the end of 1959, another contract was awarded to Noxon Construction Co. of Los Angeles to build the 23,000-square-foot, one-story administrative and services building at the Haynes Steam Plant. The building would house the plant's offices, mechanical shops, and on-site maintenance and repair facilities (LAT 1959c).

By April of 1961, the structural steel framework for the Haynes Steam Plant was complete. Construction plans called for two generator units, including site development and common facilities for the plant, with an estimated price tag of $60 million (LAT 1961a). Units 1 and 2 would be natural-circulation, positive furnace pressure, sub-critical 230 MW units (Figure 6). The units would operate at 2,000 pounds per square inch (psi) and 1,000°F, with one steam shaft connected to one generator. LADWP officials inspected the plant's construction progress via helicopter flights (LAT 1961b).

Advertisements for the new plant began to appear in local newspapers, boasting that the new plant "will have larger generators than any now serving Los Angeles … able to provide enough power to meet the needs of a city of approximately 500,000 people … about the size of Cincinnati, Ohio" (LAT 1961c).

In 1961, plans were also underway for construction of Westminster Avenue, which included bridges across the San Gabriel River and the plant's channel (LAT 1961c). Bids for construction of the bridges and a four-lane highway between Westminster Avenue and the Pacific Coast Highway were opened in October 1963, with an estimated cost of $1.4 million (LAT 1963a).

Unit 1 at the Haynes Steam Plant went into service in 1962, with Unit 2 following in 1963, followed by another unit each year until 1967, when Unit 6 was completed (Figure 7). Dedication ceremonies for the plant were held in the fall of 1963 with completion of Units 1 and 2. The cost of the first two generator units was approximately $57 million. It was anticipated that by 1967, when the plant was expected to be completed, it would harness a capacity 14% greater than the maximum capacity of the Hoover Dam. This single plant would be the source of more than half of all electric power in Los Angeles (LAT 1963b). The boiler, feed-water and condensate controls, and the generator voltage regulators were recently upgraded to a digitally controlled system (LADWP 2015).

Originally, the plant was to be called the South Coast Steam Plant, but the Board of Water and Power Commissioners suggested that the plant be named in memory of a man who contributed greatly to the growth and development of LADWP (LADWP Barcode 1005531). The Haynes Steam Plant was named in honor of Dr. John Randolph Haynes (1853–1937), a pioneer civic leader and philanthropist who was dedicated to the municipal ownership of water and electric utilities. He was a member of the Board of Water and Power Commissioners from 1921 to 1937, serving 6 of those years as Board President. Haynes' career in reform began in Los Angeles in 1897 when he helped organize a local chapter of the Union Reform League. Over the next four decades Haynes would become a major figure for reform in Los Angeles and the state of California, holding numerous city and county positions. Haynes had a profound influence on politics in Los Angeles, and helped guide the city's urban progressive movement from the turn of the century through the beginning of the New Deal (Haynes Foundation 2010).

Following the dedication of Units 1 and 2, a 181-ton power transformer constructed by Hitachi Ltd. in Japan was shipped to the Port of Los Angeles for installation at the Haynes Steam Plant. The transformer would be the first of two to be installed at the plant. This time, there were no protests over the foreign purchase, because LADWP was legally required to purchase equipment from the lowest bidder (LAT 1963c).

By 1965, construction of Units 3 and 4 was nearly complete, with costs for the two new units estimated at $46 million. Work had also begun on Units 5 and 6 (Figure 8), at an estimated cost of $70 million. Units 5 and 6 were scheduled for commercial operation by 1966 (Figure 9). LADWP awarded a contract to Volz Construction Co. of Santa Monica for the extension of the circulating waterway and construction of filter structures for Units 5 and 6 (LAT 1965a). By the fall of 1965, the structural steel framework for the addition to the plant was completed, with over 2,800 tons of steel fabricated and assembled by Bethlehem Steel Corp. (LAT 1965b).

In the summer of 1971, LADWP found itself with an insufficient supply of natural gas to operate its steam plants through the 7-month "summer" season. This resulted in the need to substantially increase supplies of oil, especially during the "winter" season (between November and April). In order to support such a large supply of oil, the Board of Water and Power Commissioners approved a nearly $1.5 million contract to construct two fuel oil tanks (no longer extant) at the Haynes Steam Plant. These massive tanks had a capacity of 500,000 gallons each. Prior to the shortage, the plant was using natural gas for approximately 80% of its fuel demand (LAT 1971).

At the turn of the twenty-first century, the Federal Clean Water Act (Section 316(b)) and policy set by the California State Water Resources Control Board mandated that coastal power plants cut their use of ocean water for the once-through cooling process by 93% to minimize impacts on wildlife and fish populations. These significant regulatory changes triggered a multi-billion-dollar repowering program by LADWP for its coastal generating stations (including Haynes, Scattergood, and Harbor) to greatly reduce water usage (TMI 2016).

In 2005, Haynes became the first generating station to undergo an extensive repowering project. LADWP repowered Units 3 and 4 with a 575 MW 2×1 combined-cycle power block using large-frame gas turbines (which became known as Units 8–10). This replacement was 40% more efficient and released 94% fewer emissions than the original Unit 3 and 4 boilers. Initially, Units 5 and 6 were expected to follow a similar path to Units 3 and 4; however, changes in the once-through cooling regulations led to a different approach. LADWP installed six 100 MW GE LMS 100 fast-start, simple-cycle gas turbines (Units 11–16), as opposed to one large combined-cycle unit (TMI 2016).

In 2011, LADWP broke ground on the Haynes Repowering Project, a $782 million, 2-year effort to replace the original 1960s generating units with more efficient equipment. New turbines and generators began arriving at the plant in the spring of 2012 for the first three of six new power generating units (Units 11–16). Testing and tuning of the new units took place in 2013. The modernization of Haynes was considered a major milestone in LADWP's power transformation efforts, which involve replacing approximately 70% of LADWP's existing power generation with renewable and efficient energy and natural gas generators (LADWP 2012).

One of the most valuable investments of the Haynes Repowering Project was the inclusion of the SSS clutch system for the LMS 100 units. These overrunning clutches were placed between the turbine and generator to allow the units to operate as synchronous condensers and maintain stability in the power grid, supplying needed reactive support (TMI 2016).

CRHR Evaluation

CRHR Criterion 1: Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

Units 1 through 6 of the Haynes Steam Plant were constructed between 1963 and 1967 to meet the energy demands of a rapidly growing post-World War II population in Los Angeles. Most power plants in the United States are constructed in response to population increases and a demand for more electricity. Because of the important function these plants provide, one may conclude that most power plants have a high level of significance to the communities they serve. Therefore, it was necessary to evaluate the Haynes Steam Plant in the context of similar property types in order to distinguish between power plants that were designed expressly for the purpose of providing electricity to a given service area and plants that have made a significant contribution within the context of the property type. For example, the LADWP Harbor Steam Plant was specifically constructed to support wartime industries during World War II, and its construction allowed local industries to fulfill the important function of building planes, ships, and other essential wartime technology. Although the Haynes Steam Plant played an important role in meeting the rapidly increasing demand for electricity in Los Angeles, it is not associated with specific events that influenced broad patterns of history. Haynes was constructed to replace the significantly older Seal Beach Steam Plant, which operated from 1925 to 1962 and was demolished in 1967. Haynes is relatively recent in comparison to other Southern California power plants that were built during the 1940s and 1950s (e.g., LADWP's Harbor, Valley, and Scattergood plants and SCE's Redondo Beach, Etiwanda, and El Segundo plants), and it cannot be credited as a pioneer of any specific type of steam generating technology. Therefore, the plant does not appear eligible under CRHR Criterion 1.

CRHR Criterion 2: Is associated with the lives of persons important in our past.

No important historical figures were found to be associated with the Haynes Steam Plant. Although the plant does bear the name of a very significant figure in the history of Los Angeles and the struggle for municipal ownership of utilities, John Randolph Haynes is not directly associated with the plant, as he died almost 30 years before its construction and well before its conception. Therefore, the plant does not appear eligible for listing under CRHR Criterion 2.

CRHR Criterion 3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

The big utility companies in California (i.e., LADWP, SCE, SDG&E, and PG&E) embarked on a massive steam plant building campaign from the late 1940s to the late 1960s, and many of these plants were quite similar to each other. The Haynes Steam Plant follows the same general design criteria for steam power plants in California at the time, which included reducing transmission costs by constructing facilities close to load centers, close to fuel supplies, and close to the ocean for cooling, as well as on a site suitable for a good, solid foundation and with enough land to allow for future expansion (most plants were constructed in phases over the course of many years). Although the number of generating units and amount of associated infrastructure varied by plant, most plants also shared the same general list of equipment. As such, the Haynes plant does not appear to represent new aspects of plant siting or construction techniques. Further, there is no evidence that the Haynes Steam Plant was revolutionary in terms of steam generating technology. The original 1960s steam generating equipment appears to have been catalog ordered from well-known manufacturers like Hitachi, GE, and Brown Boveri, and does not appear to be unique to the Haynes Steam Plant, nor does this equipment appear to represent the last of its kind. For all of the reasons described herein, the plant does not appear eligible under CRHR Criterion 3.

CRHR Criterion 4: Has yielded, or may be likely to yield, information important in prehistory or history.

The Haynes Steam Plant is unlikely to yield any information important to prehistory or history, nor is it associated with any archaeological resources. Therefore, the plant does not appear eligible under CRHR Criterion 4.

***Resource Name or #** (Assigned by recorder) Haynes Steam Plant

***Recorded by:** Samantha Murray ***Date:** 11/21/16 ■ Continuation ☐ Update

City of Long Beach Designation Criteria

The Haynes Steam Plant is not listed as a City historic landmark and it has never been evaluated for local landmark designation. There is no discussion of the Haynes Steam Plant or LADWP in the City of Long Beach's Historic Context Statement (City of Long Beach 2009), which examines the City from prehistory up to 1965. Steam-generated electrical power is discussed only in the context of port and harbor development, specifically the SCE plants in Long Beach Harbor. The plant is located on easternmost edge of the City, at the Orange County line, in an area that was not annexed as part of the City of Long Beach until after 1955. Because the City's landmark designation criteria mirror that of the CRHR, a separate evaluation is not required. An evaluation of the plant's significance based on the City's landmark designation criteria (as listed in Section 1.3.3) indicates that the property is not eligible for local listing.

Although the Haynes Steam Plant appears to retain good integrity overall, it does not appear to meet any of the CRHR or City of Long Beach eligibility criteria.

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***Recorded by:** Samantha Murray

***Date:** 11/21/16 ■ Continuation ☐ Update

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