Appendix A

NOP/IS, Scoping Meeting Materials, and NOP and Scoping Meeting Comments

ESA

The Los Cerritos Wetlands Authority greensplains its Restoration Plan for the Los Cerritos Wetlands. The public comment period on the Initial Study ends April 8th. Please review and comment online at: http://intoloscerritoswetlands.org/the-lcws-eir/

The Los Cerritos Wetlands Authority has now "optimized" its Final Los Cerritos Wetlands Conceptual Restoration Plan of 2015 to complete the Los Cerritos Wetlands Program EIR. Because the LCWA agreed to new oil extraction operations, sites once proposed for a visitors center and least tern nesting area will become oil drilling platforms. The visitors center, parking lot, and access road will move onto the wetlands. A new pipeline will extend across the wetlands and over the Newport Inglewood earthquake fault. "Restoration" plans include breaching the berm now protecting Steamshovel Slough, the only ancient salt marsh in Southern California, polluting the marsh with contaminants from years of oil drilling while flooding existing wetlands with saltwater. New trenches on the Seal Beach/Hellman Ranch property will flood tribal natural/cultural resources and sites and reduce habitat for wildlife.LCWA's plan ignores new evidence that added tidal influence is not true restoration and is not needed due to climate change/sea level rise.

The LCWA is composed of 4 voting members, the Coastal Conservancy, the Rivers and Mountains Conservancy, and the cities of Long Beach and Seal Beach. The LCWA traded our public land to expand fossil fuel extraction from 300 to 24,000 barrels a day. They think that an additional 70,000 tons of GHG emissions and 200,000 barrels of oil are worth the deed to lands that will be underwater in 50 years. They now propose to increase public access and tidal influence to "restore" the Los Cerritos Wetlands. As long as the wetlands are under their control we will continue to question their decisions. Our asks include:

1. No trenching or bulldozing on Hellman Ranch wetlands, no trails through wildlife habitat
2. Minimal disturbance of wildlife habitat (including non-native plants) no pesticides/herbicides
3. Protect existing salt pennes (salt deposits that were a trade item for local tribal peoples)
4. Involve tribal ethnobotanists in restoration planning (pay them!)
5. No Visitors Center on wetlands*
3. No breaching of berm protecting Steam Shovel Slough*
4. No pipeline across wetlands*

* The LCWA states that these decisions cannot be challenged because they were approved as part of the oil drilling project. We think they should be open to discussion as they pose serious risks to the success of any proposed restoration.

for more info email achris259@yahoo.com Conservation Chair, Long Beach Area Group, Sierra Club

INITIAL STUDY

LOS CERRITOS WETLANDS RESTORATION PLAN

LOS CERRITOS WETLANDS AUTHORITY

Los Cerritos Wetlands Authority

Submitted to:

Los Cerritos Wetlands Authority
100 North Old San Gabriel Canyon Road
Azusa, California 91702
(626) 815-1019

Prepared by:

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ESA

Project No. D170537

March 2019

Additional comments from LACFCD.

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INITIAL STUDY

1. Project Title:	Los Cerritos Wetlands Restoration Plan
2. Lead Agency Name and Address:	Los Cerritos Wetlands Authority 100 N. Old San Gabriel Canyon Road Azusa, CA 91702
3. Contact Person and Phone Number:	Sally Gee Los Cerritos Wetlands Authority 100 N. Old San Gabriel Canyon Rd. Azusa, California 91702 (626) 815-1019 sgee@rmc.ca.gov
4. Project Location:	The program area is located in the North Seal Beach area and East Long Beach area, straddling the border of Orange County and Los Angeles County in southern California. **Figure 1 s**hows the regional location of the proposed program and **Figure 2** shows a localized view of the program area.
5. Project Sponsor's Name and Address:	Sally Gee Los Cerritos Wetlands Authority 100 N. Old San Gabriel Canyon Road Azusa, CA 91702
6. General Plan Designation(s):	Community Facilities, Industrial-Oil Extraction, Open Space, Commercial Service, Unassigned, Land Use District No.7 Mixed Uses
7. Zoning:	Specific Plan Regulation, Open Space Natural, Oil Extraction, Planned Development District 1

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SOURCE: ESRI

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 1
Regional Location

ESA

SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 2

Project Site and Local Vicinity

ESA

8. Description of Project:

a) Introduction

The Los Cerritos Wetlands Authority (LCWA), as the Lead Agency pursuant to CEQA, is proposing to implement the Los Cerritos Wetlands Restoration Plan. The Los Cerritos Wetlands Restoration Plan is a planning document that identifies restoration designs for 503 acres of land. The program area contains large expanses of open space, including wetland habitat, as well as other uses described in more detail below.

b) Background

The LCWA, founded in 2006, is a joint powers authority consisting of the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC), State Coastal Conservancy (SCC), and Cities of Long Beach and Seal Beach. The LCWA currently owns 165 acres within the program area.

The LCWA previously developed the Los Cerritos Wetlands Final Conceptual Restoration Plan, a restoration alternatives analyses report that provides the LCWA with a roadmap for habitat enhancement and improved public access. Adopted by the LCWA Board of Directors in August 2015, the Los Cerritos Wetlands Final Conceptual Restoration Plan identifies three restoration design alternatives with varying degrees of alterations to existing site conditions. This plan is supported by eight technical reports that provide baseline information for numerous topics including hydrology and hydraulics, soils, watershed, and habitat.

A portion of the program area has been evaluated as part of a project-level Environmental Impact Report for the Los Cerritos Wetlands Oil Consolidation and Restoration Project. The EIR evaluated the environmental impacts associated with the consolidation of existing oil operations and implementation of a wetlands habitat restoration project. The EIR was certified by the City of Long Beach City Council on January 16, 2018.

c) Project Objectives

As documented in the Los Cerritos Wetlands Final Conceptual Restoration Plan, the goals and objectives of the proposed program are presented here (Moffatt & Nichol, 2015):

1) Restore tidal wetland process and functions to the maximum extent possible

    a) Increase estuarine habitat with a mix of tidal channels, mudflat, salt marsh, and brackish/ freshwater marsh and ponds.

    b) Provide adequate area for wetland-upland ecotone and upland habitat to support wetlands.

    c) Restore and maintain habitat that supports important life history phases for species of special concern (e.g., federal and state listed species), essential fish habitat, and migratory birds as appropriate.

2) Maximize contiguous habitat areas and maximize the buffer between habitat and sources of human disturbance.

a) Maximize wildlife corridors within the LCW Complex and between the LCW Complex and adjacent natural areas within the region.

b) Incorporate native upland vegetation buffers between habitat areas and human development to mitigate urban impacts (e.g., noise, light, unauthorized human encroachment, domestic animals, wastewater runoff) and reduce invasion by non-native organisms.

c) Design the edges of the LCW Complex to be respectful and compatible with current neighboring land uses.

3) Create a public access and interpretive program that is practical, protective of sensitive habitat and ongoing oil operations, economically feasible, and will ensure a memorable visitor experience.

a) Build upon existing beneficial uses.

b) Minimize public impacts on habitat/wildlife use of the LCW Complex.

c) Design interpretive concepts that promote environmental stewardship and the connection between the wetlands and the surrounding community.

d) Solicit and address feedback from members of the surrounding community and other interested parties.

4) Incorporate phasing of implementation to accommodate existing and future potential changes in land ownership and usage, and as funding becomes available.

a) Include projects that can be implemented as industrial operations are phased out and other properties are acquired over the near-, mid- and long-term (next 10 years, 10-20 years, and 20+ years).

b) Investigate opportunities to restore levels of tidal influence that are compatible with current oil leases and neighboring private land holdings.

c) Remove/realign/consolidate existing infrastructure (roads, pipelines, etc.) and accommodate future potential changes in infrastructure, to the maximum extent feasible.

5) Strive for long-term restoration success.

a) Implement an adaptive management framework that is sustainable.

b) Restore habitats in appropriate areas to minimize the need for long-term maintenance activities that are extensive and disruptive to wildlife.

c) Design habitats that will accommodate climate changes, e.g., incorporate topographic and habitat diversity and natural buffers and transition zones to accommodate migration of wetlands with rising sea levels.

d) Provide economic benefit to the region.

6) Integrate experimental actions and research into the project, where appropriate, to inform restoration and management actions for this project.

a) Include opportunities for potential experiments and pilot projects to address gaps in information (e.g., effect of warm river water on salt marsh ecosystem) that are protective of sensitive habitat and wildlife and that can be used to adaptively manage the restoration project.

7) Include areas on the site, where appropriate, that prioritize research opportunities (such as those for adaptive management) over habitat sensitivities.

d) Project Location and Existing Characteristics

Project Site

The proposed program area is composed of 4 areas (South, Isthmus, Central, and North) and 17 individual sites (Figure 2). Each area's location and ownership is provided in more detail below:

- South Area: The South Area is bounded by the Isthmus and Island Village to the north, industrial and residential development to the east, residential development to the south, and the Pacific Coast Highway to the west. It includes the **Haynes Cooling Channel** owned by the City of Los Angeles Department of Water and Power, along with two small upland parcels owned by the City of Long Beach and the State of California, **State Lands Parcel** site owned by the State of California, the **South LCWA** site owned by the LCWA, the **Hellman Retained** site owned by Hellman Properties, LLC, and the **Los Alamitos Pump Station** and **Los Alamitos Retarding Basin** sites, both owned by the County of Orange Flood Control District. The South area is within the city of Seal Beach with the exception of the Haynes Cooling Channel and Los Alamitos Retarding Basin site which are within both Seal Beach and Long Beach, and Los Alamitos Pump Station site which is within Long Beach. (Assessor's Parcel Numbers: 7237-020-902, 7237-020-900, 7237-020-275, 7237-020-276, 7237-020-280, 7237-020-281, 7237-020-282, 7237-020-282, 0431-603-6, 0431-605-3, 0431-604-5, 0950-106-3, 0950-106-4, 0950-106-7, 0950-106-8, 0950-103-6, 7237-020-277, 7237-020-278, and 7237-020-279)
- Isthmus Area: The Isthmus area is bounded by the San Gabriel River and 2nd Street to the north, Haynes Cooling Channel to the east and south, and Pacific Coast Highway to the west. It includes the **Callaway Marsh** site owned by the City of Los Angeles Department of Water and Power, **Isthmus LCWA** site owned by the LCWA (surface rights only), **Zedler Marsh** site owned by the LCWA, and **Isthmus Bryant** site owned by Bryant Dakin, LLC. The Isthmus area is within the city of Long Beach. (Assessor's Parcel Numbers: 7237-020-275, 7237-020-276, 7237-020-901, 7237-020-054)
- Central Area: The Central area is bounded by 2nd Street to the north, the Isthmus to the east and south, and commercial-retail uses at the Marketplace Long Beach development to the west. It includes the **Central LCWA** site owned by the LCWA (surface rights only), **Central Bryant** site owned by Bryant Dakin, LLC, the **Long Beach City Property** site owned by the City of Long Beach, the **Pumpkin Patch** site owned by Lyon Housing Pumpkin Patch, and the **San Gabriel River.** Portions of 2nd Street and Shopkeeper Road adjacent to the individual sites are also part of the Central area. The portion of the San Gabriel River that is located within the program boundary is owned by the LCWA. The Central area is within the city of Long Beach. (Assessor's Parcel Numbers: 7237-020-901, 7237-020-903, 7237-020-053, 7237-020-044, 7237-020-045, and 7237-020-043)

Note LACFCD Easement for O&M

Note that Los Cerritos Channel is own by LACFD and any potential impacts to channel

- North Area: The North area is bounded by the Los Cerritos Channel to the north, Studebaker Road to the east, 2nd Street to the south, and Pacific Coast Highway to the west. It includes the **Northern Synergy Oil Field** site and **Southern Synergy Oil Field** site owned by Los Cerritos Wetlands Partners, LLC, and **Alamitos Bay Partners** site owned by Alamitos Bay Partnership, LLC. The North area is within the city of Long Beach. (Assessor's Parcel Numbers: 7237-022-012, 7237-017-010, 7237-017-011, 7237-017-012, 7237-017-013, 7237-017-014, 7237-017-018, and 7237-017-019)

Existing Land Management and Site Conditions

The existing use of each of the sites in the South, Isthmus, Central, and North program areas are described below. All 17 individual sites within the four program areas support a variety of wetland flora and fauna, including special-status plants and animals, as documented in the *Los Cerritos Wetlands Habitat Assessment Report: Habitat Types and Special Status Species* prepared by Tidal Influence in 2012.

South Area

Coordinate w/ LACFCD regarding discharge into SG River

The Haynes Cooling Channel is a waterway used by the Haynes Generating Station located north of the program area to bring in water from the Pacific Ocean via seven culverts in the Alamitos Bay Marina to cool the power plant through a method called once-through cooling. Once the water is used, it is discharged into the San Gabriel River slightly upstream of where the River crosses under 2nd Street. The Haynes Generating Station is a natural gas and steam power plant that was built in the mid-1960s. The Haynes Generating Station is undergoing a modernization project that would eliminate the use of ocean water to cool the power plant by 2029. The State Lands Parcel site contains the remnant building foundation of what was once a music venue called the Airport Club and Marina Palace. The South LCWA site is currently owned and maintained by the LCWA and contains multiple former sumps, landfills, and contaminated areas from prior oil operations. The Hellman Retained site is an active oil field owned and operated by Hellman Properties, LLC and contains substantial oil operation infrastructure (pipelines, pumps, tanks, and roadways). The Los Alamitos Retarding Basin site is a 30-acre depressed basin surrounded by an earthen berm and access road that receives stormwater runoff and other drainage from a 3,600-acre area in Seal Beach. The site is owned and operated by the County of Orange Flood Control District. The Los Alamitos Pump Station site includes a pump station, which moves the stormwater runoff from the Los Alamitos Retarding Basin, under the San Gabriel River Levee, and into the San Gabriel River.

If modification to discharge, coordinate w/ LACFCD

The South Area is adjacent to the Hellman Ranch Trail, Gum Grove Park, and Gum Grove Trail.

Isthmus Area

The Callaway Marsh and Isthmus Bryant sites are vacant and not currently in use. The Zedler Marsh site is a 12-acre restoration site operated and managed by the LCWA, and is currently being enhanced and restored. The Isthmus LCWA site is an active oil field with oil operation infrastructure, maintained and operated by Signal Hill Petroleum, Inc. who own the mineral rights.

Central Area

The Long Beach City Property site is an active oil field with oil storage tanks, and associated oil production infrastructure, such as pipelines and tanks, which are maintained and operated by Synergy Oil and Gas, LLC. The Central LCWA site is an active oil field with oil operation infrastructure (roadways, wells, power lines, pipelines, and pumps) which are maintained and operated by Signal Hill Petroleum, Inc. who own the mineral rights. The Central Bryant site is a vacant parcel with no oil operations on the surface.

Coordinate w/ LACFD for any modification of levees or trail

There are levees along the north and south banks of the San Gabriel River within the program boundary. LCWA owns the levees as part of their property that extends from the Central Area into the Isthmus Area (APN #7237-020-901). The Class 1 San Gabriel River Trail runs on the levee on the south bank which extends upstream beyond the program area to the Azusa Wilderness Park located about 38 miles inland.

North Area

The Northern Synergy Oil Field site contains Steamshovel Slough, an area of tidally-influenced salt marsh, tidal channels, and mud flats. Steamshovel Slough contains no active oil operations and is separated from the oil operations areas to the south by an earthen berm approximately 6 feet high and varying expanses of open space. The Southern Synergy Oil Field site is an active oil field with oil production and wells, tank farms, and a network of roads, pipelines, and other oil field-related amenities including the Bixby Ranch Field Office. The oil operation is maintained and operated by Synergy Oil and Gas, LLC. The Alamitos Bay Partners site is an active oil field with oil wells and associated oil production infrastructure, such as pipelines and tanks, which are maintained and operated by the Termo Company.

e) Land Use and Zoning Designations

The program area is located entirely within the California Coastal Zone, which means it is subject to the California Coastal Act and the City of Long Beach Local Coastal Program, adopted in 1980.

The Seal Beach General Plan designates the portion of the program area within Seal Beach city boundaries as Community Facilities, Industrial – Oil Extraction, Open Space, and Commercial Service (see **Figure 3, General Plan Land Use Designations)**.

According to the Seal Beach zoning map, and as shown in **Figure 4, Zoning Districts**, the properties within Seal Beach are zoned as Specific Plan Regulation, Open Space Natural, and Oil Extraction. The Hellman Ranch Specific Plan applies to the entire portion of the program area within Seal Beach.

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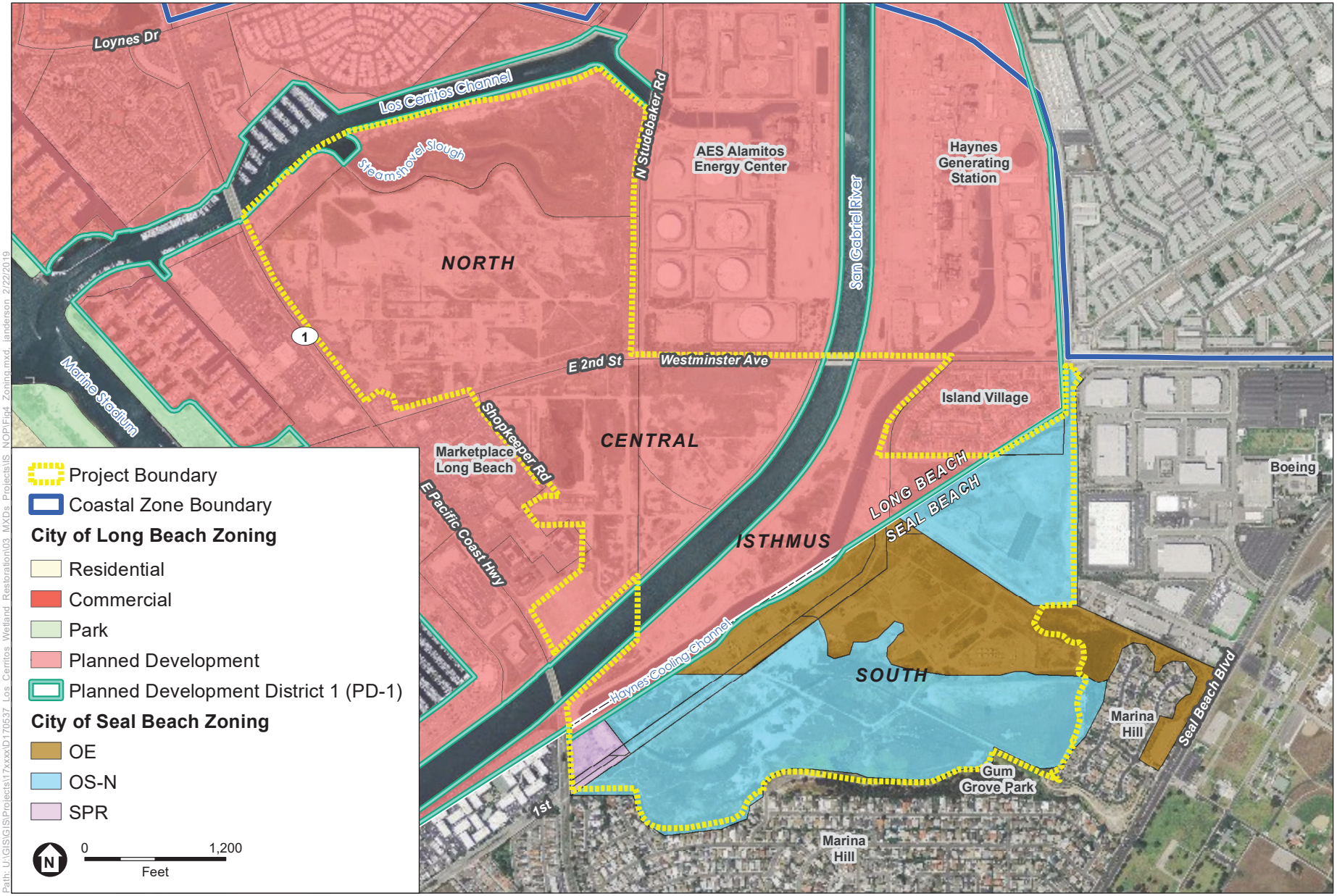
SOURCE: Mapbox, LCWA, City of Long Beach, City of Seal Beach, ESA

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 3

General Plan Land Use Designations

ESA



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SOURCE: Mapbox, LCWA, City of Long Beach, City of Seal Beach

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 4
Zoning Districts

ESA

According to the City of Long Beach General Plan Land Use Designations map, and as shown in Figure 3, the properties within Long Beach are not assigned a specific General Plan Land Use District, with the exception of the Alamitos Bay Partners site and Pumpkin Patch site, and portions of the Northern Synergy Oil Field, Long Beach City Property, Pumpkin Patch, and Callaway Marsh sites which have a designation of Land Use District No. 7, Mixed Uses. The City of Long Beach is currently updating their General Plan and once adopted would change the land use designations to an Open Space PlaceType with a Specific Plan Overlay.

The properties within Long Beach are subject to the South East Area Development and Improvement Plan (SEADIP), a specific plan which zones the program area as Planned Development District 1 (PD-1) (see Figure 4).

The City of Long Beach is in the process of replacing the SEADIP specific plan with the Southeast Area Specific Plan 2060, which would change the zoning of the site and introduce new development standards (setbacks, densities, heights, buffers, etc.) and design guidelines.

Coordinate w/ LACFCD regarding impact resulting from proposals and construction activities

f) Proposed Program

Overview

The proposed program would restore wetland and upland habitats throughout the program area. This would involve remediation of contaminated soil, grading, revegetation, construction of new public access opportunities (including trails, visitor centers, parking lots, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities.

The construction activities would be phased over time as properties become available for acquisition by LCWA. The timing of construction at each site is dependent on multiple variables, including property acquisition, removal of oil infrastructure, wells, and related facilities, availability of funding, and permit approvals. Construction on properties currently under the ownership of LCWA or in the process of being transferred to the LCWA is expected to occur in the **near-term** (within approximately 10 years). Construction on properties that would be connected to or are associated with operation of the Haynes Cooling Channel or that may require more time than the near-term time frame, is expected to occur in the **mid-term** (between approximately 10-20 years), once the channel is decommissioned. The timing of the **long-term** phase depends on decommissioning of existing oil operations and could vary from 20 years (where agreements are already in place) to longer time frames. For oil operations that do not have agreements in place with LCWA, it is expected that overall level of oil and natural gas production would continue until production decreases to below economically viable levels, after which oil production would stop. LCWA considered the possibility of purchasing mineral rights from oil operators, and decommissioning existing oil operations in order to implement wetland restoration on a faster timeline; however, sufficient public funding was not available to pay for the additional cost.

The description of each of the program areas is broken down into the following elements: ecosystem restoration, flood risk and stormwater management, public access and visitor facilities, infrastructure and utility modification, implementation and restoration process, monitoring and adaptive management, and operation and maintenance activities. An overview of each of these elements is provided below.

Ecosystem Restoration

Ecosystem restoration includes actions that will restore more natural ecosystem processes (physical and biological) to disturbed habitats within the program area. Restoration of more natural ecosystem processes through actions like grading, modifying tidal connections, and revegetation, will lead to more extensive and higher functioning wetland, transition and upland habitats. Habitat types that would be restored or enhanced within the program area include subtidal channels, intertidal salt marsh, salt marsh-upland transition zone, brackish marsh, freshwater marsh, native grassland, coastal sage scrub, and riparian scrub. Restored habitat distribution and acreages would vary by area.

The restored salt marsh areas would be re-vegetated through a combination of seeding and installation of nursery stock. Successful re-vegetation will likely require soil amendments (to alter soil texture and nutrients), irrigation, and weed control, all under a carefully laid out adaptive management approach. Revegetation activities in non-tidal areas would include removing or controlling invasive plant species and seeding/planting native plant species. Appropriate conditions will need to be restored in order to support target plant communities. Potential disturbances to sensitive habitats and species during operation of the proposed program would be minimized through effective design of public access areas to keep people on trails and out of habitat areas, and predator management. The success of restoration efforts would be measured based on established performance criteria focusing on the abundance and diversity of native vegetation and the wildlife that use Los Cerritos Wetlands.

Flood Risk and Stormwater Management

The flood risk and stormwater management elements of the proposed program would allow for habitat restoration through improved connection of wetlands to tidal flows while maintaining or improving existing flood risk and stormwater management. Potential flood risk and stormwater management would include modifications to project structures within the program area by removing portions of the existing levee adjacent to the program boundary along the San Gabriel River and constructing new flood risk management levees, restoring the wetland floodplain, and constructing new water-control structures, such as gated culverts, that allow for increased tidal connections. The proposed program would also include modifications to existing operations and maintenance practices for flood risk and stormwater management structures.

Coordinate w/ LACFCD

Public Access and Visitor Facilities

Potential public access improvements and visitor amenities would include construction of new pedestrian trails and bike paths, elevated perimeter pedestrian walkways, educational or interpretive features, viewing areas with overlooks, new and improved parking facilities, and visitor centers. These improvements would develop and enhance public access, recreation,

and educational opportunities within the program area, while balancing protection of sensitive habitats.

Infrastructure and Utility Modification

Potential infrastructure and utility modifications include oil well and associated pipeline abandonment and relocation, and electric and water line relocation. These modifications would allow for increased connectivity of habitat restoration within the program area and protection of existing utilities that are not otherwise abandoned or relocated.

Implementation and Restoration Process

Implementation would potentially include: clearing and grubbing, grading and soil transport across and off-site, soil remediation, levee lowering and breaching, revegetation, construction of flood risk and stormwater management facilities, access roads/trails, and utility modifications.

Monitoring and Adaptive Management

The goal of monitoring would be to document trends in habitat development and assess progress toward meeting restoration objectives. Monitoring would focus on the major biotic and abiotic factors that drive habitat development and ecosystem function—in particular, those factors that can be manipulated and managed or those parameters that can be used to gauge habitat development and ecosystem function (Thom et al. 2010).

Successful adaptive management would first require baseline monitoring in order to fill data gaps and refine the restoration design. Consistent with the U.S. Department of Interior Technical Guide for Adaptive Management (2009), an adaptive management plan would be prepared prior to project implementation to track restoration success relative to performance criteria and determine when criteria have been met and the restoration would proceed to its next phase.

Operation and Maintenance Activities

Ongoing activities to ensure restoration success and management of public access features would potentially include the following:

Coordinate w/ LACFCD immediately to discuss viability

Impacts/ responsibilities of LACFCD?

- Planting and seeding of restored areas after earthmoving is completed
- Vegetation maintenance, irrigation, weeding, and invasive species removal in restored habitats
- Trash removal from restored wetlands and installation of trash booms in flood control channels
- Annual and post-storm event inspection of levees and berms
- Periodic repaving of access roads and trails, repair and replacement of overlook or educational equipment, trash collection, and vandalism repair
- Operation and maintenance of water control structures
- Maintenance of bio-swales
- Creation of a schedule of hours of operation for public use of the new parking lots, trails and visitor centers

9. Surrounding Land Uses and Setting

The proposed program is located within the cities of Seal Beach and Long Beach. The city of Seal Beach is within the northwestern portion of Orange County, California. The city of Long Beach is within the southeastern portion of Los Angeles County, California.

The city of Seal Beach is bounded by the city of Long Beach to the west; the city of Los Alamitos and the neighborhood of Rossmoor to the north; and the cities of Huntington Beach, Westminster and Garden Grove to the east. The Pacific Ocean borders the city of Seal Beach to the south. The U.S. Navy Naval Weapons Station Seal Beach is located within Seal Beach city boundaries to the southeast of the program area.

Long Beach is bounded by the cities of Carson and Los Angeles, the neighborhood of Wilmington, and the Port of Los Angeles to the west; the cities of Compton, Paramount, and Lakewood to the north; and the cities of Hawaiian Gardens, Cypress, Los Alamitos, and Seal Beach to the east. The Pacific Ocean borders the city of Long Beach to the south.

10. Other Public Agencies Whose Approval is Required

Subsequent to the preparation of a programmatic EIR, the LCWA would develop more detailed designs that would serve to implement the proposed Restoration Plan. Restoration activities associated with the more detailed design would require discretionary approval from the following agencies. The specific permits/approvals necessary for each project activity will vary depending on the nature and location of the activity.

Add: Los Angeles County Flood Control District

- Los Cerritos Wetlands Authority
- City of Long Beach
- City of Seal Beach
- City of Los Angeles Department of Water and Power
- Los Angeles County Department of Public Works
- Orange County Public Works
- South Coast Air Quality Management District
- Santa Ana Regional Water Quality Control Board
- Los Angeles Regional Water Quality Control Board
- California Department of Fish and Wildlife
- California State Lands Commission
- California Department of Conservation, Division of Oil, Gas and Geothermal Resources
- California Coastal Commission
- California Coast Guard
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. National Marine Fisheries Service

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

LCWA will be conducting consultation with California Native American tribes who are traditionally and culturally affiliated with the project area pursuant to Public Resources Code section 21080.3.1. LCWA will consult with tribes on the identification of tribal cultural resources within the program area, and in determining significance of any identified tribal cultural resources. If tribal cultural resources meeting the definition provided in Public Resources Code section 21074 are identified, LCWA will consult with tribes in assessing impacts and developing mitigation, consistent with Public Resources Code section 21080.3.2. LCWA will ensure that information submitted to LCWA during the environmental review process is not included in the environmental document or otherwise disclosed without the prior written consent of the tribe that provided the information in accordance with Public Resources Code section 21082.3(c).

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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 checklist on the following pages.

☒ Aesthetics	☐ Agriculture and 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: (To be completed by the Lead Agency)

On the basis of this initial study:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is requi red

Signature 03/07/19

Date

Signature

Date

Back of Signed Determination

Environmental Checklist

Aesthetics

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with 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?	☒	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☒	☐	☐	☐
c) In non-urbanized 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?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	☒	☐	☐	☐

Discussion

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

Potentially Significant Impact. The existing visual environment mainly includes large expanses of open space, areas developed with oil operations and associated infrastructure, a large stormwater basin, roads and overhead utilities, and channelized waterways. Although restoration of wetlands within the program area would likely improve the visual character and/or quality of the area, the proposed program's potential to have a substantial adverse effect on scenic vistas will be evaluated in the Programmatic Environmental Impact Report (PEIR). Mitigation measures, to the extent necessary and available, will be recommended to reduce potentially significant aesthetic impacts.

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

Potentially Significant Impact. According to the California Department of Transportation (Caltrans) California Scenic Highway Mapping System, the nearest eligible scenic highway is State Route 1, also known as the Pacific Coast Highway (PCH). The PCH is located directly west of the program area and is currently designated as an Eligible State Scenic Highway - Not Officially Designated. There are no State-designated scenic highways in the cities of Seal Beach or Long Beach. However, given its proximity to PCH, the proposed program's impacts to Eligible State Scenic Highways, as well as any scenic resources identified in relevant City Plans, will be identified in the

PEIR. Mitigation measures, to the extent necessary and available, will be recommended to reduce potentially significant aesthetic impacts.

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?

Potentially Significant Impact The program is located in a largely urbanized area, surrounded by the Los Cerritos Channel, the AES Alamitos Energy Center and Haynes Generation Station to the north, Pacific Coast Highway and commercial-retail strip mall to the west, residential development to the south, and residential and industrial development to the east, including a Boeing office complex. The San Gabriel River bisects the program area. Although restoration of wetlands within the program area would likely improve the visual character and/or quality of the area, the proposed program's potential to conflict with applicable zoning and other regulations governing scenic quality will be evaluated in the PEIR. Mitigation measures, to the extent necessary and available, will be recommended to reduce potentially significant aesthetic impacts.

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

Potentially Significant Impact. The proposed program would restore wetland habitats throughout the program area, which would involve construction activities for remediation of contaminated soil and groundwater, grading, revegetation, construction of new public access opportunities (including trails, visitor centers, parking lots, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities. The proposed program is not expected to create any reflective surfaces or the potential for light/glare during the day. However, some lighting may be needed during construction and maintenance activities, as well as nighttime lighting to provide minimum illumination needed for safety, security and wayfinding for the visitor centers and parking lots. Because the proposed program may include new sources of light, the proposed program's potential to create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area will be evaluated in the PEIR. Mitigation measures, to the extent necessary and available, will be recommended to reduce potentially significant aesthetic impacts.

References

Caltrans, California Scenic Highway Mapping System Los Angeles County, http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm, accessed February 7, 2019.

Agriculture and Forestry Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion

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 program area is located within a highly urbanized area primarily used as privately owned or leased oil fields, wetland habitat areas, or a stormwater basin. No farmland, agricultural uses, or related operations are present within the program area or surrounding areas. According to the California Department of Conservation (CDC) Los Angeles County Important Farmland 2016 Map, pursuant to Farmland Mapping and Monitoring Program (FMMP), there are no farmlands located within the vicinity of the program area (CDC, 2016). Therefore, the project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use, and no impact would occur, and no mitigation measures are required. This topic will not be evaluated in the PEIR.

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

No Impact. The Williamson Act of 1965 allows local governments to enter into contract agreements with local landowners with the purpose of trying to limit specific parcels of land to agricultural or other related open space use. According to the California Department of Conservation (CDC) Los Angeles County Williamson Act Fiscal Year 2015/2016 Map, the program area is not zoned for agricultural use nor is it subject to a Williamson Act Contract or located within the vicinity of a property subject to a Williamson Act Contract (CDC, 2016). Therefore, the proposed program would not conflict with any zoning for agricultural uses or a Williamson Act Contract and, thus, no impacts would occur. This topic will not be evaluated in the PEIR and no mitigation measures would be required.

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 program area is largely developed with facilities associated with oil extraction and located in a highly urbanized area. The program area is located entirely within the California Coastal Zone, which means it is subject to the California Coastal Act and the City of Long Beach Local Coastal Program, adopted in 1980. The Seal Beach zoning map designates the program area within the Seal Beach boundaries as Specific Plan Regulation, Open Space Natural, and Oil Extraction. The Hellman Ranch Specific Plan applies to the entire portion of the program area within Seal Beach. According to the City of Long Beach General Plan Land Use Designations map, the portion of the program area within the City of Long Beach boundaries has a zoning designation of Planned Development District 1 (PD-1) within the Southeast Community Plan Area (SEADIP). The City of Long Beach is in the process of replacing the SEADIP specific plan with the Southeast Area Specific Plan 2060, which would change the zoning of the site and introduce new development standards (setbacks, densities, heights, buffers, etc.) and design guidelines. However, given the current zoning and uses, the program area is not expected to be rezoned as forest land or timberland zoning in the Southeast Area Specific Plan 2060. Thus, the program area is not zoned as forest land or timberland, and as such would not conflict with forest land or timberland zoning or result in the loss of forest land or conversion of forest land or timberland to non-forest uses. Therefore, no impact would occur, and no mitigation measure would be necessary. This topic will not be evaluated in the PEIR.

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

No Impact. Refer to Response (c), above. This topic will not be evaluated in the PEIR.

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. As discussed above, the program area is not expected to contain farmland, forest land, or timberland. Accordingly, the project would not result in the conversion of farmland to non-agricultural uses or forest land to non-forest uses. The program area is located in a highly urbanized area and is not adjacent to existing farmland or forest lands. Therefore, no impacts would occur, and no mitigation measures would be necessary. This topic will not be discussed in the EIR.

References

CDC, Los Angeles County Important Farmland Map, ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/los16.pdf, 2016, accessed February 7, 2019.

CDC, Los Angeles County Williamson Act FY 2015-2016 Map, ftp://ftp.consrv.ca.gov/pub/dlrp/wa/LA_15_16_WA.pdf, 2016, accessed February 7,2019.

Air Quality

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with 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?	☒	☐	☐	☐
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?	☒	☐	☐	☐

Discussion

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

Potentially Significant Impact. The program area is located within the jurisdiction of the South Coast Air Quality Control District (SCAQMD) within the South Coast Air Basin (SCAB), which consists of the urbanized areas of Los Angeles, Riverside, San Bernardino and Orange Counties. SCAQMD is designated as a nonattainment area for national ambient air quality standards (NAAQS) for ozone (O_3), lead (Pb), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and is designated as a maintenance area for particulate matter less than 10 microns in diameter (PM_{10}), carbon monoxide (CO) and nitrogen dioxide (NO_2). The SCAB is designated as a nonattainment area under the California ambient air quality standards (CAAQS) for O_3, Pb, $PM_{2.5}$, and PM_{10}. The SCAQMD and Southern California Association of Governments (SCAG), in cooperation with the California Air Resources Board (CARB) and USEPA, have developed air quality management plans (AQMP) designed to bring the SCAB into attainment of the national and state ambient air quality standards. The latest version of the AQMP was adopted by the SCAQMD Governing Board in March 2017 (SCAQMD, 2016).

The proposed program would involve construction and operation activities for remediation of contaminated soil and groundwater, grading, revegetation, construction of new public access facilities (including trails, visitor centers, parking lots, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities. Thus, implementation of the proposed program could result in increases in pollutants and alter long-term local and regional air quality on and in the vicinity of the program area. The proposed program's potential to conflict with or obstruct implementation of the applicable air quality plan will be evaluated in the PEIR. Mitigation measures, to the

extent necessary and available, will be recommended to reduce potentially significant air quality impacts.

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?

Potentially Significant Impact. Short-term construction activities and long-term operation of the proposed program may generate emissions that could result in an increase of existing emission levels of criteria pollutants and/or contribute to the nonattainment status for these criteria pollutants in the SCAB. Due to the elevated concentrations of air pollutants that currently occur in the SCAB, when combined with past, present, or reasonably foreseeable future projects in the area, the net increase of criteria pollutants could cumulatively contribute to the nonattainment of criteria pollutants in the SCAB, including O_3, as well as ozone precursor emissions of volatile organic compounds (VOC) and nitrogen oxides (NO_X), and particulate matter ($PM_{2.5}$ and PM_{10}). The generation of these compounds during and after construction could potentially exceed the SCAQMD's significance thresholds for such emissions (including quantitative thresholds for ozone precursors). Operation of the proposed program may result in increased emissions of air pollutants from the potential in increased vehicle trips accessing the proposed program area and operational maintenance activities. The proposed program's potential to result in a cumulative considerable net increase of any criterial pollutant for which the program region is nonattainment under an applicable federal or state ambient air quality threshold will be evaluated in the PEIR. Mitigation measures, to the extent necessary and available, will be recommended to reduce potentially significant air quality impacts.

c) Expose sensitive receptors to substantial pollutant concentrations?

Potentially Significant Impact. Sensitive receptors are locations where uses or activities result in increased exposure of persons more sensitive to the unhealthful effects of emissions (such as children and the elderly). Examples of land uses that can be classified as sensitive receptors include residences, schools, daycare centers, parks, recreational areas, medical facilities, rest homes, and convalescent care facilities. Development of the proposed program may have the potential to expose sensitive receptors to substantial concentrations of criteria air pollutants and toxic air contaminants (TACs) as a result of emissions generated during construction. The proposed program's potential to expose sensitive receptors to substantial pollutant concentrations will be evaluated in the PEIR. Mitigation measures will be recommended to reduce potential significant air quality impacts to sensitive receptors.

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

Potentially Significant Impact. Potential sources that may emit odors during construction activities include the use of architectural coatings and solvents. SCAQMD

Rule 1113 (Architectural Coatings) limits the amount of VOCs from architectural coatings and solvents. According to the SCAQMD CEQA Air Quality Handbook, construction equipment is not a typical source of odors. Odors from the combustion of diesel fuel would be minimized by complying with the CARB Air Toxics Control Measure (ATCM) that limits diesel-fueled commercial vehicle idling to 5 minutes at any given location, which was adopted in 2004. Program-related construction would also comply with SCAQMD Rule 402 (Nuisance), which prohibits the emissions of nuisance air contaminants or odorous compounds. Through adherence with mandatory compliance with SCAQMD Rules and State measures, construction activities and materials would not result in other emissions that create objectionable odors.

Coordinate w/ LACFCD immediately to discuss viability

According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed program would not involve elements related to these types of uses. Trash removal would occur as needed within the restored wetlands. The Los Angeles County Flood Control District operates and maintains trash booms and nets in other flood control channels and a similar boom/net could be installed upstream of the Central Area across the San Gabriel River. If a trash boom/net was installed, the Los Angeles County Flood Control District would inspect the trash net weekly and remove trash from the boom/net as necessary. Although the proposed program is not expected to include any stationary sources or equipment located on-site that would generate objectionable odors, the PEIR will discuss the program's potential to result in other emissions, including odor. Mitigation measures, to the extent necessary and available, will be recommended to reduce potentially significant air quality impacts related to other emissions.

References

California Air Resources Board (CARB), *Area Designation Maps/State and National*, http://www.arb.ca.gov/desig/adm/adm.htm/, 2019, accessed February 6, 2019.

Biological Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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?	☒	☐	☐	☐
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?	☒	☐	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion

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?

Potentially Significant Impact. All 17 individual sites within the four program areas can potentially support special-status species that could be affected under the proposed program. The proposed program's potential to have a substantial adverse effect, either directly or through habitat modifications, on any candidate, sensitive, or otherwise special-status species in local or regional plans or regulations by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS) will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to biological resources.

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 Wildlife or U.S. Fish and Wildlife Service?

Potentially Significant Impact. Sensitive natural communities are considered rare in the region by the USFWS, CDFW, or local regulatory agencies and are known to provide habitat for special-status plant and wildlife species. Within the program area, sensitive natural communities include riparian, wetland, and limited upland habitats such as pickleweed (*Salicornia pacifica*) mats and black willow (*Salix gooddingii*) thickets. Development of the proposed program would ultimately restore the wetlands within the program area; however, the proposed program's potential to have a substantial adverse effect on any riparian habitat or other sensitive natural community during construction and operation will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to biological resources.

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?

Potentially Significant Impact. State or federally protected wetlands or waters in the program area include those protected under the Clean Water Act, Porter-Cologne Water Quality Control Act, California Coastal Act, and Section 1602 of the Fish and Game Code. Aquatic and wetland habitats in the program area such as Steamshovel Slough, mudflats, as well as the tidal channels surrounding the program area, could be removed, filled or otherwise disturbed. While implementation of the proposed program would ultimately restore the wetlands within the program area, the proposed program could have a potentially significant impact on the state or federally protected wetlands during construction and operation. The proposed program's potential to have a substantial adverse effect on state or federally protected wetlands will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to biological resources.

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?

Potentially Significant Impact. Implementation of the proposed program may significantly affect habitat linkages (i.e., wildlife and riparian corridors). While the proposed program would ultimately restore the wetlands, the program's potential to interfere substantially with the movement of any native resident or migratory fish or wildlife species or with an established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to biological resources.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Potentially Significant Impact. Existing local policies or ordinances protecting biological resources may potentially be impacted by the development of the proposed program. The PEIR will include a review of all relevant policies and ordinances and the proposed program's potential conflict with the City of Seal Beach and the City of Long Beach's policies or ordinances protecting biological resources, and any conflicts with potential Environmentally Sensitive Habitat Area (ESHA) pursuant to the California Coastal Act, will be evaluated in the PEIR.

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. Based on a review of the California Department of Fish and Wildlife California Regional Conservation Plans, there are no Habitat Conservation Plans or other approved habitat conservation plans prepared for the program area (CDFW 2017). Given that the program area is not subject to an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan, no impacts would occur, and no further discussion is needed in the PEIR.

References

California Department of Fish and Wildlife (CDFW), California Regional Conservation Plans, https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=68626&inline, October 2017, accessed February 6, 2019.

Cultural Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
V. CULTURAL RESOURCES — Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☒	☐	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☒	☐	☐	☐

Discussion

a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

Potentially Significant Impact. The program boundary totals approximately 503 acres, including areas extensively developed with oil operations and associated infrastructure. A cultural resources assessment will be conducted to identify potential historical resources within the program area, which will include archival research and a site visit. The proposed program's potential to cause a substantial adverse change in the significance of historical resources will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to historical resources.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Potentially Significant Impact. The program area is in the vicinity of known archaeological resources and may have the potential to contain undocumented prehistoric and historic-period archaeological resources. Archaeological evidence from the Channel Islands indicates that the first people migrated down the California Coast as early as 12,000 years ago (Cassidy et al. 2004; Erlandson et al. 2007), with permanent settlements established between 8,000 and 3,000 years ago (Douglass et al. 2015; Glassow et al. 1988; Grenda and Altschul 2002; Koerper et al. 2002; Macko 1998). From 1,000 years before present to approximately 1542 A.D., Los Angeles County and Northern Orange County were occupied by the Gabrielino people (named after the Spanish Mission where many of them were baptized). Approximately 50 major villages were located along the coast and inland prairies. The Gabrielino used the local wetlands, rivers, and streams to hunt and fish, to gather reeds and willows to build homes, and as a reliable water source McCawley, 1996). Nearby Native American sites are known to be located at California State University Long Beach, Rancho Los Alamitos Historic Ranch, and Heron Point (California Coastal Commission, 2018). Development of the proposed program would result in ground-disturbing activities, such as grading and excavation, that could uncover previously unidentified subsurface archaeological resources. Additional background

research on the program area, including a records search at the South Central Coastal Information Center (SCCIC), review of historic topographic maps and aerial photographs, site visit, and geoarchaeological study will be conducted. The proposed program's potential to cause an adverse change in the significance of an archaeological resource will be evaluated in the PEIR. Mitigation measures will be recommended to reduce potential significant impacts to cultural resources.

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

Potentially Significant Impact. Native American burials have been encountered at sites in the vicinity of the program area (California Coastal Commission, 2018). Since the proposed program would require excavation and grading in some portions of the program area, ground-disturbing activities could unearth subsurface human remains. The proposed program's potential to disturb any human remains, including those interred outside of formal cemeteries will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to cultural resources.

References

California Coastal Commission. 2018. Staff Report: Regular Calendar – Application No. 9-18-0395 (Beach Oil Minerals [BOM] and the Los Cerritos Wetlands Authority [LCWA]). State of California Natural Resources Agency, Sacramento, California.

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Energy

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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?	☒	☐	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☒	☐	☐	☐

Discussion

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

Potentially Significant Impact. The implementation of the proposed program would result in construction and operational and maintenance activities on the site that would increase energy consumption associated with electricity, natural gas and transportation fuel. Although the increase in energy consumption is not anticipated to be wasteful, inefficient, or unnecessary and would comply with existing energy conservation plans, it is recommended that this topic be evaluated further in an PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to energy.

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

Potentially Significant Impact. The proposed program would be required to comply with the California Green Building Standards (CALGreen) pursuant to Title 24, Part 11 of the California Code of Regulations for any new development, including the construction of the visitor centers, parking lots, and modification of existing infrastructure and utilities. In conformance with these requirements, the program would be designed to incorporate various energy and resource conservation measures. In addition, the proposed program would implement applicable energy and resource conservation measures such as those described in California Air Resources Board AB 32 Climate Change Scoping Plan and supporting documents. However, further evaluation in the PEIR is required to determine if the proposed program would achieve consistency with state or local plans for renewable energy or energy efficiency. If necessary, mitigation measures will be recommended to reduce potential significant impacts to energy.

References

None.

Geology and Soils

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

Discussion

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

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

Less than Significant Impact. Seismically-induced surface or ground rupture occurs when movement on a fault deep within the earth breaks through to the surface as a result of seismic activity. Fault rupture almost always follows preexisting faults, which are zones of weakness. Under the Alquist-Priolo Earthquake Fault Zoning Act of 1972, the California State Geologist (CGS) identifies areas in the state that are at risk from surface fault rupture. This requires CGS to establish regulatory zones, known as Alquist-Priolo

Earthquake Fault Zones, around the surface traces of active faults and to issue appropriate maps that identify these areas. The program area is located within a trace of the active Newport-Inglewood Fault, as identified by the California Department of Conservation, Earthquake Zones of Required Investigation-Los Alamitos Quadrangle Map (CDC, 1986). Currently, active oil and natural gas operations are located on several properties along the fault and in the project area. Over time, the proposed program would result in the reduction and removal of some of these operations, and the consolidation of others in smaller footprints with modern equipment. The overall surface footprint of oil production operations would be reduced, while the footprint of restored wetland habitat would be increased. The overall level of oil and natural gas production would continue at about current levels until production decreases to below economically viable levels, after which oil production would decrease. The oil and natural gas operations would continue to maintain subsurface pressures by the legally required pumping of produced water back into the production zones to maintain existing pressures.[1] Thus, the oil production operations would not be significantly changed in the short term and would be reduced over the long term. Maintaining subsurface pressures and the long-term reduction of movement of oil, natural gas, and fluids from and back into the subsurface would reduce the potential to initiate movement along the fault, resulting in a beneficial impact and no mitigation measures would be required.

The proposed program consists of wetland habitat restoration. To facilitate the restoration, levees and tidal channels would be removed and constructed as needed to restore the natural tidal functions. Although this action would not directly or indirectly cause fault movement, it is recognized that fault rupture along the Newport-Inglewood Fault could breach a levee and result in the risk of damage to nearby structures or injury to people maintaining or visiting the site. Therefore, for informational purposes, this topic will be evaluated in the PEIR. If needed, mitigation measures will be recommended to reduce potential significant impacts relative to fault rupture.

ii) Strong seismic ground shaking?

Less than Significant Impact. The program area is located in the seismically active region of Southern California and the active Newport-Inglewood Fault crosses the program area (CDC, 1986). The program area would be subject to shaking during earthquake events. The level of ground shaking that would be experienced at the program area from the Newport-Inglewood Fault or any other active faults in the region would be a function of several factors including earthquake magnitude, type of faulting, rupture and propagation path, distance from the epicenter, earthquake depth, duration of shaking, site topography and site geology. As discussed above in the criteria on fault rupture, the proposed program would not directly or indirectly cause seismic shaking. The proposed program consists of wetland habitat restoration that would include the construction of levees and tidal channels as needed to restore the natural tidal functions. Although this

[1] The extraction of oil also results in the extraction of saline water, referred to as produced water. To maintain the existing pressures in the subsurface and prevent subsidence, the produced water is injected back into the production zone.

action would not directly or indirectly cause a seismic event, it is recognized that seismic shaking could breach a levee and result in the risk of damage to nearby structures or injury to people. Therefore, for informational purposes, the proposed program's potential to be affected by strong seismic ground shaking will be evaluated in the PEIR. If needed, mitigation measures will be recommended to reduce potential significant impacts to geology and soils.

iii) Seismic-related ground failure, including liquefaction?

Less than Significant Impact. Liquefaction is a form of earthquake induced ground failure that occurs primarily in relatively shallow, loose, granular, water-saturated soils. According to the California Department of Conservation, the program area is located in Seismic Hazard Zone for liquefaction (CDC, 1999). As discussed above, the proposed program would not directly or indirectly cause seismic shaking or seismic-induced ground failure, such as liquefaction. The proposed program consists of wetland habitat restoration that would include the construction of levees and tidal channels as needed to restore the natural tidal functions. Although this action would not directly or indirectly cause a seismic-induced ground failure, it is recognized that a seismic-induced ground failure could breach a levee and result in the risk of damage to nearby structures or injury to people. Therefore, for informational purposes, the proposed program's potential for seismic-induced ground failure, including liquefaction, will be evaluated in the PEIR. if needed, mitigation measures will be recommended to reduce potential significant impacts to geology and soils.

iv) Landslides?

No Impact. The program area is located in an area of relatively flat topography, with little likelihood of being subject to landslides or earthquake-induced landslides. According to the CDC, the program area is not expected to be located within a State-designated hazard zone for landslides under the Seismic Hazards Zoning Act of 1990 (CDC 2017). Therefore, no impact would occur. Therefore, no further discussion is warranted, and this topic will not be evaluated in the PEIR.

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

Potentially Significant Impact. The proposed program would restore wetland habitats throughout the program area, which would involve grading that could potentially disturb native soil and expose the soil to erosion. The proposed program's potential to result in substantial soil erosion or the loss of topsoil will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to geology and soils.

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?

No Impact. Impacts related to liquefaction and landslides are addressed above in Responses a.iii and a.iv, respectively. Lateral spreading results from earthquake-induced liquefaction, causing landslides associated with gentle slopes that flow laterally, like water. Land subsidence occurs when large amounts of groundwater have been withdrawn from certain types of sediments, causing the land to subside. When water is withdrawn the sediments collapse on themselves. The program area lies in a relatively flat topography where lateral spreading and subsidence and collapse are unlikely to occur. Therefore, no impact would occur. Therefore, no further discussion is warranted, and this topic will not be evaluated in the PEIR.

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?

Potentially Significant Impact. Expansive soils are fine-grained soils (generally high plasticity clays) that can undergo a significant increase in volume with an increase in water content and a significant decrease in volume with a decrease in water content. Changes in the water content of a highly expansive soil can result in severe distress to structures constructed on or against the soil. There is a potential for expansive soils to exist within the program area given the presence of fine-grained soils deposited in the currently and previously existing wetlands area and its location near waterways. The proposed program's potential to be located on expansive soil creating direct or indirect substantial risks to life or property will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to geology and soils.

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?

No Impact. The proposed program would not be expected to involve the use of septic tanks or alternative water disposal systems. Implementation of the proposed program is anticipated to connect to the City's existing sewer lines and wastewater disposal systems. Therefore, no impact would occur. Therefore, no further discussion is warranted, and this topic will not be evaluated in the PEIR.

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

Potentially Significant Impact. No paleontological resources are known be located within the program area, but there are records of vertebrate fossil localities from older Quaternary deposits near the program area (Rieboldt, 2016). Portions of the program area are underlain by Artificial Fill and Undivided Young Alluvial Fan and Channel Deposits

(Saucedo et al. 2003). Artificial Fill has no paleontological sensitivity. The Undivided Young Alluvial Fan and Channel Deposits have low paleontological sensitivity in the uppermost layers; however, these deposits increase in age with depth and fossil-bearing sediments may be encountered in deeper excavations (Rieboldt, 2016). The project would require excavation and grading in some portions of the site and ground-disturbing activities could unearth undocumented subsurface paleontological resources. Additional research will be conducted to assess the potential for the proposed project to encounter paleontological resources, which will include a database locality search at the Natural History Museum of Los Angeles County and a review of geologic maps. The proposed project's potential to directly or indirectly destroy a unique paleontological resource or site or unique geologic feature will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to paleontological resources.

References

CDC, Earthquake Fault Zones and Seismic Hazard Zones Map: Los Alamitos Quadrangle, http://gmw.conservation.ca.gov/SHP/EZRIM/Maps/LOS_ALAMITOS_EZRIM.pdf, 1989 and 1999, February 9, 2019.

CDC, CGS Information Warehouse: Landslides, http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps, accessed February 7, 2019.

Rieboldt, Sarah. 2016. *Paleontological Resources Assessment: Los Cerritos Oil Consolidation and Wetland Restoration Project, City of Long Beach, County of Los Angeles, California*. Prepared for Lyon Communities, Newport Beach. Prepared by LSA Associates, Inc., Irvine, California.

Saucedo, G.J., H.G. Greene, M.P. Kennedy, and S.P. Bezore. 2003. Geologic Map of the Long Beach 30′ x 60′ Quadrangles, California. Version 1.0. California Geological Survey. Map Scale 1:100,000.

Greenhouse Gas Emissions

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with 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?	☒	☐	☐	☐
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☒	☐	☐	☐

Discussion

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

Potentially Significant Impact. Greenhouse gas (GHG) emissions emitted by human activity are implicated in global climate change or global warming. The GHGs defined in State law are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The temporary construction activities associated with the proposed program, which would involve operation of heavy off-road equipment, on-road trucks (for deliveries and hauling), construction worker commute trips, as well as visitor trips during operations would generate GHGs. The proposed program may include potential carbon sequestration in the form of additional net new vegetation and sequestration in restored salt marsh soils. As discussed previously in the Proposed Program Overview, potential infrastructure modifications include oil well and associated pipeline abandonment and relocation. The decommissioning of existing oil operations could vary from 10 years (where agreements are already in place) to longer time frames. For oil operations that do not have agreements in place with LCWA, it is expected that overall level of oil and natural gas production would continue at about current levels until production decreases to below economically viable levels, after which oil production would stop. LCWA considered the possibility of purchasing mineral rights from oil operators, and decommissioning existing oil operations in order to implement wetland restoration on a faster timeline; however, sufficient public funding was not available to pay for the additional cost. As decommissioning of the existing oil operations would occur over time, the existing site GHG emissions would decrease. Nonetheless, implementation of the proposed program would result in the generation of GHG emissions that may directly or indirectly have potential significant impacts. Potential impacts associated with GHG emissions generated during construction and operation of the proposed program will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant GHG impacts.

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

Potentially Significant Impact. The California Global Warming Solutions Act of 2006 (Assembly Bill No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32) requires California Air Resource Board (CARB) to design and implement emissions limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020 (representing an approximate 25 percent reduction in emissions). The proposed program has the potential to increase GHG emissions and as such, has the potential to result in levels of emissions that may conflict with applicable local air quality/greenhouse gas plans and policies. The PEIR will discuss the applicable plans, policies and regulations adopted for the reduction of GHG emissions and determine whether the proposed program may have the potential to conflict with AB 32 and other regulations adopted for the purpose of reducing GHG emissions. If necessary, mitigation measures will be recommended to reduce potential significant GHG impacts.

References

California Legislative Information. Division 25.5. California Global Warming Solutions Act of 2006. Available athttp://leginfo.legislature.ca.gov/faces/codes_displayexpandedbranch.xhtml?lawCode=HSC&division=25.5.&title=&part=3.&chapter=&article=&goUp=Y; accessed on March 6, 2019.

Hazards and Hazardous Materials

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

Discussion

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

Potentially Significant Impact. The proposed program would restore wetland habitats throughout the program area, which would involve construction activities for remediation of contaminated soil and groundwater, extensive grading, revegetation, construction of new public access opportunities (including trails, visitor centers, parking lots, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities. Implementation of the proposed program's short-term construction activities would involve transport, use, and disposal of hazardous materials such as solvents, oils, grease, and cleaning fluids. In addition, hazardous materials may be needed for fueling and servicing construction equipment in the program area. The proposed program's potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials will be evaluated in the PEIR. If

necessary, mitigation measures will be recommended to reduce potential significant hazardous impacts.

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?

Potentially Significant Impact. Construction and operation of the proposed program may include the accidental release of hazardous materials associated with the remediation of contaminated soil and groundwater in areas with former oil fields. There are certain hazards associated with petroleum production operations including, but not limited to spills, blowouts, fires, and explosions (OSHA, 2019). The proposed program's potential to create a significant hazard to the public or environment involving the release of hazardous materials into the environment will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant hazardous impacts.

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

Potentially Significant Impact. The nearest existing schools to the program area are Rosie the Riveter Charter High School, located approximately 0.25-mile northeast of the program area on 690 Studebaker Road in Long Beach; Seal Beach Playgroup Preschool, located 0.35 mile west of the program area on 151 N Marina Drive in Seal Beach; J.H. McGaugh Elementary School, located approximately 0.4-mile south of the program area on 1698 Bolsa Avenue in Seal Beach, and Charles F. Kettering Elementary School, located approximately 0.7-mile north of the program area on 550 Silvera Avenue in Long Beach. No new schools are proposed in the vicinity of the program area. Given the proposed program's proximity to Riveter Charter High School, the proposed program's potential to emit hazardous emissions or handle hazardous or acutely hazardous substances or waste within one-quarter mile of an existing or proposed school will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant hazardous impacts.

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?

Potentially Significant Impact. California Government Code Section 65962.5 requires the compiling of lists of the following types of hazardous materials sites: hazardous waste facilities, hazardous waste discharges for which the State Water Quality Control Board (SWQCB) has issued certain types of orders; public drinking water wells containing detectable levels of organic contaminants; underground storage tanks with reported unauthorized releases; and solid waste disposal facilities from which hazardous waste has migrated. Given that large portion of the program area have or are actively used as oil operating facilities, the proposed program's potential to be located on a site which is

included on a list of hazardous materials sites pursuant to Government Code Section 65962.5 will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant hazardous impacts.

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?

Less than Significant. The nearest public use airport is the Long Beach Airport, located approximately 4 miles northwest of the program area, at 4100 Douglas Drive in Long Beach. According to the Los Angeles County Airport Land Use Commission Airports Interactive Map, the program area is not within the Long Beach Airport Influence Area (Los Angeles County, 2019). The program area is located within the Airport Environs Land Use Plan (AELUP) for the Joint Forces Base Los Alamitos, which is a federally owned and operated private airport facility approximately 2.5 miles northeast from the program area (Orange County, 2019). However, implementation of the proposed program is not anticipated to significantly increase the population in the program area or result an aircraft safety hazard or excessive noise due to the program area's distance from the existing airport. Note that the proposed program would not result in the construction of structures that could intersect flight paths. Therefore, the impact would be less than significant. Given the proposed program is located within the AELUP for the Joint Forces Base Los Alamitos, the proposed program's potential to result in a safety hazard or excessive noise for people residing or working in the program area will be evaluated in the PEIR but will result in a less than significant impact. No mitigation measures will be necessary.

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

No Impact. the City of Seal Beach Emergency Operations Plan provides emergency response and evacuation procedures for the city in lieu of firm routes of evacuation. These procedures are based on the number of people to be evacuated, the road capacity, and which roads may be blocked or have their capacity reduced by disaster conditions (City of Seal Beach, 2017). Similarly, the City of Long Beach General Plan Public Safety Element does not establish firm routes of evacuation, rather it provides emergency response and emergency evacuation procedures for the City based on availability of through streets, multiple access routes and bridges depending on the disaster and the street conditions at the time (City of Long Beach, 1975). The proposed program would not expect to stage or store construction materials or construction equipment on public roadways. The program would not propose any public road closures or rerouting of the existing public roadway network. Although the proposed program may generate traffic trips during construction and operation, the traffic trips would be minimal and would not interfere with an adopted emergency response plan. Therefore, the program would not substantially impair an adopted emergency response plan or emergency evacuation plan,

and no impact would occur, and no mitigation measures are required. This topic will not be evaluated in the PEIR.

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

Potentially Significant Impact. Although the program area is located in a highly urbanized area, there are wetlands located within the area that have been subject to wildfires, therefore, the proposed program's potential to expose people or structures, directly or indirectly, to significant risk or loss, injury or death involving wildland fires will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant hazardous impacts.

References

City of Long Beach, *General Plan Public Safety Element*, http://www.lbds.info/civica/filebank/blobdload.asp?BlobID=2545, 1975, accessed February 7, 2019.

Airport Land Use Commission Airports Interactive Map, http://planning.lacounty.gov/assets/obj/anet/Main.html, accessed February 7, 2019.

Occupational Safety and Health Administration, *Safety Hazards with Oil and Gas Extraction Activities*, https://www.osha.gov/SLTC/oilgaswelldrilling/safetyhazards.html, accessed February 7, 2019.

Orange County Airport Land Use Commission, *Airport Land Use Commission for Orange County Airport Planning Areas Figure 1*, http://www.ocair.com/commissions/aluc/docs/airportlu.pdf, accessed February, 2019.

Hydrology and Water Quality

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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?	☒	☐	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☒	☐	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of imperious surfaces, in a manner which would:	☒	☐	☐	☐
i) result in substantial erosion or siltation on- or off-site;	☒	☐	☐	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☒	☐	☐	☐
iii) create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☒	☐	☐	☐
iv) impede or redirect flood flows?	☒	☐	☐	☐
d) In flood hazard, tsunami, or seiche zones, risk or release of pollutants due to project inundation?	☒	☐	☐	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☒	☐	☐	☐

Address impacts to LACFCD

Discussion

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

Potentially Significant Impact. Construction activities associated with the proposed program, including clearing and grubbing, grading, excavation, and revegetation, could introduce sediment and other pollutants to surface water or groundwater, potentially impacting water quality and/or violating surface water and groundwater quality standards or waste discharge requirements. Operational activities of the proposed program, such as vegetation maintenance and periodic maintenance of access roads and trails, also have the potential to introduce sediment and other pollutants to surface water or groundwater, thereby impacting water quality such that water quality standards or waste discharge requirements are violated. Post-restoration, the new flow patterns could increase erosion from the wetlands during a large storm event, which could re-suspend sediment and potential constituents such as metals (e.g., copper, zinc, silver, and lead) and organic compounds (e.g., PAHs, pesticides, and PCBs) within the estuary. Additionally, post-

restoration, contaminated water and sediment from the watershed could be transported into the restored marsh resulting in areas of accumulated contaminated sediments. Lastly, water quality degradation could occur at ocean disposal sites if excavated program site sediments are placed there. The proposed program's potential to violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts.

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

Potentially Significant Impact. The proposed program would involve grading and excavation and, depending on the depth to groundwater, may require dewatering. While dewatering would not likely remove a substantial amount of groundwater from the basin, further analysis is necessary to determine its potential impacts to groundwater supply. The proposed program would add impervious surfaces to the program area, including bike paths, viewing areas with overlooks, parking facilities, and visitor centers, thereby reducing the potential ground surface area capable of groundwater recharge. The increase of the extent of tidal inundation could increase infiltration of salt water into the groundwater table resulting in the inland advancement of sea water intrusion. The proposed program's potential to decrease groundwater supplies or interfere substantially with groundwater recharge such that the program may impede sustainable groundwater management of the basin will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts.

c) Substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner that would:

i) result in substantial erosion or siltation on- or off-site?

Potentially Significant Impact. The existing drainage pattern of the proposed program area is determined by a variety of factors, including its topography, soil type, vegetation cover, and impervious surface cover. Proposed program construction activities, including clearing, grubbing, grading, soil remediation, and revegetation could temporarily alter drainage patterns such that substantial erosion or siltation occurs either on- or off-site. Once operational, the proposed program would permanently alter the existing drainage pattern of the program area through the lowering and breaching of existing levees, as well as the installation of new levees, berms, and water control structures. Permanent drainage pattern alterations could also result in erosion or siltation on- or off-site. Erosion could result in significant loss of habitat and/or levee destabilization. The proposed program's potential to substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner that would result in substantial erosion or siltation on- or off-site,

will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts.

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

Potentially Significant Impact. Permanent drainage pattern alterations could result in increased flooding on- or offsite. The proposed program's potential to substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which could result in flooding on- or offsite, will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts.

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?

Potentially Significant Impact. The existing drainage pattern of the proposed program area is determined by a variety of factors, including its topography, soil type, vegetation cover, and impervious surface cover. The proposed program area drains via surface runoff to the San Gabriel River and the Los Cerritos Channel, both of which are considered part of the Los Angeles County storm drain system (LADPW, 2019). Proposed program construction activities, including clearing, grubbing, grading, soil remediation, and revegetation could temporarily alter drainage patterns such that stormwater drainage system capacity is exceeded. Construction activities also have the potential to result in polluted runoff. Once operational, the proposed program would permanently alter the existing drainage pattern of the program area through the lowering and breaching of existing levees, as well as the installation of new levees, berms, and water control structures. Permanent drainage pattern alterations could also exceed stormwater drainage system capacities. As discussed in Impact (a), the proposed program has the potential to violate water quality standards during construction and operation; therefore, the proposed program has the potential to introduce pollutants to surface waters and generate sources of polluted runoff. The proposed program's potential to substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts.

iv) impede or redirect flood flows?

Potentially Significant Impact. The existing drainage pattern of the proposed program area is determined by a variety of factors, including its topography, soil type, vegetation cover, and impervious surface cover. Proposed program construction activities, including clearing, grubbing, grading, soil remediation, and revegetation could temporarily alter

drainage patterns such that flood flows are impeded or redirected. Once operational, the proposed program would permanently alter the existing drainage pattern of the program area through the lowering and breaching of existing levees, as well as the installation of new levees, berms, and water control structures. Permanent drainage pattern alterations could also impede or redirect flood flows. The proposed program's potential to substantially alter the existing drainage pattern of a site or area through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner that impedes or redirects flood flows, will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts.

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

Flood Zone A and

Potentially Significant Impact. The majority of the proposed program area is located within Flood Zone X, which is designated as an area of reduced flood risk due to levees. Some portions of the proposed program areas are located within Flood Zone A, meaning they have a 1% annual chance of flooding. A small segment of the program area is located within Flood Zone AE, which has a 1% annual chance of flooding at 9 feet NAVD (FEMA, 2019). However, increasing on-site flooding is one of the primary goals of the restoration and a desired beneficial effect of reconnecting the floodplain. Portions of the Central Area and North Area are located in an identified tsunami inundation area (State of California and Los Angeles County, 2009). The proposed program area is located adjacent to two partially enclosed bodies of water, including the San Gabriel River and Los Cerritos channel, and would be creating additional areas that would be inundated and is thus at risk for seiche. As discussed in Impact (a), the proposed program has the potential to violate water quality standards during construction and operation and could thus release pollutants if inundated by tsunami or seiche. The proposed program's potential to risk release of pollutants due to program inundation in tsunami or seiche zones will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts.

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

Potentially Significant Impact. The proposed program is located within the jurisdiction of the Los Angeles Regional Water Quality Control Board (LARWQCB), and therefore must meet the requirements of the LARWQCB Water Quality Control Plan (or Basin Plan) for the Coastal Watersheds of Los Angeles and Ventura Counties. The Basin Plan designates beneficial uses for surface water and groundwater, sets water quality objectives that must be attained or maintained, and describes implementation programs to protect all waters within its jurisdiction. As described in Impact (a), the proposed program has the potential to degrade water quality during construction and operation. Therefore, the proposed program could conflict with the Basin Plan. The proposed program's potential to conflict with or obstruct implementation of a water quality control

plan will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts.

The proposed program site is underlain by three groundwater basins. The Coastal Plain of Los Angeles (Central) and the Coastal Plain of Los Angeles (West Coast) are designated as very low priority groundwater basins by the State, while the Coastal Plain of Orange County is designated as a medium priority groundwater basin by the State (DWR, 2018), but is not critically overdrafted (DWR, 2019). The State of California plans to manage all high and medium priority groundwater basins per a groundwater management plan by January 31, 2022 (LACWD, 2019). As described in Impact (b), the proposed program has the potential to degrade groundwater quality during construction and operation. Therefore, the proposed program has the potential to conflict with implementation of a sustainable groundwater management plan. The proposed program's potential to conflict with or obstruct implementation of a sustainable groundwater management plan will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts.

References

State of California Department of Water Resources (DWR), 2018. Statewide Map of 2018 SGMA Basin Prioritization Results, December 17, 2018. Available athttps://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Basin-Prioritization/Files/2018-SGMA-Basin-Prioritization-Results_Dec17_2018_tabloid.pdf?la=en&hash=0B983B16080967D1FB3203032B8D223953225DBD; accessed on February 22, 2009.

DWR, 2019. "Bulletin 118 Groundwater Basins Subject to Critical Conditions of Overdraft–Update based on 2018 Final Basin Boundary Modifications," published February 11, 2019. Available at https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Critically-Overdrafted-Basins/Files/2018CODBasins.pdf?la=en&hash=3014D2F2299AA503C469D41BBC0E8DCFCE0267F8; accessed on February 22, 2019.

Federal Emergency Management Agency (FEMA), 2019. "FEMA Flood Map Service Center: Search By Address." Available at https://msc.fema.gov/portal/search; accessed on February 22, 2019.

Los Angeles County Department of Public Works (LADPW), 2019. "Los Angeles County Storm Drain System." Available at https://dpw.lacounty.gov/fcd/StormDrain/index.cfm; accessed on February 22, 2019.

Los Angeles County Waterworks District (LACWD), 2019. "Sustainable Groundwater Management Act." Available at https://dpw.lacounty.gov/wwd/web/about/SGMA.aspx; accessed on February 22, 2009.

State of California and Los Angeles County, 2009. Tsunami Inundation Map for Emergency Planning: Los Alamitos Quadrangle, Seal Beach Quadrangle. March 1, 2009. Available at https://www.conservation.ca.gov/cgs/Documents/Tsunami/Maps/Tsunami_Inundation_LosA; lamitosSealBeach_Quads_LosAngeles.pdf; accessed on February 22, 2009.

Land Use and Planning

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

Discussion

a) Physically divide an established community?

Less Than Significant. The program area contains large expanses of open space, oil operations and associated facilities and infrastructure, a large stormwater basin and pump station, roads and overhead utilities, and waterways. The program is located in a largely urbanized and generally built out area with a fully developed roadway system, surrounded by the Los Cerritos Channel, the AES Alamitos Energy Center and Haynes Generation Station to the north, Pacific Coast Highway and commercial-retail strip mall to the west, residential development to the south, and residential and industrial development to the east, including a Boeing office complex. The San Gabriel River bisects the program area. The proposed program would restore wetlands within the program area and construct new public access opportunities that would increase access through/along the program area. Although the program is not expected to physically divide an established community, the proposed program's relationship to adjacent existing uses will be addressed in the PEIR.

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?

Potentially Significant Impact. The program area is located entirely within the California Coastal Zone, which means it is subject to the California Coastal Act and the City of Long Beach Local Coastal Program, adopted in 1980.

The Seal Beach General Plan designates the portion of the program area within Seal Beach city boundaries as Community Facilities, Industrial – Oil Extraction, Open Space, and Commercial Service. The Seal Beach zoning map designates the program area within the Seal Beach boundaries as Specific Plan Regulation, Open Space Natural, and Oil Extraction. The Hellman Ranch Specific Plan applies to the entire portion of the program area within Seal Beach.

According to the City of Long Beach General Plan Land Use Designations map, the majority of the program area within Long Beach is not assigned a specific General Plan Land Use District, with the exception of the Alamitos Bay Partners site, and portions of the Long Beach Property and Callaway Marsh sites which have a designation of Land Use District No. 7, Mixed Uses. The City of Long Beach is currently updating their General Plan and once adopted would change the land use designations of the properties within Long Beach to an Open Space PlaceType with a Specific Plan Overlay. The portion of the program area within the City of Long Beach boundaries has a zoning designation of Planned Development District 1 (PD-1) within the Southeast Community Plan Area (SEADIP). The City of Long Beach is in the process of replacing the SEADIP specific plan with the Southeast Area Specific Plan 2060, which would change the zoning of the site and introduce new development standards (setbacks, densities, heights, buffers, etc.) and design guidelines.

The proposed program's potential to conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the program will be evaluated in the PEIR.

References

None.

Mineral Resources

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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?	☒	☐	☐	☐
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?	☒	☐	☐	☐

Discussion

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?

Potentially Significant Impact. The program area is largely developed with past and present oil fields. Development of the proposed program would result in the eventual removal and abandonment per DOGGR standards of the existing oil wells and restoration of the wetlands. When completed, the proposed program would preclude the ability in the future to extract subsurface resources from the program area. Because the Los Cerritos Restoration Plan is a long-term program that would be implemented in phases, and oil resources are located in vast subsurface deposits that can be withdrawn from various locations, the program is not expected to prevent the loss of availability of a known mineral resource of value to the region and state. However, the proposed program's impacts on the ability to extract a known mineral resource that is of value to the region and the state will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to mineral resources.

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?

Potentially Significant Impact. According to the California Geological Survey, the program area has been in an area identified as a Mineral Resource Zone 3 (MRZ-3), which indicates the area contains mineral deposits the significance of which cannot be evaluated from available data (CGS, 1982). The program's potential to result in the loss of availability of a locally important mineral resource recovery site will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to mineral resources.

References

California Geological Survey (CGS), *Generalized Aggregate Resource Classification Map San Gabriel Valley and Adjacent Production –Consumption Regions*, ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sr/SR_143/PartIV/Plate_4-1.pdf, 1982, accessed February 8, 2019.

Noise

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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?	☒	☐	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☒	☐	☐	☐

Discussion

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?

Potentially Significant Impact. The program area is within a predominantly urbanized area that contains various sources of noise, including noise associated with traffic from roadways and noise from maintenance activities and other noises associated with the operation of oil fields. During program-related construction activities, the use of heavy-duty equipment would generate noise on a temporary basis. The proposed program may generate additional vehicle trips from the establishment of the visitor centers and public access enhancements that could contribute to noise levels on a permanent basis. The proposed program's potential to result in exposure to noise levels in excess of standards established in the Seal Beach and Long Beach General Plans, noise ordinances, or applicable standards of other agencies will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to noise.

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

Potentially Significant Impact. The proposed program would have the potential to generate and expose people to excessive groundborne vibration and noise levels during short-term construction activities. The proposed program's potential to result in the generation of excessive vibration or groundborne noise levels during construction and operation will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to noise.

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?

Potentially Significant Impact. The program area is not located within the vicinity of a public airport or public use airport. However, the Boeing Seal Beach (rooftop) Heliport is located within the program area. Further, the proposed site is located within the airport influence area of the Joint Forces Training Base Los Alamitos. Therefore, the proposed program's potential to expose people working in the program area (at the proposed visitor centers or as part of wetland restoration maintenance activities) to excessive noise due to proximity to a private airstrip will be evaluated in the PEIR. If necessary, mitigation measures will be recommended to reduce potential significant impacts to noise.

References

None.

Population and Housing

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

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 program would provide temporary new employment to the area during the construction activities for remediation of contaminated soil and groundwater, extensive grading, revegetation, construction of new public access opportunities (including trails, visitor centers, parking lots, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities. Construction jobs are anticipated to be filled by residents in the local area or by commuters within the larger Los Angeles Metropolitan Area.

Employment opportunities during operation of the proposed program would be mainly maintenance workers and operation of the visitors' centers and volunteers; these are not anticipated to directly increase the population or housing in the area, as positions are anticipated to be filled by local residents or regional commuters.

Indirect growth from extension of roads and infrastructure would not be anticipated, as the proposed program would not add any new roadways and would be served by existing infrastructure with minor proposed upgrades and connections to accommodate the proposed program.

Therefore, the program would not induce substantial unplanned population growth in an area, either directly or indirectly, and no impact would occur, and no mitigation measures are required. This topic will not be evaluated in the PEIR.

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

No Impact. The proposed program is not sited on lands that contain people or housing units. On occasion, homeless individuals camp in the program area. The Cities of Seal Beach and Long Beach actively work on an ongoing basis with homeless individuals to identify appropriate shelters off-site. Therefore, implementing the proposed program would not displace substantial numbers of people, necessitating the construction of replacement housing elsewhere. The proposed program's potential to displace substantial numbers of housing units will not be evaluated in the PEIR.

References

None.

Public Services

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

Discussion

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

i) Fire protection?

Potentially Significant Impact. Local fire protection and prevention services (and paramedic services) within the program area would be provided by the City of Long Beach Fire Department (LBFD) and the Orange County Fire Authority (OCFA) (City of Long Beach, 2016). New development within the proposed program would be designed to meet modern fire safety codes, including access requirements and fire suppression and emergency response systems. The LBFD and OCFA would check and review site design plans for compliance with appropriate safety codes prior to construction within their jurisdictions. Implementation of the proposed program would increase the daytime visitor and employee population. The proposed program's potential to adversely impact fire protection services will be evaluated in the PEIR.

ii) Police protection?

Potentially Significant Impact. Police protection and emergency services within the program area would be provided by the Seal Beach Police Department and Long Beach Police Department (LBPD). Implementation of the proposed program would increase the daytime visitor and employee population. The proposed program's potential to adversely impact police protection services will be evaluated in the PEIR.

iii) Schools?

No Impact. The proposed program would not include the development of any residential land uses. However, during construction of the proposed program, it is expected that most of these workers would live in the region and would commute to the program area from where their children are already enrolled in school. Even if these workers came from out of the area, they would likely return to their out-of-town residences once the facilities were built and would not take their children out of their current schooling situation. Therefore, substantial temporary increases in population that would adversely affect local school populations are not expected. During operation of the proposed program, the number of employees is not expected to increase significantly over existing operations, and no impact on schools is anticipated. The proposed program's potential to adversely impact schools will not be evaluated in the PEIR.

iv) Parks?

Potentially Significant Impact. Recreational facilities and programs in the City of Seal Beach are provided by the Community Services and Recreation Department and in the City of Long Beach area by Long Beach Parks, Recreation and Marine Department (PRM). Within the City of Seal Beach there are 18 parks, four community centers, one tennis center, one gymnasium, and one aquatics facility (City of Seal Beach, 2013). Within the City of Long Beach there are 170 parks with 26 community centers, two historic sites, two major tennis courts and five golf courses (PRM, 2019). The proposed program would restore wetland habitats throughout the program area and create new public access opportunities and viewpoints. Potential public access improvements and visitor amenities would include construction of new pedestrian trails and bike paths, elevated perimeter pedestrian walkways, educational or interpretive features, viewing areas with overlooks, new and improved parking facilities, and visitor centers. These improvements would connect to existing trails in and around the program area, including the San Gabriel River Trail located on the south bank of the river, develop and enhance public access, recreation, and educational opportunities within the program area. Restoration of the program area would attract visitors to the site and has the potential to attract additional visitors to nearby parks as well. The proposed program's potential to adversely impact park services will be evaluated in the PEIR.

Coordinate w/ LACFCD

v) Other public facilities?

No Impact. The Orange County Public Libraries provides library services to the City of Seal Beach, while the Long Beach Public Library provides library services to the City of Long Beach. The proposed program would not include any residential land uses or any land uses that would induce a substantial permanent population. Thus, the proposed program's potential to adversely impact libraries will not be evaluated in the PEIR.

References

City of Long Beach Fire Department, official website, http://www.longbeach.gov/fire/, accessed February 8, 2019.

City of Long Beach Police, official website, http://www.longbeach.gov/police/contact-us/contact-us/, accessed February 8, 2019.

City of Long Beach Parks, Recreation and Marine (PRM), official website, http://www.longbeach.gov/park/, accessed February 8, 2019.

City of Seal Beach, official website, http://www.sealbeachca.gov/About-Us/New-Residents, accessed February 9, 2019.

City of Seal Beach, Parks and Community Services Master Plan, http://www.sealbeachca.gov/Portals/0/Documents/APPROVED%20MASTER%20PLAN%20-%20Website.pdf, accessed February 8, 2019.

OC Public Libraries, official website, http://www.ocpl.org/libloc/sb, accessed February 9, 2019.

Recreation

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☒	☐	☐	☐

Discussion

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?

Less Than Significant Impact. The proposed program would restore wetland habitats throughout the program area and create new public access opportunities and viewpoints. Potential public access improvements and visitor amenities would include construction of new pedestrian trails and bike paths, elevated perimeter pedestrian walkways, educational or interpretive features, viewing areas with overlooks, new and improved parking facilities, and visitor centers. These improvements would develop and enhance public access, recreation, and educational opportunities within the program area. Although no new housing is proposed that would increase the residential population, restoration of the program area would attract visitors to the site and has the potential to attract additional visitors to nearby sites as well. The proposed program's potential to increase the use of existing neighborhood and regional parks such that substantial physical deterioration of the facilities would occur or be accelerated will be evaluated in the PEIR.

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

Potentially Significant Impact. The proposed program would include the construction of new pedestrian trails and bike paths, elevated perimeter pedestrian walkways, educational or interpretive features, viewing areas with overlooks, new and improved parking facilities, and visitor centers. The proposed recreational facilities' potential to have an adverse physical effect on the environment will be evaluated in the PEIR.

References

None.

Transportation

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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?	☒	☐	☐	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☒	☐	☐	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
d) Result in inadequate emergency access?	☐	☐	☐	☒

Discussion

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

Potentially Significant Impact. Implementation of the proposed program has the potential to affect the transportation system and increase traffic through the hauling of excavated materials and debris, the transport of construction equipment, the delivery of construction materials, and travel by construction workers to and from the program area. Although program operation will introduce new trips due to the visitor centers and pedestrian trails, these trips are not anticipated to occur during peak commuting hours. The program area is served by several public transit options, including Long Beach Transit and Orange County Transit Authority (OCTA). Long Beach Transit operates bus routes 121, 131, and 171 along the Pacific Coast Highway, adjacent to the program area. OCTA operates bus route 1 along the Pacific Coast Highway adjacent to the project area. The City of Long Beach General Plan Mobility Element identifies a Class II Bike Lane along the Pacific Coast Highway, which runs along the western boundary of the program area and the Class 1 San Gabriel Bike River Trail, which runs along the south bank of the river within the program boundary (City of Long Beach, 2013). Sidewalk improvements would be implemented in accordance with the Cities of Seal Beach and Long Beach along adjacent streets in the program area, improving public access around the perimeter and to the program area. A crosswalk would be installed on 2nd Street to provide access to the proposed visitor center. Program construction would not likely require the temporary closure of any streets, bus stops, the Class II bike lane, or the Class 1 San Gabriel River Bike Trail, but the proposed program's potential to conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities will be evaluated in the PEIR.

Coordinate w/ LACFCD

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

Potentially Significant Impact. Implementation of the proposed program has the potential to affect the transportation system through the hauling of excavated materials and debris, the transport of construction equipment, the delivery of construction materials, and travel by construction workers to and from the program area. Program operation would also introduce new trips due to the visitor centers and pedestrian trails. The program also proposes sidewalk enhancements and crosswalks. As described above, the program area is served by several public transit options, including Long Beach Transit and Orange County Transit Authority. Per CEQA Guidelines, Section 15064.3(b), the program's transportation impacts would be evaluated in the PEIR based on vehicle miles traveled compared to existing conditions and proximity to existing transit.

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

Potentially Significant Impact. The proposed program would involve changes to sidewalks and crosswalks. New driveways would be constructed to access the parking lots for the proposed visitor centers. The program's potential to increase hazards due to a geometric design feature or incompatible uses will be evaluated in the PEIR.

d) Result in inadequate emergency access?

No Impact. The proposed program would not expect to stage or store construction materials or construction equipment on public roadways. The program would not propose any public road closures or rerouting of the existing public roadway network. Although the proposed program may generate traffic trips during construction and operation, the traffic trips would be minimal and would not interfere with emergency access. Therefore, the program would not substantially impair emergency access, and no impact would occur, and no mitigation measures are required. This topic will not be evaluated in the PEIR.

References

City of Long Beach, *General Plan Mobility Element*, http://www.lbds.info/civica/filebank/blobdload.asp?BlobID=4112, 2013, accessed February 8, 2019.

Tribal Cultural Resources

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

Discussion

a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Potentially Significant Impact. The program area is considered sensitive for Native American cultural resources. The coastal and inland areas have been occupied by Native American groups since as early as 12,000 years ago. Consultation conducted as part of another project within the Los Cerritos Wetlands identified a potential Tribal Cultural Landscape that may be eligible for the National Register as a Tribal Cultural Property

(California Coastal Commission, 2018). According to Native American representatives, the Los Cerritos Wetlands are located between the village sites of Puvungna and Motuucheyngna and is considered by them to be part of the larger cultural landscape of Puvungna and the surrounding villages. Therefore, potential significant impacts may occur. Additional background research on the program area, including California Native American Heritage Commission Sacred Lands File Search and consultation with Native Americans who are traditionally and cultural affiliated with the geographic area of the program area, will be conducted. The proposed program's potential to cause a substantial adverse change in the significance of a tribal cultural resource will be evaluated in the PEIR. Mitigation measures will be recommended to reduce potential significant impacts to tribal resources.

References

California Coastal Commission. 2018. Staff Report: Regular Calendar – Application No. 9-18-0395 (Beach Oil Minerals [BOM] and the Los Cerritos Wetlands Authority [LCWA]). State of California Natural Resources Agency, Sacramento, California.

Utilities and Service Systems

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☒	☐	☐	☐
b) Have sufficient water supplies available to serve the project and responsibly foreseeable future development during normal, dry and multiple dry years?	☒	☐	☐	☐
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?	☒	☐	☐	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☒	☐	☐	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☒	☐	☐	☐

Discussion

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

Potentially Significant Impact. The proposed program would restore wetland habitats throughout the program area, which would involve construction activities for remediation of contaminated soil and groundwater, extensive grading, revegetation, construction of new public access opportunities (including trails, visitor centers, parking lots, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities. Implementation of the program may increase the demand for water services compared to the existing water demand. Additionally, temporary construction activities and long-term operations could require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. The proposed program's potential to result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, or telecommunications facilities will be evaluated in the PEIR.

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

Potentially Significant Impact. The potable water supply for the program area would be provided by the Seal Beach Utility Services or Long Beach Water Department, or other local water purveyor which uses groundwater, imported surface water and recycled supplies. Construction of the proposed program would use water for various purposes, such as dust suppression, mixing and pouring concrete, and other construction related activities. Typically, the majority of water used during construction is associated with dust suppression during grading and trenching, which is generally performed by water trucks. Water usage during construction would be temporary and not substantial and would not exceed the existing supply. The proposed program would introduce new visitor centers which would also require water for their operations. The proposed program's potential to have sufficient water supplies available to serve the program area and responsibly foreseeable future development during normal, dry and multiple dry years will be evaluated in the PEIR.

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

Potentially Significant Impact. The proposed program would introduce public access opportunities (including trails, visitor centers, parking lots, and viewpoints) that would induce additional population (e.g., volunteers and users of the visitor centers) on-site, which may increase wastewater generated from the program area. Therefore, the PEIR will analyze the potential impacts associated with the program's wastewater generation and wastewater treatment capacity in the region.

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

Potentially Significant Impact. Construction of the proposed program would generate solid waste, including short-term construction debris. The materials that would be removed would be disposed of at a local recycling facility equipped to handle construction debris in a timely manner and in accordance to all applicable laws and regulations. Further, debris associated with the removal and abandonment of the oil wells would be in accordance with the terms of the Surface Use Agreement which requires abandonment to a standard acceptable to the State of California Division of Oil, Gas, and Geothermal Resources. Trash removal would occur as needed within the restored wetlands. The Los Angeles County Flood Control District operates and maintains trash booms and nets in other flood control channels and a similar boom/net could be installed upstream of the Central Area across the San Gabriel River. If a trash boom/net was installed, the Los Angeles County Flood Control District would inspect the trash net weekly and remove trash from the boom/net as necessary. The proposed program would

introduce a new land use to the site, two visitor centers and public access opportunities, which would increase the daytime population of visitors on-site. As a result of this increase in the daytime population, the generation of solid waste on the program area would increase. Therefore, the PEIR will evaluate waste generated by the project and planned solid waste disposal capacity for the region.

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

Potentially Significant Impact. The proposed program would be required to comply with all applicable federal, state, County, and City statutes and regulations pertaining to solid waste disposal. This includes compliance with AB 939, the California Solid Waste Management Act, which requires each city in the state to divert at least 50 percent of their solid waste from landfill disposal through source reduction, recycling, and composting. AB 341 builds upon AB 939 and requires jurisdictions to implement mandatory commercial recycling with a statewide 75 percent diversion rate (from landfill disposal) by 2020. The proposed program's potential to conflict with federal, state, and local statutes and regulations related to solid waste will be evaluated in the PEIR.

References

City of Long Beach Water Department, official website, http://www.lbwater.org/sewage-treatment, accessed February 8, 2019.

Wildfire

Issues (and Supporting Information Sources):	Potentially Significant Impact	Less Than Significant with 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?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

Discussion

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

No Impact. The program area is not located in a very high fire hazard severity zone (CAL FIRE, 2019). The City of Seal Beach Emergency Operations Plan provides emergency response and evacuation procedures for the city in lieu of firm routes of evacuation. These procedures are based on the number of people to be evacuated, the road capacity, and which roads may be blocked or have their capacity reduced by disaster conditions (City of Seal Beach, 2017). Similarly, the City of Long Beach General Plan Public Safety Element does not establish firm routes of evacuation, rather it provides that emergency response and emergency evacuation procedures for the City will be based on availability of through streets, multiple access routes and bridges depending on the disaster and the street conditions at the time (City of Long Beach, 1975). The proposed program would not expect to stage or store construction materials or construction equipment on public roadways. The program would not propose any public road closures or rerouting of the existing public roadway network. Although the proposed program may generate traffic trips during construction and operation, the traffic trips would be minimal and would not interfere with an adopted emergency response plan. Therefore, the program would not substantially impair an adopted emergency response plan or emergency evacuation plan, and no impact would occur, and no mitigation measures are required. This topic will not be evaluated in the PEIR.

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

No Impact. The program area is not located in a very high fire hazard severity zone (CAL FIRE, 2019). The program area is located in a highly urbanized area with an overall flat terrain. Therefore, the program would not exacerbate wildfire risks due to slope, prevailing winds or other factors, and thereby expose program occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire, and no impact would occur, and no mitigation measures are required. This topic will not be evaluated in the PEIR.

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

No Impact. The program area is not located in a very high fire hazard severity zone (CAL FIRE, 2019). The proposed program would not involve the installation or maintenance of roads, fuel breaks, emergency water sources, or other utilities. Although work on power lines would occur, it would involve raising existing overhead electrical lines which would not exacerbate fire risk. Therefore, the program would not require the installation or maintenance of associated infrastructure that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment, and no impacts would occur, and no mitigation measures are required. This topic will not be evaluated in the PEIR.

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 program area is not located in a very high fire hazard severity zone (CAL FIRE, 2019). Therefore, the program would not 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, and no impacts would occur, and no mitigation measures are required. This topic will not be evaluated in the PEIR.

References

City of Long Beach, *General Plan Public Safety Element*, http://www.lbds.info/civica/filebank/blobdload.asp?BlobID=2545, 1975, accessed February 7, 2019.

City of Seal Beach, Emergency Operations Plan, *http://www.sealbeachca.gov/Portals/0/Documents/LinkClick.aspx?fileticket=RCGspjGTVtw%3D&portalid=0*, accessed February 21, 2019.

Mandatory Findings of Significance

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporated*	*Less Than Significant Impact*	*No Impact*
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?	☒	☐	☐	☐
b) Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

Discussion

a) 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?

Potentially Significant Impact. As discussed above, the proposed program could impact the habitat of fish or wildlife spaces, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of rare or endangered plant or animal. The proposed program could also result in potentially significant impacts with regard to historic and cultural resources. The PEIR will analyze and document such potentially significant impacts.

b) 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)?

Potentially Significant Impact. The potential for cumulative impacts occurs when the independent impacts of the proposed program are combined with impacts from other developments to result in impacts that are greater than the impacts of the proposed program alone. Located within the vicinity of the program area are other current and reasonably foreseeable projects whose development, in conjunction with that of the

proposed program, may contribute to potential cumulative impacts. Impacts of the program's construction and implementation on both an individual and cumulative basis will be addressed in the PEIR for the following subject areas: aesthetics, air quality, biological resources, cultural resources, energy, geology and soils, GHG emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, public services (fire protection, police protection and parks), recreation, transportation and traffic, tribal cultural resources, and utilities and service systems.

With regard to cumulative effects for the issues of agriculture and forest resources, population and housing, and other public services (schools and libraries) as well as parks and recreation and wildfire, the proposed program would not combine with related projects or other cumulative growth to result in significant cumulative impacts. With regard to agricultural and forest resources, the proposed program would have no impact to these resources and would not combine with other projects to result in cumulative impacts. With regard to population and housing, schools, and libraries, the proposed program would not include permanent or temporary housing, and thus would not increase the permanent population of the area, and would not directly contribute to population growth, and the need for schools and libraries within the program area vicinity. With regard to wildfire, the program area is not located within a very high fire hazard severity zone and would have no effect on the potential risk of wildfire and would not combine with other projects to result in cumulative impacts. Therefore, cumulative impacts for these subject areas would be considered less than significant and will not be evaluated in the PEIR.

c) Have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?

Potentially Significant Impact. The proposed program could result in potentially significant impacts with regard to aesthetics, air quality, biological resources, cultural resources, energy, geology and soils, GHG emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, public services (fire protection, police protection and parks), recreation, transportation and traffic, tribal cultural resources, and utilities and service systems. Implementation of the proposed program could result in significant impacts that may result in substantial adverse effects on human beings. These potential effects will be analyzed in the PEIR.

References

None.

ALAMITOS BARRIER PROJECT
Observation Wells Within Los Cerritos Wetlands

Attachment:
LACFCD existing
Infrastructure

DEPARTMENT OF TRANSPORTATION
DISTRICT 7 – Office of Regional Planning
100 S. MAIN STREET, MS 16
LOS ANGELES, CA 90012
PHONE (213) 897-9140
FAX (213) 897-1337
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MAR 30 2019
LOS CERRITOS
WETLANDS AUTHORITY

Making Conservation a California Way of Life.

March 28, 2019

Sally Gee
Los Cerritos Wetland Authority
100 N. Old San Gabriel Canyon Rd.,
Azusa, CA 91702

RE: Los Cerritos Wetlands Restoration Plan – Notice of Preparation (NOP)
SCH# 2019039050
GTS # 07-LA-2019-02363
Vic. LA-1/PM: 0.08

Dear Ms. Sally Gee:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project's NOP. The proposed program would restore wetland, transitional, and upland habitats throughout the program area. This would involve remediation of contaminated soil, grading, revegetation, construction of new public access opportunities, construction of flood management facilities, and modification of existing infrastructure and utilities.

After reviewing this project's NOP Caltrans has the following comments:

- A Transportation Impact Study is required if the project will result in potentially significant or significant transportation impacts. Please consider including the following items when evaluating the project's potential impact to the circulation system:

1) During construction trucks for hauling of excavated materials/debris, transport of construction equipment, the delivery of construction materials, and trips from construction workers will all potentially increase traffic. Please assess/address the impact of the added traffic volumes to the State Route 1 (SR-1) and State Route 22 (SR-22) on and off-ramp locations in the Programmatic Environmental Impact Report (PEIR).

2) Please provide the number of trips generated that will be accessing the SR-1 and SR-22 interchange.

3) The Initial Study indicated that significant earth-moving activities will take place during construction. Caltrans recommends vehicles are covered when hauling dirt/sediment. Please be cautious of lost sediment spilling onto roads and state facilities during this process as this can adversely impact state facilitates.

4) Any transportation of heavy construction equipment and/or materials which requires use of oversized-transport vehicles on State highways will need a Caltrans transportation permit. We recommend large size truck trips be limited to off-peak commute periods

5) Please consider the installation of a sidewalk along Studebaker Road. This addition would greatly

enhance accessibility and promote active transportation to the proposed project

Further information included for your consideration:

Caltrans seeks to promote safe, accessible multimodal transportation. Methods to reduce pedestrian and bicyclist exposure to vehicles improve safety by lessening the time that the user is in the likely path of a motor vehicle. These methods include the construction of physically separated facilities such as sidewalks, raised medians, refuge islands, and off-road paths and trails, or a reduction in crossing distances through roadway narrowing.

Caltrans recommends the project to consider the use of methods such as, but not limited to, pedestrian and bicyclist warning signage, flashing beacons, crosswalks, signage and striping, be used to indicate to motorists that they should expect to see and yield to pedestrians and bicyclists. Visual indication from signage can be reinforced by road design features such as lane widths, landscaping, street furniture, and other design elements.

An encroachment permit will be required for any project on, or in the vicinity of, the Caltrans right of way. Please note that any modifications to the State facility (SR-1 or SR-22) will be subject to additional review by the Office of Permits prior to issuance of the permit.

Storm water run-off is a sensitive issue for Los Angeles County. Please be mindful that projects should be designed to discharge clean run-off water. Discharge of storm water run-off is not permitted onto State Highway facilities without a storm water management plan.

If you have any questions regarding these comments, please contact project coordinator Reece Allen, at reece.allen@dot.ca.gov and refer to GTS# 07-LA-2019-02363.

Sincerely,

MIYA EDMONSON
IGR/CEQA Branch Chief

cc: Scott Morgan, State Clearinghouse

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

GAVIN NEWSOM, GOVERNOR

CALIFORNIA COASTAL COMMISSION

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April 8, 2019

Sally Gee
Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Rd.
Azusa, California 91702

Re: **Comments on Notice of Preparation of a Draft Environmental Impact Report for the Los Cerritos Wetlands Restoration Plan**

Dear Ms. Gee:

Thank you for the opportunity to provide input on the Los Cerritos Wetlands Authority's ("LCWA") preparation of an Environmental Impact Report ("EIR") for the Los Cerritos Wetlands Plan in the East Long Beach and North Seal Beach areas in Los Angeles and Orange counties. The proposed restoration plan will identify restoration designs for 503 acres of land on both sides of the San Gabriel River. The Plan seeks to restore tidal wetlands and upland habitat across 17 individual sites and will involve remediation of contaminated soil, grading, revegetation, construction of new public access ways, construction of flood management facilities and modification of existing infrastructure.

All project sites within the Plan are located within the Coastal Zone. Portions of the site are also within the City of Long Beach's ("City") Local Coastal Program (LCP) jurisdiction and within the boundary of the City's Southeast Area Development and Improvement Plan (SEADIP). Development proposed under the Plan will require a Coastal Development Permit (CDP) from the Commission for portions of the project within Seal Beach and areas outside the City of Long Beach's LCP jurisdiction. The City is in the process of updating the SEADIP plan to be included in the City's certified LCP. This process is ongoing and the timing of potential certification of the revised SEADIP plan (i.e., SEASP) could affect which entity issues a CDP for certain portions of LCWA's proposed Plan. For the portions of the Plan that fall within the Commission's jurisdiction, the standard of review that the Commission will use to evaluate a CDP is the policies in Chapter 3 of the Coastal Act, with the City's LCP used as guidance.

The Coastal Commission will refer to the contents of this EIR in its evaluation of any projects proposed as part of the Plan. Potential Coastal Act issues raised by the Project include: siting of hazardous industrial development; seismic and subsidence hazards; soil and groundwater contamination; oil spills and release of other hazardous materials; water and air quality; hydrology; greenhouse gas emissions; noise; visual impacts; recreation and public access; cultural and tribal resources; wetlands and other environmentally sensitive habitats; and cumulative impacts.

The Notice of Preparation ("NOP") identifies each of these as potentially significant impacts that will be evaluated in the EIR. To assist us in our review of proposed project elements, we request that the EIR specifically address the following:

General:

1. For all issue areas, please include in the EIR all relevant Coastal Act and LCP policies, an analysis of the project's conformity with the identified policies, and any identification of mitigation measures necessary to bring the project into conformity with the Coastal Act and LCP (where applicable).

2. Please include a thorough discussion of the regulatory jurisdictions of the various project sites and components. Also, please include a complete list of permits required by local, state and federal agencies to implement the proposed project.

3. Please clarify how the evaluation and possible approval of the proposed project fits in with the City's ongoing efforts to update and certify the updated SEADIP (i.e., SEASP).

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4. Please include a detailed description of existing and future oil and gas development within the Program Area and how this development will interact with proposed restoration areas.

5. Please describe in detail how long-term management management of created habitat areas will be implemented and funded.

6. Please describe a proposed baseline monitoring program and the framework for adaptive management that LCWA will use to track restoration success.

Environmental Factors

7. Aesthetics: Please assess if this project will be visible from any scenic view corridors or other public viewing areas like parks, etc. Please include visual simulations of this project's effects on the coastal scenic vista from public viewing areas.

8. Biological Resources: Please analyze the extent of noise, vibration, traffic and other impacts, if any, on surrounding biological resources including wetlands, sensitive habitats and species. The noise analysis should identify all sensitive receptors and evaluate peak noise and nighttime noise for the different phases of Plan Implementation.

9. Cultural and Tribal Resources: Please analyze impacts to known and unknown cultural and tribal resources as well as potential impacts to sacred places and Tribal Cultural

Landscapes. We recommend reaching out to tribal representatives involved in the Beach Oil Minerals Partners Oil Consolidation and Wetlands Restoration Project.

10. Hazards and Hazardous Materials: As part of the hazards analysis, please provide detailed mapping of utilities and pipelines located within the Plan Area. The EIR should include a section analyzing the potential for oil spills from existing oil infrastructure and potential effects on restored habitat areas, including in a seismic event, flood, or other hazard-inducing event. The EIR should also identify mitigation measures necessary to minimize the potential for adverse impacts from releases of oil and other hazardous materials from adjacent or nearby properties.

11. Hydrology and Water Quality: Please include hydrologic modeling and analysis that uses current data to evaluate anticipated tidal flows within future wetland areas and determine flood potential and risks associated with proposed projects. Modeling should include analysis of future flows with and without circulation provided by the Haynes Power Plant (as applicable). In addition, please include analysis of various sea level rise scenarios and the potential effect of rising sea level on proposed projects. This modeling and analysis will also inform determination of impacts under other Coastal Act policies.

12. Recreation: Please analyze the impact of the proposed public access and recreation plan elements on existing and proposed wetland and other habitat areas. It will be important to understand both the recreational benefits from adding public access within the proposed wetland and other habitat areas and the potential adverse effects on the biological resources from introducing public access to sensitive areas.

We greatly appreciate the outreach, regular updates and other communications between the LCWA and Coastal Commission staff as Plan details develop and the EIR commences. We look forward to working closely with the LCWA as it prepares a Draft EIR. Please do not hesitate to call me at 415-396-9708 if we can be of assistance at any phase of the environmental review process.

Sincerely,

KATE HUCKELBRIDGE
Senior Environmental Scientist

Cc: Dani Ziff, CCC Long Beach

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

April 17, 2019

Ms. Sally Gee
Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Road
Azusa, CA 91702
sgee@rmc.ca.gov

Subject: Comments on the Notice of Preparation of a Draft Program Environmental Impact Report for the Los Cerritos Wetlands Restoration Plan Project; SCH# 2019039050; Los Angeles and Orange Counties

Dear Ms. Gee:

The California Department of Fish and Wildlife (CDFW) has reviewed the Notice of Preparation (NOP) for the Los Cerritos Wetlands Restoration Plan (Project) Draft Program Environmental Impact Report (DPEIR) prepared pursuant to the California Environmental Quality Act (Public Resources Code 21000 et seq.) with the Los Cerritos Wetlands Authority (LCWA) acting as lead agency.

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

CDFW's Role

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the State [Fish & Game Code §§ 711.7, subdivision (a) & 1802; Public Resources Code § 21070; CEQA Guidelines § 15386, subdivision (a)]. CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (Id., § 1802). Similarly, for purposes of CEQA, CDFW is directed to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect state fish and wildlife resources.

CDFW is also submitting comments as a Responsible Agency under CEQA (Public Resources Code § 21069; CEQA Guidelines § 15381). CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code, including lake and streambed alteration (LSA) regulatory authority (Fish & Game Code § 1600 et seq.). Likewise, to the extent implementation of the Project as proposed may result in "take" (see Fish & Game Code § 2050) of any species protected under the California Endangered Species Act (CESA; Fish & Game Code § 2050 et seq.) or the Native Plant Protection Act (NPPA; Fish & Game Code §1900 et seq.), CDFW recommends the project proponent obtain appropriate authorization under the Fish and Game Code.

Project Location: The 503-acre Project site is located in northern Seal Beach and eastern Long Beach, straddling the border of Orange and Los Angeles Counties.

Background/History: A portion of the Project site has been evaluated as part of a project-level Environmental Impact Report (EIR) for the Los Cerritos Wetlands Oil Consolidation and Restoration Project (SCH# 2016041083). The EIR evaluated the environmental impacts associated with the consolidation of existing oil operations and implementation of a wetlands habitat restoration project. The EIR was certified by the City of Long Beach City Council on January 16, 2018. In December 2018, the California Coastal Commission approved an application by Beach Oil Minerals (Synergy) of Long Beach, for new oil production and wetlands restoration project that includes: 1) construction and operation of two oil production facilities, including drilling and operation of up to 120 new wells; 2) construction and operation of 2,200 ft. of above-ground oil pipeline; 3) decommissioning of existing oil facilities on two sites; 4) conversion of existing building to a visitor's center for Los Cerritos Wetlands; and, 5) implementation of wetlands restoration as part of a mitigation bank on the northern portion of the existing oil field (northern Synergy Oil field site).

LCWA previously developed a Los Cerritos Wetlands Final Conceptual Restoration Plan, which was adopted by the LCWA Board of Directors in August 2015. The Los Cerritos Wetlands Final Conceptual Restoration Plan identified three restoration designs and provided an alternatives analyses report for habitat enhancement and improved public access.

Project Description/Objectives: The proposed Project would restore wetland, transitional, and upland habitats throughout four areas identified as North, Central, Isthmus, and South. This would involve remediation of contaminated soil, grading, re-vegetation, construction of new public access opportunities (including trails, visitor centers, parking lots, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities. Project objectives include restoring tidal wetland processes and functions, maximizing contiguous habitat areas, buffering human disturbance, and creating public access and an interpretive program.

COMMENTS AND RECOMMENDATIONS

CDFW offers the following comments and recommendations to assist LCWA in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources.

Specific Comments

1) Conceptual Restoration Plan. The NOP references the Los Cerritos Wetlands Final Conceptual Restoration Plan, which describes restoration alternatives. It is unclear from the NOP whether the Los Cerritos Wetlands Final Conceptual Restoration Plan has undergone independent scientific review or public review under CEQA. The DPEIR should incorporate any relevant planning documents related to scientific and/or public review for the Final Conceptual Restoration Plan by reference, and/or include them in the appendices of the DPEIR (CEQA Guidelines § 15150).

2) Mitigation Bank. CDFW has been coordinating with the LCWA on Upper Los Cerritos Wetlands Mitigation Bank, a potential mitigation bank within northern Synergy Oil field site at

Steamshovel Slough. Regarding potential mitigation banking proposed within the Project site:

a) The DPEIR should provide a clear description of how the potential mitigation bank relates to the Los Cerritos Wetlands Final Conceptual Restoration Plan and/or the proposed Project;

b) The DPEIR should describe the exact location and extent where mitigation banking will take place. This description should include an analysis of existing habitat types, areas proposed for restoration/creation, and accompanying figures. If biological resources will be adversely impacted through habitat type conversion, the DPEIR should identify, analyze, and appropriately mitigate these impacts;

c) The DPEIR should identify any potential slant drilling or other mineral production techniques occurring underneath conserved areas proposed for banking. Potential impacts to conserved areas should be disclosed and analyzed in the DPEIR. Mitigation measures to bring such impacts below a level of significance should be included in the DPEIR;

d) Long-term habitat values, and therefore the quality of habitat-level credits, may be significantly adversely impacted by variables such as levels of public access/anthropogenic disturbance and mining infrastructure/operations. We encourage LCWA to minimize these variables within the overall Project site and especially in areas which are being considered for mitigation banking, whenever feasible; and

e) Mitigation banking inquiries may be directed to the CDFW's South Coast Region Banking Coordinator, Warren Wong, at (858) 627-3997 or via email at warren.wong@wildlife.ca.gov.

3) Previous Mitigation. The DPEIR should clearly identify whether any part of the Project site was used as mitigation for previous municipal, county, or state projects. Replacement mitigation for impacts to areas where mitigation has already occurred in association with other CEQA actions should be considered separate from and in addition to compensation for other biological resources impacts. In such cases, appropriate and in-kind mitigation at no less than a 10:1 mitigation ratio should be provided.

4) Potentially Existing Biological Resources. CDFW recommends surveys for the following wildlife species be conducted and the results included in the DPEIR: 1) the south coast marsh vole (*Microtus californicus stephensi*), a Species of Special Concern (SSC) limited to grasslands and tidal marshes from Ventura to Orange County; and, 2) southern California salt marsh shrew (*Sorex ornatus salicornicus*), a Species of Special Concern. The southern California salt marsh shrew is confined to coastal salt marshes and uses Salicornia marshes, saltgrass marshes, dense *Salix* spp. and *Scirpus* sp. thickets in Los Angeles, Orange, and Ventura counties (Williams 1986). Available data indicate that there may be as few as six disjunct patches of salt marsh habitat remaining and only two California salt marsh shrew populations (Bolster, 1998). Although the species may meet the threshold of threatened or endangered, the southern California salt marsh shrew is currently designated as a SSC because of the need for additional information. Impacts to SSC, including the south coast marsh vole and southern California salt marsh shrew, should be considered a significant direct and cumulative adverse effect under CEQA without implementing

appropriate avoidance and/or mitigation measures (CEQA Guidelines §§ 15064, 15065, 15125[c] and 15380).

If either species is determined to be present in the Project site, CDFW recommends designing the Project in a manner to avoid any impacts to these species, their habitat, or the processes that support their habitat.

5) Known Existing Biological Resources. CDFW recommends the DPEIR evaluate how the proposed alternative designs account for the presence and avoidance of the following special status species documented on the Project site: southern tarplant (*Centromadia parryi australis*), Belding's savannah sparrow (*Passerculus sandwichensis*), burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), wandering skipper butterfly (*Panoquina errans*), wooly seablite *(Sueada taxifolia*), estuary seablite (*Suaeda esteroa*), and mudflat tiger beetle (*Cicindela trifasciata sigmoidea*). In addition, the Project site provides foraging areas for the fully protected, federally-listed, and State-listed California least tern (*Sterna antillarum browni*) and California brown pelican (*Pelicanus occidnetalis*). Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock or as part of an approved Natural Community Conservation Plan (Fish and Game Code § 2835). The DPEIR should identify how the proposed Project will avoid impacts to California least tern, California brown pelican and any other fully protected species.

6) Newport-Inglewood Fault. Due to the Newport-Inglewood fault crossing through the Project site, there is a potential for spills and leaks of existing wells, proposed slant-drilled wells, pipelines, and other facilities containing materials hazardous to substantially impact critically important wildlife including rare aquatic habitat areas. The DPEIR should identify and analyze potential impacts related to the Newport-Inglewood fault given that it is inter-connected with the Los Cerritos wetland complex.

7) Existing and Future Oil and Gas Development. The DPEIR should include a detailed description of existing and future oil and gas development within the Project site and how this development will interact with proposed restoration areas. An analysis of noise, vibration, traffic, and other impacts from oil/gas operations on biological resources including wetlands, sensitive habitats, and species should be conducted. The noise/vibration analysis should identify all sensitive receptors and evaluate peak and night-time noise for the different phases of Project implementation.

General Comments

1) Project Description and Alternatives. To enable CDFW to adequately review and comment on the proposed Project from the standpoint of the protection of plants, fish, and wildlife, we recommend the following information be included in the DPEIR:

   a) A complete discussion of the purpose and need for, and description of, the proposed Project, including all staging areas and access routes to the construction and staging areas; and,

   b) A range of feasible alternatives to Project component location and design features to ensure that alternatives to the proposed Project are fully considered and evaluated

(CEQA Guidelines § 15126.6). The alternatives should avoid or otherwise minimize direct and indirect impacts to sensitive biological resources and wildlife movement areas.

2) LSA Agreements. As a Responsible Agency under CEQA, CDFW has authority over activities in streams and/or lakes that will divert or obstruct the natural flow; or change the bed, channel, or bank (including vegetation associated with the stream or lake) of a river or stream; or use material from a streambed. For any such activities, the project applicant (or "entity") must provide written notification to CDFW pursuant to section 1600 et seq. of the Fish and Game Code. Based on this notification and other information, CDFW determines whether a LSA Agreement with the applicant is required prior to conducting the proposed activities. CDFW's issuance of an LSA Agreement for a project that is subject to CEQA will require related environmental compliance actions by CDFW as a Responsible Agency. As a Responsible Agency, CDFW may consider the CEQA document prepared by the local jurisdiction (Lead Agency) for the Project. To minimize additional requirements by CDFW pursuant to section 1600 *et seq.* and/or under CEQA, the DPEIR should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the LSA Agreement[1].

   a) The Project area supports aquatic, riparian, and wetland habitats; therefore, a preliminary jurisdictional delineation of the streams and their associated riparian habitats should be included in the DPEIR. The delineation should be conducted pursuant to the U. S. Fish and Wildlife Service (USFWS) wetland definition adopted by the CDFW (Cowardian, 1970). Some wetland and riparian habitats subject to CDFW's authority may extend beyond the jurisdictional limits of the U.S. Army Corps of Engineers' section 404 permit and Regional Water Quality Control Board section 401 Certification.

   b) In areas of the Project site which may support ephemeral streams, herbaceous vegetation, woody vegetation, and woodlands also serve to protect the integrity of ephemeral channels and help maintain natural sedimentation processes; therefore, CDFW recommends effective setbacks be established to maintain appropriately-sized vegetated buffer areas adjoining ephemeral drainages.

   c) Project-related changes in drainage patterns, runoff, and sedimentation should be included and evaluated in the DPEIR.

3) Wetlands Resources. CDFW, as described in Fish and Game Code section 703(a), is guided by the Fish and Game Commission's policies. The Wetlands Resources policy (http://www.fgc.ca.gov/policy/) of the Fish and Game Commission "…seek[s] to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California. Further, it is the policy of the Fish and Game Commission to strongly discourage development in or conversion of wetlands. It opposes, consistent with its legal authority, any development or conversion that would result in a reduction of wetland acreage or wetland habitat values. To that end, the Commission opposes wetland development proposals unless, at a minimum, project mitigation assures there will be 'no net loss' of either wetland habitat values or acreage. The Commission strongly prefers mitigation which would achieve expansion of wetland acreage and enhancement of wetland habitat values."

[1] A notification package for a LSA may be obtained by accessing the CDFW's web site at www.wildlife.ca.gov/habcon/1600.

a) The Wetlands Resources policy provides a framework for maintaining wetland resources and establishes mitigation guidance. CDFW encourages avoidance of wetland resources as a primary mitigation measure and discourages the development or type conversion of wetlands to uplands. CDFW encourages activities that would avoid the reduction of wetland acreage, function, or habitat values. Once avoidance and minimization measures have been exhausted, the Project must include mitigation measures to assure a "no net loss" of either wetland habitat values, or acreage, for unavoidable impacts to wetland resources. Conversions include, but are not limited to, conversion to subsurface drains, placement of fill or building of structures within the wetland, and channelization or removal of materials from the streambed. All wetlands and watercourses, whether ephemeral, intermittent, or perennial, should be retained and provided with substantial setbacks, which preserve the riparian and aquatic values and functions for the benefit to on-site and off-site wildlife populations. CDFW recommends mitigation measures to compensate for unavoidable impacts be included in the DPEIR and these measures should compensate for the loss of function and value.

b) The Fish and Game Commission's Water policy guides CDFW on the quantity and quality of the waters of this state that should be apportioned and maintained respectively so as to produce and sustain maximum numbers of fish and wildlife; to provide maximum protection and enhancement of fish and wildlife and their habitat; encourage and support programs to maintain or restore a high quality of the waters of this state; prevent the degradation thereof caused by pollution and contamination; and, endeavor to keep as much water as possible open and accessible to the public for the use and enjoyment of fish and wildlife. CDFW recommends avoidance of water practices and structures that use excessive amounts of water, and minimization of impacts that negatively affect water quality, to the extent feasible (Fish & Game Code § 5650).

4) CESA. CDFW considers adverse impacts to a species protected by CESA to be significant without mitigation under CEQA. As to CESA, take of any endangered, threatened, candidate species, or State-listed rare plant species that results from the Project is prohibited, except as authorized by state law (Fish and Game Code §§ 2080, 2085; Cal. Code Regs., tit. 14, §786.9). Consequently, if the Project, Project construction, or any Project-related activity during the life of the Project will result in take of a species designated as endangered or threatened, or a candidate for listing under CESA, CDFW recommends that the Project proponent seek appropriate take authorization under CESA prior to implementing the Project. Appropriate authorization from CDFW may include an Incidental Take Permit (ITP) or a consistency determination in certain circumstances, among other options [Fish & Game Code, §§ 2080.1, 2081, subds. (b) and (c)]. Early consultation is encouraged, as significant modification to a Project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, may require that CDFW issue a separate CEQA document for the issuance of an ITP unless the Project CEQA document addresses all Project impacts to CESA-listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of an ITP. For these reasons, biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA ITP.

5) Biological Baseline Assessment. To provide a complete assessment of the flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, sensitive, regionally and locally unique species, and sensitive habitats, the DPEIR should include the following information:

a) Information on the regional setting that is critical to an assessment of environmental impacts, with special emphasis on resources that are rare or unique to the region [CEQA Guidelines, § 15125(c)];

b) A thorough, recent, floristic-based assessment of special status plants and natural communities, following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (see https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline);

c) Floristic, alliance- and/or association-based mapping and vegetation impact assessments conducted at the Project site and within the neighboring vicinity. *The Manual of California Vegetation*, second edition, should also be used to inform this mapping and assessment (Sawyer, 2008). Adjoining habitat areas should be included in this assessment where site activities could lead to direct or indirect impacts offsite. Habitat mapping at the alliance level will help establish baseline vegetation conditions;

d) A complete, recent, assessment of the biological resources associated with each habitat type on site and within adjacent areas that could also be affected by the project. CDFW's California Natural Diversity Data Base (CNDDB) in Sacramento should be contacted to obtain current information on any previously reported sensitive species and habitat. CDFW recommends that CNDDB Field Survey Forms be completed and submitted to CNDDB to document survey results. Online forms can be obtained and submitted at http://www.dfg.ca.gov/biogeodata/cnddb/submitting_data_to_cnddb.asp;

e) A complete, recent, assessment of rare, threatened, and endangered, and other sensitive species on site and within the area of potential effect, including California SSC and California Fully Protected Species (Fish & Game Code, §§ 3511, 4700, 5050 and 5515). Species to be addressed should include all those which meet the CEQA definition of endangered, rare or threatened species (CEQA Guidelines, § 15380). Seasonal variations in use of the project area should also be addressed. Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with CDFW and the USFWS; and,

f) A recent, wildlife and rare plant survey. CDFW generally considers biological field assessments for wildlife to be valid for a one-year period, and assessments for rare plants may be considered valid for a period of up to three years. Some aspects of the proposed project may warrant periodic updated surveys for certain sensitive taxa, particularly if build out could occur over a protracted time frame, or in phases.

6) Biological Direct, Indirect, and Cumulative Impacts. To provide a thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts, the following should be addressed in the DPEIR:

a) A discussion of potential adverse impacts from lighting, noise, human activity, exotic species, and drainage. The latter subject should address Project-related changes on drainage patterns and downstream of the project site; the volume, velocity, and

frequency of existing and post-Project surface flows; polluted runoff; soil erosion and/or sedimentation in streams and water bodies; and, post-Project fate of runoff from the project site. The discussion should also address the proximity of the extraction activities to the water table, whether dewatering would be necessary and the potential resulting impacts on the habitat (if any) supported by the groundwater. Mitigation measures proposed to alleviate such Project impacts should be included;

b) A discussion regarding indirect Project impacts on biological resources, including resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands (e.g., preserve lands associated with a NCCP (Fish and Game Code § 2800 et. seq.). Impacts on, and maintenance of, wildlife corridor/movement areas, including access to undisturbed habitats in adjacent areas, should be fully evaluated in the DPEIR;

c) An analysis of impacts from land use designations and zoning located nearby or adjacent to natural areas that may inadvertently contribute to wildlife-human interactions. A discussion of possible conflicts and mitigation measures to reduce these conflicts should be included in the DPEIR; and,

d) A cumulative effects analysis, as described under CEQA Guidelines section 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.

7) Avoidance, Minimization, and Mitigation for Sensitive Plants. The DPEIR should include measures to fully avoid and otherwise protect sensitive plant communities from Project-related direct and indirect impacts. CDFW considers these communities to be imperiled habitats having both local and regional significance. Plant communities, alliances, and associations with a statewide ranking of S-1, S-2, S-3 and S-4 should be considered sensitive and declining at the local and regional level. These ranks can be obtained by querying the CNDDB and are included in *The Manual of California Vegetation* (Sawyer et al. 2008).

8) Compensatory Mitigation. The DPEIR should include mitigation measures for adverse Project-related impacts to sensitive plants, animals, and habitats. Mitigation measures should emphasize avoidance and reduction of Project impacts. For unavoidable impacts, on-site habitat restoration or enhancement should be discussed in detail. If on-site mitigation is not feasible or would not be biologically viable and therefore not adequately mitigate the loss of biological functions and values, off-site mitigation through habitat creation and/or acquisition and preservation in perpetuity should be addressed. Areas proposed as mitigation lands should be protected in perpetuity with a conservation easement, financial assurance and dedicated to a qualified entity for long-term management and monitoring. Under Government Code section 65967, the lead agency must exercise due diligence in reviewing the qualifications of a governmental entity, special district, or nonprofit organization to effectively manage and steward land, water, or natural resources on mitigation lands it approves.

9) Long-term Management of Mitigation Lands. For proposed preservation and/or restoration, the DPEIR should include measures to protect the targeted habitat values from direct and indirect negative impacts in perpetuity. The objective should be to offset the Project-induced

qualitative and quantitative losses of wildlife habitat values. Issues that should be addressed include (but are not limited to) restrictions on access, proposed land dedications, monitoring and management programs, control of illegal dumping, water pollution, and increased human intrusion. An appropriate non-wasting endowment should be set aside to provide for long-term management of mitigation lands.

10) Nesting Birds. CDFW recommends that measures be taken to avoid Project impacts to nesting birds. Migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (Title 50, § 10.13, Code of Federal Regulations). Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests including raptors and other migratory nongame birds (as listed under the Federal MBTA). Proposed Project activities including (but not limited to) staging and disturbances to native and nonnative vegetation, structures, and substrates should occur outside of the avian breeding season which generally runs from February 1 through September 1 (as early as January 1 for some raptors) to avoid take of birds or their eggs. If avoidance of the avian breeding season is not feasible, CDFW recommends surveys by a qualified biologist with experience in conducting breeding bird surveys to detect protected native birds occurring in suitable nesting habitat that is to be disturbed and (as access to adjacent areas allows) any other such habitat within 300-feet of the disturbance area (within 500-feet for raptors). Project personnel, including all contractors working on site, should be instructed on the sensitivity of the area. Reductions in the nest buffer distance may be appropriate depending on the avian species involved, ambient levels of human activity, screening vegetation, or possibly other factors.

11) Translocation/Salvage of Plants and Animal Species. Translocation and transplantation is the process of moving an individual from the Project site and permanently moving it to a new location. CDFW generally does not support the use of, translocation or transplantation as the primary mitigation strategy for unavoidable impacts to rare, threatened, or endangered plant or animal species. Studies have shown that these efforts are experimental and the outcome unreliable. CDFW has found that permanent preservation and management of habitat capable of supporting these species is often a more effective long-term strategy for conserving sensitive plants and animals and their habitats.

12) Moving out of Harm's Way. The proposed Project is anticipated to result in clearing of natural habitats that support many species of indigenous wildlife. To avoid direct mortality, we recommend that a qualified biological monitor approved by CDFW be on-site prior to and during ground and habitat disturbing activities to move out of harm's way special status species or other wildlife of low mobility that would be injured or killed by grubbing or Project-related construction activities. It should be noted that the temporary relocation of on-site wildlife does not constitute effective mitigation for the purposes of offsetting project impacts associated with habitat loss. If the project requires species to be removed, disturbed, or otherwise handled, we recommend that the DPEIR clearly identify that the designated entity shall obtain all appropriate state and federal permits.

13) Revegetation/Restoration Plan. Plans for restoration and re-vegetation should be prepared by persons with expertise in southern California ecosystems and native plant restoration techniques. Plans should identify the assumptions used to develop the proposed restoration strategy. Each plan should include, at a minimum: a) the location of restoration sites and assessment of appropriate reference sites; b) the plant species to be used, sources of local propagules, container sizes, and seeding rates; c) a schematic depicting the mitigation area;

d) a local seed and cuttings and planting schedule; e) a description of the irrigation methodology; f) measures to control exotic vegetation on site; g) specific success criteria; h) a detailed monitoring program; i) contingency measures should the success criteria not be met; and, j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity. Monitoring of restoration areas should extend across a sufficient time frame to ensure that the new habitat is established, self-sustaining, and capable of surviving drought.

a) CDFW recommends that local on-site propagules from the Project area and nearby vicinity be collected and used for restoration purposes. On-site seed collection should be initiated in the near future to accumulate sufficient propagule material for subsequent use in future years. On-site vegetation mapping at the alliance and/or association level should be used to develop appropriate restoration goals and local plant palettes. Reference areas should be identified to help guide restoration efforts. Specific restoration plans should be developed for various Project components as appropriate.

b) Restoration objectives should include providing special habitat elements where feasible to benefit key wildlife species. These physical and biological features can include (for example) retention of woody material, logs, snags, rocks and brush piles (see Mayer and Laudenslayer, 1988).

CONCLUSION

CDFW appreciates the opportunity to comment on the NOP for the Los Cerritos Wetlands Restoration Plan to assist LCWA in identifying, avoiding and mitigating Project impacts on biological resources. If you have any questions or comments regarding this letter, please contact Kelly Schmoker-Stanphill (Senior Environmental Scientist, Specialist), at (626) 335-9092 or by email at Kelly.schmoker@wildlife.ca.gov.

Sincerely,

Randy F. Ridgy for

Erinn Wilson
Environmental Program Manager I

cc: CDFW
Erinn Wilson – Los Alamitos
Gail Sevrens – San Diego
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Scott Morgan (State Clearinghouse)

References

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SENT VIA USPS AND E-MAIL: April 2, 2019

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Los Cerritos Wetlands Authority
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Azusa, CA 91702

Notice of Preparation of a Draft Environmental Impact Report for the Proposed Los Cerritos Wetlands Restoration Plan

South Coast Air Quality Management District (SCAQMD) staff appreciates the opportunity to comment on the above-mentioned document. SCAQMD staff's comments are recommendations regarding the analysis of potential air quality impacts from the Proposed Project that should be included in the Draft Environmental Impact Report (EIR). Please send SCAQMD a copy of the Draft EIR upon its completion. Note that copies of the Draft EIR that are submitted to the State Clearinghouse are not forwarded to SCAQMD. Please forward a copy of the Draft EIR directly to SCAQMD at the address shown in the letterhead. **In addition, please send with the Draft EIR all appendices or technical documents related to the air quality, health risk, and greenhouse gas analyses and electronic versions of all air quality modeling and health risk assessment files[1]. These include emission calculation spreadsheets and modeling input and output files (not PDF files). Without all files and supporting documentation, SCAQMD staff will be unable to complete our review of the air quality analyses in a timely manner. Any delays in providing all supporting documentation will require additional time for review beyond the end of the comment period.**

Air Quality Analysis

SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. SCAQMD staff recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analyses. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. More recent guidance developed since this Handbook was published is also available on SCAQMD's website at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993). SCAQMD staff also recommends that the Lead Agency use the CalEEMod land use emissions software. This software has recently been updated to incorporate up-to-date state and locally approved emission factors and methodologies for estimating pollutant emissions from typical land use development. CalEEMod is the only software model maintained by the California Air Pollution Control Officers Association (CAPCOA) and replaces the now outdated URBEMIS. This model is available free of charge at: www.caleemod.com.

On March 3, 2017, the SCAQMD's Governing Board adopted the 2016 Air Quality Management Plan (2016 AQMP), which was later approved by the California Air Resources Board on March 23, 2017. Built upon the progress in implementing the 2007 and 2012 AQMPs, the 2016 AQMP provides a regional

[1] Pursuant to the CEQA Guidelines Section 15174, the information contained in an EIR shall include summarized technical data, maps, plot plans, diagrams, and similar relevant information sufficient to permit full assessment of significant environmental impacts by reviewing agencies and members of the public. Placement of highly technical and specialized analysis and data in the body of an EIR should be avoided through inclusion of supporting information and analyses as appendices to the main body of the EIR. Appendices to the EIR may be prepared in volumes separate from the basic EIR document, but shall be readily available for public examination and shall be submitted to all clearinghouses which assist in public review.

perspective on air quality and the challenges facing the South Coast Air Basin. The most significant air quality challenge in the Basin is to achieve an additional 45 percent reduction in nitrogen oxide (NOx) emissions in 2023 and an additional 55 percent NOx reduction beyond 2031 levels for ozone attainment. The 2016 AQMP is available on SCAQMD's website at: http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan.

SCAQMD staff recognizes that there are many factors Lead Agencies must consider when making local planning and land use decisions. To facilitate stronger collaboration between Lead Agencies and SCAQMD to reduce community exposure to source-specific and cumulative air pollution impacts, SCAQMD adopted the Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning in 2005. This Guidance Document provides suggested policies that local governments can use in their General Plans or through local planning to prevent or reduce potential air pollution impacts and protect public health. SCAQMD staff recommends that the Lead Agency review this Guidance Document as a tool when making local planning and land use decisions. This Guidance Document is available on SCAQMD's website at: http://www.aqmd.gov/docs/default-source/planning/air-quality-guidance/complete-guidance-document.pdf. Additional guidance on siting incompatible land uses (such as placing homes near freeways or other polluting sources) can be found in the California Air Resources Board's *Air Quality and Land Use Handbook: A Community Health Perspective*, which can be found at: http://www.arb.ca.gov/ch/handbook.pdf. Guidance[2] on strategies to reduce air pollution exposure near high-volume roadways can be found at: https://www.arb.ca.gov/ch/rd_technical_advisory_final.PDF.

SCAQMD has also developed both regional and localized air quality significance thresholds. SCAQMD staff requests that the Lead Agency compare the emissions to the recommended regional significance thresholds found here: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf. In addition to analyzing regional air quality impacts, SCAQMD staff recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LSTs can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the Proposed Project, it is recommended that the Lead Agency perform a localized analysis by either using the LSTs developed by SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds.

When specific development is reasonably foreseeable as result of the goals, policies, and guidelines in the Proposed Project, the Lead Agency should identify any potential adverse air quality impacts and sources of air pollution that could occur using its best efforts to find out and a good-faith effort at full disclosure in the Draft EIR. The degree of specificity will correspond to the degree of specificity involved in the underlying activity which is described in the Draft EIR (CEQA Guidelines Section 15146). When quantifying air quality emissions, emissions from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and

[2] In April 2017, CARB published a technical advisory, *Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways: Technical Advisory*, to supplement CARB's Air Quality and Land Use Handbook: A Community Health Perspective. This technical advisory is intended to provide information on strategies to reduce exposures to traffic emissions near high-volume roadways to assist land use planning and decision-making in order to protect public health and promote equity and environmental justice. The technical advisory is available at: https://www.arb.ca.gov/ch/landuse.htm.

entrained dust). Air quality impacts from indirect sources, such as sources that generate or attract vehicular trips, should be included in the analysis. Furthermore, for phased projects where there will be an overlap between construction and operation, the emissions from the overlapping construction and operational activities should be combined and compared to SCAQMD's regional air quality CEQA *operational* thresholds to determine the level of significance.

In the event that the Proposed Project generates or attracts vehicular trips, especially heavy-duty diesel-fueled vehicles, it is recommended that the Lead Agency perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("*Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*") can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mobile-source-toxics-analysis. An analysis of all toxic air contaminant impacts due to the use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the Proposed Project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate these impacts. Pursuant to CEQA Guidelines Section 15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed. Several resources are available to assist the Lead Agency with identifying possible mitigation measures for the Proposed Project, including:

- Chapter 11 "Mitigating the Impact of a Project" of SCAQMD's *CEQA Air Quality Handbook*
- SCAQMD's CEQA web pages available here: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies
- SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook for controlling construction-related emissions and Rule 1403 – Asbestos Emissions from Demolition/Renovation Activities
- CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures* available here: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

Alternatives

In the event that the Proposed Project generates significant adverse air quality impacts, CEQA requires the consideration and discussion of alternatives to the project or its location which are capable of avoiding or substantially lessening any of the significant effects of the project. The discussion of a reasonable range of potentially feasible alternatives, including a "no project" alternative, is intended to foster informed decision-making and public participation. Pursuant to CEQA Guidelines Section 15126.6(d), the Draft EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the Proposed Project.

Permits

In the event that implementation of the Proposed Project requires a permit from SCAQMD, SCAQMD should be identified as a Responsible Agency for the Proposed Project in the Draft EIR. For more information on permits, please visit SCAQMD's webpage at: http://www.aqmd.gov/home/permits. Questions on permits can be directed to SCAQMD's Engineering and Permitting staff at (909) 396-3385.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's webpage (http://www.aqmd.gov).

SCAQMD staff is available to work with the Lead Agency to ensure that project air quality impacts are accurately evaluated and mitigated where feasible. Please contact me at (909) 396-3308, should you have any questions.

Sincerely,

Lijin Sun

Lijin Sun, J.D.
Draft Supervisor, CEQA IGR
Planning, Rule Development & Area Sources

LS
LAC190313-04
Control Number

WATER RECLAMATION
SOLID WASTE MANAGEMENT

COUNTY SANITATION DISTRICTS
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Chief Engineer and General Manager

RECEIVED
IN19-00056
APR 05 2019
LOS CERRITOS
WETLANDS AUTHORITY

April 3, 2019

Ref. Doc. No.: 4959987

Ms. Sally Gee
Los Cerritos Wetlands Authority
100 North Old San Gabriel Canyon Road
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Dear Ms. Gee:

NOP for Los Cerritos Wetlands Restoration Plan

The Sanitation Districts of Los Angeles County (Districts) received a Notice of Preparation of a Draft Environmental Impact Report (NOP) for the subject project on March 12, 2019. The majority of the proposed project area is located within the jurisdictional boundaries of District No. 3. We offer the following comments:

1. The proposed project may impact existing and/or proposed Districts' facilities (e.g. trunk sewers, recycled waterlines, etc.) over which it will be constructed. Districts' facilities are located directly under and/or cross directly beneath the proposed project alignment. The Districts cannot issue a detailed response to or permit construction of, the proposed project until project plans and specification that incorporate Districts' facilities are submitted for our review. To obtain copies of as-built drawings of the Districts' facilities within the project limits, please contact the Districts' Engineering Counter at engineeringcounter@lacsd.org or (562) 908-4288, extension 1205. When project plans that incorporate our facilities have been prepared, please submit copies of the same to the Engineering Counter for our review and comment.

2. Availability of sewer capacity depends upon project size and timing of connection to the sewerage system. Because there are other proposed developments in the area, the availability of trunk sewer capacity should be verified as the project advances. Please submit a copy of the project's build-out schedule to the undersigned to ensure the project is considered when planning future sewerage system relief and replacement projects.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2717.

Very truly yours,

Adriana Raza
Customer Service Specialist
Facilities Planning Department

AR:ar

cc: Engineering Counter
A. Howard

DOC 4994105.D03

OC Public Works
Integrity, Accountability, Service, Trust
Shane L. Silsby, Director

April 8, 2019 NCL-19-005

Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Rd.
Azusa, CA 91702

Subject: Draft Environmental Impact Report for the Los Cerritos Wetlands Restoration Plan

Dear Ms. Sally Gee:

Thank you for the opportunity to comment on the Draft Environmental Impact Report for the Los Cerritos Wetlands Restoration Plan. The County of Orange offers the following comments for your consideration.

OC Infrastructure Programs /Flood Programs/Hydrology

1. It appears that the proposed project could have a potential significant impact on the Orange County Flood Control District (OCFCD) facilities. Los Alamitos Channel (Facility No.C01), Federal Storm Channel (Facility No.C01S06), Los Alamitos Retarding Basin (Facility No.C01B01), and Los Alamitos Pump Station (Facility No.C01PS1) are in the subject project's vicinity. A map/exhibit should clearly identify and indicate regional flood control facilities that will likely be impacted by the proposed project. Drainage Facility Base maps that depict existing local and regional drainage facilities owned by the OCFCD are available for review at http://www.ocflood.com/docs/drawings

2. The proposed program should not worsen existing conditions or shift flooding problems upstream or downstream of proposed developments. Appropriate mitigation measures should be provided to address adverse impacts, and minimize increased runoff resulting from the project.

3. A discussion of such impacts supported by hydrology and hydraulics analyses, and mitigation measures, including erosion and scour in natural watercourses, should be included in the next submittals.

4. Hydrologic and hydraulic analyses should evaluate and compare quantitatively the runoff volumes, peak flow rate increases, and adequacy and capacity of existing drainage facilities. All appropriate studies (if necessary) must conform to the current guidelines and criteria as specified in the Orange County Hydrology Manual (OCHM), Addendum No. 1 to the OCHM, and the OCFCD Design Manual.

5. Since the City of Seal Beach is responsible for land use planning and development within City limits, the City should review and approve all local hydrology and hydraulic analyses including the needed 100-year flood protection for proposed changes to the developments within the project area.

6. The City of Seal Beach, as floodplain administrators, should ensure that floodplains are properly identified and that structures are designed in conformance with local floodplain ordinances, and Federal Emergency Management Agency (FEMA) regulations.

7. All work within or adjacent to any OCFCD right-of-way for flood control facilities shall be conducted so as not to adversely impact channel's structural integrity, hydraulic flow conditions, access and maintainability. Furthermore, all proposed projects within OCFCD's right-of-way should be reviewed and approved by OC Public Works, and the work should be conducted only after an encroachment permit has been obtained. For information regarding the permit application process and other details please refer to the Encroachment Permits Section link on OC Public Works' website http://www.ocpublicworks.com/ds/permits/encroachment_permits. Technical reviews and approvals for the proposed work will be accomplished within the permit process.

If you have any questions regarding these comments, please contact Sahar Parsi at (714) 647-3988 or Penny Lew at (714) 647-3990 in OC Infrastructure Programs or Cindy Salazar at (714) 667-8870 in OC Development Services.

Sincerely,

Richard Vuong, Manager, Planning Division
OC Public Works Service Area/OC Development Services
300 North Flower Street
Santa Ana, California 92702-4048
Richard.Vuong@ocpw.ocgov.com

cc: Sahar Parsi, OC Flood Programs/Hydrology & Floodplain Management
Penny Lew, OC Flood Programs/Hydrology & Floodplain Management

From: Sally Gee
Sent: Friday, April 12, 2019 1:48 PM
To: Reema Shakra; Ryan Todaro
Cc: Raiven Greenberg; eric@tidalinfluence.com
Subject: Fw: Los Cerritos Wetlands Restoration Plans NOP-DEIR
Attachments: Additional LACFCD comments.pdf; LACFCD Existing Infrastructures.pdf

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Hi Reema,

Meant to forward these to you sooner, but didn't get the chance to.

Thanks,
Sally

From: Toan Duong <TDUONG@dpw.lacounty.gov>
Sent: Tuesday, April 9, 2019 1:17 PM
To: Sally Gee
Cc: Long Thang; Jose Suarez; Alex Mikhailpoor; Liana Poghosyan
Subject: Los Cerritos Wetlands Restoration Plans NOP-DEIR

Ms. Sally Gee
Los Cerritos Wetlands Authority

Thank you for the opportunity to review the Notice Of Preparation of a Draft Environmental Impact Report (DEIR) for the subject project. The following comments from the Los Angeles County Public Works Department (Public Works) and the Los Angeles County Flood Control District (LACFCD) are for your information and consideration:

1. The LACFCD is also a required permitting agency for this project. Any proposed construction affecting LACFCD facilities must comply with Public Works design standards and mitigations provided. For permit information, please contact Mr. Sam Chin of Public Works, Land Development Division, Encroachment Permit and Inspection Section, at (626) 458-4921 or schin@dpw.lacounty.gov.

2. If the project will result in this land being inundated by a 1% annual chance flood, please consult with the National Flood Insurance Program (NFIP) Floodplain Managers for the Cities of Long Beach and Seal Beach to ascertain whether FEMA's regulations for the NFIP will require a Conditional Letter of Map Revision (CLOMR) and final LOMR from FEMA.

3. LACFCD has existing infrastructure within the project area that need continuous access to for measuring groundwater, sampling, and maintenance. Please provide and confirm that LACFCD will have access to its facilities (See attached map – "LACFCD Existing Infrastructure".)

4. Provide and maintain vehicular access for maintenance purposes along the San Gabriel River on both Right and Left bank.

5. The North Area of the Project shall establish a new easement and maintenance road to access along the Left bank of Los Cerritos Channel.

6. Sediment removal within Los Cerritos Channel and San Gabriel River impacted by the Project shall be assessed and removed in order to restore flow capacity per the original as-built plans.

7. LACFCD shall not be responsible for the new wetland improvements or its maintenance except for our responsibility to maintain Los Cerritos Channel, San Gabriel River, associated easements and our maintenance roads.

8. A long-term Operation and Maintenance Agreement shall be established identifying LACFCD's maintenance responsibilities and others.

9. It is our understanding that:

   9.1. LCWA previously developed a concept that included technical reports that provide baseline data on proposed project could potentially have significant impacts on hydrology and water quality mainly during construction.

   9.2. Operational activities of the proposed Post-restoration such as vegetation maintenance and periodic maintenance of roads and trails have the potential to introduce sediment and other pollutants to surface or groundwater, thereby impacting water quality such that water standards or waste discharge requirements could be violated.

   9.3. New flow patterns after restoration could increase erosion from the wetlands during large storm event, which could re-suspend sediment and potential constituents such as metals (e.g. cooper zinc, silver and lead), and organic compounds (e.g. PAHs pesticides and PBCs) within the estuary. Additionally, post-restoration, contaminated water and sediment from the watershed could be transported into the restored marsh resulting in areas of accumulated contaminated sediments. Lastly, water quality degradation could occur at ocean disposal sites if excavated program sediments are placed there.

10. Please see additional comments (via markups) in the attached copy of the Initial Study.

We request the opportunity to review the future environmental document when it is available. If you have any questions regarding these comments, please contact Mr. Long Thang of Public Works, Stormwater Planning Division at (626) 458 5119 or lthang@dpw.lacounty.gov.

Thank you.

Toan Duong
Civil Engineer
Los Angeles County Public Works
Office: (626) 458-4921

STATE OF CALIFORNIA Gavin Newsom, Governor

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

RECEIVED
IN19-00055
APR 05 2019
LOS CERRITOS
WETLANDS AUTHORITY

April 2, 2019

Sally Gee
Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Rd.
Azusa, CA 91702

RE: SCH# 2019039050 Los Cerritos Wetlands Restoration Plan, Los Angeles and Orange County

Dear Ms. Gee:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
   a. A brief description of the project.
   b. The lead agency contact information.
   c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
   d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).
   a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
   a. Alternatives to the project.
   b. Recommended mitigation measures.
   c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
   a. Type of environmental review necessary.
   b. Significance of the tribal cultural resources.
   c. Significance of the project's impacts on tribal cultural resources.
   d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
   a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
   b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
    a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
    b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
        i. Planning and construction to avoid the resources and protect the cultural and natural context.
        ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
        i. Protecting the cultural character and integrity of the resource.
        ii. Protecting the traditional use of the resource.
        iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

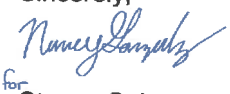
2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
    a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
    b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
    a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
    b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
    c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Steven.Quinn@nahc.ca.gov.

Sincerely,



for

Steven Quinn
Associate Governmental Program Analyst

cc: State Clearinghouse

From: Anna Christensen

Sent: Monday, April 8, 2019 5:03 PM

To: Sally Gee

Subject: Fw: LCWA Los Cerritos Wetlands DEIR NOP - comments

Attachments: LCWA Rest handout.pdf

Protect the Long Beach/Los Cerritos Wetlands supports the following statements

On Monday, April 8, 2019 5:00 PM, Anna Christensen <achris259@yahoo.com> wrote:

To: Sally Gee, Los Cerritos Wetlands Authority

Re: LCWA Los Cerritos Wetlands Restoration Plan DEIR, NOP

From: Sierra Club, Angeles Chapter, Long Beach Area Group

Contact Person: Conservation Committee Representative, Anna Christensen
achris259@yahoo.com

Comments and concerns as follows:

1. The Site Map (Fig 2) - unclear, incorrect - most properties are designated by owner, one by its nickname, one, not at all. Since the LCWA is listing properties/owners at the present time, it should include its own 5 acre property at 2nd and Studebaker which has been included in the LCWA's previous maps of the Los Cerritos Wetlands (as the site of the proposed visitors center and land bridge over 2nd St connecting wetlands areas). As the "Pumpkin Patch" is included, it's owner should be listed, and plans for the entire site (including new oil operations and an office building) should be described in the EIR.
2. Misleading statement in this document and by representatives of the LCWA at the Public Scoping Meeting lead the public to conclude that conditions imposed on the Los Cerritos Wetlands and LCWA properties under the FEIR of the Los Cerritos Wetlands Restoration and Oil Consolidation Project are legal, final, and cannot be challenged or even discussed in comments to the LCWA's Los Cerritos Wetlands Restoration DEIR. "The EIR (for the Los Cerritos Wetlands Restoration and Oil Consolidation Project) was certified by the City of Long Beach City Council in July 2018. - No mention CCC approval - is this because of the lawsuit filed against the CCC for violating the Coastal Act in approving the Los Cerritos Wetlands Restoration and Oil Consolidation Project?
3. The restoration project is described as "habitat enhancement." However, many of the proposed alterations to the project area will damage or destroy existing wetlands, seasonal and salt marshes, and wildlife habitat. They will endanger wildlife, including protected species and migratory birds. The assumption that bulldozing and trenching to create additional tidal influence will improve a seasonal wetlands subject to sea rise must be questioned. The assumption that all non-native species are "invasive," have no value, and must be erradacated must be questioned. The need to

destroy existing plant communities to remove toxic soil must be questioned. The NOP is out of date in all these respects.

4. “Public Access” is a plus when seeking approval at the city and state levels as it gains the support of those who want to reassure constituents that the public will get to enjoy their natural resources up close and personal. It fails to take into account that for wildlife areas, public access is problematic to the extreme. No public access is warranted to ensure that the Los Cerritos Wetlands survive and thrive as a living ecosystem. No visitors center with access road, parking lot, and security lighting, no and walking trails within the wetlands. These are not “restoration” elements as they were not there in the first place. They may satisfy human wants and needs but they expand the human footprint and risk the present health and future well being of wildlife.
5. We submit that the Cultural Resources section is disrespectful to tribal peoples who have been excluded from participating in the NOP, distorts and omits tribal history, denies the proven existence of tribal cultural resources in the project area, fails to describe the Los Cerritos Wetlands as a Tribal Traditional Cultural Property and Sacred Site.
6. We concur with others that this is not the time to create/submit an EIR for the “restoration” of the Los Cerritos Wetlands and that a “Program EIR” is not appropriate.
7. We attach documents with which we concur and reserve the right to expand our comments at a later date.
8. The Los Cerritos Wetlands EIR (Program EIR) - “optimizing” 2015 plan/drafting EIR alters 2015 to allow for the oil extraction project -
9. It moves visitors center (including parking and roadway) onto wetlands ESHA, builds new berm on wetlands ESHA, breaches oil berm flooding wetlands ESHA with saltwater, polluting salt marsh, oil and other pipelines on ESHA crossing faultline, trenching/flooding will unearth/destroy tribal natural/cultural resources and sites, removal of non-natives destroys habitat for native species, and flooding ESHA, walking and bike trails disrupt wildlife
10. It uses outdated understanding of “restoration” - added tidal influence is not restoration, added public access is not restoration, not beneficial to wildlife preserve, not adjusted for sea level rise
11. It has a conflict of interest, use of Tidal Influence and other contractors involved in the oil extraction project

From: Rececca Robles

Sent: Monday, April 8, 2019 4:07 PM

To: Sally Gee

Cc: Anthony Morales

Subject: Comments on the Los Cerritos Wetlands Restoration DEIR, Notice of Preparation

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April 8, 2019

To: Sally Gee, Los Cerritos Wetlands Authority

Re: Comments on the Los Cerritos Wetlands Restoration DEIR, Notice of Preparation

Tribal concerns about the LCWA's NOP for the Los Cerritos Wetlands Restoration DEIR include:

1. Lack of inclusion of tribal perspectives in the preparation of the NOP (the basic design of the project).

• No evidence of consultation with any tribal entity, tribal member with expertise in tribal culture or tribal ethnobotany, or tribal individual with a previous history of involvement in protecting the Los Cerritos Wetlands. *"LCWA **will be** conducting consultation," LCWA **will consult** with tribes"*

• The NOP fails to include tribal cultural information from the 2015 Final Los Cerritos Wetlands Restoration Plan

2. The Cultural Resources Section asks if the project would "*Cause a substantial adverse change in the significance of an archaeological resource"* and further states, "*The program*

area is in the vicinity of known archaeological resources and may have the potential to contain undocumented prehistoric and historic-period archaeological resources." Written from an outdated Eurocentric perspective, the section ignores the current understanding and acknowledgement of **tribal cultural resources**, current laws (SB18), and current policies (CCC and State Lands Tribal Consultation Policies) which recognize California Indian peoples as sovereign living nations capable of planning and engaging in cultural resource management over public lands within their tribal territories and/or with which they maintain a cultural connection.

• The Cultural Resource section omits or misidentifies tribes having historic and cultural connection to the Los Cerritos Wetlands. The tribal history of the area identifies only one tribe by name, the Gabrielino, a name given by Spanish Missionaries, not that in current use. *From 1,000 years before present to approximately 1542 A.D., Los Angeles County and*

Northern Orange County were occupied by the Gabrielino people (named after the Spanish Mission where many of them were baptized).” The Tongva, Acjachemen and other Southern California tribes maintain their connection to the Los Cerritos Wetlands through ceremonial and social activities and by monitoring and opposing developments which threaten the health of the wetlands, the waterways, and the surrounding communities. • The Cultural Resources section omits highly significant tribal history and place names, including Puvungna, a major ceremonial center and the birthplace of Chinigchinich, the founder of a spiritual tradition practiced by multiple Southern California tribes today.

• The Cultural Resources section improperly questions whether tribal cultural resources exist within the project area. It describes known village, burial and cultural sites as being “nearby” the wetlands rather than including the wetlands **within** the tribal communities of Puvungna and Motuuchenya. “*Nearby Native American sites are known to be located at California State University Long Beach, Rancho Los Alamitos Historic Ranch, and Heron Point.” “Native American burials have been encountered at sites in the vicinity of the program area (California Coastal Commission, 2018).” “If necessary, mitigation measures will be recommended to reduce potential significant impacts to historical resources.”*

• Tribal interests are assumed to be limited to their connection to archaeological sites and cultural resources including burial sites that could be disturbed/destroyed during excavation. Tribes are not acknowledged as living communities and governing bodies with a legal right to maintain a physical and spiritual connection to the Los Cerritos Wetlands. Nor are past and present tribal efforts to protect and use the wetlands for spiritual, cultural, and recreational purposes acknowledged.

• The NOP fails to acknowledge that the Tongva and Acjachemen recognize the Los Cerritos Wetlands as a Tribal Cultural Landscape, eligible to be listed as such by the NAHC .

• In ignoring tribal cultural perspectives, tribal historic and current connections to the Los Cerritos Wetlands, the NOP fails to identify potentially significant impacts to the Los Cerritos Wetlands and to the tribal peoples having physical and cultural connections to the project area. The proposed mitigation measures fail to acknowledge the continued and consistent comments by numerous tribal leaders that any and all disruption of natural areas do harm and should be avoided. *If necessary, mitigation measures will be recommended to reduce potential significant impacts to cultural resources.* It describes “potentially significant impacts” and “cultural resources” as follows: *Since the proposed program would require excavation and grading in some portions of the program area, ground-disturbing activities could unearth subsurface human remains”* and *“historic-period archaeological resources”*

• Restoration plans that include increased public access at the expense of wildlife, that involve the destruction of existing plant communities supporting wildlife, that employ pesticides and involve excavation and bulldozing, are in and of themselves destructive and disrespectful measures. Realistically, restoring the Los Cerritos Wetlands to the once magnificent river estuary beloved by its tribal occupants is not possible. To include tribal peoples in protecting what remains is essential. Failing to do so, the

NOP reveals a lack of true appreciation for the natural world and the original peoples of the land.

Sincerely,

Anthony Morales

Chief of Gabrielino/Tongva

Rebecca Robles

Acjachemen Descendent

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April 8, 2019

Ms. Sally Gee
Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Road
Azusa, CA 91702

Via email *sgee@rmc.ca.gov*

Re: Notice of Preparation and Scoping for Los Cerritos Wetlands Restoration Plan Environmental Impact Report

Dear Ms. Gee:

We submit these Notice of Preparation comments on behalf of the Los Cerritos Wetlands Land Trust (LCWLT). LCWLT has spent more than a decade educating and advocating for the protection and restoration of Los Cerritos Wetlands. The Los Cerritos Wetlands Authority (LCWA's) Los Cerritos Wetlands Restoration Plan (Project) presents a once-in-a-lifetime opportunity for comprehensive planning of the restoration of Los Cerritos Wetlands that will guide investment in restoration activities for decades. The restoration of the remaining extent of Los Cerritos Wetlands is one of LCWLT's primary goals, and LCWLT appreciates the opportunity to comment on the Project and its environmental review at an early stage of development.

The Project proposes restoration of wetlands, transitional, and upland habitats throughout 503 acres of the historic Los Cerritos Wetlands complex of southeast Long Beach and northwestern Seal Beach. Restoration would include remediation of contaminated soil, grading, revegetation, the construction of public access points, trails, and visitor centers, the construction of flood management facilities, and other activities in sensitive wetland and upland habitats.

LCWLT's major concerns include the following:

- Lack of specificity in the description of the Project, which, in turn could hamper restoration investment and implementation;
- Absence of an adequate range of alternatives that recognize the co-benefits of alternative wetlands connections that could provide green infrastructure benefits (e.g., enhanced flood control, water quality improvements) associated with a

bigger vision (e.g., options for connecting the wetlands in conjunction with bridge and road improvements that may also deliver superior water quality and flooding benefits); and

- A very strong emphasis on the protection of oil facilities in a Wetlands Restoration Project.

LCWLT submits these comments to ensure that the draft environmental impact report (EIR) thoroughly discloses, analyzes, and mitigates the many potential impacts of a large, long-term, and comprehensive restoration Project undertaken in sensitive wetlands with past, present, and future oil extraction. As the Initial Study correctly recognizes, unless all feasible alternatives are included and analyzed and the least-damaging alternatives are chosen, and unless all available mitigation is incorporated, the Project has the potential to cause significant and adverse impacts related to air quality, biological resources, greenhouse gases, aesthetics, water quality, hydrology and flooding, earthquake hazards, and hazardous materials, among others. LCWLT appreciates that the LCWA has chosen to prepare an EIR. But, more importantly, without the changes we suggest in this letter, the proposed Project will fail to realize the full potential of these important wetlands and environs.

I. A Clear and Complete Project Description is Necessary.

The Initial Study describes the Project area and includes a range of activities that may occur in the 500 -acre Restoration Plan area, but it fails to provide readers with any idea which type of activities are proposed where. LCWLT expects greater clarity of specific Project activities, timelines, and exact locations will be provided in the EIR.

The Initial Study is unclear about which of the three alternatives described in the Conceptual Restoration Plan is the preferred alternative, or whether LCWA's preferred alternative is included in the Conceptual Restoration Plan at all. This information must be provided in the EIR's Project Description. Full analysis of all potential environmental impacts should occur for each of the no project, Minimum Alteration, Moderate Alteration, and Maximum Alteration alternatives, as each alternative will have very different footprints and impacts.

The Conceptual Restoration Plan is likely the only comprehensive planning document that will be prepared for Los Cerritos Wetlands restoration, and it is crucial to include all relevant properties in the Project area. The Project area already includes the privately-owned Pumpkin Patch, Synergy, and Hellman Ranch properties. It should be expanded to include the Hitchcock and AES properties. The Coastal Commission has already required restoration of the Hitchcock property as upland habitat, which is

consistent with the Project. This upland habitat will be crucial as lowland habitat is consumed by sea level rise.

The Project description should also clearly define Project phasing to ensure that short-term and long-term outcomes do not conflict. For example, constructing levees around the Hellman property to protect short-term oil interests could impede long-term flood relief from sea-level rise if Project levees prevent water from flowing into other portions of the wetlands.

II. Careful and Complete Studies are Needed to Determine the Baseline for CEQA Analysis.

The adequacy of the CEQA analysis contained in the Wetlands Restoration Plan EIR will hinge on the accuracy of baselines used for environmental analysis. An accurate baseline is required to ensure that the Project's likely environmental impacts are neither exaggerated nor obscured. Mere projections of baseline information are insufficient for baseline analysis. (*Fairview Neighbors v. County of Ventura*, (1999) 70 Cal.App.4th 238; *Save Our Peninsula Committee v. Monterey Bd. of Supervisors*, (2001) 87 Cal.App.4th 99 [CEQA "requires that the preparers of the EIR conduct the investigation and obtain documentation to support a determination of preexisting conditions."]). Further, *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931 states that recitation of raw data without explanation of how such levels were derived or maintained "does not provide an adequate description of the existing environment." *Citizens for East Shore Parks v. State Lands Commission*, (2011) 202 Cal.App.4th 549 held the proper baseline for analysis of environmental impacts is "what [is] actually happening," not what might happen or should be happening.

Determining proper baselines may require updating the technical studies referenced in the Notice of Preparation. The hydrological study, for example, has become outdated in the face of new information about climate change and the likely impacts of sea level rise in Los Cerritos Wetlands.

The baseline is particularly important for determining whether the Project can or will increase wetland habitat. A comprehensive wetlands delineation of the Project area has not yet occurred, so it is unknown how many acres of federally or state-defined wetlands are present in the area or how many could be created by the Project. Once the baseline has been determined, quantifiable performance criteria must be established to determine whether new acres of wetlands have been created.

Related to this, the Project provides for financial benefits, presumably from continued oil extraction activities. Information about the existing "baseline" benefits will

need to be provided during the administrative process in order to make informed decisions, supported by substantial evidence, about the feasibility of Project alternatives and mitigation measures. This is particularly important given that some conflicts are inherent between wetland restoration and continued oil production on the same or adjacent lands.

III. The Biological Resources Analysis Must Discuss Impacts to Wetlands, Sensitive Species, and Habitat.

LCWLT is pleased that the LCWA agrees that the Restoration Project, all of which will occur in Los Cerritos Wetlands, could have significant impacts on biological resources, including sensitive species and rare habitats. If alternative Project configurations are required to "avoid or substantially lessen" those impacts, the EIR must discuss these alternatives, as well. (Pub. Resources Code § 21002.) Any impacts to these wetlands would have corresponding impacts on species that inhabit these waterways, including the eggs and larvae of oceanic species that use wetlands as nurseries. Impacts to water quality due to the stirring up of sediment or pollutants contained in sediment or runoff from construction materials stored near water may also impact the regulatory status of waterways that are already listed as impaired on the 303(d) list. If any of these impacts may occur, they must be disclosed in the EIR.

LCWLT's Notice of Preparation review committee noticed that the cited Habitat Assessment omitted any mention of aquatic macroinvertebrates, including marine invertebrates currently present in Steamshovel Slough. Macroinvertebrates are very responsive to environmental changes. The species composition of the macroinvertebrate community in a given location provides a useful measure of ecosystem health that can be used as a benchmark for determining whether restoration activities are providing benefits or harm. An adequate analysis of the Project's biological resources will require a survey of aquatic macroinvertebrates present in the Project area, particularly in Steamshovel Slough. The biological resources analysis and its conclusions should not rely on the California Rapid Assessment Method (CRAM), which does not consider macroinvertebrates.

The Project area appears to include only a portion of the San Gabriel River. The Wetlands are located in and part of a larger watershed. As such, if the Project or its activities could have any impacts on the San Gabriel River, upstream or downstream, CEQA requires they be disclosed, analyzed, and properly mitigated.

The Initial Study for the City's already-approved Southeast Area Specific Plan (SEASP) provided for a wetlands delineation study for the wetland portions of southeast Long Beach. LCWLT understands that a wetlands delineation for this area is currently

in-progress. LCWLT expects the EIR to include information from this delineation study, or from a separate LCWA delineation of the entire Project area. Any delineations relied upon by the Restoration Plan EIR must comply with all relevant EPA guidance to ensure that wetlands are properly delineated for future regulation and conservation.

IV. The EIR Must Consider Cumulative Impacts with the Beach Oil Minerals Project.

The City of Long Beach and California Coastal Commission recently approved Beach Oil Minerals' (BOM) Los Cerritos Wetlands Restoration and Oil Consolidation Project, which will cluster oil extraction activities on 10 acres of land at the LCWA and Pumpkin Patch parcels, thereby freeing up land at the Synergy and City of Long Beach parcels for habitat restoration. The BOM Project will require construction of a pipeline, and will considerably increase oil extraction and greenhouse gas emissions within the area of the Restoration Project. The EIR must consider any direct impacts of the BOM Project on the Restoration Project, as well as any cumulative impacts caused by the implementation and operation of both projects, in the same area, at the same time.

V. Studebaker Road Cannot Be Widened or Extended.

CEQA requires an analysis of the "whole of an action, which has the potential for physical impact on the environment." (CEQA Guidelines, § 15037.) If the Project will require or induce any other local road improvements, these must be disclosed, analyzed, and mitigated in the environmental document. LCWLT is particularly concerned about any improvements or reconfigurations that would increase pressure on roads surrounding the Los Cerritos Wetlands or that would lead to the widening or extension of Studebaker Road through the wetlands. There may be alternatives (e.g., improvements of the 2nd Street bridge and PCH) that would not only provide solutions to traffic management obviating any perceived need for the extension of Studebaker, but would also provide improved flows to the wetlands and superior restoration of this watershed. This is the time to identify and explore these broader options.

Any widening or expansion of Studebaker Road would have significant, adverse, and irreversible impacts on the health and viability of Los Cerritos Wetlands and the Restoration Project. Long Beach's SEASP acknowledges the regulatory constraints of such an extension, which would cause significant disruption of habitat values of environmentally sensitive habitat areas in violation of the Coastal Act. The EIR should clarify that widening or extension of Studebaker Road will not occur due to the significance of impacts on the wetlands associated with the extension and clarify it is not undergoing environmental review in this document. Project conditions of approval

should include a blanket prohibition on the widening or extension of Studebaker Road ideally because there are other solutions that benefit both wetlands and traffic flows.

VI. Steamshovel Slough Cannot be Dredged or Filled.

Although the three alternatives outlined in the Conceptual Restoration Plan purport to leave Steamshovel Slough in its current, pristine condition, the Initial Study states, "Aquatic and wetlands habitats in the program area, such as Steamshovel Slough, mudflats, as well as tidal channels surrounding the program area, could be removed, filled, or otherwise disturbed." (IS, p. 28.) Fill or dredging of Steamshovel Slough would violate Coastal Act protections for both wetlands and environmentally sensitive habitat area. Consequently, in December 2018, the Coastal Commission altered Beach Oil Minerals' restoration plans and imposed limits on the grading and earth movement proposed in the vicinity of Steamshovel Slough. LCWLT will defend Steamshovel Slough and its thriving wildlife from any and all disturbance. The EIR and its alternatives cannot consider any plans to dredge or otherwise alter Steamshovel Slough.

VII. The EIR Must Contain Thorough Analysis of Sea level Rise.

Sea level rise has already begun to impact planning in southeast Long Beach, and much of the Project area will experience sea level rise-induced flooding in the next century. The EIR must include an updated hydrology study, graphics, and analysis comparing existing water circulation with Project-induced water circulation, overlaid with the anticipated impacts of sea level rise. Worst-case scenarios for sea level rise should be used, as the damaging impacts of climate change have arrived sooner than anticipated. Here, sea level rise can adversely affect the Project, and the Project can also adversely affect the resilience of Los Cerritos Wetlands to sea level rise.

VIII. Objectives Must be Clarified and Prioritized.

The Restoration Plan's objectives are to provide benefits including wetlands restoration, recreation, climate change adaptation, flood control, and oil infrastructure protection. However, it is unclear which objectives or benefits will control if a conflict arises. The best solution for protecting oil infrastructure against climate change-induced sea level rise is not necessarily the best solution to ensure the resilience of wetlands. The EIR must prioritize these objectives.

IX. Alternatives to the Project Should Be Evaluated in the EIR.

CEQA prohibits approval of projects with adverse environmental impacts if there are feasible alternatives. (Guidelines § 15021, subd. (a)(2).) The CEQA Guidelines

require an agency to "[d]isclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved." In order to implement this policy, the Guidelines specify that:

> A public agency may approve a project even though the project would cause a significant effect on the environment *if* the agency makes a fully informed and *publicly disclosed decision* that: (a) There is no feasible way to lessen or avoid the significant effect...."

(Guidelines § 15043, emphasis added.)

The LCWA is obligated to evaluate a reasonable range of alternatives to the conceptual Wetlands Restoration Plan. (*Laurel Heights I*, *supra*, 47 Cal.3d at 400.) The LCWA "bears the burden of *affirmatively demonstrating* that . . . the agency's *approval* of the proposed project *followed meaningful consideration of alternatives* and mitigation measures." (*Mountain Lion Foundation v. Fish and Game Commission* (1997) 16 Cal.4th 105, 134, emphasis added; accord *Village Laguna of Laguna Beach v. Board of Supervisors* (1982) 134 Cal.App.3d 1022, 1035.) As the Court has said, while an EIR is "the heart of CEQA", the "core of an EIR is the mitigation and alternatives sections." (*Citizens of Goleta Valley v. Bd. Of Supervisors* (1990) 52 Cal.3d 553, 564.) Preparation of an adequate EIR with analysis of a reasonable range of alternatives is crucial to CEQA's substantive mandate to "prevent significant avoidable damage to the environment" when alternatives or mitigation measures are feasible. (Guidelines § 15002(a)(3).)

While "[a]n EIR need not consider every conceivable alternative to a project, 'it must consider 'a reasonable range of *potentially* feasible alternatives...'." (Guidelines § 15126.6(a), emphasis added.) "The range of feasible alternatives [for an EIR] shall be selected and discussed in a manner to foster meaningful public participation and informed decision making." (Guidelines § 15126.6 (f).) "[T]he discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly." (Guidelines § 15126.6(b).)

In addition to the proposed Restoration Plan and the "no project" alternative required by CEQA, the EIR should include a full analysis of the "Minimum Alteration" alternative, which will likely provide the greatest resilience for wetlands as sea level rises.

Additionally, LCWLT would like to see a more visionary alternative that consolidates existing oil operations, such as those ongoing at Hellman Ranch, to maximize the land available for near-term restoration as well as evaluates other options for connecting the wetlands to the watershed (e.g., possibly an improved, elevated bridge at 2nd Street and/or under roadways in conjunction with roadway improvements). The alternatives presented fail to describe or evaluate a wetland restoration plan that results in an integrated watershed with co-benefits to both green infrastructure (water quality and flood attenuation) but also to traffic and streetscapes. Planned and needed improvements to existing roads including 2nd Street, the 2nd Street Bridge and PCH provide an opportunity to revitalize both wetlands and community. In restoring the Colorado Lagoon, the community insisted on evaluating options that involved new and different infrastructure to achieve the best alternative. Specifically, in order to provide better circulation to the lagoon, the city and advocates called for removal of the westernmost portion of Marina Vista Park to create a tidal channel. Creating the channel not only requires part of the park to be removed, but also involves building two bridges to allow Eliot and Colorado streets to cross over the channel. This is the last opportunity to describe and evaluate visionary alternatives, with co-benefits that could also be funding opportunities, such as alternatives flow connections in conjunction with other hard and green infrastructure improvements.

The City of Long Beach and California Coastal Commission recently approved such an approach for the Beach Oil Mineral (BOM) project, which will consolidate oil operations currently occurring on the Synergy and City of Long Beach parcels onto less than 10 acres at the LCWA and Pumpkin Patch parcels. BOM's pursuit of the Project demonstrates the feasibility of the consolidation approach.

Finally, the Initial Study emphasizes the protection of ongoing oil and gas extraction in light of expected sea level rise through the construction of berms and updating of associated infrastructure. A reader of the Initial Study or Final Conceptual Restoration Plan is left wondering how much of the Restoration Plan is geared toward protecting oil infrastructure, as opposed to restoring necessary wetland habitat. The Initial Study is clear that funds have not been available to purchase oil production lands, but this may change. At some time in the future, oil operations will end through depletion of the oil field, reductions in demand as the energy industry transitions to new energy sources, or purchase of the land for wetland restoration. Accordingly, LCWLT requests consideration of an alternative that provides for the cessation of oil production in the Project area.

X. The EIR Must Consider the Impacts of Bike Paths and Visitor Facilities.

LCWLT supports visitor access and appreciation of Los Cerritos Wetlands, so long as they may be accomplished without adverse impacts to existing or enhanced habitat. The Initial Study discusses the construction of pedestrian trails, bike paths, elevated pedestrian walkways, educational and interpretive features, viewing areas, overlooks, parking facilities, and visitor centers. The EIR must clearly describe proposed public access facilities, including trails, visitor centers, parking lots, and bike trails and their proposed locations. All potential environmental impacts of these new facilities must be disclosed and mitigated in the EIR. In order to avoid impacts, bike paths should not be located in wetlands, even if located atop levees. It has been LCWLT's understanding that existing bike paths were being maintained, but that no new bike paths were being considered. The EIR should clarify this point.

XI. Hydrology and Water Quality Impacts Require Consideration.

The EIR must be based on a current hydrology study, as opposed to the existing, outdated study. Current sea level rise forecasts should be used to reevaluate plans to constrain or direct water flows with inlets, outlets, and levees, given that the impacts of sea level rise have already begun. More cutting-edge ideas than wetlands enclosed in levees should be considered, including alternative options for delivering and regulating flows described above. The EIR must also analyze whether the inlets, outlets, and protective levees under consideration for early-phase restoration will obstruct pathways to contain sea level rise. It is important that the Project not reduce the cities' or wetlands' resilience to climate change.

The Project's plans must also be consistent with the sea level rise adaptation plans of the Cities of Long Beach and Seal Beach.

XII. Mitigation of ALL Potentially Significant Impacts is Required.

Finally, LCWLT seeks to ensure that any direct, indirect, or cumulative impacts of the Wetlands Restoration Plan are fully mitigated as required by CEQA. This will require an environmental review process that fully discloses the Project's likely significant environmental impacts and provides a thorough discussion of alternatives and mitigation measures designed to "avoid or substantially lessen" those environmental impacts as required by Public Resources Code § 21002. Any mitigation measures developed must be concrete and enforceable. (Pub. Res. Code 21081.6(b); *Lincoln Place Tenants Ass'n v. City of Los Angeles* (2007) 155 Cal. App. 4th 425, 445 ["mitigation

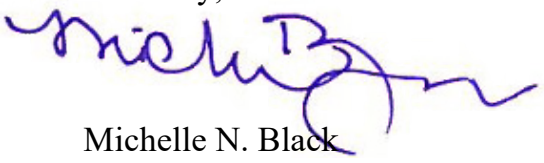
measures must be feasible and enforceable"]). Additionally, the environmental review document prepared for CEQA compliance must evaluate the efficacy of the mitigation measures proposed, as well as any significant environmental impacts that the mitigation measures may cause. (*San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645; Guidelines s. 15126.4.)

Of particular importance will be mitigation measures designed to protect and preserve existing species as wetlands restoration and topographical modifications proceed. Grading and reconfiguration of the land in this sensitive area could have significant adverse impacts on Belding's savannah sparrows, least bell vireos, and bubble snails, among others. Robust and enforceable mitigation measures must be imposed along with clear and quantifiable performance standards.

Conclusion.

Thank you again for this opportunity to provide feedback on what may be Los Cerritos Wetlands' most important planning process. The LCWLT appreciates the LCWA's acknowledgement in the Initial Study of the Project's many potentially significant impacts on important wetland, transitional, and upland habitats and on sensitive, threatened, and endangered species. We look forward to the release of the draft environmental impact report and to collaborating with the LCWA to ensure that the EIR thoroughly evaluates and fully mitigates the Project's potential impacts on wetlands and the species that inhabit them. The public deserves a well-considered Project that properly prioritizes wetlands restoration over oil interests. Please contact us if you have any questions about these comments.

Sincerely,



Michelle N. Black

From: Michael Zelniker

Sent: Monday, April 8, 2019 3:41 PM

To: Sally Gee

Subject: EIR Los Cerritos Wetland Public Comment

Hello Sally Gee,

I'm writing to voice my concern about the Program EIR concerning the Los Cerritos Wetlands as currently proposed. I am the Co-Chair of the Los Angeles chapter of the Climate Reality Project. I sat in and spoke out against the proposal that happened in front of the California Coastal Commission concerning new oil drilling by BOM that took place in December.

Many of us in the environmental community are deeply troubled by that vote and are working to reverse that decision. We also understand that there is a lawsuit that has been filed that has yet to be heard or decided. So the idea that there would be a plan to "restore" the wetlands before this issue of new oil drilling in the wetlands is resolved makes absolutely no sense. This plan needs to be revisited and at the very least delayed.

Please let me know if there's anything else I can do. Thank you for your time in this matter.

Kind regards,

Michael

--

Michael Zelniker

Climate Reality Project

Co-Chair Los Angeles Chapter

323-851-5289 (office)

323-481-3962 (cell)

@michaelzelniker

michaelzelniker.wordpress.com

From: Molly Basler

Sent: Monday, April 8, 2019 2:20 PM

To: Sally Gee

Subject: Public Comment: Program EIR/Los Cerritos Wetlands

Hello Sally Gee,

I'm writing to voice my concern about the Program EIR concerning the Los Cerritos Wetlands as currently proposed. I am an environmentalist/ activist Climate Reality Leader and a very concerned citizen in regard to the assault that is being put in NATURE, our natural habitats. I sat in and spoke out against the proposal that happened in front of the California Coastal Commission concerning new oil drilling by BOM that took place in December.

Many of us in the environmental community are deeply troubled by that vote and are working to reverse that decision. We also understand that there is a lawsuit that has been filed that has yet to be heard or decided. So the idea that there would be a plan to "restore" the wetlands before this issue of new oil drilling in the wetlands is resolved makes absolutely no sense. This plan needs to be revisited and at the very least delayed.

Please let me know if there's anything you need from me. Thank you for your time in this matter.

Kind regards,

Molly Basler

CONSCIOUS LIVING

Climate Reality Leader🌍

The Climate Reality Project

State and National Issues Chair/West LA Democratic Club

Mollybasler.com

From: Sally Gee
Sent: Tuesday, March 19, 2019 12:46 PM
To: Reema Shakra; Ryan Todaro
Subject: FW: Los Cerritos restoration plan

Response to NOP

From: mrs.boerum <boerum245@gmail.com>
Sent: Wednesday, March 13, 2019 11:31 AM
To: Sally Gee <sgee@rmc.ca.gov>
Cc: Tom Boerum <trb1075@sbcglobal.net>
Subject: Los Cerritos restoration plan

Goodmorning,
My question regarding the wetlands is how will this effect my flood insurance for my home at 6251 Majorca Circle, Long Beach?

1-Amy LeSage

Name: Amy LeSage

Address: 6621 E. Pac Coast Hwy, Ste 130, Long Beach, 90803

Organization: Enjoy Healing Center

Email: amylesage@gmail.com

My name is Amy LeSage. I'm a business owner leasing an office space at 6621 E. Pac Coast Hwy, Ste. 130. I am an acupuncturist and Chinese medicine physician. My work requires a noise-free environment. I am concerned that when work begins at the pumpkin patch site and Long Beach City Property Site (directly behind my office), the noise pollution, air pollution, vibrations from construction, greenhouse gas emissions + other toxic chemicals as well as the affected water quality will significantly negatively impact my small business. In fact, I feel most of my patients will not come to a place of healing that is toxic.

I would like to know the timeline of the COMP projects and what you are doing to accommodate small businesses like mine that are in the path of this project.

Please contact me and advise. Thank you!

2-Kim Garvey

Name: Kim Garvey

Address: 389 Haines Avenue

Organization: N/A

Email: kjgarvey12@verizon.net

1.) What is proposed project to be analyzed? Why not presented at this meeting?

2.) How come triangular-shaped property along Loynes (near Studebaker) not included in project/program boundary? Would like to see this included in EIR. Otherwise what can/will happen there?

3.) How come LCWA property at the corner of 2nd St. /Studebaker not included? Could be public/interpretive center. (Agree it is not suitable for habitat restoration)

Janice Dahl
6212 E. Vista Street
Long Beach, CA 90803
(562) 594-0902

April 7, 2019

Sally Gee
Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Road
Azusa, CA 91702

Via email: sgee@rmc.ca.gov

Subject: Los Cerritos Wetlands Restoration Plan

Dear Ms. Gee:

After thoroughly reading the Los Cerritos Wetlands Restoration Plan, I find the report unacceptable and lacking in areas that are critical to the successful restoration of Los Cerritos Wetlands, and misguided in its goals.

The most inconceivable aspect of the plan is the possibility of filling-in Steamshovel Slough! Environmental Science Associates, the author of the Plan, wants to destroy the very habitat that's at stake. 20 years ago I made the video, "The Lost Jewel of the Coast, Los Cerritos Wetlands" that was made on Steamshovel Slough. I've thought that it should be updated, since it appeared that the path to the restoration wetlands complex was going in the right direction. Now I read that the wetlands are in more dire straits than 20 years ago. ESA writes on page 28 under c): "Aquatic and wetland habitats in the program area such as **Steamshovel Slough**, mudflats, as well as the tidal channels surrounding the program area, **could be removed, filled** or otherwise disturbed." How did this line of thinking get into the plan and how was it reviewed and allowed to stay in the Plan? Steamshovel Slough needs 100% protection and must not be altered or disturbed.

The Plan totally overlooks marine invertebrates. These creatures are essential to thriving wetlands: they are a food source for birds and fish, are one the elements that has kept Steamshovel Slough pristine, among many other benefits. Analysis of the aquatic and benthic macroinvertebrates should be one of the cornerstones of the Plan, but there is complete omission. It takes a simple search of the internet to see that the study and protection of marine invertebrates are an essential element of wetlands restoration.

With further reading, one concludes that the Plan's goal is not for wetlands restoration, preservation and protection, but for a park. Throughout the Plan it is stated that there will be creation of BIKE TRAILS through the wetlands! Bike trails have never been a part of Los Cerritos Wetlands restoration. Bike trails and wetlands restoration are not compatible. What's alarming and sends up red flags is that there is ample mention of creating bike trails BUT NO ANALSYSIS OF THE MARINE INVERTEBRATES! Bike trails through the wetlands **MUST** be removed from the Plan.

The Plan emphasizes the protection of the existing oils wells, and "mitigation measures will be recommended to reduce potential significant impacts to mineral resources." The Plan wants to use precious wetlands restoration funding and resources to protect oil wells. Yet, the Plan has no plans to protect the marine invertebrates. Funding and resources will be used to create bike paths through the wetlands, yet, there's no analysis, funding or protection of the marine invertebrates?

Another troubling aspect of the restoration that's not specifically stated in the Plan, but it is elsewhere, is the removal of the palm trees. The birds have had to adapt to environments that have been shaped by mankind. Their natural habitats have been destroyed so they adapt to what's left for them. Now, that will be taken from them in Los Cerritos Wetlands. The only reasonable means of removing the palm trees is to phase them out while at the same time planting mature trees suitable as nesting habitat that are native to and around the local wetlands. The Audubon Report, "Birds & Climate Change" states "While some species may be able to adapt, others will have nowhere to go. Many of our most cherished birds, including the Bald Eagle, Brown Pelican, and Common Loon, face an increased risk of extinction." The scorched earth method of removing trees, listed as invasive in one of the Plans habitat assessments, after the birds have struggled to adapt is unacceptable.

After reading the Plan it was evident that there was no final restoration goal. Los Cerritos Wetlands Authority has developed three models from minimal to maximum touch. Whether or not one agrees with the three models, at least there was a platform for discussion and direction for the restoration. I would add a fourth model…ultra-minimal touch considering sea level rise. This would be the least destructive to this fragile habitat and allow time for the animals to adapt.

In conclusion, Los Cerritos Wetlands Authority needs a new Plan that's relevant to the restoration, preservation and protection of Los Cerritos Wetlands, that I look forward to reading.

Respectfully,

Janice Dahl

Ps; I am mailing to you The Audubon Report, "Birds & Climate Change."

Sally Gee
Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Road Azusa, CA 91702
Email: sgee@rmc.c.gov

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6. I agree with the statement on page 70 that "the proposed program could result in potentially significant impacts with regard to aesthetics, air quality, biological resources, cultural resources, energy, geology and soils, GHG emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, public services (fire protection, police protection and parks), recreation, transportation and traffic, tribal cultural resources, and utilities and service systems. Implementation of the proposed program could result in significant impacts that may result in substantial adverse effects on human beings." I do not agree with the statement that these can all be mitigated.

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From: Sally Gee
Sent: Friday, April 12, 2019 1:49 PM
To: Reema Shakra; Ryan Todaro
Cc: Raiven Greenberg; eric@tidalinfluence.com
Subject: Fw: Los Cerritos Wetlands Restoration NOP comments
Attachments: Scoping comments for LCW EIR 4819.docx; Scoping comments for LCW EIR 4819.pdf

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One more...

From: anngadfly@aol.com <anngadfly@aol.com>
Sent: Monday, April 8, 2019 7:20 PM
To: Sally Gee
Subject: Fwd: Los Cerritos Wetlands Restoration comments

Dear Sally,

I submitted my comments today, but just noticed the e-mail was returned because of an incorrect address, which was on the website. (http://intoloscerritoswetlands.org/wp-content/uploads/2019/03/Scoping-Meeting-Comment-Card-FINAL.pdf).

I believe that the comment time should be extended and a corrected e-mail address be posted as several people used the incorrect one.
Ann Cantrell

-----Original Message-----
From: anngadfly <anngadfly@aol.com>
To: sgee <sgee@rmc.c.gov>
Sent: Mon, Apr 8, 2019 4:45 pm
Subject: Los Cerritos Wetlands Restoration comments

Sally Gee
Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Road Azusa, CA 91702
Email: sgee@rmc.c.gov

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Thank you for your consideration of my comments.

Ann Cantrell
Protect the Los Cerritos/Long Beach Wetlanda
3106 Claremore
Long Beach, CA 90808

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Sally Gee
Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Road Azusa, CA 91702
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Los Cerritos Wetlands Restoration Plan
Program Environmental Impact Report

CEQA Scoping Meeting
March 21, 2019
7:00pm-8:30pm

Los Cerritos Wetlands Authority

Comment Card

Please use the space below to provide comments you may have regarding the Los Cerritos Wetlands Restoration Plan Program Environmental Impact Report, including areas to address, potential mitigation measures, and/or alternatives to consider. Please use the back if necessary:

KEEP UP THE GREAT WORK!

Considering that the original SEADIP plan was to develop another 'Naples,' it is so gratifying to see that we are trying to maximize these wetlands to its original state.

D. C. Frankenfeld

Name: Douglas Frankenfeld Organization (if applicable):
Address: 3847 Pine Ave. Long Beach, CA 90807
Email: dougenfeld@msn.com

Please submit comments tonight or send by:

Post: Sally Gee
Los Cerritos Wetlands Authority
100 N. Old San Gabriel Canyon Road
Azusa, CA 91702

Email: sgee@rmc.c.gov

Comments must be submitted by April 8, 2019. Please note that these comments will become part of the public record.

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We like the "Flood Risk Management Levee with Trail Access" concept. It is our understanding this levee is planned for the Central site and will wrap around on both the 2nd St. side and Marketplace side of Los Cerritos Wetlands. Comparing the previous BOM plan for the Synergy Oil (or Northern) site, this levee follows the same path as the new Synergy Oil pipeline and the levee will sit between the pipeline and the wetlands/future restoration, which would address concerns of oil spills getting into the wetlands (note the previous and separate BOM plan stated a risk of oil spill in wetlands on the Marketplace side from their new pipeline) which LCWA's levee solves the concern. Levees of this type might also be a good feature for other wetlands areas adjacent to any oil operations. The dual use of the levee for public access trails (walking only) is a good plan providing public enjoyment and view of the wetlands, birds and wildlife from a perimeter trail.

The plan concept outlined in the LCWA studies to restore a diverse habitat with a mix of tidal channels, mudflats, saltmarsh, brackish/freshwater marsh and uplands (including buffer zones) will help support an array of birds, wildlife, native plants and aquatic creatures and is a much needed habitat on the Pacific Flyway, also crucial to migratory birds as a rest stop on their long journeys. The study also mentions wildlife corridors with adjacent natural areas in the region, this is good as a restored Los Cerritos Wetlands would host even more species which would travel locally between areas such as Colorado Lagoon, Sim's Pond, Alamitos Bay, Seal Beach National Wildlife Refuge and Bolsa Chica Ecological Reserve. With the extent of the loss of coastal habitat and wetlands, every acre we can preserve and restore back to this important habitat type matters.

We look forward to participating in this process in the future. In general, we are in agreement with the basic project objectives outlined in the Initial Study document, Project No. D170537 dated March 2019, which are stated as follows:

c) Project Objectives

As documented in the Los Cerritos Wetlands Final Conceptual Restoration Plan, the goals and objectives of the proposed program are presented here (Moffatt & Nichol, 2015):

1. Restore tidal wetland process and functions to the maximum extent possible
   a. Increase estuarine habitat with a mix of tidal channels, mudflat, salt marsh, and brackish/ freshwater marsh and ponds.

b. Provide adequate area for wetland-upland ecotone and upland habitat to support wetlands.
c. Restore and maintain habitat that supports important life history phases for species of special concern (e.g., federal and state listed species), essential fish habitat, and migratory birds as appropriate.

2. Maximize contiguous habitat areas and maximize the buffer between habitat and sources of human disturbance.
   a. Maximize wildlife corridors within the LCW Complex and between the LCW Complex and adjacent natural areas within the region.
   b. Incorporate native upland vegetation buffers between habitat areas and human development to mitigate urban impacts (e.g., noise, light, unauthorized human encroachment, domestic animals, wastewater runoff) and reduce invasion by nonnative organisms.
   c. Design the edges of the LCW Complex to be respectful and compatible with current neighboring land uses.

3. Create a public access and interpretive program that is practical, protective of sensitive habitat and ongoing oil operations, economically feasible, and will ensure a memorable visitor experience.
   a. Build upon existing beneficial uses.
   b. Minimize public impacts on habitat/wildlife use of the LCW Complex.
   c. Design interpretive concepts that promote environmental stewardship and the connection between the wetlands and the surrounding community.
   d. Solicit and address feedback from members of the surrounding community and other interested parties.

4. Incorporate phasing of implementation to accommodate existing and future potential changes in land ownership and usage, and as funding becomes available.
   a. Include projects that can be implemented as industrial operations are phased out and other properties are acquired over the near-, mid- and long-term (next 10 years, 10-20 years, and 20+ years).
   b. Investigate opportunities to restore levels of tidal influence that are compatible with current oil leases and neighboring private land holdings.
   c. Remove/realign/consolidate existing infrastructure (roads, pipelines, etc.) and accommodate future potential changes in infrastructure, to the maximum extent feasible.
5. Strive for long-term restoration success.
   a. Implement an adaptive management framework that is sustainable.
   b. Restore habitats in appropriate areas to minimize the need for long-term maintenance activities that are extensive and disruptive to wildlife.
   c. Design habitats that will accommodate climate changes, e.g., incorporate topographic and habitat diversity and natural buffers and transition zones to accommodate migration of wetlands with rising sea levels.
   d. Provide economic benefit to the region.
6. Integrate experimental actions and research into the project, where appropriate, to inform restoration and management actions for this project.
   a. Include opportunities for potential experiments and pilot projects to address gaps in information (e.g., effect of warm river water on salt marsh ecosystem) that are protective of sensitive habitat and wildlife and that can be used to adaptively manage the restoration project.
7. Include areas on the site, where appropriate, that prioritize research opportunities (such as those for adaptive management) over habitat sensitivities.

Name: Mary Parsell, Cindy Crawford Organization (if applicable): El Dorado Audubon

Address: P.O. Box 90713, Long Beach CA 90809-0713

Email: mfp2001@hotmail.com , ccrawfordeda@gmail.com

Please submit comments tonight or send by: Comments must be submitted by April 8, 2019.

Post: Sally Gee Please note that these comments will become part Los Cerritos Wetlands Authority of the public record.

100 N. Old San Gabriel Canyon Road Azusa,
CA 91702

Email: sgee@rmc.c.gov

Appendix B
Air Quality Technical Report

ESA

LOS CERRITOS WETLANDS RESTORATION PROGRAM

Air Quality Technical Report

Prepared for
Los Cerritos Wetlands Authority

May 2020

ESA

LOS CERRITOS WETLANDS RESTORATION PROGRAM

Air Quality Technical Report

Prepared for
Los Cerritos Wetlands Authority

May 2020

626 Wilshire Boulevard
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Los Angeles, CA 90017
213.599.4300
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ESA

Bend	Orlando	San José
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LOS CERRITOS WETLANDS RESTORATION PROGRAM

Air Quality Technical Report

1.0 Introduction

ESA has conducted an air quality assessment to evaluate the potential air quality impacts associated with construction and operations activities of the Los Cerritos Wetlands Restoration Program (program) that have the potential to generate criteria air pollutant emissions. The objectives of this Air Quality Technical Report are to:

- Evaluate the construction and operational criteria air pollutant emissions associated with program level restoration process and the potential for regional air quality impacts based on applicable standards and thresholds;
- Identify air quality benefits from improving habitat areas and restoring wetlands;
- Provide, if needed, air quality mitigation measures as required to meet applicable air quality standards and thresholds as specified by the South Coast Air Quality Management District (SCAQMD).

The program area is approximately 503 acres of land located in an urbanized and industrialized area in North Seal Beach and East Long Beach, straddling the border of Orange County and Los Angeles County in southern California (see **Figure 1**, *Program Area and Local Vicinity*). Regional access to the program area is provided by Interstate 405 (I-405) and Interstate 605 (I-605) as well as State Route 22 (SR-22), which terminates as 7th Street. Pacific Coast Highway (SR-1) traverses the area from the northwest corner to the southeast corner. The program area is located on four individual areas (South, Isthmus, Central, and North), as described in Chapter 2, *Project Description*, of the Los Cerritos Wetlands Restoration Plan Program Environmental Impact Report (PEIR). The proposed program would restore wetland, transition, and upland habitats throughout the program area. This would involve remediation of contaminated soil and groundwater, grading, revegetation, construction of new public access opportunities (including trails, visitor center, parking lot, overlook, sidewalk enhancements, and bikeway improvements), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities.

SOURCE: ESRI

Los Cerritos Wetlands Restoration Plan

Figure 1

Program Area and Local Vicinity

ESA

2.0 Environmental Setting

Regional and Local Air Quality

South Coast Air Basin

The Project Site is located within the South Coast Air Basin (Air Basin). The Air Basin is an approximately 6,745-square-mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east (SCAQMD, 2012). The Air Basin consists of Orange County, Los Angeles County (excluding the Antelope Valley portion), and the western, non-desert portions of San Bernardino and Riverside counties, in addition to the San Gorgonio Pass area in Riverside County. The terrain and geographical location determine the distinctive climate of the Air Basin, as it is a coastal plain with connecting broad valleys and low hills.

The Air Basin lies in the semi-permanent high-pressure zone of the eastern Pacific Ocean. The usually mild climatological pattern is interrupted by periods of hot weather, winter storms, or Santa Ana winds. The extent and severity of criteria pollutant concentrations in the Air Basin is a function of the area's natural physical characteristics (weather and topography) and anthropogenic influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and dispersion of pollutants throughout the Air Basin, making it an area of high pollution potential. The Air Basin's meteorological conditions, in combination with regional topography, are particularly conducive to the formation and retention of ozone (O_3), which is a secondary pollutant that forms through photochemical reactions in the atmosphere. Thus, the greatest air pollution impacts throughout the Air Basin typically occur from June through September. This condition is generally attributed to the emissions occurring in the Air Basin, light winds, and shallow vertical atmospheric mixing. These factors reduce the potential for pollutant dispersion causing elevated air pollutant levels. Pollutant concentrations in the Air Basin vary with location, season, and time of day. Concentrations of O_3, for example, tend to be lower along the coast, higher in the near inland valleys, and lower in the far inland areas of the Air Basin and adjacent desert (SCAQMD, 2012).

Criteria Air Pollutants and Ozone Precursors

Certain air pollutants have been recognized to cause notable health problems and consequential damage to the environment either directly or in reaction with other pollutants, due to their presence in elevated concentrations in the atmosphere. Such pollutants have been identified as criteria air pollutants and regulated as part of the overall endeavor to prevent further deterioration and facilitate improvement in air quality. The following criteria pollutants are regulated by the United States Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB), and are subject to emissions control requirements adopted by federal, state, and local regulatory agencies. Ambient air quality standards (AAQS) have been established to limit the pollutant health impacts discussed below, and air district mass emission significance thresholds have been established that tie to the achievement and maintenance of the AAQS (SCAQMD, 2017).

Ozone (O_3): Ozone is a secondary pollutant formed by the chemical reaction of volatile organic compounds (VOCs) and nitrogen oxides (NO_X) in the presence of sunlight under favorable meteorological conditions, such as high temperature and stagnation episodes. Ozone concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable. According to the USEPA, ozone can cause muscles in the airways to constrict, potentially leading to wheezing and shortness of breath (USEPA, 2018a). Ozone can make it more difficult to breathe deeply and vigorously; cause shortness of breath and pain when taking a deep breath; cause coughing and sore or scratchy throat; inflame and damage the airways; aggravate lung diseases such as asthma, emphysema and chronic bronchitis; increase the frequency of asthma attacks; make the lungs more susceptible to infection; continue to damage the lungs even when the symptoms have disappeared; and cause chronic obstructive pulmonary disease (USEPA, 2018a). Long-term exposure to ozone is linked to aggravation of asthma and is likely to be one of many causes of asthma development. Long-term exposures to higher concentrations of ozone may also be linked to permanent lung damage, such as abnormal lung development in children (USEPA, 2018a). The USEPA states that people most at risk from breathing air containing ozone include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers (USEPA, 2018a). Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure (USEPA, 2018a). According to CARB, studies show that children are no more or less likely to suffer harmful effects than adults; however, children and teens may be more susceptible to ozone and other pollutants because they spend nearly twice as much time outdoors and engaged in vigorous activities compared to adults (CARB, 2018). Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults and are less likely than adults to notice their own symptoms and avoid harmful exposures (CARB, 2018). Further research may be able to better distinguish between health effects in children and adults (CARB, 2018).

Volatile Organic Compounds (VOCs): VOCs are organic chemical compounds of carbon and are not "criteria" pollutants themselves; however, they contribute with NO_X to form ozone, and are regulated to prevent the formation of ozone (USEPA, 2017b). According to CARB, some VOCs are highly reactive and play a critical role in the formation of ozone, other VOCs have adverse health effects, and in some cases, VOCs can be both highly reactive and have adverse health effects (CARB, 2016b). VOCs are typically formed from combustion of fuels and/or released through evaporation of organic liquids, internal combustion associated with motor vehicle usage, and consumer products (e.g., architectural coatings, etc.) (CARB, 2016b).

Nitrogen Dioxide (NO_2): NO_X is a term that refers to a group of compounds containing nitrogen and oxygen. The primary compounds of air quality concern include NO_2 and nitric oxide (NO). Ambient air quality standards have been promulgated for NO_2, which is a reddish-brown, reactive gas (CARB, 2019b). The principle form of NO_X produced by combustion is NO, but NO reacts quickly in the atmosphere to form NO_2, creating the mixture of NO and NO_2 referred to as NO_X (CARB, 2019b). Major sources of NO_X include emissions from cars, trucks and buses, power plants, and off-road equipment (USEPA, 2016b). The terms NO_X and NO_2 are sometimes used interchangeably. However, the term NO_X is typically used when discussing emissions, usually

from combustion-related activities, and the term NO_2 is typically used when discussing ambient air quality standards. Where NO_X emissions are discussed in the context of the thresholds of significance or impact analyses, the discussions are based on the conservative assumption that all NO_X emissions would oxidize in the atmosphere to form NO_2. According to the USEPA, short-term exposures to NO_2 can potentially aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing). Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections, leading to hospital admissions and emergency room visits (USEPA, 2016b). According to CARB, controlled human exposure studies show that NO_2 exposure can intensify responses to allergens in allergic asthmatics (CARB, 2019b). In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses (CARB, 2019b). Infants and children are particularly at risk from exposure to NO_2 because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure duration. In adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease (CARB, 2019b). CARB states that much of the information on distribution in air, human exposure and dose, and health effects is specifically for NO_2 and there is only limited information for NO and NO_X, as well as large uncertainty in relating health effects to NO or NO_X exposure (CARB, 2019b).

Carbon Monoxide (CO): CO is primarily emitted from combustion processes and motor vehicles due to the incomplete combustion of fuel, such as natural gas, gasoline, or wood, with the majority of outdoor CO emissions from mobile sources (CARB, 2019a). According to the USEPA, breathing air with a high concentration of CO reduces the amount of oxygen that can be transported in the blood stream to critical organs like the heart and brain and at very high levels, which are possible indoors or in other enclosed environments, CO can cause dizziness, confusion, unconsciousness, and death (USEPA, 2016a). Very high levels of CO are not likely to occur outdoors; however, when CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease because these people already have a reduced ability for getting oxygenated blood to their hearts and are especially vulnerable to the effects of CO when exercising or under increased stress (USEPA, 2016a). In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain also known as angina (USEPA, 2016a). According to CARB, the most common effects of CO exposure are fatigue, headaches, confusion, and dizziness due to inadequate oxygen delivery to the brain (CARB, 2019a). For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress; inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance (CARB, 2019a). Unborn babies, infants, elderly people, and people with anemia or with a history of heart or respiratory disease are most likely to experience health effects with exposure to elevated levels of CO (CARB, 2019a).

Sulfur Dioxide (SO_2): According to the USEPA, the largest source of sulfur dioxide (SO_2) emissions in the atmosphere is the burning of fossil fuels by power plants and other industrial

facilities, while smaller sources of SO_2 emissions include industrial processes such as extracting metal from ore; natural sources such as volcanoes; and locomotives, ships and other vehicles and heavy equipment that burn fuel with a high sulfur content (USEPA, 2018b). In 2006, California phased-in the ultra-low-sulfur diesel regulation limiting vehicle diesel fuel to a sulfur content not exceeding 15 parts per million (ppm), down from the previous requirement of 500 ppm, substantially reducing emissions of sulfur from diesel combustion (CARB, 2004). According to the USEPA, short-term exposures to SO_2 can harm the human respiratory system and make breathing difficult (USEPA, 2018b). According to CARB, health effects at levels near the State one-hour standard[1] are those of asthma exacerbation, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness of breath and chest tightness, especially during exercise or physical activity, and exposure at elevated levels of SO_2 (above 1 ppm) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality (CARB, 2019c). Children, the elderly, and those with asthma, cardiovascular disease, or chronic lung disease (such as bronchitis or emphysema) are most likely to experience the adverse effects of SO_2 (CARB, 2019c; USEPA, 2018b).

Particulate Matter (PM10 and PM2.5): Particulate matter air pollution is a mixture of solid particles and liquid droplets found in the air (USEPA, 2018c). Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye while other particles are so small they can only be detected using an electron microscope (USEPA, 2018c). Particles are defined by their diameter for air quality regulatory purposes: inhalable particles with diameters that are generally 10 micrometers and smaller (PM10); and fine inhalable particles with diameters that are generally 2.5 micrometers and smaller (PM2.5) (USEPA, 2018c). Thus, PM2.5 comprises a portion or a subset of PM10. Sources of PM10 emissions include dust from construction sites, landfills and agriculture, wildfires and brush/waste burning, industrial sources, and wind-blown dust from open lands (CARB, 2017). Sources of PM2.5 emissions include combustion of gasoline, oil, diesel fuel, or wood (CARB, 2017). PM10 and PM2.5 may be either directly emitted from sources (primary particles) or formed in the atmosphere through chemical reactions of gases (secondary particles) such as SO_2, NO_X, and certain organic compounds (CARB, 2017). According to CARB, both PM10 and PM2.5 can be inhaled, with some depositing throughout the airways; PM10 is more likely to deposit on the surfaces of the larger airways of the upper region of the lung while PM2.5 is more likely to travel into and deposit on the surface of the deeper parts of the lung, which can induce tissue damage, and lung inflammation (CARB, 2017). Short-term (up to 24 hours' duration) exposure to PM10 has been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits (CARB, 2017). The effects of long-term (months or years) exposure to PM10 are less clear, although studies suggest a link between long-term PM10 exposure and respiratory mortality. The International Agency for Research on Cancer published a review in 2015 that concluded that particulate matter in outdoor air pollution causes lung cancer (IARC, 2014). Short-term exposure to PM2.5 has been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days; and long-term exposure to PM2.5 has been linked to premature death, particularly in people who have

[1] The State one-hour standard for SO_2 is 0.25 ppm.

chronic heart or lung diseases, and reduced lung function growth in children (CARB, 2017). According to CARB, populations most likely to experience adverse health effects with exposure to PM10 and PM2.5 include older adults with chronic heart or lung disease, children, and asthmatics. Children and infants are more susceptible to harm from inhaling pollutants such as PM10 and PM2.5 compared to healthy adults because they inhale more air per pound of body weight than do adults, spend more time outdoors, and have developing immune systems (CARB, 2017).

Lead (Pb): Major sources of lead emissions include ore and metals processing, piston-engine aircraft operating on leaded aviation fuel, waste incinerators, utilities, and lead-acid battery manufacturers (USEPA, 2017a). In the past, leaded gasoline was a major source of lead emissions; however, the removal of lead from gasoline has resulted in a decrease of lead in the air by 98 percent between 1980 and 2014 (USEPA, 2017a). Lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system, and affects the oxygen carrying capacity of blood (USEPA, 2017a). The lead effects most commonly encountered in current populations are neurological effects in children, such as behavioral problems and reduced intelligence, anemia, and liver or kidney damage (CARB, 2019d). Excessive lead exposure in adults can cause reproductive problems in men and women, high blood pressure, kidney disease, digestive problems, nerve disorders, memory and concentration problems, and muscle and joint pain (CARB, 2019d).

Non-Criteria Air Pollutants

In addition to criteria air pollutants and ozone precursors, the State and local air districts regulate non-criteria pollutants that contribute to adverse air quality and health effects, which are discussed below.

Toxic Air Contaminants: Toxic air contaminants (TACs) are generally defined as those contaminants that are known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard. TACs are also defined as an air pollutant that may increase a person's risk of developing cancer and/or other serious health effects; however, the emission of a toxic chemical does not automatically create a health hazard. Other factors, such as the amount of the chemical, its toxicity, how it is released into the air, the weather, and the terrain, all influence whether the emission could be hazardous to human health. TACs are emitted by a variety of industrial processes such as petroleum refining, electric utility and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust and may exist as PM10 and PM2.5 or as vapors (gases). TACs include metals, other particles, gases absorbed by particles, and certain vapors from fuels and other sources.

The emission of toxic substances into the air can be damaging to human health and to the environment. Human exposure to these pollutants at sufficient concentrations and durations can result in cancer, poisoning, and rapid onset of sickness, such as nausea or difficulty in breathing. Other less measurable effects include immunological, neurological, reproductive, developmental, and respiratory problems. Pollutants deposited onto soil or into lakes and streams affect ecological systems and eventually human health through consumption of contaminated food. The carcinogenic potential of TACs is a particular public health concern because many scientists

currently believe that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of contracting cancer.

Diesel Particulate Matter: According to the 2006 California Almanac of Emissions and Air Quality, the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from the exhaust of diesel-fueled engines, i.e., diesel particulate matter (DPM). The State of California has identified DPM as a TAC. However, DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances.

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

The most common exposure to DPM is breathing the air that contains diesel exhaust. The fine and ultra-fine particles are respirable (similar to PM2.5), which means that they can avoid many of the human respiratory system defense mechanisms and enter deeply into the lung. Exposure to DPM comes from both on-road and off-road engine exhaust that is either directly emitted from the engines or lingering in the atmosphere.

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

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

Other Emissions (Odors)

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). Offensive odors are unpleasant and can lead to public distress, generating citizen complaints to local governments. Although unpleasant, offensive odors rarely cause physical harm. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source, wind speed, direction, and the sensitivity of receptors.

Existing Pollutant Levels at Nearby Monitoring Stations

Criteria Air Pollutants

The SCAQMD maintains a network of air quality monitoring stations located throughout the Air Basin to measure ambient pollutant concentrations. The program area is in the South Los Angeles County Coastal Source-Receptor Area (SRA) 4. The monitoring station most representative of the program area is the Long Beach (Hudson) Monitoring Station (South Coastal LA County 3 location). Criteria pollutants monitored at this station include CO, O_3, NO_2, PM10, and SO_2. PM2.5 and lead readings were taken from the South Coastal Los Angeles County 2 location. The most recent data available from the SCAQMD for this monitoring station is from years 2013 to 2017. The pollutant concentration data for these years are summarized in **Table 1**, *Ambient Air Quality Data*.

TABLE 1
AMBIENT AIR QUALITY DATA

Pollutant/Standard	2013	2014	2015	2016	2017	2018
O_3 (1-hour)						
Maximum Concentration (ppm)	0.090	0.087	0.087	0.079	0.082	0.074
Days > CAAQS (0.09 ppm)	0	0	0	0	0	0
O_3 (8-hour)						
Maximum Concentration (ppm)	0.069	0.072	0.066	0.059	0.068	0.063
4th High 8-hour Concentration (ppm)	0.057	0.061	0.056	0.055	0.062	0.053
Days > CAAQS (0.070 ppm)	0	1	0	0	0	0
Days > NAAQS (0.075 ppm)	0	0	0	0	0	0
NO_2 (1-hour)						
Maximum Concentration (ppm)	0.0813	0.1359	0.1018	0.0756	0.0895	0.0853
98th Percentile Concentration (ppm)	0.0713	0.0848	0.0644	0.0663	0.0729	0.0627
Days > CAAQS (0.18 ppm)	0	0	0	0	0	0
NO_2 (Annual)						
Annual Arithmetic Mean (0.030 ppm)	0.0215	0.0207	0.0198	0.0185	0.0179	0.0173
CO (1-hour)						
Maximum Concentration (ppm)	—	4.0	3.3	3.3	3.9	2.0
Days > CAAQS (20 ppm)	—	0	0	0	0	0
Days > NAAQS (35 ppm)	—	0	0	0	0	0
CO (8-hour)						
Maximum Concentration (ppm)	2.6	2.6	2.2	2.2	2.6	1.7
Days > CAAQS (9 ppm)	0	0	0	0	0	0
Days > NAAQS (9 ppm)	0	0	0	0	0	0

TABLE 1
AMBIENT AIR QUALITY DATA

Pollutant/Standard	2013	2014	2015	2016	2017	2018
SO_2 (1-hour)						
Maximum Concentration (ppm)	0.0151	0.0375	0.0126	0.0178	0.0197	0.0105
99th Percentile Concentration (ppm)	0.0116	0.0118	0.0063	0.0012	0.0143	0.0094
Days > CAAQS (0.25 ppm)	0	0	0	0	0	0
Days > NAAQS (0.075 ppm)	0	0	0	0	0	0
PM10 (24-hour)						
Maximum Concentration (µg/m^3)	—	—	80	75	79	84
Samples > CAAQS (50 µg/m^3)	—	—	6	8	9	1
Samples > NAAQS (150 µg/m^3)	—	—	0	0	0	0
PM10 (Annual Average)						
Annual Arithmetic Mean (20 µg/m^3)	—	—	31.5	31.9	33.3	23.9
PM2.5 (24-hour)						
Maximum Concentration (µg/m^3)	42.9	52.2	48.3	28.93	56.3	47.10
98th Percentile Concentration (µg/m^3)	24.6	27.2	31.2	22.05	31.10	27.70
Samples > NAAQS (35 µg/m^3)	1	2	4	0	5	2
PM2.5 (Annual)						
Annual Arithmetic Mean (12 µg/m^3)	10.97	10.72	10.26	9.62	11.02	11.15
Lead						
Maximum 30-day average (µg/m^3)	0.012	0.012	0.010	0.008	0.010	0.006
Samples > CAAQS (1.5 µg/m^3)	0	0	0	0	0	0

NOTES:

ppm = parts per million; µg/m^3 = micrograms per cubic meter; CAAQS = California Ambient Air Quality Standards; NAAQS = National Ambient Air Quality Standards

SOURCE: South Coast Air Quality Management District. Historical Data by Year. Available at: http://www.aqmd.gov/home/air-quality/air-quality-data-studies/historical-data-by-year. Accessed June 2019.

Toxic Air Contaminants

Concentrations of TACs are also used as indicators of ambient air quality conditions. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

The public's exposure to TACs is a significant public health issue in California. The Air Toxics "Hotspots" Information and Assessment Act is a State law requiring facilities to report emissions of TACs to air districts. The program is designated to quantify the amounts of potentially hazardous air pollutants released, the location of the release, the concentrations to which the public is exposed, and the resulting health risks. The State Air Toxics Program (Assembly Bill 2588) identified over 200 TACs, including the 188 TACs identified in the Clean Air Act (CAA). The USEPA has assessed this expansive list of toxics and identified 21 TACs as Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. USEPA also extracted a subset of these 21 MSAT compounds that it now labels as the six priority MSATs: benzene, formaldehyde, acetaldehyde,

diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. While these six MSATs are considered the priority transportation toxics, USEPA stresses that the lists are subject to change and may be adjusted in future rules.

Between July 2012 and June 2013, the SCAQMD conducted the Multiple Air Toxics Exposure Study (MATES IV), which is a follow-up to previous air toxics studies conducted in the Air Basin. The MATES IV Final Report was issued in May 2015. The study, based on actual monitored data throughout the Air Basin, consisted of a monitoring program, an updated emissions inventory of TACs, and a modeling effort to characterize carcinogenic risk across the Air Basin from exposure to TACs. The study concluded that the average of the modeled air toxics concentrations measured at each of the monitoring stations in the Air Basin equates to a background cancer risk of approximately 418 per million based on the average of 10 fixed monitoring sites and 367 per million based on a population-weighted average risk. The risk is primarily due to diesel exhaust, which is about 65 percent lower for the average of 10 fixed monitoring sites and 57 percent lower for the population-weighted risk than the previous MATES III cancer risk (SCAQMD 2015, ES-2-3). Subsequent to the SCAQMD's risk calculations estimates performed for MATES IV, the California Environmental Protection Agency Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA Guidance) updated the methods for estimating cancer risks (OEHHA 2015). The updated method utilizes higher estimates of cancer potency during early life exposures and uses different assumptions for breathing rates and length of residential exposures. When combined together, SCAQMD staff estimates that risks for the same inhalation exposure level will be about 2.5 to 2.7 times higher using the updated methods. This would be reflected in the average lifetime air toxics risk estimated from the monitoring sites data going from 418 per million to 1,023 per million the average of 10 fixed monitoring sites and from 367 per million to 897 per million for the population-weighted risk (SCAQMD 2015, 2-11). Under the updated OEHHA methodology, adopted in March 2015, the relative reduction in risk from the MATES IV results compared to MATES III would be the same (about 65 percent reduction in risk).

Approximately 68 percent of the airborne carcinogenic risk is attributed to DPM, approximately 22 percent to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde), and approximately 10 percent is attributed to stationary sources (which include industries and other certain businesses, such as dry cleaners and chrome plating operations) (SCAQMD 2015, ES-2). The study also found lower ambient concentrations of most of the measured air toxics compared to the levels measured in the previous study conducted during 2004 and 2006. Specifically, benzene and 1,3-butadiene, pollutants generated mainly from vehicles, were down 35 percent and 11 percent, respectively (SCAQMD 2015, 6-1). The reductions were attributed to air quality control regulations and improved emission control technologies. In addition to air toxics, MATES IV included continuous measurements of black carbon and ultrafine particles (particles smaller than 0.1 micron in size), which are emitted by the combustion of diesel fuels. Sampling sites located near heavily-trafficked freeways or near industrial areas were characterized by increased levels of black carbon and ultrafine particles compared to more rural sites.

Sensitive Receptors

Certain population groups, such as children, elderly, and acutely and chronically ill persons (especially those with cardio-respiratory diseases), are considered more sensitive to the potential effects of air pollution than others. The nearest sensitive land uses to the program area are shown in **Figure 2**, *Air Quality Sensitive Receptors*, and include the following:

- JH McGaugh Elementary School: 1,800 feet south from program boundary
- Charles F Kettering Elementary School: 2,000 feet north from program boundary
- Long Beach VA Hospital: 5,165 feet northwest from the program boundary (not shown on map)
- Residential neighborhoods (including the Leisure World retirement community) to the north, east, south, and west of the program boundary. Residential neighborhoods to the south are immediately adjacent to the program boundary.

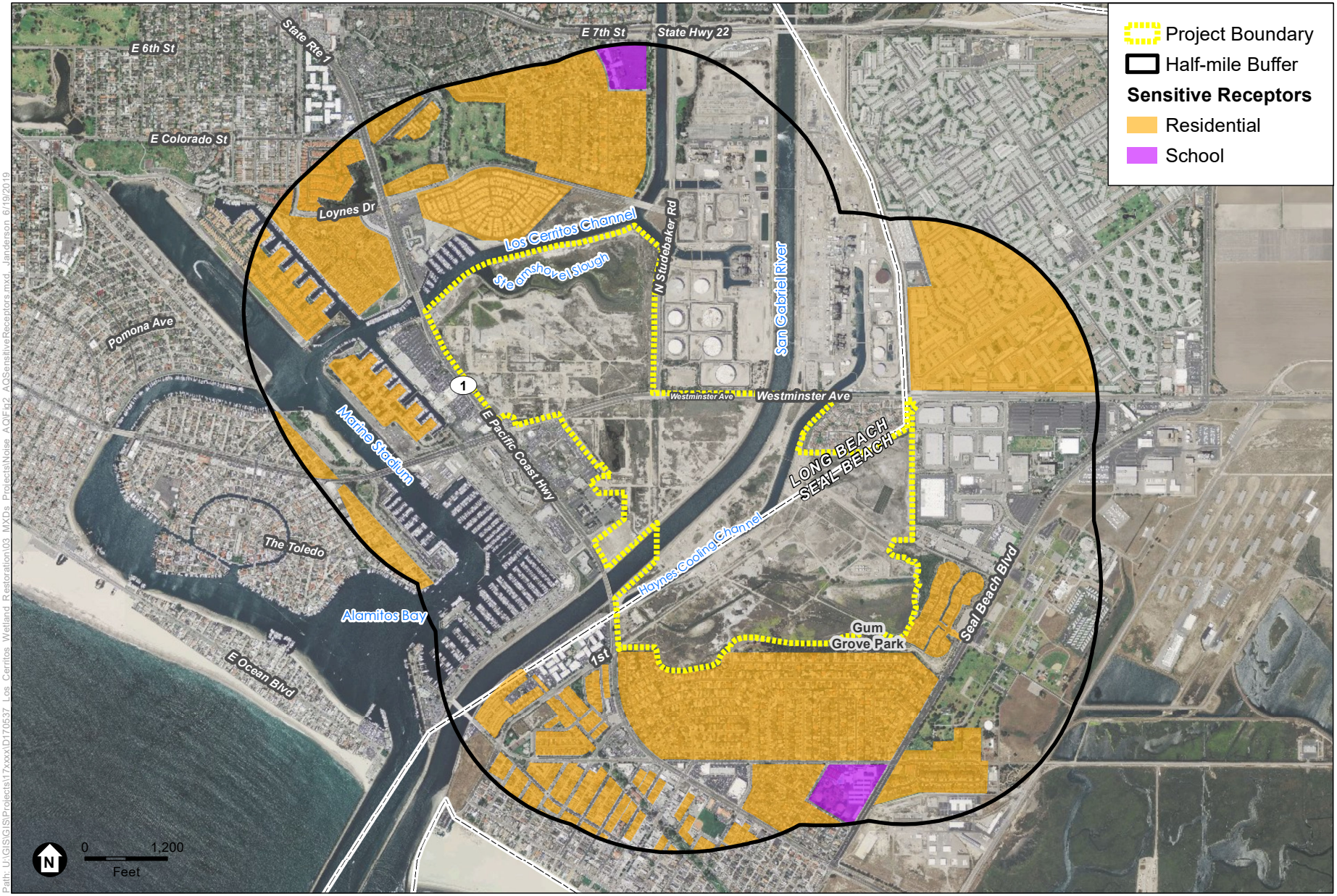
3.0 Regulatory Framework

Federal

The federal Clean Air Act of 1963 was the first federal legislation regarding air pollution control and has been amended numerous times in subsequent years, with the most recent amendments occurring in 1990. At the federal level, the USEPA is responsible for implementation of certain portions of the Clean Air Act including mobile source requirements. Other portions of the Clean Air Act, such as stationary source requirements, are implemented by state and local agencies.

The Clean Air Act establishes federal air quality standards, known as National Ambient Air Quality Standards (NAAQS) and specifies future dates for achieving compliance. The 1990 Amendments to the Clean Air Act identify specific emission reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or to meet interim milestones. Title I (Nonattainment Provisions) and Title II (Mobile Source Provisions) of the Clean Air Act are most applicable to the development and operations of the program. Title I provisions were established with the goal of attaining the NAAQS for the following criteria pollutants: (1) O_3; (2) NO_2; (3) CO; (4) SO_2; (5) PM10; and (6) Pb. The NAAQS were updated in 1997 to include separate standards for PM2.5, which is a subset of PM10 emissions. **Table 2**, *Ambient Air Quality Standards*, shows the NAAQS currently in effect for each criteria pollutant.

The program is located within the South Coast Air Basin, which is an area designated as non-attainment because it does not currently meet NAAQS for certain pollutants regulated under the Clean Air Act. Currently, the Air Basin does not meet the NAAQS for O_3 and PM2.5 and is classified as being in non-attainment for these pollutants. The Air Basin is in non-attainment for PM10 California Ambient Air Quality Standards (CAAQS) in both Los Angeles and Orange counties. The Los Angeles County portion of the Air Basin is designated as non-attainment for the lead NAAQS, while the Orange County portion of the Air Basin is designated as attainment for lead NAAQS. **Table 3**, *South Coast Air Basin Attainment Status*, lists the criteria pollutants and their relative attainment status.



SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan

Figure 3.2-1

Air Quality Sensitive Receptors

ESA

TABLE 2
AMBIENT AIR QUALITY STANDARDS

Pollutant	Average Time	California Standards[a]		National Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
O_3[h]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
NO_2[i]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemi-luminescence	100 ppb (188 µg/m^3)	None	Gas Phase Chemi-luminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		53 ppb (100 µg/m^3)	Same as Primary Standard	
CO	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10mg/m^3)		9 ppm (10 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
SO_2[j]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)[9]
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[j]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[j]	—	
PM10[k]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
PM2.5[k]	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3 [k]	15 µg/m^3	
Pb[l,m]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[m]	Same as Primary Standard	
	Rolling 3-Month Average[m]	--		0.15 µg/m^3		

TABLE 2
AMBIENT AIR QUALITY STANDARDS

Pollutant	Average Time	California Standards[a]		National Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
Visibility Reducing Particles[n]	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates (SO_4)	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[l]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

NOTES:

[a] California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than O_3, PM10, PM2.5, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] Any equivalent procedure which can be shown to the satisfaction of CARB to give equivalent results at or near the level of the air quality standard may be used.

[e] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[f] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[g] Reference method as described by the USEPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the USEPA.

[h] On October 1, 2015, the national 8-hour O_3 primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[i] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb.

[j] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated non-attainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[k] On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3.

[l] CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[m] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated non-attainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[n] In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

SOURCE: CARB 2016a.

TABLE 3
SOUTH COAST AIR BASIN ATTAINMENT STATUS

Pollutant	National Standards (NAAQS)	California Standards (CAAQS)
O_3 (1-hour standard)	N/A[a]	Non-attainment
O_3 (8-hour standard)	Non-attainment – Extreme	Non-attainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM10	Attainment	Non-attainment
PM2.5	Non-attainment – Serious	Non-attainment
Lead (Pb)	Non-attainment (Los Angeles County)[b]; Unclassified/Attainment (Orange County)	Attainment
Visibility Reducing Particles	N/A	Unclassified
Sulfates	N/A	Attainment
Hydrogen Sulfide	N/A	Attainment
Vinyl Chloride[c]	N/A	Attainment

NOTES: N/A = not applicable

[a] The NAAQS for 1-hour ozone was revoked on June 15, 2005, for all areas except Early Action Compact areas.

[b] Partial Non-attainment designation – Los Angeles County portion of the Air Basin only for near-source monitors.

[c] In 1990, the California Air Resources Board identified vinyl chloride as a toxic air contaminant and determined that it does not have an identifiable threshold. Therefore, the California Air Resources Board does not monitor or make status designations for this pollutant.

SOURCES: California Air Resources Board, Area Designations Maps/State and National, last reviewed December 28, 2018. Available at http://www.arb.ca.gov/desig/adm/adm.htm. Accessed June 2019;
South Coast Air Quality Management District, *National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin*, February 2016. Accessed June 2019.

The Clean Air Act also specifies future dates for achieving compliance with the NAAQS and mandates that states submit and implement a State Implementation Plan (SIP) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards would be met. The 1990 amendments to the Clean Air Act identify specific emission reduction goals for basins not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or to meet interim milestones.

Title II of the Clean Air Act pertains to mobile sources, such as cars, trucks, buses, and planes. Reformulated gasoline, automobile pollution control devices, and vapor recovery nozzles on gas pumps are a few of the mechanisms the USEPA uses to regulate mobile air emission sources. The provisions of Title II have resulted in tailpipe emission standards for vehicles, which have strengthened in recent years to improve air quality. For example, the standards for NO_X emissions have been lowered substantially, and the specification requirements for cleaner burning gasoline are more stringent.

State

California Air Resources Board

CARB, a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets the CAAQS, complies emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emission standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB has primary responsibility for the development of California's State Implementation Plan (SIP), for which it works closely with the federal government and local air districts. The SIP is required for the State to take over implementation of the federal Clean Air Act from the USEPA.

California Clean Air Act

The California Clean Air Act, signed into law in 1988, requires all areas of the State to achieve and maintain the CAAQS by the earliest practical date. The CAAQS apply to the same criteria pollutants as the federal Clean Air Act but also include State-identified criteria pollutants, which include sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. CARB has primary responsibility for ensuring the implementation of the California Clean Air Act, responding to the federal Clean Air Act planning requirements applicable to the state, and regulating emissions from motor vehicles and consumer products within the state. Table 2 shows the CAAQS currently in effect for each of the criteria pollutants as well as the other pollutants recognized by the state. As shown in Table 2, the CAAQS include more stringent standards than the NAAQS for most of the criteria air pollutants.

Health and Safety Code Section 39607(e) requires CARB to establish and periodically review area designation criteria. Table 3 provides a summary of the attainment status of the Air Basin for both Los Angeles and Orange Counties with respect to the state standards. The Air Basin is designated as attainment for the California standards for sulfates, hydrogen sulfide, and vinyl chloride.

On-Road and Off-Road Vehicle Rules

In 2004, CARB adopted an Airborne Toxic Control Measure (ATCM) to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other vehicle emissions (Title 13 California Code of Regulations [CCR], Section 2485). The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. This measure does not allow diesel-fueled commercial vehicles to idle for more than 5 minutes at any given time.

In 2008, CARB approved the Truck and Bus regulation to reduce NO_X, PM10, and PM2.5 emissions from existing diesel vehicles operating in California (13 CCR, Section 2025). The requirements were amended in December 2010 and apply to nearly all diesel fueled trucks and busses with a gross vehicle weight rating greater than 14,000 pounds. For the largest trucks in the

fleet, those with a gross vehicle weight rating greater than 26,000 pounds, there are two methods to comply with the requirements. The first way is for the fleet owner to retrofit or replace engines, starting with the oldest engine model year, to meet 2010 engine standards, or better. This is phased over 8 years, starting in 2015 and would be fully implemented by 2023, meaning that all trucks operating in the State subject to this option would meet or exceed the 2010 engine emission standards for NO_X and particulate matter by 2023. The second option, if chosen, requires fleet owners, starting in 2012, to retrofit a portion of their fleet with diesel particulate filters achieving at least 85 percent removal efficiency, so that by January 1, 2016 their entire fleet is equipped with diesel particulate filters. However, diesel particulate filters do not typically lower NO_X emissions. Thus, fleet owners choosing the second option must still comply with the 2010 engine emission standards for their trucks and buses by 2023.

In addition to limiting exhaust from idling trucks, CARB recently promulgated emission standards for off-road diesel construction equipment of greater than 25 horsepower (hp), such as bulldozers, loaders, backhoes and forklifts, as well as many other self-propelled off-road diesel vehicles. The regulation adopted by the CARB on July 26, 2007, aims to reduce emissions by installation of diesel soot filters and encouraging the retirement, replacement, or repower of older, dirtier engines with newer emission-controlled models (13 CCR, Section 2449). Implementation is staggered based on fleet size (which is the total of all off-road horsepower under common ownership or control), with the largest fleets to begin compliance by January 1, 2014. Each fleet must demonstrate compliance through one of two methods. The first option is to calculate and maintain fleet average emissions targets, which encourages the retirement or repowering of older equipment and rewards the introduction of newer cleaner units into the fleet. The second option is to meet the Best Available Control Technology (BACT) requirements by turning over or installing Verified Diesel Emission Control Strategies (VDECS) on a certain percentage of its total fleet horsepower. The compliance schedule requires that BACT turn overs or retrofits (VDECS installation) be fully implemented by 2023 in all equipment in large and medium fleets and across 100 percent of small fleets by 2028.

Regional

South Coast Air Quality Management District

As indicated previously, the cities of Seal Beach and Long Beach are located within the South Coast Air Basin (Air Basin). The SCAQMD has jurisdiction over an area of approximately 10,743 square miles. This area includes all of Orange County, Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County. The Air Basin is a sub-region of the SCAQMD jurisdiction. While air quality in this area has improved, the Air Basin requires continued diligence to meet air quality standards.

Air Quality Management Plan

The SCAQMD has adopted a series of Air Quality Management Plans (AQMP) to meet the CAAQS and NAAQS. The 2012 AQMP incorporates the latest scientific and technological information and planning assumptions, including regional growth projections to achieve federal standards for air quality in the Air Basin. It incorporates a comprehensive strategy aimed at

controlling pollution from all sources, including stationary sources, and on-road and off-road mobile sources. The 2012 AQMP includes new and changing federal requirements, implementation of new technology measures, and the continued development of economically sound, flexible compliance approaches. Additionally, it highlights the significant amount of emissions reductions needed and the urgent need to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria pollutant standards within the timeframes allowed under the federal Clean Air Act (SCAQMD, 2012).

The key understanding of the 2012 AQMP is to bring the Air Basin into attainment with the NAAQS for the 24-hour PM2.5 standard. It also intensifies the scope and pace of continued air quality improvement efforts toward meeting the 2024 8-hour O_3 standard deadline with new measures designed to reduce reliance on the federal Clean Air Act Section 182(e)(5) long-term measures for NOx and VOC reductions. The SCAQMD expects exposure reductions to be achieved through implementation of new and advanced control technologies as well as improvement of existing technologies.

The SCAQMD Governing Board adopted the 2016 AQMP on March 3, 2017. CARB approved the AQMP on March 23, 2017. Key elements of the 2016 AQMP include implementing fair-share emissions reductions strategies at the federal, state, and local levels; establishing partnerships, funding, and incentives to accelerate deployment of zero and near-zero-emissions technologies; and taking credit from co-benefits from greenhouse gas (GHG), energy, transportation and other planning efforts (SCAQMD, 2017). The strategies included in the 2016 AQMP are intended to demonstrate attainment of the NAAQS for the federal non-attainment pollutants O_3 and PM2.5 (SCAQMD, 2016). Similar to the 2012 AQMP, the 2016 AQMP relies on "…aggressive mobile source control strategy supplemented with focused and strategic stationary source control measures" (SCAQMD, 2017, p. 4-1). The 2016 AQMP also recognizes the reduction in traditional air pollutants which occur as a "co-benefit" with the reduction in climate change-related pollutants achieved through GHG emission reduction programs and policies (SCAQMD, 2016). Vehicles and appliances (boilers, water heaters, space heaters, etc.) used in the construction and operation of the Project would comply with applicable regulations. While the 2016 AQMP was adopted by the SCAQMD and CARB, it has not yet received USEPA approval for inclusion in the SIP. Therefore, until such time as the 2016 AQMP is approved by the USEPA, the 2012 AQMP remains the applicable AQMP for federal purposes; however, this analysis considers both the 2012 and 2016 AQMP as appropriate.

Air Quality Guidance Documents

The SCAQMD published the CEQA Air Quality Handbook to provide local governments with guidance for analyzing and mitigating project-specific air quality impacts (SCAQMD, 1993). The CEQA Air Quality Handbook provides standards, methodologies, and procedures for conducting air quality analyses in EIRs and was used extensively in the preparation of this analysis. However, the SCAQMD is currently in the process of replacing the CEQA Air Quality Handbook with the Air Quality Guidance Handbook. While this process is underway, the SCAQMD recommends that lead agencies avoid using the screening tables in Chapter 6, Determining the Air Quality Significance of a Project, of the CEQA Air Quality Handbook and instead recommends using other approved models to calculate emissions from land use projects, such as

the California Emissions Estimator Model (CalEEMod) software. The SCAQMD has published a guidance document called the *Final Localized Significance Threshold Methodology* that is intended to provide guidance in evaluating localized effects from mass emissions during construction and operations (SCAQMD, 2008). The SCAQMD adopted additional guidance regarding PM2.5 in a document called Final Methodology to Calculate Particulate Matter (PM)2.5 and PM2.5 Significance Thresholds (SCAQMD, 2006). This latter document has been incorporated by the SCAQMD into its CEQA significance thresholds and Localized Significance Threshold Methodology.

Regulations and Rules

Several SCAQMD rules adopted to implement portions of the AQMP may apply to construction or operation of the program. The program may be subject to the following SCAQMD rules and regulations:

Regulation IV – Prohibitions: This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, start-up/shutdown exemptions and breakdown events. The following is a list of rules which may apply to the program:

- **Rule 401 – Visible Emissions:** This rule states that a person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is as dark or darker in shade as that designated No. 1 on the Ringelmann Chart or of such opacity as to obscure an observer's view (USBM, 1967).
- **Rule 402 – Nuisance:** This rule 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.
- **Rule 403 – Fugitive Dust:** This rule requires projects to prevent, reduce or mitigate fugitive dust emissions from a site. Rule 403 restricts visible fugitive dust to the project property line, restricts the net PM10 emissions to less than 50 $\mu g/m^3$ and restricts the tracking out of bulk materials onto public roads. Additionally, projects must utilize one or more of the best available control measures (identified in the tables within the rule). Mitigation measures may include adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities. Finally, a contingency plan may be required if so determined by the USEPA.

Regulation XI – Source Specific Standards: Regulation XI sets emissions standards for different specific sources. The following is a list of rules which may apply to the program:

- **Rule 1113 – Architectural Coatings:** This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.
- **Rule 1166. Volatile organic compound emissions from decontamination of soil procedures and requirements:** This rule sets requirements to control the emissions of

VOC from excavating, grading, handling, and treating VOC-contaminated soil as a result of leakage from storage or transfer operations, accidental spillage, or other deposition.

- **Rule 1186 – PM10 Emissions from Paved and Unpaved Roads, and Livestock Operations:** This rule applies to owners and operators of paved and unpaved roads and livestock operations. The rule is intended to reduce PM10 emissions by requiring the cleanup of material deposited onto paved roads, use of certified street sweeping equipment, and treatment of high-use unpaved roads (see also **Rule 403**).

Local

Seal Beach General Plan

The City of Seal Beach General Plan, adopted in December 2003, does not contain a stand-alone air quality element. Rather, the City is able to comply with SCAQMD's AQMP through its Land Use Element, which "organizes land uses in relation to the circulation system, promotes commercial and industrial land uses with convenient access to transportation, and provides a Land Use Plan that promotes a favorable relationship between jobs and housing" (City of Seal Beach, 2003). In addition, the Circulation Element sets a goal to minimize air pollution through development of regional transportation facilities and a transportation demand management system. A reduction in vehicle miles traveled would have a resulting beneficial impact to air quality emissions.

Long Beach General Plan: Air Quality Element

The City of Long Beach adopted an "Air Quality Element," (adopted December 3, 1996) as part of the City's General Plan. The Air Quality Element, "identifies a series of policies, programs, and strategies that encourage fewer vehicle trips, increased opportunities for alternative transportation modes and fuels, and land use patterns that can be efficiently served by a diversified transportation system (Long Beach, 1996)." The following goals and policies are relevant to the program:

Air Quality Element—1996

Goal 6.0: Minimize particulate emissions from the construction and operation of roads and buildings, from mobile sources, and from the transportation, handling and storage of materials.

Policy 6.1: Control Dust. Further reduce particulate emissions from roads, parking lots, construction sites, unpaved alleys, and port operations and related uses.

Goal 7.0: Reduce emissions through reduced energy consumption.

4.0 Significance Thresholds and Methodology

Significance Thresholds

For the purposes of this PEIR and consistency with Appendix G of the *CEQA Guidelines*, the program would have a significant impact on air quality if it would:

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; or

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

The *CEQA Guidelines* Section 15064.7 indicates that significance criteria established by the applicable air quality management district or air pollution control district, when available, may be relied upon to make determinations of significance. SCAQMD has set thresholds for both construction and operational emissions as shown in **Table 4**, *SCAQMD Air Quality Significance Thresholds*. A project with daily emission rates below these thresholds would be considered to have a less than significant impact to air quality.

Methodology

Existing Emissions

For the purposes of this program-level analysis, it is conservatively assumed that the program activities would result in all net new emissions. Most of the program area is either vacant or an active oil field. Existing emissions from oil fields within the boundaries of the Los Cerritos Wetlands Oil Consolidation and Restoration Project, located on the Southern Synergy Oil Field site and the Long Beach City Property site in the northern and central portion of the program area, were found to be minimal and have already been addressed in a previously certified EIR, and therefore are not analyzed in this EIR. As the program activities would restore habitats and eventually decommission and remove existing oil operations, the net change for emissions in the long term could be negative. However, this would be difficult to quantify since the exact timing and commitments to cease oil operations in the future is unknown. As a conservative approach, no existing emissions were subtracted from estimated program emissions before comparison to emission thresholds.

Construction Emissions

Daily regional emissions during construction are forecasted by assuming a worst-case scenario year for the maximum acreage to be disturbed in one year. The emissions are estimated using the CalEEMod (Version 2016.3.2) software, an emissions inventory software, which is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professions to quantify potential criteria pollutant emissions from a variety of land use projects. CalEEMod was developed in collaboration with the air districts of California. Regional data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is considered to be an accurate and comprehensive tool for quantifying air pollutant emissions from land use projects throughout California and is recommended by the SCAQMD.

TABLE 4
SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS

Pollutant	Construction[a]	Operations[b]
MASS DAILY THRESHOLDS		
NO_X	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SO_X	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Pb	3 lbs/day	3 lbs/day
TOXIC AIR CONTAMINANTS (TACS), ODOR, AND GHG THRESHOLDS		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000 MT/yr CO_2eq for industrial facilities	
AMBIENT AIR QUALITY STANDARDS FOR CRITERIA POLLUTANTS[c]		
NO_2		
SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards:		
1-hr average	0.18 ppm (state)	
Annual arithmetic mean	0.03 ppm (state) and 0.0534 ppm (federal)	
PM10		
24-hour average	10.4 μg/m^3 (construction)[e] & 2.5 μg/m^3 (operation)	
Annual average	1.0 μg/m^3	
PM2.5		
24-hour average	10.4 μg/m^3 (construction)[d] & 2.5 μg/m^3 (operation)	
SO_2		
1-hour average	0.25 ppm (state) & 0.075 ppm (federal – 99th percentile)	
24-hour average	0.04 ppm (state)	
Sulfate		
24-hour average	25 μg/m^3 (state)	
CO		
SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards:		
1-hour average	20 ppm (state) and 35 ppm (federal)	
8-hour average	9.0 ppm (state/federal)	
Lead		
30-day average	1.5 μg/m^3 (state)	
Rolling 3-month average	0.15 μg/m^3 (federal)	

NOTES:

N/A = not applicable

[a] Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).

[b] For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.

[c] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.

[d] Ambient air quality threshold based on SCAQMD Rule 403.

SOURCE: South Coast Air Quality Management District, Air Quality Significance Thresholds, April 2019. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf, Accessed June 2019.

The input values used in this analysis were adjusted to account for the nature of wetlands restoration activities and referenced the equipment and assumptions used for the Los Cerritos Wetlands Oil Consolidation and Restoration Project for consistency (**Table 5**, *Off-Road Equipment List*). Specialized construction equipment was added as appropriate according to the activities listed in Chapter 2, *Project Description*, of the of the Los Cerritos Wetlands Restoration Plan PEIR.

TABLE 5
OFF-ROAD EQUIPMENT LIST

Construction Subphase	Equipment	Number	Hours/Day
Demolition and Site Preparation	Concrete saws	1	8
Demolition and Site Preparation	Excavators	3	8
Demolition and Site Preparation	Rubber Tired Dozers	2	8
Demolition and Site Preparation	Tractors/Loaders/Backhoes (Low ground pressure equipment)*	2	8
Grading/Excavation	Excavators	2	8
Grading/Excavation	Graders	1	8
Grading/Excavation	Rubber Tired Dozers	1	8
Grading/Excavation	Scrapers	2	8
Grading/Excavation	Tractors/Loaders/Backhoes	2	8
Grading/Excavation	Other Construction Equipment (Hydraulic Dredge)*	2	8
Grading/Excavation	Cranes (Clamshell and dragline crane)*	1	7
Drainage/Utilities/Subgrade	Excavators (Amphibious excavator)*	2	8
Drainage/Utilities/Subgrade	Trenchers (rotary ditcher)*	2	2
Drainage/Utilities/Subgrade	Pumps	2	8
Drainage/Utilities/Subgrade	Bore/drill rig	1	6
Building Construction	Cranes	1	7
Building Construction	Forklifts	3	8
Building Construction	Generator Sets	1	8
Building Construction	Tractors/Loaders/Backhoes	3	7
Building Construction	Welders	1	8
Paving	Pavers	2	8
Paving	Paving Equipment	2	8
Paving	Rollers	2	8
Architectural Coating	Air Compressors	1	6

* Surrogates were used in place of special equipment for CalEEMod.

Construction haul and vendor truck emissions were evaluated using regional heavy-duty truck emission factors from the CARB on-road vehicle emissions factor model (EMFAC), with emission factors from the USEPA-approved EMFAC2017 model used for the analysis. Subphases of construction would include demolition and site preparation, grading/excavation for levees, drainage/utilities/subgrade, building construction for the visitor center, paving for access roads and parking, and architectural coating for the visitor center and traffic markings. The demolition and site preparation includes removal of pipelines, tanks, and other oil infrastructure within the Alamitos

Bay Partners site, Central LCWA site, Hellman Ranch site, and Isthmus area. Waste is assumed to be hauled to the Montebello landfill located approximately 23 miles away. The main wetland restoration activities are covered in the grading/excavation subphase, which includes construction, modifying, and removing berms as well as establishing tidal channels. It is assumed that a tug boat would be used to pull the barges for soil transport and that there would be two crew/survey boats at most on any given day. The program may use either a tugboat or a combination of a tugboat and trucks to transport soil. However, the use of a tugboat for soil transport would generate greater emissions of VOC, NO_X, CO, and SO_2 compared to trucks (see **Table 6**, *Maximum Unmitigated Regional Construction Emissions [Pounds per Day]*). Therefore, it is more conservative to assume soil transport by tugboat compared to truck travel. Tugboat emissions were calculated using emission factors from USEPA marine engine rules for Tier 2 engines. Emission factors were multiplied by the number of vessels and estimated hours of operation per day for usage and travel to and from the program area. Calculations are included in Appendix A of this Technical Report. These off-shore emissions (tugboats and other crew/survey boats) were added to the on-shore emissions for the grading/excavation subphase. For building construction and paving, for the purposes of this program-level air quality analysis, it is estimated that approximately 2,000 square feet of visitor center space and 50 parking spaces would be required to serve the program area. Emissions from these activities are estimated by construction subphase.

TABLE 6
MAXIMUM UNMITIGATED REGIONAL CONSTRUCTION EMISSIONS (POUNDS PER DAY)

Source	VOC	NO_x	CO	SO_2	PM10[a]	PM2.5[a]
Construction Subphases						
Demolition and Site Preparation	4	38	27	<0.1	27	6
Grading/Excavation – Combined On-Shore and Off-Shore	17	172	116	28	44	13
On-Shore Emissions	*6*	*67*	*43*	*<0.1*	*41*	*9*
Off-Shore Emissions	*11*	*105*	*73*	*28*	*4*	*4*
Drainage/Utilities/Subgrade	2	22	22	<0.1	1	1
Building Construction	2	20	18	<0.1	2	1
Paving	3	14	15	<0.1	1	1
Architectural Coating[b]	5	2	2	<0.1	<0.1	<0.1
Combined Regional (On-Site and Off-Site) Emissions[c]	**33**	**268**	**200**	**28**	**76**	**22**
SCAQMD Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Over (Under)	(42)	168	(350)	(122)	(74)	(33)
Exceeds Thresholds?	No	**Yes**	No	No	No	No

NOTES:

Totals may not add up exactly due to rounding in the modeling calculations. Detailed emissions calculations are provided in Appendix A of this Technical Report.

[a] Emissions include fugitive dust control measures consistent with SCAQMD Rule 403.

[b] Architectural coating emissions for VOC are assumed by CalEEMod to paint the entire 10,000-square-foot floor area in 1 day. VOC emissions have been adjusted to spread out the painting over 20 days.

[c] Emissions from all subphases are combined to simulate a worst-case scenario where all construction activities are occurring simultaneously.

SOURCE: ESA, 2019 [Appendix A].

Fugitive emissions from paved and unpaved roads are calculated in CalEEMod using emission factors for off-road equipment from CARB's OFFROAD model and on-road vehicles from CARB's EMFAC model (CARB, 2019e). All unpaved demolition and construction areas shall be wetted (i.e., three times daily unless soils already contain equivalent moisture content) during excavation and construction, and temporary dust covers shall be used where needed to reduce dust emissions and meet SCAQMD District Rule 403. Wetting would reduce fugitive dust emissions by 61 percent.

The maximum daily emissions are estimated values for the worst-case day and do not represent the emissions that would occur for every day of program construction. The construction year was set to 2020 to obtain conservative emission factors for the construction activities. Emission factors decline in later years because of the requirement and development of cleaner and more efficient equipment. The year 2020 would represent a worst case scenario with all of the construction activities occurring simultaneously that are associated with the near-term restoration and public access. Construction activities for the mid-term, and long-term phases were not modeled specifically, but would likely be less than the modeled 2020 year due to similar construction subphases, but lower emission factors. The maximum daily emissions are compared to the SCAQMD daily regional numeric indicators. Detailed construction equipment lists, construction scheduling, and emissions calculations are provided in Appendix A of this Technical Report.

Localized impacts to air quality were not analyzed quantitatively in this program-level document due to the uncertainty of the timing and exact locations of the construction activities. Rather, local air quality was discussed qualitatively with regard to the potential for localized impacts.

Potential odor impacts are evaluated by conducting a screening-level analysis followed by a more detailed analysis as necessary. The screening-level analysis consists of reviewing the program site plan and project description to identify new or modified odor sources. If it is determined that the program would introduce a potentially significant new odor source or modify an existing odor source, then downwind sensitive receptor locations are identified, and a site-specific analysis is conducted to determine potential impacts.

Operational Emissions

The operational emissions are estimated using the CalEEMod software. CalEEMod was used to forecast the daily regional emissions from mobile sources that would occur during long-term Project operations. The operational year was set to 2021 for a conservative emissions estimate. This consists mostly of truck trips for maintenance of the trails and wetlands and emissions from passenger vehicles from visitors. The analysis relied on the Institute of Transportation Engineers (ITE) Manual, 10th Edition "Public Park" category trip rates (i.e., denoted in the ITE Manual as "Land Use [LU] 411").

Area source emissions are based on natural gas (building heating and water heaters), landscaping equipment, and consumer product usage (including paints) rates provided in CalEEMod for the visitor center building, which was assumed to be up to 2,000 square feet of floor area.

Operational air quality impacts are presented as net new emissions. As discussed previously, no existing emissions were subtracted from estimated program emissions before comparison to emission thresholds given desire for a conservative approach. Program activities would restore habitats and eventually decommission and remove existing oil operations potentially resulting in a net change in emissions in the long term that could be negative, but cannot be accurately evaluated at this program-level given the uncertainty of the timing of specific restoration activities in the program area. The maximum daily emissions from operation of the Project are compared to the SCAQMD daily regional numeric indicators. Detailed operational emissions calculations are provided in Appendix A of this Technical Report.

5.0 Program Impacts and Mitigation Measures

Impact AQ-1: The program would result in a significant impact if the program would conflict with or obstruct implementation of the applicable air quality plan.

The SCAQMD is required, pursuant to the Clean Air Act, to reduce emissions of criteria pollutants for which the Air Basin is in non-attainment of the NAAQS (e.g., O_3 and PM2.5). The Air Basin is also in non-attainment of the CAAQS (e.g., O_3, PM10, and PM2.5). The SCAQMD's AQMP contains a comprehensive list of pollution control strategies directed at reducing emissions and achieving the NAAQS and CAAQS. These strategies are developed, in part, based on regional growth projections prepared by the SCAG. Projects that are consistent with the assumptions used in the AQMP do not interfere with attainment because the growth is included in the projections utilized in the formulation of the AQMP. Thus, projects, uses, and activities that are consistent with the applicable growth projections and control strategies used in the development of the AQMP would not jeopardize attainment of the air quality levels identified in the AQMP, even if they exceed the SCAQMD's numeric indicators. As noted above, while the 2016 AQMP was adopted by the SCAQMD and CARB, it has not yet received USEPA approval for inclusion in the SIP. Therefore, until such time as the 2016 AQMP is approved by the USEPA, the 2012 AQMP remains the applicable AQMP for federal purposes, however, this analysis considers both the 2012 and 2016 AQMP as appropriate.

Criteria for determining the program's consistency with the AQMP are defined in Chapter 12, Section 12.2 and Section 12.3, of the SCAQMD's CEQA Air Quality Handbook, and include the following:

- Consistency Criterion No. 1: The proposed project will not result in an increase in the frequency or severity of existing air quality violations, or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

The violations to which Consistency Criterion No. 1 refers are the CAAQS and the NAAQS. Daily regional emissions during construction are estimated by subphase for a worst case scenario year. For the purposes of the analysis, the construction year was assumed to be 2020. Actual construction for the program will vary over the three phases of near-, mid-, and long-term (next 10 years, 10–20 years, and 20+ years). As discussed below under Impact AQ-2, maximum daily emissions from construction activities would exceed the SCAQMD regional threshold for NO_X

(Table 6). Regional construction emissions of NO_X would be mitigated to less than significant levels (Table 9, *Maximum Mitigated Regional Construction Emissions [Pounds per Day]*, below). However, as discussed below under Impact AQ-3, localized impacts to sensitive receptors at the program-level during construction would be considered potentially significant. Operational emissions would be less than significant (Table 6) and no mitigation measures would be required. Therefore, while incorporation of mitigation would reduce regional construction emissions to less than significant, the program could still potentially result in significant localized construction impacts and as such, could conflict with Criterion No. 1 and would result in a potentially significant impact for construction emissions.

- Consistency Criterion No. 2: The proposed project will not exceed the assumptions in the AQMP or increments based on the years of the project build-out phase.

Under Consistency Criterion No. 2, the AQMP contains air pollutant reduction strategies based on the SCAG's latest growth forecasts, and SCAG's growth forecasts were defined in consultation with local governments and with reference to local general plans. The SCAQMD recommends that lead agencies demonstrate that a project would not directly obstruct implementation of an applicable air quality plan and that a project be consistent with the assumptions upon which the air quality plan is based. During construction, the Project would be required to comply with CARB requirements to minimize short-term emissions from on-road and off-road diesel equipment, and with SCAQMD's regulations for controlling fugitive dust and other construction emissions. Compliance with these requirements is consistent with and meets or exceeds the AQMP requirements for control strategies intended to reduce emissions from construction equipment and activities.

Construction would occur sporadically over the next 20+ years across the 503-acre program area. Construction subphases and the required number of workers would vary over the near-, mid-, and long-term phasing of the program. Because the construction would only occur for short periods of time in each location, construction emissions and duration would still be considered short-term and, therefore, would not conflict with the AQMP. For operations, the program would restore wetlands and habitat areas which would reduce emissions in the long term from the existing environmental setting as oil operations cease. The program would not increase population growth as it includes no housing and would generate a minimal number of jobs for maintenance of the facilities. The improvements to pedestrian access would help decrease vehicle miles traveled region-wide as it provides a recreational area near existing residential communities in the cities of Long Beach and Seal Beach thereby reducing the need to travel long distances for recreation (see Figure 2, above). Program emissions would be only a small percentage of overall Basin-wide emissions (Table 7, *Maximum Unmitigated Regional Operational Emissions [Pounds per Day]*, below). Therefore, the program would not conflict with Criterion No. 2.

Because the program could conflict with Criterion No. 1, there would be a significant impact from conflicting with or obstructing implementation of the applicable air quality plan.

Mitigation Measure

Mitigation Measure AQ-1 as described below under Impact AQ-2 would reduce air quality impacts.

Significance after Mitigation

Significant and unavoidable (construction)

Impact AQ-2: The proposed program would result in a significant impact if the proposed program would have a cumulatively considerable net increase of any criteria pollutant for which the program region is non-attainment under an applicable federal or state ambient air quality standard.

Construction

The South Coast Air Basin is in non-attainment of the NAAQS for O_3 and PM2.5 and also in non-attainment of the CAAQS for O_3, PM10, and PM2.5. As shown in Table 6, there would be exceedances to the SCAQMD daily regional threshold for NO_X during individual construction subphases. In addition, there is potential for subphases to overlap as well, thereby worsening the exceedances for NO_X, but likely not causing a new exceedance. The emissions for CO, SO_2, PM10, and PM2.5 would not be exceeded even if all subphases of construction occurred at the same time. Construction emissions would vary temporally and spatially as the exact construction schedules, staging areas, and work plans are not known at this time. Despite the long construction duration for near-term, mid-term, and long-term activities, emissions from a singular activity would not be concentrated in one place for an extended duration. It is anticipated that a project level analyses would be conducted when more specific construction information is known. At a program level, construction emissions could potentially exceed the SCAQMD daily regional thresholds for the nonattainment ozone precursor emissions (i.e., NO_X), construction impacts would be potentially significant and mitigation measure would be required.

Construction Health Impacts from Regional Emissions (Friant Ranch Case)

The accumulation and dispersion of air pollutant emissions within an air basin is dependent upon the size and distribution of emission sources in the region and meteorological factors such as wind, sunlight, temperature, humidity, rainfall, atmospheric pressure, and topography. As expressed in the *amicus curiae* brief submitted for the *Sierra Club v. County of Fresno* case (*Friant Ranch* case) (SJVAPCD, 2015), the air districts established and recommend CEQA air quality analysis of criteria air pollutants use significance thresholds that were set at emission levels tied to the region's attainment status, based on emission levels at which stationary pollution sources permitted by the air district must offset their emissions. Such offset levels allow for growth while keeping the cumulative effects of new sources at a level that will not impede attainment of the NAAQS. The health risks associated with exposure to criteria pollutants are evaluated on a regional level, based on the region's attainment of the NAAQS. Moreover, the formation of ozone occurs through a complex photo-chemical reaction between NO_X and ROG in the atmosphere with the presence of sunlight. The impacts of ozone are typically considered on a basin-wide or regional basis and not on a localized basis. The mass emissions significance

thresholds used in CEQA air quality analysis are not intended to be indicative of human health impacts that a project may have (SCAQMD, 2012; SJVAPCD, 2015). Therefore, the project's exceedance of the mass regional emissions threshold prior to mitigation (i.e., project construction NO_X exceedance) from project-related activities does not necessarily indicate that the project would cause or contribute to the exposure of sensitive receptors to ground-level concentrations in excess of health-protective levels. Nonetheless, as indicated above, project construction would require the implementation of feasible mitigation measures to reduce the NO_X exceedance. As shown below, mitigation measures AQ-1 would reduce construction emission impacts to less than significant, which would also minimize construction-related air pollution health effects.

The health-based ambient air quality standards for ozone are established as concentrations of ozone and not as tonnages of their precursor pollutants (i.e., NO_X and ROG). It is not necessarily the tonnage of pollutants that causes human health effects, but the concentration of the resulting pollutants, such as ozone. Because of the complexity of ozone formation and the non-linear relationship of ozone concentration with its precursor gases, and given the state of environmental science modeling in use at this time, it is not practical to determine whether, or the extent to which, a single project's precursor (i.e., NO_X and ROG) emissions would potentially result in the formation of secondary ground-level ozone and the geographic and temporal distribution of such secondary formed emissions. Meteorology, the presence of sunlight, seasonal impacts, and other complex photochemical factors all combine to determine the ultimate concentration and location of ozone (SCAQMD 2012; SJVAPCD 2015). Running the regional-scale photochemical grid model used for predicting ozone attainment with the emissions from any individual project can be done, but it would not yield reliable information regarding a measurable increase in ozone concentrations sufficient to accurately quantify ozone-related health effects. Based on this information, a general description of the adverse health effects resulting from the program-level criteria pollutants, which is discussed previously, is all that can be feasibly provided at this time.

Operation

As shown in **Table 7**, *Maximum Unmitigated Regional Operational Emissions (Pounds per Day)*, all operational criteria air pollutants emissions would be well below the SCAQMD regional thresholds during operation. Operational emissions are mainly generated from mobile sources including visitors traveling to and from the wetlands for recreation and the employees who work at the visitor center. There would be a minimal amount of emissions from maintenance staff who would need to maintain the trails, access roads, and facilities within the program area. No operational mitigation measures are required.

Table 8, *Comparison of Program-Level Operational Emissions and South Coast Air Basin Emissions (Tons per Year)*, compares program-level operational emissions with South Coast Air Basin emissions. The net increase in emissions from the proposed program would be minuscule in comparison to basin-wide emissions. SCAQMD presents baseline inventories for 2019, 2022, 2023, 2025 and 2031 in their 2016 AQMP. Air Basin emissions from 2031 were chosen for consistency with the Los Cerritos Wetlands Oil Consolidation and Restoration Project analysis.

TABLE 7
MAXIMUM UNMITIGATED REGIONAL OPERATIONAL EMISSIONS (POUNDS PER DAY)

Source	VOC	NO_X	CO	SO_2	PM10	PM2.5
Phases						
Area	1	<0.1	<0.1	<0.1	<0.1	<0.1
Energy	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mobile	4	4	29	<0.1	5	1
Total	**5**	**4**	**29**	**<0.1**	**5**	**1**
Maximum Regional (On-Site and Off-Site) Emissions	5	4	29	<0.1	5	1
SCAQMD Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Over (Under)	(50)	(51)	(521)	(150)	(145)	(54)
Exceeds Thresholds?	No	No	No	No	No	No

NOTE:

Totals may not add up exactly due to rounding in the modeling calculations. Detailed emissions calculations are provided in Appendix A of this Technical Report.

SOURCE: ESA, 2019 [Appendix A].

TABLE 8
COMPARISON OF PROGRAM-LEVEL OPERATIONAL EMISSIONS AND SOUTH COAST AIR BASIN EMISSIONS (TONS PER YEAR)

Source	VOC	NO_X	CO	SO_2	PM10	PM2.5
Program Emissions (Operation)	0.60	0.37	2.75	0.005	0.47	0.13
2031 South Coast Air Basin Emissions	345	214	1,188	18	N/A	65
Program as Percentage of Basin	0.17%	0.17%	0.23%	0.03%	N/A	0.20%

SOURCE: South Coast Air Quality Management District, *Final 2016 Air Quality Management Plan*, Table 3-4E. Available at: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf. Accessed June 2019.

Mitigation Measure

The program will require **Mitigation Measure AQ-1: Construction NOX Reduction Measures**. Mitigation Measure AQ-1 would reduce NO_X and associated health impacts. The emission reductions are shown in **Table 9**, *Maximum Mitigated Regional Construction Emissions (Pounds per Day)*.

TABLE 9
MAXIMUM MITIGATED REGIONAL CONSTRUCTION EMISSIONS (POUNDS PER DAY)

Source	VOC	NO_X	CO	SO_2	PM10[a]	PM2.5[a]
Phases						
Demolition and Site Preparation	1	3	29	<0.1	25	4
Grading/Excavation – combined	12	70	119	28	40	10
On-Shore Emissions	*1*	*6*	*46*	*<0.1*	*38*	*7*
Off-Shore Emissions	*11*	*65*	*73*	*28*	*2*	*4*
Drainage/Utilities/Subgrade	<1	2	25	<0.1	<1	<1
Building Construction	1	4	19	<0.1	1	<1
Paving	1	1	18	<0.1	<1	<1
Architectural Coating	3	<1	2	<0.1	<1	<1
Combined Regional (On-Site and Off-Site) Emissions[b]	**18**	**80**	**212**	**28**	**66**	**15**
SCAQMD Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Over (Under)	(57)	(20)	(338)	(122)	(84)	(40)
Exceeds Thresholds?	No	No	No	No	No	No

NOTES:

Totals may not add up exactly due to rounding in the modeling calculations. Detailed emissions calculations are provided in Appendix A of this Technical Report.

[a] Emissions include fugitive dust control measures consistent with SCAQMD Rule 403.

[b] Emissions from all subphases are combined to simulate a worst-case scenario where all subphases are occurring simultaneously.

SOURCE: Air Quality Technical Report, ESA 2019.

Mitigation Measure AQ-1: Construction NO_X Reduction Measures. The Applicant for the proposed project shall be responsible for the implementation of the following construction-related NO_X reduction measures:

- Require all off-road diesel-powered construction equipment greater than 50 hp (e.g., excavators, graders, dozers, scrappers, tractors, loaders, etc.) to comply with EPA-Certified Tier IV emission controls where commercially available. Documentation of all off-road diesel equipment used for this project including Tier IV certification, or lack of commercial availability if applicable, shall be maintained and made available by the contractor to the local permitting agency (City of Long Beach and City of Seal Beach) for inspection upon request. In addition, all construction equipment shall be outfitted with Best Available Control Technology (BACT) devices certified by CARB such as certified Level 3 Diesel Particulate Filter or equivalent. A copy of each unit's certified tier specification, BACT documentation, and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit of equipment. If Tier IV construction equipment is not available, LCWA shall require the contractor to implement other feasible alternative measures, such as reducing the number and/or hp rating of construction equipment, and/or limiting the number of individual construction subphases occurring simultaneously. The determination of commercial availability of Tier IV construction equipment shall be made by the City prior to issuance of grading or building permits based on applicant-provided evidence of the availability or unavailability of Tier IV equipment and/or evidence obtained by the City from expert sources such as construction contractors in the region.

- Require all main engines for tugboats to comply with EPA-Certified Tier IV emission controls.
- Eliminate the use of all portable generators. Require the use of electricity from power poles rather than temporary diesel or gasoline power generators.
- Provide temporary traffic controls such as a flag person, during all phases of construction to maintain smooth traffic flow, including during the transportation of oversized equipment and vehicles.
- Provide dedicated turn lanes for movement of construction trucks and equipment on and off site. The location of these dedicated lanes shall be addressed in the Construction Trip Management Plan.
- Reroute construction trucks away from congested streets or sensitive receptor areas.
- Prohibit the idling of on-road trucks and off-road equipment in excess of 5 continuous minutes, except for trucks and equipment where idling is a necessary function of the activity, such as concrete pour trucks. The Applicant or construction contractor(s) shall post signs at the entry/exit gate(s), storage/lay down areas, and at highly visible areas throughout the active portions of the construction site of the idling limit.
- On-road heavy-duty diesel haul trucks with a gross vehicle weight rating of 19,500 pounds or greater used to transport construction materials and soil to and from the project site shall be engine model year 2010 or later or shall comply with the USEPA 2007 on-road emissions standards.

Significance after Mitigation

Less than significant

Impact AQ-3: The program would result in a significant impact if the program would expose sensitive receptors to substantial pollutant concentrations.

Construction

The South Coast Air Basin is in attainment of the NAAQS for PM10, CO and SO_2, and also in attainment of the CAAQS for CO and SO_2. As shown in Table 6, the program would not exceed the SCAQMD regional thresholds for these pollutants during construction. Sensitive receptors surround the program area with residents located adjacent to the southern border of the program area (see Figure 2, above). Typically, SCAQMD's Localized Significance Threshold (LST) Methodology (June 2003, revised July 2008) relies on on-site mass emission rate screening tables and project-specific dispersion modeling, where appropriate. The program area includes both Long Beach, located in Source Receptor Area (SRA) 4, and Seal Beach, located in SRA 18.

Construction screening LSTs for both cities are shown in **Table 10**, *Construction Screening LSTs (Pounds per Day)*, for a 5-acre area and a receptor distance of 50 meters for SRA 4 and 25 meters for SRA 18. Compared to Table 6, if only on-site emissions (no off-shore tugboat and survey boat emissions) are considered, then the unmitigated on-site construction emissions would exceed the construction screening LSTs for NOx, PM10, and PM2.5.

TABLE 10
CONSTRUCTION SCREENING LSTS (POUNDS PER DAY)

Source	NO_X	CO	PM10	PM2.5
SRA 4 LST Thresholds (25-meter receptor distance)	123	1,530	14	8
SRA 18 LST Thresholds (25-meter receptor distance)	197	1,711	14	9

NOTE:

LST thresholds are listed for a 5-acre site. Receptor distances were chosen based on the nearest sensitive receptor. Within Seal Beach, there are residences directly south and adjacent to the program boundary. Within Long Beach, there are residences within 50 meters across from the Los Cerritos Channel.

SOURCE: SCAQMD, Table C-1, 2006–2008 Thresholds for Construction and Operation with Gradual Conversion of NO_X to NO_2. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2.

However, on-site emissions for the program will vary greatly in location and by subphase for the Los Cerritos Wetlands Restoration Program. Therefore, it is not possible to conduct a quantified localized analysis without speculating due to the uncertainty of the specific locations, timing, and intensity of construction activities, particularly in areas near sensitive receptors. Without a specific quantitative analysis, the impact to sensitive receptors at the program-level during construction would be considered potentially significant.

Operation

During operation, all criteria pollutants would be below the SCAQMD regional thresholds (Table 6). Operational activities would include mobile trips by visitors and minimal maintenance of the wetlands once established. Passenger vehicles would be spread out within the entire program area as there would be multiple parking areas and overlook terraces. Siting of these locations would account for the potential of ongoing emissions in the vicinity of a sensitive receptor. Therefore, mobile emissions would not be concentrated by any one sensitive receptor. As discussed above, SCAQMD's LST Methodology (June 2003, revised July 2008) relies on on-site mass emission rate screening tables and project-specific dispersion modeling, where appropriate. Operational screening LSTs for the program area are shown in **Table 11**, *Operational Screening LSTs (Pounds per Day)*, for a 5-acre area and a receptor distance of 25 meters for SRA 4 and 25 meters for SRA 18. Compared to Table 7, the unmitigated on-site operational emissions would not exceed any of the operational screening LSTs since most of the operational emissions are from mobile sources (off site).

TABLE 11
OPERATIONAL SCREENING LSTS (POUNDS PER DAY)

Source	NO_X	CO	PM10	PM2.5
SRA 4 LST Thresholds (25-meter receptor distance)	123	1,530	4	2
SRA 18 LST Thresholds (25-meter receptor distance)	197	1,711	4	2

NOTE:

LST thresholds are listed for a 5-acre site. Receptor distances were chosen based on the nearest sensitive receptor. Within Seal Beach, there are residences directly south and adjacent to the program boundary. Within Long Beach, there are residences within 50 meters across from the Los Cerritos Channel.

SOURCE: SCAQMD, Table C-1, 2006–2008 Thresholds for Construction and Operation with Gradual Conversion of NO_X to NO_2. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2.

Toxic Air Contaminants

A quantitative evaluation of emissions from toxic air contaminants, particularly for program construction activities, would be speculative given the uncertainty of the specific locations, timing, and intensity of construction activities. Therefore, a construction Health Risk Assessment (HRA) cannot be conducted for the program-level analysis without speculating on the locations, timing, and intensity of construction activities. Localized air quality emissions, including toxic air contaminants, would be evaluated quantitatively at the project-level when adequate information is known for individual wetland restoration projects. For example, the Los Cerritos Wetlands Oil Consolidation and Restoration Project found cancer risk to be less than significant after mitigation. At the program level, any subsequent projects within the program area would be required to implement Tier IV engines per Mitigation Measure AQ-1. This would reduce NO_X emissions and other TACs (including diesel particulate matter). However, without a specific construction scenario, impacts to toxic air contaminants at the program-level would be considered potentially significant.

Mitigation Measure

Mitigation Measure AQ-1.

Significance after Mitigation

Significant and Unavoidable (construction)

Impact AQ-4: The program would result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Construction

As shown in Table 6, construction emissions associated with the program would not exceed the SCAQMD regional significance thresholds for the State and federal attainment pollutants of CO and SO_2, and the federal attainment pollutant of PM10, even if the construction activities were to overlap. With respect to odors, potential activities that may emit odors during construction activities include the use of architectural coatings and solvents and the combustion of diesel fuel in on- and off-road equipment. As discussed in Section 2.0, *Environmental Setting*, of this technical report, SCAQMD Rule 1113 would limit the amount of VOCs in architectural coatings and solvents reducing the potential for odorous emissions. Through mandatory compliance with SCAQMD Rules, no construction activities or materials are expected to create objectionable odors affecting a substantial number of people. Therefore, construction of the program would result in less-than-significant impacts with respect to odors.

Operation

As shown in Table 7, operational emissions associated with the program would not exceed the SCAQMD regional significance thresholds for the State and federal attainment pollutants of CO and SO_2, and the federal attainment pollutant of PM10. With respect to odors, according to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints typically

include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. Odors are regulated by SCAQMD Rule 402 for causing a nuisance. SCAQMD Rule 402 states, "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." While the program area contains active oil fields and historic landfills, the proposed program would focus on ecosystem restoration and public access improvements. Because the program would decommission oil wells and pipelines in the long term, the impact to odors would be expected to be reduced compared to the existing setting. As a result, the program is not expected to discharge contaminants into the air in quantities that would cause a nuisance, injury, or annoyance to the public or property pursuant to SCAQMD Rule 402. Therefore, the Project would not create adverse odors affecting a substantial number of people, and impacts would be less than significant.

Mitigation Measure

No mitigation is required.

Significance after Mitigation

Less than Significant

6.0 Cumulative Impacts

Construction

Per the SCAQMD guidance on cumulative impacts, cumulative significance is based upon project significance (SCAQMD, 2003). As shown in Impact AQ-2, the program would result in potential significant impacts to air quality as program construction activities could result in an exceedance of the SCAQMD regional significance threshold for NO_X emissions during construction. With implementation of feasible mitigation measures, regional construction NO_X emissions would be reduced to less than significant. However, due to the uncertainty of the specific locations, timing, and intensity of construction activities, particularly in areas near sensitive receptors, without a specific quantitative analysis, the impact to sensitive receptors at the program-level during construction would be considered potentially significant for localized emissions.

Because the City of Long Beach and City of Seal Beach have not adopted their own Citywide significance thresholds for air quality impacts, it is appropriate to rely on thresholds established by the SCAQMD (refer to *CEQA Guidelines* Section 15064.7). It would not be meaningful to sum multiple cumulative or related project emissions as there are no thresholds set for comparison. Additionally, regional emissions from a project have the potential to affect the Air Basin as a whole, and it is not possible to establish a geographical radius from a specific project site where potential cumulative impacts from regional emissions would be limited. Therefore, consistent with accepted and established SCAQMD cumulative impact evaluation methodologies,

the potential for the program to result in cumulative air quality impacts is assessed based on the SCAQMD thresholds. Thus, given the potentially significant localized construction impact at the project-level, cumulative localized construction air quality impacts would be potentially significant.

Mitigation Measure

Mitigation Measure AQ-1.

Significance after Mitigation

Significant and Unavoidable (construction)

Operations

Per the SCAQMD guidance on cumulative impacts, cumulative significance is based upon project significance (SCAQMD, 2003). As shown in Impact AQ-2, program operational impacts to air quality would be less than significant. Operational cumulative impacts would follow the same methodology as demonstrated for construction cumulative impacts. Therefore, the cumulative air quality impacts would be less than significant during operation and mitigation measures would not be required.

Mitigation Measure

No mitigation is required.

Significance after Mitigation

Less than Significant

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Appendix A

Construction Program Emission Calculations

Construction Assumptions

Construction Schedule Assume 1 day for every phase.

Phase	*# Workers*	*Start Date*	*End Date*	*# Days*	*Days/week*	*Days/year*
Demolition and site prep		1/1/2020	1/1/2020	1	5	130
Grading/Excavation -option 1		1/2/2020	1/2/2020	1	5	260
Grading/Excavation -option 2		1/3/2020	1/3/2020	1	5	260
Drainage/Utilities/Subgrade		1/6/2020	1/6/2020	1	5	130
Building Construction		1/7/2020	1/7/2020	1	5	130
Paving		1/8/2020	1/8/2020	1	5	40
Architectural Coating		1/9/2020	1/9/2020	1	5	20

General equipment (Table 2-15)	**Special Equipment (Table 2-15)**	
Grader	Low ground pressure equipment	similar to tractor
Truck	Mats	similar to tractor
Loader	Long reach excavator	
Backhoe	Clamshell and dragline crane	
Generator Set	Amphibious excavator	levees need amphibious equipment like cranes and excavators
Drill Rig	Rotary ditcher	
Forklift	Floating equipment	
	Hydraulic dredge (this can be 60-800 hp!)	

Default Trips	**#Worker Trips/day**	**#Vendor Trips/day**	**#Hauling Trips**
Demolition and Site Prep	20	0	3
Grading/Excavation - option 1	28	0	6
Grading/Excavation - option 2	35	20	11
Drainage/Utilities/Subgrade	18	0	0
Building Construction	30	15	0
Paving	15	0	0
Architectural Coating	7	0	0

Off-Road Equipment Assumptions

Phase	**Equipment**	**Number**	**Hours/Day**	**HP**	**Load Factor**	**Mitigate to Tier IV?**
Demolition and Site Preparation	Concrete saws	1	8	81	0.73	TRUE
Demolition and Site Preparation	Excavators	3	8	158	0.38	TRUE
Demolition and Site Preparation	Rubber Tired Dozers	2	8	247	0.4	TRUE
Demolition and Site Preparation	Tractors/Loaders/Backhoes	2	8	97	0.3685	TRUE
Grading/Excavation - option 1	Excavators	2	8	158	0.38	TRUE
Grading/Excavation - option 1	Graders	1	8	187	0.41	TRUE
Grading/Excavation - option 1	Rubber Tired Dozers	1	8	247	0.4	TRUE
Grading/Excavation - option 1	Scrapers	2	8	367	0.48	TRUE
Grading/Excavation - option 1	Tractors/Loaders/Backhoes	2	8	97	0.37	TRUE
Grading/Excavation - option 1	Other Construction Equipment	2	8	172	0.4154	TRUE
Grading/Excavation - option 1	Cranes	1	7	231	0.2881	TRUE
Grading/Excavation - option 2	Excavators	2	8	158	0.38	TRUE
Grading/Excavation - option 2	Graders	1	8	187	0.41	TRUE
Grading/Excavation - option 2	Rubber Tired Dozers	1	8	247	0.4	TRUE
Grading/Excavation - option 2	Scrapers	2	8	367	0.48	TRUE
Grading/Excavation - option 2	Tractors/Loaders/Backhoes	2	8	97	0.37	TRUE
Grading/Excavation - option 2	Other Construction Equipment	2	8	172	0.4154	TRUE
Grading/Excavation - option 2	Cranes	1	6	231	0.2881	TRUE
Grading/Excavation - option 2	Cement and Mortar Mixers	2	6	9	0.56	FALSE
Grading/Excavation - option 2	Bore/drill rig	1	6	221	0.5025	TRUE
Drainage/Utilities/Subgrade	Excavators	2	8	158	0.38	TRUE
Drainage/Utilities/Subgrade	Trenchers	2	2	78	0.5025	TRUE
Drainage/Utilities/Subgrade	Pumps	2	8	84	0.74	TRUE
Drainage/Utilities/Subgrade	Bore/drill rig	1	6	221	0.5025	TRUE
Building Construction	Cranes	1	7	231	0.29	TRUE
Building Construction	Forklifts	3	8	89	0.2	TRUE
Building Construction	Generator Sets	1	8	84	0.74	TRUE
Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37	TRUE
Building Construction	Welders	1	8	46	0.45	FALSE
Paving	Pavers	2	8	130	0.42	TRUE
Paving	Paving Equipment	2	8	132	0.36	TRUE
Paving	Rollers	2	8	80	0.38	TRUE
Architectural Coating	Air Compressors	1	6	78	0.48	TRUE

*Highlighted is non-default

Demolition:

Sq. footage of demolition:	0?	
Haul truck capacity (CY)		16
Round trip haul distance		23.1

Site Prep:

Equipment (defaults)

Grading/Excavation:
Max daily acres of disturbance:
Staging area: onsite
Total soil to be excavated (Near term, worst case):

	Cut (CY)	Fill (CY)	net	trips	estimated trips/year (central area is 10 years)	estimated trips/day assuming construction is 5 days/week
Central Area option 1	494000	278000	216000	13500	1350	6
Central Area option 2	494000	37000	457000	28562.5	2856.25	11

Max number haul trucks/day
haul trucks
Round trip haul distance off-site soil export to local landfills or barge out of the Ports

Soil Transport Equipment
Scrapers
loaders
haul and dump trucks
track excavators and dozers
low ground pressure equipment
hydraulic dredge

Drainage/utilities/subgrade:
Equipment (defaults)

Building Construction:
Equipment (defaults)

Architectural Coating:
Equipment (defaults)

Mitigation:
Construction: To achieve SCAQMD standard dust control minimum requirements:
Soil Stabilizers (61% reduction)
Water exposed area (3x per day)
Unpaved roads (15 mph)

Acreage Calculation Sheet

Table 2-6

Post-Restoration Habitats and Acreages in South Area

Habitat Type	Existing Conditions	Near-Term Proposed Restoration	Mid-Term Proposed Restoration	Long-Term Proposed Restoration	Near-Term Difference from previous	Mid-Term Difference from previous	Long-Term Difference from previous
Wetlands[1]	**49.7**	**94.3**	**94.5**	**146.3**	44.6	0.2	51.8
Transitional zone	4.3	15.5	15.5	19.2	11.2	0	3.7
Salt flat	2.9	0	0	0	-2.9	0	0
Tidal salt marsh	0	0	66.5	115	0	66.5	48.5
Muted-tidal salt marsh	18.8	66.3	0	0	47.5	-66.3	0
Non-tidal salt marsh	8.6	0	0	0	-8.6	0	0
Non-Native Wetlands	6.6	2	1.9	0	-4.6	-0.1	-1.9
Subtidal	8.5	10.5	10.7	12.1	2	0.2	1.4
Uplands	**60.3**	**10.7**	**10.6**	**10.2**	-49.6	-0.1	-0.4
Native Grassland	0	10	10	10	10	0	0
Native Shrubland	7.1	0.5	0.5	0.2	-6.6	0	-0.3
Non-Native Upland	53.1	0.2	0.1	0	-52.9	-0.1	-0.1
Managed Habitats	**0**	**3.6**	**3.6**	**0**	3.6	0	-3.6
Vegetated berms	0	3.6	3.6	0	3.6	0	-3.6
Non-Natural	**51.1**	**52.5**	**52.4**	**4.9**	1.4	-0.1	-47.5
Disturbed	22.1	22	22	0	-0.1	0	-22
Developed	29.1	30.5	30.4	4.9	1.4	-0.1	-25.5
Total*	**161**	**161**	**161**	**161**			

1. These habitat acreages may or may not be jurisdictional wetlands, but they have plants and/or hydrology that is indicative of wetlands. Jurisdictional surveys would be conducted when individual projects move forward.

*Acreages do not include the Los Alamitos Pump Station site or the Los Alamitos Retarding Basin site.

*Acreages presented here assume the construction of an earthen berm which has a slightly larger footprint than a flood wall

Table 2-8

Post-Restoration Habitats and Acreages in Isthmus Area

Habitat Type	Existing Conditions	Near-Term Proposed Restoration	Mid-Term Proposed Restoration	Long-Term Proposed Restoration	Near-Term Difference from previous	Mid-Term Difference from previous	Long-Term Difference from previous
Wetlands[1]	**10.5**	**10.7**	**10.7**	**13.5**	0.2	0	2.8
Transitional zone	0	3	3.8	2.2	3	0.8	-1.6
Salt flat	1.9	0.2	0.2	0	-1.7	0	-0.2
Muted-tidal salt marsh	3.3	5.3	5.2	11.2	2	-0.1	6
Non-tidal salt marsh	3.1	0.1	0.1	0	-3	0	-0.1
Non-Native wetlands	2.2	2.2	1.4	0	0	-0.8	-1.4
Uplands	**7.7**	**7.7**	**8**	**11.7**	0	0.3	3.7
Native shrubland[2]	7.3	7.7	8	11.7	0.4	0.3	3.7
Non-native upland	0.4	0	0	0	-0.4	0	0
Non-Natural	**9.8**	**9.7**	**9.7**	**2.9**	-0.1	0	-6.8
Developed	9.8	9.7	9.7	2.9	-0.1	0	-6.8
Total*	**28**	**28**	**28**	**28**			

1. These habitat acreages may or may not be jurisdictional wetlands, but they have plants and/or hydrology that is indicative of wetlands. Jurisdictional surveys would be conducted when individual projects move forward.

2. Under existing conditions, this category includes recently restored shrubland that is still being weeded and irrigated. However, it is expected that this habitat will evolve to a natural stand in the future.

Table 2-10

Post-Restoration Habitats and Acreages in Central Area

Habitat Type	Existing Conditions	Option 1, Levees and Raised Oil Wells		Option 2, Flood Walls		Option 1, Levees and Raised Oil Wells		Option 2, Flood Walls	
		Near-Term	Long-Term	Near-Term	Long-Term	Near-Term	Long-Term	Near-Term	Long-Term
		Proposed Restoration	Proposed Restoration	Proposed Restoration	Proposed Restoration	Difference from previous	Difference from previous	Difference from previous	Difference from previous
Wetlands[1]	**68.6**	**63.7**	**64.2**	**71.2**	**76.5**	-4.9	0.5	2.6	5.3
Transitional zone	0	0.7	1.1	3.7	5.3	0.7	0.4	3.7	1.6
Salt flat	3.9	1	0	1.3	0.1	-2.9	-1	-2.6	-1.2
Tidal salt marsh	0	20.2	42.6	22.2	48.4	20.2	22.4	22.2	26.2
Non-tidal salt marsh	42.1	19.3	0	21.4	1.9	-22.8	-19.3	-20.7	-19.5
Brackish wetlands	3.7	3.7	2.1	3.7	2.1	0	-1.6	0	-1.6
Intermittently Flooded Brackish Pond	0.4	0.4	0	0.4	0	0	-0.4	0	-0.4
Non-Native wetlands	1.4	0.6	0	0.7	0.1	-0.8	-0.6	-0.7	-0.6
Subtidal	17.2	17.8	18.5	17.9	18.7	0.6	0.7	0.7	0.8
Uplands	**7.4**	**3.2**	**0**	**3.9**	**0.7**	-4.2	-3.2	-3.5	-3.2
Native shrubland	0.2	0.1	0	0.1	0	-0.1	-0.1	-0.1	-0.1
Non-native upland	7.2	3.1	0	3.8	0.7	-4.1	-3.1	-3.4	-3.1
Managed Habitats	**0**	**14.2**	**23.8**	**2**	**4.9**	14.2	9.6	2	2.9
Bioswale	0	1.2	3.5	1.2	3.5	1.2	2.3	1.2	2.3
Vegetated levees/berms	0	12.9	20.4	0.8	1.4	12.9	7.5	0.8	0.6
Non-Natural	**31.9**	**26.6**	**20.4**	**30.7**	**26**	-5.3	-6.2	-1.2	-4.7
Disturbed	0.1	0	0	0	0	-0.1	0	-0.1	0
Developed	31.8	26.6	20.4	30.6	25.9	-5.2	-6.2	-1.2	-4.7
Total	**108**	**108**	**108**	**108**	**108**				

1. These habitat acreages may or may not be jurisdictional wetlands, but they have plants and/or hydrology that is indicative of wetlands. Jurisdictional surveys would be conducted when individual projects move forward.

Table 2-12

Post-Restoration Habitats and Acreages in North Area

Habitat Type	Existing Conditions	Long-Term	Long-Term
		Proposed Restoration	Difference from previous
Wetlands[1]	**40.2**	**67.1**	26.9
Salt flat	9.8	0	-9.8
Tidal salt marsh	0	63.1	63.1
Non-tidal salt marsh	30.4	0	-30.4
Freshwater Wetland	0	2.1	2.1
Subtidal	0	2	2
Uplands	**10.2**	**0**	-10.2
Native Shrubland	1.2	0	-1.2
Non-Native Upland	9	0	-9
Managed Habitats	**0**	**11.1**	11.1
Vegetated berms	0	11.1	11.1
Non-Natural	**22.8**	**1.7**	-21.1
Disturbed	1.4	0	-1.4
Developed	21.4	1.7	-19.7
Total*	**73**	**80**	

Note: Does not include Synergy project acreages

Maximum Acreage disturbed in 1 year by Land Use Type and Location										
		Near-Term			Mid-Term			Long-Term		
Location	Habitat Type	Years	Max Acreage	**Max Acres/Year doubled if greater than 1 year**	Years	Max Acreage	**Max Acres/Year doubled if greater than 1 year**	Years	Max Acreage	**Max Acres/Year doubled if greater than 1 year**
South	Overall	3	52.9	**35.27**	1	66.5	**66.50**	5	51.8	**20.72**
	Wetlands		47.5	31.67		66.5	**66.50**		51.8	**20.72**
	Uplands		52.9	35.27		0.1	**0.10**		0.4	**0.16**
	Managed Habitats		3.6	2.40		0	**0.00**		3.6	**1.44**
	Non-Natural		1.4	0.93		0.1	**0.10**		47.5	**19.00**
Isthmus	Overall	1	3	**3.00**	1	0.8	**0.80**	3	6.8	**4.53**
	Wetlands		3	3.00		0.8	**0.80**		6	**4.00**
	Uplands		0.4	0.40		0.3	**0.30**		3.7	**2.47**
	Managed Habitats		N/A			N/A			N/A	
	Non-Natural		0.1	0.10		0	**0.00**		6.8	**4.53**
Central	Overall	5	22.8	**9.12**	N/A			5	26.2	**10.48**
	Wetlands		22.8	9.12					26.2	**10.48**
	Uplands		4.2	1.68					3.2	**1.28**
	Managed Habitats		14.2	5.68					9.6	**3.84**
	Non-Natural		5.3	2.12					6.2	**2.48**
North	Overall	N/A			N/A			4	63.1	**31.55**
	Wetlands								63.1	**31.55**
	Uplands								10.2	**5.10**
	Managed Habitats								11.1	**5.55**
	Non-Natural								21.1	**10.55**
MAXIMUM by schedule				35.27			66.50			31.55

Highest Acreage Overall	66.50

MAXIMUM by habitat type	
Wetlands	66.50
Uplands	35.27
Managed Habitats	5.68
Non-Natural	19.00

Los Cerritos
Construction Results - unmitigated
On and OffSite
SUMMER

Demolition and Site Preparation

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						25.0368	0	25.0368	3.79E+00	0	3.79E+00
Off-Road		3.7311	37.4113	26.3126	0.045		1.9249	1.9249		1.7868	1.7868
Total		3.7311	37.4113	26.3126	0.045	25.0368	1.9249	26.9618	3.79E+00	1.7868	5.5776

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.008375302	0.242079301	0.046973463	7.38E-04	0.020190831	3.07E-03	0.023259629	5.53E-03	2.60E-03	8.13E-03
Vendor		0.00E+00	0	0	0.00E+00	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00
Worker		0.017264517	0.062286711	0.780728241	2.05E-03	0.223355541	1.53E-03	0.224889736	0.05920902	1.41E-03	0.060621816
Total		0.02563982	0.304366012	0.827701704	0.002786836	0.243546373	0.004602993	0.248149365	0.06474242	0.004013709	0.068756124
Phase Total		**3.75673982**	**37.71566601**	**27.1403017**	**0.047786836**	**25.28034637**	**1.929502993**	**27.20994937**	**3.85554242**	**1.790813709**	**5.646356124**

Grading and Excavation - option 1

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						37.4316	0	37.4316	6.56E+00	0	6.56E+00
Off-Road		5.8349	65.3933	42.0533	0.0794		2.9213	2.9213		2.6876	2.6876
Total		5.8349	65.3933	42.0533	0.0794	37.4316	2.9213	40.3529	6.56E+00	2.6876	9.2462

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.050251813	1.452475805	0.281840775	4.43E-03	0.121144987	1.84E-02	0.139557773	0.03320038	1.56E-02	0.048805843
Vendor		0	0	0	0.00E+00	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00
Worker		0.024170324	0.087201396	1.093019538	2.87E-03	0.312697758	2.15E-03	0.314845631	0.08289263	1.98E-03	0.084870543
Total		0.074422138	1.539677201	1.374860313	7.30E-03	0.433842745	2.06E-02	0.454403404	0.116093	1.76E-02	0.133676386
Phase Total		**5.909322138**	**66.9329772**	**43.42816031**	**0.086697372**	**37.86544274**	**2.941860659**	**40.8073034**	**6.674693**	**2.705183383**	**9.379876386**

Drainage/utilities/subgrade

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust											
Off-Road		2.384	22.1182	20.8939	3.73E-02		1.2927	1.2927		1.2225	1.2225
Total		2.384	22.1182	20.8939	3.73E-02		1.2927	1.2927		1.2225	1.2225

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.015538066	0.05605804	0.702655417	1.84E-03	0.201019987	1.38E-03	0.202400763	0.05328812	1.27E-03	0.054559635
Total		0.015538066	0.05605804	0.702655417	1.84E-03	0.201019987	1.38E-03	0.202400763	0.05328812	1.27E-03	0.054559635
Phase Total		**2.399538066**	**22.17425804**	**21.59655542**	**0.039143756**	**0.201019987**	**1.294080775**	**1.495100763**	**0.05328812**	**1.223771518**	**1.277059635**

Building Construction

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust											
Off-Road		2.1198	19.186	16.8485	2.69E-02		1.1171	1.1171		1.0503	1.0503
Total		2.1198	19.186	16.8485	2.69E-02		1.1171	1.1171		1.0503	1.0503

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0.039246303	0.90616436	0.247951478	2.97E-03	0.095681809	1.55E-02	0.111227204	0.02750845	1.41E-02	0.041629769
Worker		0.025896776	0.093430067	1.171092362	3.07E-03	0.335033312	2.30E-03	0.337334604	0.08881353	2.12E-03	0.090932725
Total		0.06514308	0.999594427	1.41904384	6.04E-03	0.430715121	1.78E-02	0.448561808	0.11632198	1.62E-02	0.132562493
Phase Total		**2.18494308**	**20.18559443**	**18.26754384**	**0.03294016**	**0.430715121**	**1.134946687**	**1.565661808**	**0.11632198**	**1.066540516**	**1.182862493**

Paving

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926
Paving		1.179					0	0		0	0
Total		2.5356	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.012948388	0.046715034	0.585546181	1.54E-03	0.167516656	1.15E-03	0.168667302	0.04440676	1.06E-03	0.045466362
Total		0.012948388	0.046715034	0.585546181	1.54E-03	0.167516656	1.15E-03	0.168667302	0.04440676	1.06E-03	0.045466362
Phase Total		**2.548548388**	**14.11231503**	**15.23764618**	**0.024336464**	**0.167516656**	**0.753950646**	**0.921467302**	**0.04440676**	**0.693659598**	**0.738066362**

Architectural Coating

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Archit. Coating		106.605					0	0		0	0
Off-Road		0.2422	1.6838	1.8314	2.97E-03		0.1109	0.1109		0.1109	0.1109
Total		106.8472	1.6838	1.8314	2.97E-03		0.1109	0.1109		0.1109	0.1109

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.006042581	0.021800349	0.273254885	7.17E-04	0.078174439	5.37E-04	0.078711408	0.02072316	4.94E-04	0.021217636
Total		0.006042581	0.021800349	0.273254885	7.17E-04	0.078174439	5.37E-04	0.078711408	0.02072316	4.94E-04	0.021217636
Phase Total		**106.8532426**	**1.705600349**	**2.104654885**	**0.003687016**	**0.078174439**	**0.111436968**	**0.189611408**	**0.02072316**	**0.111394479**	**0.132117636**

WINTER

Demolition and Site Preparation

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						25.0368	0	25.0368	3.79E+00	0	3.79E+00
Off-Road		3.7311	37.4113	26.3126	0.045		1.9249	1.9249		1.7868	1.7868
Total		3.7311	37.4113	26.3126	0.045	25.0368	1.9249	26.9618	3.79E+00	1.7868	5.5776

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.008375302	0.242079301	0.046973463	7.38E-04	0.020190831	3.07E-03	0.023259629	5.53E-03	2.60E-03	8.13E-03
Vendor		0	0	0	0.00E+00	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00
Worker		0.017264517	0.062286711	0.780728241	2.05E-03	0.223355541	1.53E-03	0.224889736	0.05920902	1.41E-03	0.060621816
Total		0.02563982	0.304366012	0.827701704	2.79E-03	0.243546373	4.60E-03	0.248149365	0.06474242	4.01E-03	0.068756124
		3.75673982	**37.71566601**	**27.1403017**	**0.047786836**	**25.28034637**	**1.929502993**	**27.20994937**	**3.85554242**	**1.790813709**	**5.646356124**

Grading and Excavation - option 1

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						37.4316	0	37.4316	6.56E+00	0	6.56E+00
Off-Road		5.8349	65.3933	42.0533	0.0794		2.9213	2.9213		2.6876	2.6876
Total		5.8349	65.3933	42.0533	0.0794	37.4316	2.9213	40.3529	6.56E+00	2.6876	9.2462

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.050251813	1.452475805	0.281840775	4.43E-03	0.121144987	1.84E-02	0.139557773	0.03320038	1.56E-02	0.048805843
Vendor		0	0	0	0.00E+00	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00
Worker		0.024170324	0.087201396	1.093019538	2.87E-03	0.312697758	2.15E-03	0.314845631	0.08289263	1.98E-03	0.084870543
Total		0.074422138	1.539677201	1.374860313	7.30E-03	0.433842745	2.06E-02	0.454403404	0.116093	1.76E-02	0.133676386
		5.909322138	**66.9329772**	**43.42816031**	**0.086697372**	**37.86544274**	**2.941860659**	**40.8073034**	**6.674693**	**2.705183383**	**9.379876386**

Drainage/utilities/subgrade

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust											
Off-Road		2.384	22.1182	20.8939	3.73E-02		1.2927	1.2927		1.2225	1.2225
Total		2.384	22.1182	20.8939	3.73E-02		1.2927	1.2927		1.2225	1.2225

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.015538066	0.05605804	0.702655417	1.84E-03	0.201019987	1.38E-03	0.202400763	0.05328812	1.27E-03	0.054559635
Total		0.015538066	0.05605804	0.702655417	1.84E-03	0.201019987	1.38E-03	0.202400763	0.05328812	1.27E-03	0.054559635
		2.399538066	**22.17425804**	**21.59655542**	**0.039143756**	**0.201019987**	**1.294080775**	**1.495100763**	**0.05328812**	**1.223771518**	**1.277059635**

Building Construction

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust											
Off-Road		2.1198	19.186	16.8485	2.69E-02		1.1171	1.1171		1.0503	1.0503
Total		2.1198	19.186	16.8485	2.69E-02		1.1171	1.1171		1.0503	1.0503

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0.039246303	0.90616436	0.247951478	2.97E-03	0.095681809	1.55E-02	0.111227204	0.02750845	1.41E-02	0.041629769
Worker		0.025896776	0.093430067	1.171092362	3.07E-03	0.335033312	2.30E-03	0.337334604	0.08881353	2.12E-03	0.090932725
Total		0.06514308	0.999594427	1.41904384	6.04E-03	0.430715121	1.78E-02	0.448561808	0.11632198	1.62E-02	0.132562493
		2.18494308	**20.18559443**	**18.26754384**	**0.03294016**	**0.430715121**	**1.134946687**	**1.565661808**	**0.11632198**	**1.066540516**	**1.182862493**

Paving

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926
Paving		1.179					0	0		0	0
Total		2.5356	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.012948388	0.046715034	0.585546181	1.54E-03	0.167516656	1.15E-03	0.168667302	0.04440676	1.06E-03	0.045466362
Total		0.012948388	0.046715034	0.585546181	1.54E-03	0.167516656	1.15E-03	0.168667302	0.04440676	1.06E-03	0.045466362
		2.548548388	**14.11231503**	**15.23764618**	**0.024336464**	**0.167516656**	**0.753950646**	**0.921467302**	**0.04440676**	**0.693659598**	**0.738066362**

Architectural Coating

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Archit. Coating		106.605					0	0		0	0
Off-Road		0.2422	1.6838	1.8314	2.97E-03		0.1109	0.1109		0.1109	0.1109
Total		106.8472	1.6838	1.8314	2.97E-03		0.1109	0.1109		0.1109	0.1109

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.006042581	0.021800349	0.273254885	7.17E-04	0.078174439	5.37E-04	0.078711408	0.02072316	4.94E-04	0.021217636
Total		0.006042581	0.021800349	0.273254885	7.17E-04	0.078174439	5.37E-04	0.078711408	0.02072316	4.94E-04	0.021217636
		106.8532426	**1.705600349**	**2.104654885**	**0.003687016**	**0.078174439**	**0.111436968**	**0.189611408**	**0.02072316**	**0.111394479**	**0.132117636**

Los Cerritos
Construction Results - mitigated with Tier 4 equipment
On and OffSite
SUMMER

Demolition and Site Preparation

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						25.0368	0	25.0368	3.79E+00	0	3.79E+00
Off-Road		0.5382	2.3324	27.964	0.045		0.0718	0.0718		0.0718	0.0718
Total		0.5382	2.3324	27.964	0.045	25.0368	0.0718	25.1086	3.79E+00	0.0718	3.8626

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.008375302	0.2420793	0.046973463	7.38E-04	0.020190831	3.07E-03	0.023259629	5.53E-03	2.60E-03	8.13E-03
Vendor		0.00E+00	0	0	0.00E+00	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00
Worker		0.017264517	0.0622867	0.780728241	2.05E-03	0.223355541	1.53E-03	0.224889736	0.059209	1.41E-03	0.060621816
Total		0.02563982	0.304366	0.827701704	0.002786836	0.243546373	0.004602993	0.248149365	0.0647424	0.004013709	0.068756124
Phase Total		**0.56383982**	**2.636766**	**28.7917017**	**0.047786836**	**25.28034637**	**0.076402993**	**25.35674937**	**3.8555424**	**0.075813709**	**3.931356124**

Grading and Excavation - option 1

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						37.4316	0	37.4316	6.56E+00	0	6.56E+00
Off-Road		0.9765	4.2314	44.7018	0.0794		0.1302	0.1302		0.1302	0.1302
Total		0.9765	4.2314	44.7018	0.0794	37.4316	0.1302	37.5618	6.56E+00	0.1302	6.6888

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.050251813	1.4524758	0.281840775	4.43E-03	0.121144987	1.84E-02	0.139557773	0.0332004	1.56E-02	0.048805843
Vendor		0	0	0	0.00E+00	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00
Worker		0.024170324	0.0872014	1.093019538	2.87E-03	0.312697758	2.15E-03	0.314845631	0.0828926	1.98E-03	0.084870543
Total		0.074422138	1.5396772	1.374860313	0.007297372	0.433842745	0.020560659	0.454403404	0.116093	0.017583383	0.133676386
Phase Total		**1.050922138**	**5.7710772**	**46.07666031**	**0.086697372**	**37.86544274**	**0.150760659**	**38.0162034**	**6.674693**	**0.147783383**	**6.822476386**

Drainage/utilities/subgrade

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust											
Off-Road		0.4289	1.8584	24.2545	3.73E-02		0.0572	0.0572		0.0572	0.0572
Total		0.4289	1.8584	24.2545	3.73E-02		0.0572	0.0572		0.0572	0.0572

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.015538066	0.056058	0.702655417	1.84E-03	0.201019987	1.38E-03	0.202400763	0.0532881	1.27E-03	0.054559635
Total		0.015538066	0.056058	0.702655417	0.001843756	0.201019987	0.001380775	0.202400763	0.0532881	0.001271518	0.054559635
Phase Total		**0.444438066**	**1.914458**	**24.95715542**	**0.039143756**	**0.201019987**	**0.058580775**	**0.259600763**	**0.0532881**	**0.058471518**	**0.111759635**

Building Construction

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust											
Off-Road		0.6261	2.8021	17.7304	2.69E-02		0.1248	0.1248		0.1248	0.1248
Total		0.6261	2.8021	17.7304	2.69E-02		0.1248	0.1248		0.1248	0.1248

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0.039246303	0.9061644	0.247951478	2.97E-03	0.095681809	1.55E-02	0.111227204	0.0275084	1.41E-02	0.041629769
Worker		0.025896776	0.0934301	1.171092362	3.07E-03	0.335033312	2.30E-03	0.337334604	0.0888135	2.12E-03	0.090932725
Total		0.06514308	0.9995944	1.41904384	0.00604016	0.430715121	0.017846687	0.448561808	0.116322	0.016240516	0.132562493
Phase Total		**0.69124308**	**3.8016944**	**19.14944384**	**0.03294016**	**0.430715121**	**0.142646687**	**0.573361808**	**0.116322**	**0.141040516**	**0.257362493**

Paving

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374
Paving		1.179					0	0		0	0
Total		1.4595	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.012948388	0.046715	0.585546181	1.54E-03	0.167516656	1.15E-03	0.168667302	0.0444068	1.06E-03	0.045466362
Total		0.012948388	0.046715	0.585546181	0.001536464	0.167516656	0.001150646	0.168667302	0.0444068	0.001059598	0.045466362
Phase Total		**1.472448388**	**1.262115**	**17.88124618**	**0.024336464**	**0.167516656**	**0.038550646**	**0.206067302**	**0.0444068**	**0.038459598**	**0.082866362**

Architectural Coating

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Archit. Coating		53.3025					0	0		0	0
Off-Road		0.0297	0.1288	1.8324	2.97E-03		3.96E-03	3.96E-03		3.96E-03	3.96E-03
Total		53.3322	0.1288	1.8324	2.97E-03		3.96E-03	3.96E-03		3.96E-03	3.96E-03

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.006042581	0.0218003	0.273254885	7.17E-04	0.078174439	5.37E-04	0.078711408	0.0207232	4.94E-04	0.021217636
Total		0.006042581	0.0218003	0.273254885	0.000717016	0.078174439	0.000536968	0.078711408	0.0207232	0.000494479	0.021217636
Phase Total		**53.33824258**	**0.1506003**	**2.105654885**	**0.003687016**	**0.078174439**	**0.004496968**	**0.082671408**	**0.0207232**	**0.004454479**	**0.025177636**

WINTER

Demolition and Site Preparation

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						25.0368	0	25.0368	3.79E+00	0	3.79E+00
Off-Road		0.5382	2.3324	27.964	0.045		0.0718	0.0718		0.0718	0.0718
Total		0.5382	2.3324	27.964	0.045	25.0368	0.0718	25.1086	3.79E+00	0.0718	3.8626

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.0083753	0.2420793	0.046973463	7.38E-04	0.020190831	3.07E-03	0.023259629	5.53E-03	2.60E-03	8.13E-03
Vendor		0.00E+00	0	0	0.00E+00	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00
Worker		0.0172645	0.0622867	0.780728241	2.05E-03	0.223355541	1.53E-03	0.224889736	0.059209	1.41E-03	0.060621816
Total		0.0256398	0.304366	0.827701704	0.002786836	0.243546373	0.004602993	0.248149365	0.0647424	0.004013709	0.068756124
		0.5638398	**2.636766**	**28.7917017**	**0.047786836**	**25.28034637**	**0.076402993**	**25.35674937**	**3.8555424**	**0.075813709**	**3.931356124**

Grading and Excavation - option 1

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust						37.4316	0	37.4316	6.56E+00	0	6.56E+00
Off-Road		0.9765	4.2314	44.7018	0.0794		0.1302	0.1302		0.1302	0.1302
Total		0.9765	4.2314	44.7018	0.0794	37.4316	0.1302	37.5618	6.56E+00	0.1302	6.6888

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0.0502518	1.4524758	0.281840775	4.43E-03	0.121144987	1.84E-02	0.139557773	0.0332004	1.56E-02	0.048805843
Vendor		0	0	0	0.00E+00	0	0.00E+00	0	0.00E+00	0.00E+00	0.00E+00
Worker		0.0241703	0.0872014	1.093019538	2.87E-03	0.312697758	2.15E-03	0.314845631	0.0828926	1.98E-03	0.084870543
Total		0.0744221	1.5396772	1.374860313	0.007297372	0.433842745	0.020560659	0.454403404	0.116093	0.017583383	0.133676386
		1.0509221	**5.7710772**	**46.07666031**	**0.086697372**	**37.86544274**	**0.150760659**	**38.0162034**	**6.674693**	**0.147783383**	**6.822476386**

Drainage/utilities/subgrade

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust											
Off-Road		0.4289	1.8584	24.2545	3.73E-02		0.0572	0.0572		0.0572	0.0572
Total		0.4289	1.8584	24.2545	3.73E-02		0.0572	0.0572		0.0572	0.0572

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.0155381	0.056058	0.702655417	1.84E-03	0.201019987	1.38E-03	0.202400763	0.0532881	1.27E-03	0.054559635
Total		0.0155381	0.056058	0.702655417	1.84E-03	0.201019987	1.38E-03	0.202400763	0.0532881	1.27E-03	0.054559635
		0.4444381	**1.914458**	**24.95715542**	**0.039143756**	**0.201019987**	**0.058580775**	**0.259600763**	**0.0532881**	**0.058471518**	**0.111759635**

Building Construction

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Fugitive Dust											
Off-Road		0.6261	2.8021	17.7304	2.69E-02		0.1248	0.1248		0.1248	0.1248
Total		0.6261	2.8021	17.7304	2.69E-02		0.1248	0.1248		0.1248	0.1248

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0.0392463	0.9061644	0.247951478	2.97E-03	0.095681809	1.55E-02	0.111227204	0.0275084	1.41E-02	0.041629769
Worker		0.0258968	0.0934301	1.171092362	3.07E-03	0.335033312	2.30E-03	0.337334604	0.0888135	2.12E-03	0.090932725
Total		0.0651431	0.9995944	1.41904384	6.04E-03	0.430715121	1.78E-02	0.448561808	0.116322	1.62E-02	0.132562493
		0.6912431	**3.8016944**	**19.14944384**	**0.03294016**	**0.430715121**	**0.142646687**	**0.573361808**	**0.116322**	**0.141040516**	**0.257362493**

Paving

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Off-Road		0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374
Paving		1.179					0	0		0	0
Total		1.4595	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.0129484	0.046715	0.585546181	1.54E-03	0.167516656	1.15E-03	0.168667302	0.0444068	1.06E-03	0.045466362
Total		0.0129484	0.046715	0.585546181	1.54E-03	0.167516656	1.15E-03	0.168667302	0.0444068	1.06E-03	0.045466362
		1.4724484	**1.262115**	**17.88124618**	**0.024336464**	**0.167516656**	**0.038550646**	**0.206067302**	**0.0444068**	**0.038459598**	**0.082866362**

Architectural Coating

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Archit. Coating		53.3025					0	0		0	0
Off-Road		0.0297	0.1288	1.8324	2.97E-03		3.96E-03	3.96E-03		3.96E-03	3.96E-03
Total		53.3322	0.1288	1.8324	2.97E-03		3.96E-03	3.96E-03		3.96E-03	3.96E-03

Category	lb/day	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Hauling		0	0	0	0	0	0	0	0	0	0
Vendor		0	0	0	0	0	0	0	0	0	0
Worker		0.0060426	0.0218003	0.273254885	7.17E-04	0.078174439	5.37E-04	0.078711408	0.0207232	4.94E-04	0.021217636
Total		0.0060426	0.0218003	0.273254885	0.000717016	0.078174439	0.000536968	0.078711408	0.0207232	0.000494479	0.021217636
		53.338243	**0.1506003**	**2.105654885**	**0.003687016**	**0.078174439**	**0.004496968**	**0.082671408**	**0.0207232**	**0.004454479**	**0.025177636**

Los Cerritos
Regional Emissions - Unmitigated

SUMMER	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
				lb/day		
Demolition and Site Preparation	3.76	37.72	27.14	0.05	27.21	5.65
Grading and Excavation - option 1	5.91	66.93	43.43	0.09	40.81	9.38
Grading and Excavation - option 2	6.34	71.52	46.13	0.10	30.42	7.88
Drainage/utilities/subgrade	2.40	22.17	21.60	0.04	1.50	1.28
Building Construction	2.18	20.19	18.27	0.03	1.57	1.18
Paving	2.55	14.11	15.24	0.02	0.92	0.74
Architectural Coating	106.85	1.71	2.10	0.00	0.19	0.13

WINTER	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
				lb/day		
Demolition and Site Preparation	3.76	37.72	27.14	0.05	27.21	5.65
Grading and Excavation - option 1	5.91	66.93	43.43	0.09	40.81	9.38
Grading and Excavation - option 2	6.36	71.58	46.05	0.10	30.42	7.88
Drainage/utilities/subgrade	2.40	22.17	21.60	0.04	1.50	1.28
Building Construction	2.18	20.19	18.27	0.03	1.57	1.18
Paving	2.55	14.11	15.24	0.02	0.92	0.74
Architectural Coating	106.85	1.71	2.10	0.00	0.19	0.13

Maximum	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
				lb/day		
Demolition and Site Preparation	4	38	27	0	27	6
Grading and Excavation - option 1	6	67	43	0	41	9
Grading and Excavation - option 2	6	72	46	0	30	8
Drainage/utilities/subgrade	2	22	22	0	1	1
Building Construction	2	20	18	0	2	1
Paving	3	14	15	0	1	1
Architectural Coating	5	2	2	0	0	0
Offshore unmitigated emissions	11	105	73	28	4	4
Grading/Excavation (on and off shore combined)	17	172	116	28	44	13
	33	268	200	28	76	22

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
				lb/day		
Combined Daily Emissions (lb/day)	33	268	200	28	76	22
SCAQMD Significance Thresholds	75	100	550	150	150	55
Above/(Under)	-42	168	-350	-122	-74	-33
Exceeds Thresholds?	No	Yes	No	No	No	No

Table for Report

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
				lb/day		
Combined Daily Emissions (lb/day)	33	268	200	28.08	76	22
SCAQMD Significance Thresholds	75	100	550	150	150	55
Above/(Under)	-42	168	-350	-122	-74	-33
Exceeds Thresholds?	No	Yes	No	No	No	No

Los Cerritos
Regional Emissions - Mitigated

SUMMER	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
				lb/day		
Demolition and Site Preparation	0.56	2.64	28.79	0.05	25.36	3.93
Grading and Excavation - option 1	1.05	5.77	46.08	0.09	38.02	6.82
Grading and Excavation - option 2	1.41	8.73	50.38	0.10	27.59	5.29
Drainage/utilities/subgrade	0.44	1.91	24.96	0.04	0.26	0.11
Building Construction	0.69	3.80	19.15	0.03	0.57	0.26
Paving	1.47	1.26	17.88	0.02	0.21	0.08
Architectural Coating	53.34	0.15	2.11	0.00	0.08	0.03

WINTER	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
				lb/day		
Demolition and Site Preparation	0.56	2.64	28.79	0.05	25.36	3.93
Grading and Excavation - option 1	1.05	5.77	46.08	0.09	38.02	6.82
Grading and Excavation - option 2	1.43	8.80	50.29	0.10	27.59	5.29
Drainage/utilities/subgrade	0.44	1.91	24.96	0.04	0.26	0.11
Building Construction	0.69	3.80	19.15	0.03	0.57	0.26
Paving	1.47	1.26	17.88	0.02	0.21	0.08
Architectural Coating	53.34	0.15	2.11	0.00	0.08	0.03

Maximum	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
				lb/day		
Demolition and Site Preparation	1	3	29	0	25	4
Grading and Excavation - option 1	1	6	46	0	38	7
Grading and Excavation - option 2	1	9	50	0	28	5
Drainage/utilities/subgrade	0	2	25	0	0	0
Building Construction	1	4	19	0	1	0
Paving	1	1	18	0	0	0
Architectural Coating	3	0	2	0	0	0
Offshore mitigated emissions	11	65	73	28	2	4
Grading/Excavation (on and off shore combined)	12	70	119	28	40	10
	18	80	212	28	66	15

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
				lb/day		
Combined Daily Emissions	18	80	212	28	66	15
SCAQMD Significance Thresholds	75	100	550	150	150	55
Above/(Under)	(57)	(20)	(338)	(122)	(84)	(40)
Exceeds Thresholds?	No	No	No	No	No	No

Table for Report

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
				lb/day		
Combined Daily Emissions	18	80	212	28.08	66	15
SCAQMD Significance Thresholds	75	100	550	150	150	55
Above/(Under)	-57	-20	-338	-122	-84	-40
Exceeds Thresholds?	No	No	No	No	No	No

Los Cerritos Wetlands Restoration Project

Unmitigated Offshore Vessel Emissions Calculations

Emission Factors for Marine Vessels

	gr/kW-hr							
	ROG	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**	**CO2**	**CH4**
Unmitigated								
Tug Main[1]	0.78	7.2	5	1.9	0.27	0.27	588	0.07
Auxillary[2]	0.52	7.5	5	2.1	0.4	0.4	690	0.09
Crew Boat[3]	0.78	7.2	5	1.9	0.2	0.2	588	0.07
Mitigated								
Tug[1]	0.78	1.8	5	1.9	0.04	0.27	588	0.07
Auxillary[2]	0.52	7.5	5	2.1	0.4	0.4	690	0.09
Crew Boat[3]	0.78	7.2	5	1.9	0.2	0.2	588	0.07

1. Assume default tugboat fleet will be Tier 2 due to existing marine engine regulations (tugboat is category 2 with displacement between 5 and 15), and Tier 4 for mitigated scenario.

2. Assume default Auxiliary engine will be Tier 2 due to existing marine engine regulations (Auxiliary is Category 1 with displacement <0.9), and no mitigation assumed for these engines

3. Assume default crew/work boats and auxiliary engines will be Tier 2 due to existing marine engine regulations (category 1 engines with displacement <5), and no mitigation are assumed for these engines

Marine Engine Emission Standards: *For NOx, CO, PM10 and PM2.5*

https://www.dieselnet.com/standards/us/marine.php

For ROG, Sox, CO2 and CH4

https://www.arb.ca.gov/regact/2008/fuelogv08/appdfuel.pdf

Los Cerritos Wetlands Restoration Project

Unmitigated Offshore Vessel Emissions Calculations

Equipment	Main Engine[4,5] HP	KW	LF	Auxiliary Engine[4,5] HP	KW	LF	
Barges	not emitters						(to be pulled by tug boat)
Tug Boats	1837	1370	0.31	126	94	0.43	
Crew Boats	587	438	0.38	55	41	0.32	

4. Engine power ratings were from the Port of Long Beach 2016 Air Emission Inventory. Horsepower of ocean tugboat and work boat were used to represent this project's tugboats and bio-monitor boats, respectively.

5. Load factors were from the Port of Long Beach 2012 Air Emission Inventory.

Port of Long Beach Emission Inventory Documents http://polb.com/environment/air/emissions.asp

Unmitigated Emissions Calculations **Unmitigated lbs/day** **MT/day**

Grading and Excavation:	#	Hrs/ day	ROG	NOx	CO	Sox	PM10	PM2.5	CO2	CH4	CO2e
Tug Usage	1	6	4.66	44.45	30.76	11.80	1.73	1.73	3671.68	0.44	1.67
Tug Travel	1	2	1.55	14.82	10.25	3.93	0.58	0.58	1223.89	0.15	0.56
Crew/Survey Boats	2	6	3.61	34.29	23.74	9.09	1.02	1.02	2827.07	0.34	1.28
Crew/Survey Boat Travel	2	2	1.20	11.43	7.91	3.03	0.34	0.34	942.36	0.11	0.43
Total Onsite			**8.27**	**78.74**	**54.50**	**20.89**	**2.75**	**2.75**			**2.95**
Total Offsite			**2.76**	**26.25**	**18.17**	**6.96**	**0.92**	**0.92**			**0.98**
Total			**11.03**	**104.99**	**72.66**	**27.85**	**3.67**	**3.67**			**3.93**

Mitigated Emissions Calculations **Mitigated lbs/day** **MT/day**

Grading and Excavation:	#	Hrs/ day	ROG	NOx	CO	Sox	PM10	PM2.5	CO2	CH4	CO2e
Tug Usage	1	6	4.66	14.12	30.76	11.80	0.44	1.73	3671.68	0.44	1.67
Tug Travel	1	2	1.55	4.71	10.25	3.93	0.15	0.58	1223.89	0.15	0.56
Crew/Survey Boats	2	6	3.61	34.29	23.74	9.09	1.02	1.02	2827.07	0.34	1.28
Crew/Survey Boat Travel	2	2	1.20	11.43	7.91	3.03	0.34	0.34	942.36	0.11	0.43
Total Onsite			**8.27**	**48.41**	**54.50**	**20.89**	**1.46**	**2.75**			**2.95**
Total Offsite			**2.76**	**16.14**	**18.17**	**6.96**	**0.49**	**0.92**			**0.98**
Total			**11.03**	**64.54**	**72.66**	**27.85**	**1.94**	**3.67**			**3.93**

Schedule

Phase	Days/year	
Demolition and site prep	130	
Grading/Excavation -option 1	260	
Grading/Excavation -option 2	260	*not used
Drainage/Utilities/Subgrade	130	
Building Construction	130	
Paving	40	
Architectural Coating	20	

Operational Assumptions

Operational Mobile Sources

Land Use Type	Trip Rate (/acre/day)			Non Res C-C Trip Length (miles)	Non Res C-W Trip Length (miles)	Non Res C-NW Trip Length (miles)
	Weekday	Saturday	Sunday			
Recreational - Public Park (LU 411)[1]	0.78	1.96	2.19	8.4	16.6	6.9
Parking	0	0	0			

[1] Used for the visitor center and wetlands land uses

No area sources

Building - Title 24 Mitigation

Water: 20% reduction
Solid Waste: 75% reduction (AB 341)

Benefit from carbon sequestration
No benefit for wetland area per CalEEMod guidance

Land Use	Sub-Category	Default CO_2 accumulation per acre (MT CO_2/ acre)
Forest Land	Scrub	14.3
	Trees	111
Cropland	--	6.20
Grassland	--	4.31
Wetlands	--	0

Source: http://www.aqmd.gov/docs/default-source/caleemod/caleemod-appendixa.pdf

Post-restoration habitats and acreages

Uplands = grassland[1]	Existing	Near Term	Long Term	Unit
South area Uplands	60.3	10.7	10.2	acre
Isthmus area Uplands	7.7	7.7	11.7	acre
Centra area Uplands (opt 1 worst case)	7.4	3.2	0	acre
North area Uplands	10.2	N/A	0	acre

1 Uplands as defined the the Project Description is most closely related to the category of "Grassland" used in the CalEEMod guidance.

Los Cerritos Wetlands Restoration

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	50.00	Space	0.45	20,000.00	0
City Park	66.50	Acre	66.50	2,896,740.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Los Cerritos Wetlands Restoration - Los Angeles-South Coast County, Summer

Project Characteristics -

Land Use -

Construction Phase - Assume 1 day for daily emission estimates. Scaled in post-processing for schedule length.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - added tractor for site prep

Off-road Equipment - added drainage/utilities/subgrade phase

Off-road Equipment - additional phase

Off-road Equipment - added crane and other equipment to account for dredge

Off-road Equipment - Added cement mixer, crane, and drill rig for wall construction. Added other construction equipment for dredge.

Off-road Equipment -

Trips and VMT - reduced building construction and arch coating workers per scaling down from BOMP EIR, added vendor for cement/ piles for wall construction, hauling estimated per day and to Montebello disposal site

Demolition - scaled up from BOMP estimate

Grading - added cut/fill numbers from Project Description

Architectural Coating -

Vehicle Trips -

Water And Wastewater - Assume no water is pumped into wetland.

Sequestration -

Construction Off-road Equipment Mitigation - water 3/day

Area Mitigation - Rule 1113 Low VOC paint < 50 g/l

Water Mitigation - 20% water conservation per Title 24

Operational Off-Road Equipment -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	1,000.00	5,000.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	3,000.00	15,000.00
tblArchitecturalCoating	ConstArea_Parking	1,200.00	3,000.00

Los Cerritos Wetlands Restoration - Los Angeles-South Coast County, Summer

tblAreaCoating	Area_Nonresidential_Exterior	1000	5000
tblAreaCoating	Area_Nonresidential_Interior	3000	15000
tblAreaCoating	Area_Parking	1200	3000
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tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	50
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tblAreaMitigation	UseLowVOCPaintParkingValue	100	50
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tblConstructionPhase	NumDays	70.00	1.00
tblConstructionPhase	NumDays	110.00	1.00
tblConstructionPhase	NumDays	110.00	1.00
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tblFleetMix	HHD	0.03	7.9665e-003
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tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
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tblFleetMix	MCY	5.0780e-003	0.02

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tblFleetMix	MDV	0.12	0.13
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MH	8.9100e-004	3.4552e-003
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tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
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tblGrading	MaterialExported	0.00	494,000.00
tblGrading	MaterialImported	0.00	278,000.00
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tblTripsAndVMT	WorkerTripNumber	245.00	7.00
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tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
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tblVehicleEF	HHD	0.03	0.03
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tblVehicleEF	LDA	0.04	0.06
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tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.24	0.49
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.01	0.08
tblVehicleEF	LDT1	1.99	2.01
tblVehicleEF	LDT1	2.62	2.08
tblVehicleEF	LDT1	366.73	349.70
tblVehicleEF	LDT1	71.32	66.31
tblVehicleEF	LDT1	0.15	0.14
tblVehicleEF	LDT1	0.16	0.28

tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.05	0.05
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.19	0.39
tblVehicleEF	LDT1	3.6940e-003	3.4605e-003
tblVehicleEF	LDT1	7.5900e-004	6.5619e-004
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.21	0.43
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.79	1.79
tblVehicleEF	LDT1	3.19	2.53
tblVehicleEF	LDT1	345.81	331.61

tblVehicleEF	LDT1	71.32	67.24
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.22	0.46
tblVehicleEF	LDT1	3.4810e-003	3.2814e-003
tblVehicleEF	LDT1	7.6900e-004	6.6538e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.24	0.50
tblVehicleEF	LDT2	7.8740e-003	6.3478e-003
tblVehicleEF	LDT2	7.2440e-003	0.08

tblVehicleEF	LDT2	0.90	1.24
tblVehicleEF	LDT2	1.49	2.87
tblVehicleEF	LDT2	395.42	367.68
tblVehicleEF	LDT2	80.68	73.77
tblVehicleEF	LDT2	0.09	0.12
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.10	0.38
tblVehicleEF	LDT2	3.9620e-003	3.6376e-003
tblVehicleEF	LDT2	8.3200e-004	7.3003e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.45

tblVehicleEF	LDT2	0.11	0.42
tblVehicleEF	LDT2	8.3450e-003	6.7606e-003
tblVehicleEF	LDT2	6.4440e-003	0.07
tblVehicleEF	LDT2	0.99	1.36
tblVehicleEF	LDT2	1.27	2.44
tblVehicleEF	LDT2	413.17	380.97
tblVehicleEF	LDT2	80.68	72.95
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.11	0.32
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.34
tblVehicleEF	LDT2	4.1400e-003	3.7691e-003
tblVehicleEF	LDT2	8.2800e-004	7.2192e-004
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15

tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LDT2	7.7190e-003	6.2197e-003
tblVehicleEF	LDT2	7.4150e-003	0.08
tblVehicleEF	LDT2	0.87	1.20
tblVehicleEF	LDT2	1.54	2.96
tblVehicleEF	LDT2	388.90	362.81
tblVehicleEF	LDT2	80.68	73.95
tblVehicleEF	LDT2	0.09	0.11
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.39
tblVehicleEF	LDT2	3.8960e-003	3.5895e-003

tblVehicleEF	LDT2	8.3300e-004	7.3182e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.11	0.43
tblVehicleEF	LHD1	6.0120e-003	6.0724e-003
tblVehicleEF	LHD1	0.01	7.3245e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.04	1.27
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.09
tblVehicleEF	LHD1	34.52	13.36
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.05	0.84
tblVehicleEF	LHD1	1.07	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003

tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.29	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7874e-003
tblVehicleEF	LHD1	4.0200e-004	1.3218e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD1	6.0120e-003	6.0856e-003
tblVehicleEF	LHD1	0.01	7.4711e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.96	0.87
tblVehicleEF	LHD1	2.90	1.21
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.11

tblVehicleEF	LHD1	34.52	13.25
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	0.98	0.79
tblVehicleEF	LHD1	1.03	0.36
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.28	0.09
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0270e-003	6.7877e-003
tblVehicleEF	LHD1	3.9900e-004	1.3115e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.03	0.03

tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.31	0.10
tblVehicleEF	LHD1	6.0120e-003	6.0700e-003
tblVehicleEF	LHD1	0.01	7.2867e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.06	1.28
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.08
tblVehicleEF	LHD1	34.52	13.37
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.03	0.83
tblVehicleEF	LHD1	1.08	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003

tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.30	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7873e-003
tblVehicleEF	LHD1	4.0200e-004	1.3235e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD2	4.3410e-003	4.3356e-003
tblVehicleEF	LHD2	5.0230e-003	5.0611e-003
tblVehicleEF	LHD2	9.9030e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.58
tblVehicleEF	LHD2	1.51	0.88
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.49
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.76	1.11

tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
tblVehicleEF	LHD2	3.1600e-004	1.0382e-004
tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.43

tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3451e-003
tblVehicleEF	LHD2	5.0980e-003	5.1274e-003
tblVehicleEF	LHD2	9.5540e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.40	0.58
tblVehicleEF	LHD2	1.44	0.84
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.38
tblVehicleEF	LHD2	28.89	10.42
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.72	1.05
tblVehicleEF	LHD2	0.58	0.26
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003

tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7498e-003
tblVehicleEF	LHD2	3.1500e-004	1.0310e-004
tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.14	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3338e-003
tblVehicleEF	LHD2	5.0030e-003	5.0440e-003
tblVehicleEF	LHD2	9.9730e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.57
tblVehicleEF	LHD2	1.52	0.89
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.50
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.75	1.09
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09

tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
tblVehicleEF	LHD2	3.1700e-004	1.0394e-004
tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	MCY	0.53	0.38
tblVehicleEF	MCY	0.15	0.24

tblVehicleEF	MCY	19.20	19.84
tblVehicleEF	MCY	9.64	8.48
tblVehicleEF	MCY	188.47	223.17
tblVehicleEF	MCY	44.88	60.40
tblVehicleEF	MCY	1.13	1.14
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	2.61	2.65
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.06	1.84
tblVehicleEF	MCY	2.2780e-003	2.2085e-003
tblVehicleEF	MCY	6.6700e-004	5.9774e-004
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	3.25	3.27
tblVehicleEF	MCY	0.62	2.17

tblVehicleEF	MCY	2.24	2.00
tblVehicleEF	MCY	0.52	0.38
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.48	19.07
tblVehicleEF	MCY	8.82	7.74
tblVehicleEF	MCY	188.47	221.70
tblVehicleEF	MCY	44.88	58.50
tblVehicleEF	MCY	0.99	0.99
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	2.55	2.58
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	1.84	1.63
tblVehicleEF	MCY	2.2640e-003	2.1939e-003
tblVehicleEF	MCY	6.4700e-004	5.7891e-004
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77

tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	3.17	3.18
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	2.00	1.77
tblVehicleEF	MCY	0.54	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.30	19.94
tblVehicleEF	MCY	9.78	8.61
tblVehicleEF	MCY	188.47	223.39
tblVehicleEF	MCY	44.88	60.73
tblVehicleEF	MCY	1.11	1.11
tblVehicleEF	MCY	0.31	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	2.62	2.66
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.10	1.88
tblVehicleEF	MCY	2.2800e-003	2.2106e-003

tblVehicleEF	MCY	6.7100e-004	6.0100e-004
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	3.26	3.28
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.29	2.05
tblVehicleEF	MDV	0.02	9.2696e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.56	1.64
tblVehicleEF	MDV	2.79	3.50
tblVehicleEF	MDV	528.65	449.45
tblVehicleEF	MDV	106.35	89.79
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.25	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.04	0.05

tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.22	0.50
tblVehicleEF	MDV	5.2990e-003	4.4442e-003
tblVehicleEF	MDV	1.1130e-003	8.8857e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.24	0.54
tblVehicleEF	MDV	0.02	9.7459e-003
tblVehicleEF	MDV	0.01	0.09
tblVehicleEF	MDV	1.69	1.77
tblVehicleEF	MDV	2.39	2.98
tblVehicleEF	MDV	551.85	463.58
tblVehicleEF	MDV	106.35	88.78
tblVehicleEF	MDV	0.15	0.14
tblVehicleEF	MDV	0.23	0.39
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.11	0.15

tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.19	0.44
tblVehicleEF	MDV	5.5330e-003	4.5840e-003
tblVehicleEF	MDV	1.1050e-003	8.7855e-004
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.21	0.48
tblVehicleEF	MDV	0.01	9.1128e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.52	1.59
tblVehicleEF	MDV	2.88	3.61
tblVehicleEF	MDV	520.14	444.29
tblVehicleEF	MDV	106.35	90.01
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.26	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003

tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.22	0.51
tblVehicleEF	MDV	5.2130e-003	4.3931e-003
tblVehicleEF	MDV	1.1140e-003	8.9074e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.24	0.56
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	2.77	1.93
tblVehicleEF	MH	6.41	2.41
tblVehicleEF	MH	1,135.33	1,557.81
tblVehicleEF	MH	61.01	20.79
tblVehicleEF	MH	1.17	1.25
tblVehicleEF	MH	0.85	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02

tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.36	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0577e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.85	1.97
tblVehicleEF	MH	6.02	2.27
tblVehicleEF	MH	1,135.33	1,557.88
tblVehicleEF	MH	61.01	20.56
tblVehicleEF	MH	1.07	1.15
tblVehicleEF	MH	0.82	0.24

tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.35	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.1500e-004	2.0342e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.15	0.11
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.38	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	2.74	1.92
tblVehicleEF	MH	6.46	2.43
tblVehicleEF	MH	1,135.33	1,557.79

tblVehicleEF	MH	61.01	20.83
tblVehicleEF	MH	1.15	1.22
tblVehicleEF	MH	0.86	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.37	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0615e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MHD	0.02	4.4568e-003
tblVehicleEF	MHD	5.7010e-003	9.4687e-003

tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.39	0.40
tblVehicleEF	MHD	0.42	0.87
tblVehicleEF	MHD	6.85	1.61
tblVehicleEF	MHD	131.02	70.09
tblVehicleEF	MHD	1,155.79	1,129.05
tblVehicleEF	MHD	65.08	12.73
tblVehicleEF	MHD	0.52	0.62
tblVehicleEF	MHD	1.23	2.74
tblVehicleEF	MHD	9.82	1.00
tblVehicleEF	MHD	2.8600e-004	2.2441e-003
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.7300e-004	2.1470e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.42	0.07

tblVehicleEF	MHD	1.2630e-003	6.6609e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7100e-004	1.2593e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	MHD	0.02	4.2175e-003
tblVehicleEF	MHD	5.7940e-003	9.5490e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.28	0.31
tblVehicleEF	MHD	0.43	0.88
tblVehicleEF	MHD	6.50	1.53
tblVehicleEF	MHD	138.77	71.71
tblVehicleEF	MHD	1,155.79	1,129.06
tblVehicleEF	MHD	65.08	12.59
tblVehicleEF	MHD	0.53	0.63
tblVehicleEF	MHD	1.16	2.58
tblVehicleEF	MHD	9.78	0.99
tblVehicleEF	MHD	2.4100e-004	1.8940e-003
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004

tblVehicleEF	MHD	2.3000e-004	1.8121e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.40	0.07
tblVehicleEF	MHD	1.3360e-003	6.8157e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.6500e-004	1.2455e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.06	0.18
tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.44	0.08
tblVehicleEF	MHD	0.02	4.7993e-003
tblVehicleEF	MHD	5.6760e-003	9.4448e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.53	0.51
tblVehicleEF	MHD	0.42	0.86

tblVehicleEF	MHD	6.91	1.63
tblVehicleEF	MHD	120.30	67.85
tblVehicleEF	MHD	1,155.79	1,129.04
tblVehicleEF	MHD	65.08	12.75
tblVehicleEF	MHD	0.49	0.61
tblVehicleEF	MHD	1.21	2.69
tblVehicleEF	MHD	9.83	1.00
tblVehicleEF	MHD	3.4800e-004	2.7274e-003
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	3.3300e-004	2.6095e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.1630e-003	6.4466e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7200e-004	1.2619e-004

tblVehicleEF	MHD	1.2900e-003	8.4856e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.04
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	OBUS	0.01	9.0528e-003
tblVehicleEF	OBUS	8.8720e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.29	0.61
tblVehicleEF	OBUS	0.60	1.25
tblVehicleEF	OBUS	5.75	2.54
tblVehicleEF	OBUS	111.80	98.82
tblVehicleEF	OBUS	1,266.65	1,458.58
tblVehicleEF	OBUS	68.32	19.86
tblVehicleEF	OBUS	0.58	0.71
tblVehicleEF	OBUS	1.73	2.50
tblVehicleEF	OBUS	2.63	0.62
tblVehicleEF	OBUS	2.0400e-004	3.3787e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	1.9500e-004	3.2325e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003

tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	7.7800e-004	9.3362e-004
tblVehicleEF	OBUS	0.07	0.14
tblVehicleEF	OBUS	0.04	0.26
tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	1.0790e-003	9.3986e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.8400e-004	1.9655e-004
tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.06	0.09
tblVehicleEF	OBUS	7.7800e-004	9.3362e-004
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.26
tblVehicleEF	OBUS	0.39	0.13
tblVehicleEF	OBUS	0.01	9.0475e-003
tblVehicleEF	OBUS	9.0250e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.27	0.57
tblVehicleEF	OBUS	0.61	1.27
tblVehicleEF	OBUS	5.43	2.40
tblVehicleEF	OBUS	117.45	100.02
tblVehicleEF	OBUS	1,266.65	1,458.61

tblVehicleEF	OBUS	68.32	19.62
tblVehicleEF	OBUS	0.60	0.72
tblVehicleEF	OBUS	1.63	2.35
tblVehicleEF	OBUS	2.59	0.61
tblVehicleEF	OBUS	1.7200e-004	2.8530e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	1.6400e-004	2.7296e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	2.1550e-003	2.7285e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	1.1010e-003	1.3226e-003
tblVehicleEF	OBUS	0.07	0.15
tblVehicleEF	OBUS	0.04	0.25
tblVehicleEF	OBUS	0.35	0.12
tblVehicleEF	OBUS	1.1330e-003	9.5128e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.7900e-004	1.9419e-004
tblVehicleEF	OBUS	2.1550e-003	2.7285e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.09

tblVehicleEF	OBUS	1.1010e-003	1.3226e-003
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.25
tblVehicleEF	OBUS	0.38	0.13
tblVehicleEF	OBUS	0.01	9.0785e-003
tblVehicleEF	OBUS	8.8310e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.31	0.66
tblVehicleEF	OBUS	0.60	1.24
tblVehicleEF	OBUS	5.81	2.56
tblVehicleEF	OBUS	104.00	97.15
tblVehicleEF	OBUS	1,266.65	1,458.57
tblVehicleEF	OBUS	68.32	19.91
tblVehicleEF	OBUS	0.56	0.71
tblVehicleEF	OBUS	1.70	2.46
tblVehicleEF	OBUS	2.64	0.62
tblVehicleEF	OBUS	2.4800e-004	4.1047e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	2.3700e-004	3.9271e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003

tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
tblVehicleEF	OBUS	0.07	0.14
tblVehicleEF	OBUS	0.04	0.28
tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	1.0040e-003	9.2410e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.8500e-004	1.9702e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.06	0.09
tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.28
tblVehicleEF	OBUS	0.40	0.14
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9517e-003
tblVehicleEF	SBUS	0.07	5.5911e-003
tblVehicleEF	SBUS	8.04	2.47
tblVehicleEF	SBUS	0.79	0.66
tblVehicleEF	SBUS	7.53	0.78
tblVehicleEF	SBUS	1,136.99	350.96
tblVehicleEF	SBUS	1,088.61	1,142.40
tblVehicleEF	SBUS	53.57	4.74
tblVehicleEF	SBUS	9.91	3.43
tblVehicleEF	SBUS	4.55	5.48

tblVehicleEF	SBUS	12.42	0.77
tblVehicleEF	SBUS	0.01	5.0981e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	4.8776e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	3.3870e-003	8.4800e-004
tblVehicleEF	SBUS	0.03	7.2494e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.3445e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.6600e-004	4.6882e-005
tblVehicleEF	SBUS	3.3870e-003	8.4800e-004
tblVehicleEF	SBUS	0.03	7.2494e-003
tblVehicleEF	SBUS	1.40	0.40
tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.01	0.05

tblVehicleEF	SBUS	0.43	0.04
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	8.0370e-003
tblVehicleEF	SBUS	0.06	4.9797e-003
tblVehicleEF	SBUS	7.92	2.43
tblVehicleEF	SBUS	0.80	0.67
tblVehicleEF	SBUS	6.11	0.64
tblVehicleEF	SBUS	1,188.84	360.21
tblVehicleEF	SBUS	1,088.61	1,142.41
tblVehicleEF	SBUS	53.57	4.49
tblVehicleEF	SBUS	10.22	3.51
tblVehicleEF	SBUS	4.29	5.17
tblVehicleEF	SBUS	12.39	0.77
tblVehicleEF	SBUS	9.0250e-003	4.3047e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	8.6350e-003	4.1185e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004

tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.35	0.03
tblVehicleEF	SBUS	0.01	3.4320e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.4200e-004	4.4468e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	1.39	0.40
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.38	0.03
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9268e-003
tblVehicleEF	SBUS	0.07	5.7268e-003
tblVehicleEF	SBUS	8.21	2.53
tblVehicleEF	SBUS	0.78	0.66
tblVehicleEF	SBUS	7.78	0.81
tblVehicleEF	SBUS	1,065.38	338.18
tblVehicleEF	SBUS	1,088.61	1,142.39
tblVehicleEF	SBUS	53.57	4.78
tblVehicleEF	SBUS	9.47	3.32
tblVehicleEF	SBUS	4.47	5.39
tblVehicleEF	SBUS	12.43	0.77
tblVehicleEF	SBUS	0.01	6.1938e-003
tblVehicleEF	SBUS	0.74	0.74

tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	5.9258e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.2238e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.7000e-004	4.7323e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	1.40	0.41
tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.44	0.04
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01

tblVehicleEF	UBUS	11.79	42.44
tblVehicleEF	UBUS	8.90	0.71
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.66
tblVehicleEF	UBUS	10.68	1.20
tblVehicleEF	UBUS	15.66	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0860e-003	8.5721e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	3.79	6.37
tblVehicleEF	UBUS	0.02	0.05

tblVehicleEF	UBUS	0.73	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.84	42.44
tblVehicleEF	UBUS	7.71	0.62
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.52
tblVehicleEF	UBUS	10.07	1.20
tblVehicleEF	UBUS	15.61	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	0.91	0.15
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.61	0.04
tblVehicleEF	UBUS	9.9300e-003	1.5961e-003
tblVehicleEF	UBUS	1.0650e-003	8.4268e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003

tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	3.80	6.37
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.77	42.44
tblVehicleEF	UBUS	9.11	0.72
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.69
tblVehicleEF	UBUS	10.47	1.20
tblVehicleEF	UBUS	15.67	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003

tblVehicleEF	UBUS	1.0900e-003	8.6004e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	3.78	6.37
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.75	0.05
tblWater	OutdoorWaterUseRate	79,233,509.75	0.00

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					
2020	106.8794	71.5172	46.1337	0.1008	96.4125	3.0059	99.3428	16.9332	2.7676	19.6292	0.0000	9,860.0105	9,860.0105	2.7780	0.0000	9,929.4613
Maximum	**106.8794**	**71.5172**	**46.1337**	**0.1008**	**96.4125**	**3.0059**	**99.3428**	**16.9332**	**2.7676**	**19.6292**	**0.0000**	**9,860.0105**	**9,860.0105**	**2.7780**	**0.0000**	**9,929.4613**

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					
2020	106.8794	71.5172	46.1337	0.1008	37.8657	3.0059	40.7959	6.6748	2.7676	9.3709	0.0000	9,860.0105	9,860.0105	2.7780	0.0000	9,929.4613
Maximum	**106.8794**	**71.5172**	**46.1337**	**0.1008**	**37.8657**	**3.0059**	**40.7959**	**6.6748**	**2.7676**	**9.3709**	**0.0000**	**9,860.0105**	**9,860.0105**	**2.7780**	**0.0000**	**9,929.4613**

	ROG	NOx	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**	**60.73**	**0.00**	**58.93**	**60.58**	**0.00**	**52.26**	**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	0.2261	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	6.0539	6.1516	50.6583	0.0993	9.1651	0.1061	9.2712	2.4413	0.0993	2.5406		10,108.9867	10,108.9867	0.7142		10,126.8424
Total	**6.2801**	**6.1517**	**50.6702**	**0.0993**	**9.1651**	**0.1062**	**9.2712**	**2.4413**	**0.0994**	**2.5406**		**10,109.0122**	**10,109.0122**	**0.7143**	**0.0000**	**10,126.8696**

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	0.2115	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	6.0539	6.1516	50.6583	0.0993	9.1651	0.1061	9.2712	2.4413	0.0993	2.5406		10,108.9867	10,108.9867	0.7142		10,126.8424
Total	**6.2655**	**6.1517**	**50.6702**	**0.0993**	**9.1651**	**0.1062**	**9.2712**	**2.4413**	**0.0994**	**2.5406**		**10,109.0122**	**10,109.0122**	**0.7143**	**0.0000**	**10,126.8696**

	ROG	NOx	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	**0.23**	**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	Demolition and Site Preparation	Demolition	1/1/2020	1/1/2020	5	1	
2	Grading and Excavation- option 1	Grading	1/2/2020	1/2/2020	5	1	
3	Grading and Excavation- option 2	Grading	1/3/2020	1/3/2020	5	1	
4	Drainage/Utilities/Subgrade	Trenching	1/6/2020	1/6/2020	5	1	
5	Building Construction	Building Construction	1/7/2020	1/7/2020	5	1	
6	Paving	Paving	1/8/2020	1/8/2020	5	1	
7	Architectural Coating	Architectural Coating	1/9/2020	1/9/2020	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.45

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 15,000; Non-Residential Outdoor: 5,000; Striped Parking Area: 3,000 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition and Site Preparation	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition and Site Preparation	Excavators	3	8.00	158	0.38
Demolition and Site Preparation	Rubber Tired Dozers	2	8.00	247	0.40

Demolition and Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading and Excavation- option 1	Cranes	1	7.00	231	0.29
Grading and Excavation- option 1	Excavators	2	8.00	158	0.38
Grading and Excavation- option 1	Graders	1	8.00	187	0.41
Grading and Excavation- option 1	Other Construction Equipment	2	8.00	172	0.42
Grading and Excavation- option 1	Rubber Tired Dozers	1	8.00	247	0.40
Grading and Excavation- option 1	Scrapers	2	8.00	367	0.48
Grading and Excavation- option 1	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading and Excavation- option 2	Bore/Drill Rigs	1	6.00	221	0.50
Grading and Excavation- option 2	Cement and Mortar Mixers	2	6.00	9	0.56
Grading and Excavation- option 2	Cranes	1	6.00	231	0.29
Grading and Excavation- option 2	Excavators	2	8.00	158	0.38
Grading and Excavation- option 2	Graders	1	8.00	187	0.41
Grading and Excavation- option 2	Other Construction Equipment	2	8.00	172	0.42
Grading and Excavation- option 2	Rubber Tired Dozers	1	8.00	247	0.40
Grading and Excavation- option 2	Scrapers	2	8.00	367	0.48
Grading and Excavation- option 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Drainage/Utilities/Subgrade	Bore/Drill Rigs	1	6.00	221	0.50
Drainage/Utilities/Subgrade	Excavators	2	8.00	158	0.38
Drainage/Utilities/Subgrade	Pumps	2	8.00	84	0.74
Drainage/Utilities/Subgrade	Trenchers	2	8.00	78	0.50
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42

Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition and Site Preparation	8	20.00	0.00	3.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Grading and Excavation- option 1	11	28.00	0.00	6.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Grading and Excavation- option 2	14	35.00	0.00	11.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Drainage/Utilities/Sub grade	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	30.00	15.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	7.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition and Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					64.1970	0.0000	64.1970	9.7200	0.0000	9.7200			0.0000			0.0000
Off-Road	3.7311	37.4113	26.3126	0.0450		1.9249	1.9249		1.7868	1.7868		4,349.2419	4,349.2419	1.2525		4,380.5544
Total	**3.7311**	**37.4113**	**26.3126**	**0.0450**	**64.1970**	**1.9249**	**66.1219**	**9.7200**	**1.7868**	**11.5068**		**4,349.2419**	**4,349.2419**	**1.2525**		**4,380.5544**

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	0.0295	0.9516	0.2152	2.6900e-003	0.0606	3.1600e-003	0.0637	0.0166	3.0200e-003	0.0196		291.1843	291.1843	0.0194		291.6698
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0655	0.8757	2.3600e-003	0.2236	1.8700e-003	0.2254	0.0593	1.7200e-003	0.0610		235.2226	235.2226	7.4200e-003		235.4080
Total	**0.1215**	**1.0171**	**1.0909**	**5.0500e-003**	**0.2841**	**5.0300e-003**	**0.2892**	**0.0759**	**4.7400e-003**	**0.0806**		**526.4069**	**526.4069**	**0.0268**		**527.0778**

3.2 Demolition and Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0368	0.0000	25.0368	3.7908	0.0000	3.7908			0.0000			0.0000
Off-Road	3.7311	37.4113	26.3126	0.0450		1.9249	1.9249		1.7868	1.7868	0.0000	4,349.2419	4,349.2419	1.2525		4,380.5544
Total	**3.7311**	**37.4113**	**26.3126**	**0.0450**	**25.0368**	**1.9249**	**26.9618**	**3.7908**	**1.7868**	**5.5776**	**0.0000**	**4,349.2419**	**4,349.2419**	**1.2525**		**4,380.5544**

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	0.0295	0.9516	0.2152	2.6900e-003	0.0606	3.1600e-003	0.0637	0.0166	3.0200e-003	0.0196		291.1843	291.1843	0.0194		291.6698
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0655	0.8757	2.3600e-003	0.2236	1.8700e-003	0.2254	0.0593	1.7200e-003	0.0610		235.2226	235.2226	7.4200e-003		235.4080
Total	**0.1215**	**1.0171**	**1.0909**	**5.0500e-003**	**0.2841**	**5.0300e-003**	**0.2892**	**0.0759**	**4.7400e-003**	**0.0806**		**526.4069**	**526.4069**	**0.0268**		**527.0778**

3.3 Grading and Excavation- option 1 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					95.9784	0.0000	95.9784	16.8170	0.0000	16.8170			0.0000			0.0000
Off-Road	5.8349	65.3933	42.0533	0.0794		2.9213	2.9213		2.6876	2.6876		7,692.4144	7,692.4144	2.4879		7,754.6114
Total	**5.8349**	**65.3933**	**42.0533**	**0.0794**	**95.9784**	**2.9213**	**98.8997**	**16.8170**	**2.6876**	**19.5046**		**7,692.4144**	**7,692.4144**	**2.4879**		**7,754.6114**

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	0.0590	1.9032	0.4304	5.3700e-003	0.1212	6.3200e-003	0.1275	0.0332	6.0500e-003	0.0393		582.3686	582.3686	0.0388		583.3396
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1289	0.0917	1.2260	3.3100e-003	0.3130	2.6200e-003	0.3156	0.0830	2.4100e-003	0.0854		329.3116	329.3116	0.0104		329.5712
Total	**0.1878**	**1.9949**	**1.6564**	**8.6800e-003**	**0.4341**	**8.9400e-003**	**0.4431**	**0.1162**	**8.4600e-003**	**0.1247**		**911.6802**	**911.6802**	**0.0492**		**912.9108**

3.3 Grading and Excavation- option 1 - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					37.4316	0.0000	37.4316	6.5586	0.0000	6.5586			0.0000			0.0000
Off-Road	5.8349	65.3933	42.0533	0.0794		2.9213	2.9213		2.6876	2.6876	0.0000	7,692.4144	7,692.4144	2.4879		7,754.6114
Total	**5.8349**	**65.3933**	**42.0533**	**0.0794**	**37.4316**	**2.9213**	**40.3529**	**6.5586**	**2.6876**	**9.2462**	**0.0000**	**7,692.4144**	**7,692.4144**	**2.4879**		**7,754.6114**

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	0.0590	1.9032	0.4304	5.3700e-003	0.1212	6.3200e-003	0.1275	0.0332	6.0500e-003	0.0393		582.3686	582.3686	0.0388		583.3396
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1289	0.0917	1.2260	3.3100e-003	0.3130	2.6200e-003	0.3156	0.0830	2.4100e-003	0.0854		329.3116	329.3116	0.0104		329.5712
Total	**0.1878**	**1.9949**	**1.6564**	**8.6800e-003**	**0.4341**	**8.9400e-003**	**0.4431**	**0.1162**	**8.4600e-003**	**0.1247**		**911.6802**	**911.6802**	**0.0492**		**912.9108**

3.4 Grading and Excavation- option 2 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					68.7239	0.0000	68.7239	12.6899	0.0000	12.6899			0.0000			0.0000
Off-Road	6.0745	67.9134	43.8122	0.0868		2.9911	2.9911		2.7535	2.7535		8,380.6953	8,380.6953	2.6939		8,448.0415
Total	**6.0745**	**67.9134**	**43.8122**	**0.0868**	**68.7239**	**2.9911**	**71.7149**	**12.6899**	**2.7535**	**15.4434**		**8,380.6953**	**8,380.6953**	**2.6939**		**8,448.0415**

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	0.1081	3.4892	0.7891	9.8500e-003	0.2221	0.0116	0.2337	0.0609	0.0111	0.0720		1,067.6757	1,067.6757	0.0712		1,069.4559
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1611	0.1146	1.5325	4.1300e-003	0.3912	3.2700e-003	0.3945	0.1038	3.0100e-003	0.1068		411.6395	411.6395	0.0130		411.9640
Total	**0.2692**	**3.6038**	**2.3215**	**0.0140**	**0.6133**	**0.0149**	**0.6282**	**0.1646**	**0.0141**	**0.1787**		**1,479.3152**	**1,479.3152**	**0.0842**		**1,481.4199**

3.4 Grading and Excavation- option 2 - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					26.8023	0.0000	26.8023	4.9491	0.0000	4.9491			0.0000			0.0000
Off-Road	6.0745	67.9134	43.8122	0.0868		2.9911	2.9911		2.7535	2.7535	0.0000	8,380.6953	8,380.6953	2.6939		8,448.0415
Total	**6.0745**	**67.9134**	**43.8122**	**0.0868**	**26.8023**	**2.9911**	**29.7934**	**4.9491**	**2.7535**	**7.7026**	**0.0000**	**8,380.6953**	**8,380.6953**	**2.6939**		**8,448.0415**

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	0.1081	3.4892	0.7891	9.8500e-003	0.2221	0.0116	0.2337	0.0609	0.0111	0.0720		1,067.6757	1,067.6757	0.0712		1,069.4559
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1611	0.1146	1.5325	4.1300e-003	0.3912	3.2700e-003	0.3945	0.1038	3.0100e-003	0.1068		411.6395	411.6395	0.0130		411.9640
Total	**0.2692**	**3.6038**	**2.3215**	**0.0140**	**0.6133**	**0.0149**	**0.6282**	**0.1646**	**0.0141**	**0.1787**		**1,479.3152**	**1,479.3152**	**0.0842**		**1,481.4199**

3.5 Drainage/Utilities/Subgrade - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3840	22.1182	20.8939	0.0373		1.2927	1.2927		1.2225	1.2225		3,582.2853	3,582.2853	0.8301		3,603.0385
Total	**2.3840**	**22.1182**	**20.8939**	**0.0373**		**1.2927**	**1.2927**		**1.2225**	**1.2225**		**3,582.2853**	**3,582.2853**	**0.8301**		**3,603.0385**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0828	0.0589	0.7881	2.1300e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		211.7003	211.7003	6.6700e-003		211.8672
Total	**0.0828**	**0.0589**	**0.7881**	**2.1300e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**211.7003**	**211.7003**	**6.6700e-003**		**211.8672**

3.5 Drainage/Utilities/Subgrade - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3840	22.1182	20.8939	0.0373		1.2927	1.2927		1.2225	1.2225	0.0000	3,582.2853	3,582.2853	0.8301		3,603.0385
Total	**2.3840**	**22.1182**	**20.8939**	**0.0373**		**1.2927**	**1.2927**		**1.2225**	**1.2225**	**0.0000**	**3,582.2853**	**3,582.2853**	**0.8301**		**3,603.0385**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0828	0.0589	0.7881	2.1300e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		211.7003	211.7003	6.6700e-003		211.8672
Total	**0.0828**	**0.0589**	**0.7881**	**2.1300e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**211.7003**	**211.7003**	**6.6700e-003**		**211.8672**

3.6 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

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	0.0534	1.5956	0.4181	3.8900e-003	0.0960	7.5100e-003	0.1035	0.0277	7.1800e-003	0.0348		415.5370	415.5370	0.0254		416.1710
Worker	0.1381	0.0982	1.3135	3.5400e-003	0.3353	2.8000e-003	0.3381	0.0889	2.5800e-003	0.0915		352.8339	352.8339	0.0111		353.1120
Total	**0.1914**	**1.6938**	**1.7316**	**7.4300e-003**	**0.4314**	**0.0103**	**0.4417**	**0.1166**	**9.7600e-003**	**0.1263**		**768.3709**	**768.3709**	**0.0365**		**769.2829**

3.6 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

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	0.0534	1.5956	0.4181	3.8900e-003	0.0960	7.5100e-003	0.1035	0.0277	7.1800e-003	0.0348		415.5370	415.5370	0.0254		416.1710
Worker	0.1381	0.0982	1.3135	3.5400e-003	0.3353	2.8000e-003	0.3381	0.0889	2.5800e-003	0.0915		352.8339	352.8339	0.0111		353.1120
Total	**0.1914**	**1.6938**	**1.7316**	**7.4300e-003**	**0.4314**	**0.0103**	**0.4417**	**0.1166**	**9.7600e-003**	**0.1263**		**768.3709**	**768.3709**	**0.0365**		**769.2829**

3.7 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.1790					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.5356**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**		**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0690	0.0491	0.6568	1.7700e-003	0.1677	1.4000e-003	0.1691	0.0445	1.2900e-003	0.0458		176.4169	176.4169	5.5600e-003		176.5560
Total	**0.0690**	**0.0491**	**0.6568**	**1.7700e-003**	**0.1677**	**1.4000e-003**	**0.1691**	**0.0445**	**1.2900e-003**	**0.0458**		**176.4169**	**176.4169**	**5.5600e-003**		**176.5560**

3.7 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.1790					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.5356**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**	**0.0000**	**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0690	0.0491	0.6568	1.7700e-003	0.1677	1.4000e-003	0.1691	0.0445	1.2900e-003	0.0458		176.4169	176.4169	5.5600e-003		176.5560
Total	**0.0690**	**0.0491**	**0.6568**	**1.7700e-003**	**0.1677**	**1.4000e-003**	**0.1691**	**0.0445**	**1.2900e-003**	**0.0458**		**176.4169**	**176.4169**	**5.5600e-003**		**176.5560**

3.8 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	106.6050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**106.8472**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0322	0.0229	0.3065	8.3000e-004	0.0782	6.5000e-004	0.0789	0.0208	6.0000e-004	0.0214		82.3279	82.3279	2.6000e-003		82.3928
Total	**0.0322**	**0.0229**	**0.3065**	**8.3000e-004**	**0.0782**	**6.5000e-004**	**0.0789**	**0.0208**	**6.0000e-004**	**0.0214**		**82.3279**	**82.3279**	**2.6000e-003**		**82.3928**

3.8 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	106.6050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**106.8472**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0322	0.0229	0.3065	8.3000e-004	0.0782	6.5000e-004	0.0789	0.0208	6.0000e-004	0.0214		82.3279	82.3279	2.6000e-003		82.3928
Total	**0.0322**	**0.0229**	**0.3065**	**8.3000e-004**	**0.0782**	**6.5000e-004**	**0.0789**	**0.0208**	**6.0000e-004**	**0.0214**		**82.3279**	**82.3279**	**2.6000e-003**		**82.3928**

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	6.0539	6.1516	50.6583	0.0993	9.1651	0.1061	9.2712	2.4413	0.0993	2.5406		10,108.9867	10,108.9867	0.7142		10,126.8424
Unmitigated	6.0539	6.1516	50.6583	0.0993	9.1651	0.1061	9.2712	2.4413	0.0993	2.5406		10,108.9867	10,108.9867	0.7142		10,126.8424

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	125.69	1,512.88	1113.21	1,337,855	1,337,855
Parking Lot	0.00	0.00	0.00		
Total	125.69	1,512.88	1,113.21	1,337,855	1,337,855

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
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455
Parking Lot	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Los Cerritos Wetlands Restoration - Los Angeles-South Coast County, Summer

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive 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	0.2115	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Unmitigated	0.2261	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272

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	0.0292					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1958					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1200e-003	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Total	**0.2262**	**1.1000e-004**	**0.0119**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0255**	**0.0255**	**7.0000e-005**		**0.0272**

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	0.0146					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1958					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1200e-003	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Total	**0.2115**	**1.1000e-004**	**0.0119**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0255**	**0.0255**	**7.0000e-005**		**0.0272**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

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

Los Cerritos Wetlands Restoration

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	50.00	Space	0.45	20,000.00	0
City Park	66.50	Acre	66.50	2,896,740.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Los Cerritos Wetlands Restoration - Los Angeles-South Coast County, Winter

Project Characteristics -

Land Use -

Construction Phase - Assume 1 day for daily emission estimates. Scaled in post-processing for schedule length.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - added tractor for site prep

Off-road Equipment - added drainage/utilities/subgrade phase

Off-road Equipment - additional phase

Off-road Equipment - added crane and other equipment to account for dredge

Off-road Equipment - Added cement mixer, crane, and drill rig for wall construction. Added other construction equipment for dredge.

Off-road Equipment -

Trips and VMT - reduced building construction and arch coating workers per scaling down from BOMP EIR, added vendor for cement/ piles for wall construction, hauling estimated per day and to Montebello disposal site

Demolition - scaled up from BOMP estimate

Grading - added cut/fill numbers from Project Description

Architectural Coating -

Vehicle Trips -

Water And Wastewater - Assume no water is pumped into wetland.

Sequestration -

Construction Off-road Equipment Mitigation - water 3/day

Area Mitigation - Rule 1113 Low VOC paint < 50 g/l

Water Mitigation - 20% water conservation per Title 24

Operational Off-Road Equipment -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	1,000.00	5,000.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	3,000.00	15,000.00
tblArchitecturalCoating	ConstArea_Parking	1,200.00	3,000.00

tblAreaCoating	Area_Nonresidential_Exterior	1000	5000
tblAreaCoating	Area_Nonresidential_Interior	3000	15000
tblAreaCoating	Area_Parking	1200	3000
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	100	50
tblConstructionPhase	NumDays	75.00	1.00
tblConstructionPhase	NumDays	1,110.00	1.00
tblConstructionPhase	NumDays	70.00	1.00
tblConstructionPhase	NumDays	110.00	1.00
tblConstructionPhase	NumDays	110.00	1.00
tblConstructionPhase	NumDays	75.00	1.00
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MCY	5.0780e-003	0.02

tblFleetMix	MDV	0.12	0.13
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MHD	0.02	0.01
tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblGrading	MaterialExported	0.00	494,000.00
tblGrading	MaterialExported	0.00	494,000.00
tblGrading	MaterialImported	0.00	278,000.00
tblGrading	MaterialImported	0.00	37,000.00
tblTripsAndVMT	HaulingTripLength	20.00	23.10
tblTripsAndVMT	HaulingTripLength	20.00	23.10
tblTripsAndVMT	HaulingTripLength	20.00	23.10
tblTripsAndVMT	HaulingTripNumber	297.00	3.00
tblTripsAndVMT	HaulingTripNumber	96,500.00	6.00
tblTripsAndVMT	HaulingTripNumber	66,375.00	11.00
tblTripsAndVMT	VendorTripNumber	478.00	15.00
tblTripsAndVMT	WorkerTripNumber	1,225.00	30.00
tblTripsAndVMT	WorkerTripNumber	245.00	7.00
tblVehicleEF	HHD	0.65	0.03
tblVehicleEF	HHD	0.09	0.08

tblVehicleEF	HHD	0.09	5.3212e-007
tblVehicleEF	HHD	2.61	5.73
tblVehicleEF	HHD	1.16	0.77
tblVehicleEF	HHD	3.36	0.01
tblVehicleEF	HHD	4,729.35	1,160.01
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	21.63	6.50
tblVehicleEF	HHD	4.20	4.58
tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.1100e-004	1.0257e-005
tblVehicleEF	HHD	4.8720e-003	4.3163e-004
tblVehicleEF	HHD	0.65	0.47
tblVehicleEF	HHD	8.3000e-005	7.1733e-006
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.3200e-004	2.2097e-003
tblVehicleEF	HHD	0.09	2.8089e-006

tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0936e-006
tblVehicleEF	HHD	1.1100e-004	1.0257e-005
tblVehicleEF	HHD	4.8720e-003	4.3163e-004
tblVehicleEF	HHD	0.76	0.54
tblVehicleEF	HHD	8.3000e-005	7.1733e-006
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.3200e-004	2.2097e-003
tblVehicleEF	HHD	0.10	3.0754e-006
tblVehicleEF	HHD	0.61	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.08	5.0957e-007
tblVehicleEF	HHD	1.90	5.57
tblVehicleEF	HHD	1.17	0.77
tblVehicleEF	HHD	3.19	0.01
tblVehicleEF	HHD	5,008.69	1,160.72
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	22.32	6.36
tblVehicleEF	HHD	3.97	4.34
tblVehicleEF	HHD	19.56	1.76
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006

tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.7000e-004	1.6157e-005
tblVehicleEF	HHD	4.9980e-003	4.3835e-004
tblVehicleEF	HHD	0.61	0.49
tblVehicleEF	HHD	1.2100e-004	1.1037e-005
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.2100e-004	2.1847e-003
tblVehicleEF	HHD	0.08	2.6976e-006
tblVehicleEF	HHD	0.05	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.5800e-004	1.0850e-006
tblVehicleEF	HHD	1.7000e-004	1.6157e-005
tblVehicleEF	HHD	4.9980e-003	4.3835e-004
tblVehicleEF	HHD	0.72	0.56
tblVehicleEF	HHD	1.2100e-004	1.1037e-005
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.2100e-004	2.1847e-003
tblVehicleEF	HHD	0.09	2.9536e-006
tblVehicleEF	HHD	0.70	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3720e-007
tblVehicleEF	HHD	3.58	5.95
tblVehicleEF	HHD	1.16	0.77

tblVehicleEF	HHD	3.39	0.01
tblVehicleEF	HHD	4,343.58	1,159.03
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	20.67	6.69
tblVehicleEF	HHD	4.13	4.51
tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.1000e-004	1.0837e-005
tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.70	0.45
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.09	2.8334e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0953e-006

tblVehicleEF	HHD	1.1000e-004	1.0837e-005
tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.82	0.51
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.10	3.1023e-006
tblVehicleEF	LDA	5.9160e-003	4.0269e-003
tblVehicleEF	LDA	6.1880e-003	0.06
tblVehicleEF	LDA	0.71	0.86
tblVehicleEF	LDA	1.27	2.24
tblVehicleEF	LDA	285.63	286.85
tblVehicleEF	LDA	59.19	56.49
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.01	0.02

tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	2.8620e-003	2.8378e-003
tblVehicleEF	LDA	6.1400e-004	5.5902e-004
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.09	0.30
tblVehicleEF	LDA	6.2800e-003	4.3047e-003
tblVehicleEF	LDA	5.4950e-003	0.05
tblVehicleEF	LDA	0.78	0.95
tblVehicleEF	LDA	1.09	1.90
tblVehicleEF	LDA	298.94	299.91
tblVehicleEF	LDA	59.19	55.86
tblVehicleEF	LDA	0.05	0.05
tblVehicleEF	LDA	0.07	0.19
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.07	0.10

tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.07	0.24
tblVehicleEF	LDA	2.9960e-003	2.9671e-003
tblVehicleEF	LDA	6.1000e-004	5.5280e-004
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	5.7950e-003	3.9414e-003
tblVehicleEF	LDA	6.3340e-003	0.06
tblVehicleEF	LDA	0.68	0.83
tblVehicleEF	LDA	1.31	2.31
tblVehicleEF	LDA	280.76	282.08
tblVehicleEF	LDA	59.19	56.63
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003

tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.28
tblVehicleEF	LDA	2.8130e-003	2.7906e-003
tblVehicleEF	LDA	6.1400e-004	5.6038e-004
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.31
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.84	1.85
tblVehicleEF	LDT1	3.09	2.45
tblVehicleEF	LDT1	351.43	336.46
tblVehicleEF	LDT1	71.32	67.07
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003

tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.21	0.45
tblVehicleEF	LDT1	3.5380e-003	3.3294e-003
tblVehicleEF	LDT1	7.6700e-004	6.6374e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.24	0.49
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.01	0.08
tblVehicleEF	LDT1	1.99	2.01
tblVehicleEF	LDT1	2.62	2.08
tblVehicleEF	LDT1	366.73	349.70
tblVehicleEF	LDT1	71.32	66.31
tblVehicleEF	LDT1	0.15	0.14
tblVehicleEF	LDT1	0.16	0.28

tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.05	0.05
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.19	0.39
tblVehicleEF	LDT1	3.6940e-003	3.4605e-003
tblVehicleEF	LDT1	7.5900e-004	6.5619e-004
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.21	0.43
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.79	1.79
tblVehicleEF	LDT1	3.19	2.53
tblVehicleEF	LDT1	345.81	331.61

tblVehicleEF	LDT1	71.32	67.24
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.22	0.46
tblVehicleEF	LDT1	3.4810e-003	3.2814e-003
tblVehicleEF	LDT1	7.6900e-004	6.6538e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.24	0.50
tblVehicleEF	LDT2	7.8740e-003	6.3478e-003
tblVehicleEF	LDT2	7.2440e-003	0.08

tblVehicleEF	LDT2	0.90	1.24
tblVehicleEF	LDT2	1.49	2.87
tblVehicleEF	LDT2	395.42	367.68
tblVehicleEF	LDT2	80.68	73.77
tblVehicleEF	LDT2	0.09	0.12
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.10	0.38
tblVehicleEF	LDT2	3.9620e-003	3.6376e-003
tblVehicleEF	LDT2	8.3200e-004	7.3003e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.45

tblVehicleEF	LDT2	0.11	0.42
tblVehicleEF	LDT2	8.3450e-003	6.7606e-003
tblVehicleEF	LDT2	6.4440e-003	0.07
tblVehicleEF	LDT2	0.99	1.36
tblVehicleEF	LDT2	1.27	2.44
tblVehicleEF	LDT2	413.17	380.97
tblVehicleEF	LDT2	80.68	72.95
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.11	0.32
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.34
tblVehicleEF	LDT2	4.1400e-003	3.7691e-003
tblVehicleEF	LDT2	8.2800e-004	7.2192e-004
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15

tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LDT2	7.7190e-003	6.2197e-003
tblVehicleEF	LDT2	7.4150e-003	0.08
tblVehicleEF	LDT2	0.87	1.20
tblVehicleEF	LDT2	1.54	2.96
tblVehicleEF	LDT2	388.90	362.81
tblVehicleEF	LDT2	80.68	73.95
tblVehicleEF	LDT2	0.09	0.11
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.39
tblVehicleEF	LDT2	3.8960e-003	3.5895e-003

tblVehicleEF	LDT2	8.3300e-004	7.3182e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.11	0.43
tblVehicleEF	LHD1	6.0120e-003	6.0724e-003
tblVehicleEF	LHD1	0.01	7.3245e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
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tblVehicleEF	LHD1	3.04	1.27
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.09
tblVehicleEF	LHD1	34.52	13.36
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tblVehicleEF	LHD1	1.05	0.84
tblVehicleEF	LHD1	1.07	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003

tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
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tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.29	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7874e-003
tblVehicleEF	LHD1	4.0200e-004	1.3218e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
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tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.32	0.11
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tblVehicleEF	LHD1	0.01	7.4711e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.96	0.87
tblVehicleEF	LHD1	2.90	1.21
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.11

tblVehicleEF	LHD1	34.52	13.25
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	0.98	0.79
tblVehicleEF	LHD1	1.03	0.36
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.28	0.09
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0270e-003	6.7877e-003
tblVehicleEF	LHD1	3.9900e-004	1.3115e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.03	0.03

tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.31	0.10
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tblVehicleEF	LHD1	0.01	7.2867e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.06	1.28
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.08
tblVehicleEF	LHD1	34.52	13.37
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.03	0.83
tblVehicleEF	LHD1	1.08	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
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tblVehicleEF	LHD1	3.5020e-003	3.1837e-003

tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.30	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7873e-003
tblVehicleEF	LHD1	4.0200e-004	1.3235e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD2	4.3410e-003	4.3356e-003
tblVehicleEF	LHD2	5.0230e-003	5.0611e-003
tblVehicleEF	LHD2	9.9030e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.58
tblVehicleEF	LHD2	1.51	0.88
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
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tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
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tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
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tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
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tblVehicleEF	LHD2	0.02	0.02
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tblVehicleEF	LHD2	0.10	0.43
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tblVehicleEF	LHD2	0.02	0.03
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tblVehicleEF	LHD2	625.73	696.38
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tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
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tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003

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tblVehicleEF	LHD2	0.09	0.42
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tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
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tblVehicleEF	LHD2	0.06	0.07
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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
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tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
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tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
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tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.13	0.07
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tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
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tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
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tblVehicleEF	MCY	0.15	0.24

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tblVehicleEF	MCY	9.64	8.48
tblVehicleEF	MCY	188.47	223.17
tblVehicleEF	MCY	44.88	60.40
tblVehicleEF	MCY	1.13	1.14
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	2.61	2.65
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.06	1.84
tblVehicleEF	MCY	2.2780e-003	2.2085e-003
tblVehicleEF	MCY	6.6700e-004	5.9774e-004
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	3.25	3.27
tblVehicleEF	MCY	0.62	2.17

tblVehicleEF	MCY	2.24	2.00
tblVehicleEF	MCY	0.52	0.38
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.48	19.07
tblVehicleEF	MCY	8.82	7.74
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tblVehicleEF	MCY	0.99	0.99
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	2.55	2.58
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	1.84	1.63
tblVehicleEF	MCY	2.2640e-003	2.1939e-003
tblVehicleEF	MCY	6.4700e-004	5.7891e-004
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77

tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	3.17	3.18
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	2.00	1.77
tblVehicleEF	MCY	0.54	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.30	19.94
tblVehicleEF	MCY	9.78	8.61
tblVehicleEF	MCY	188.47	223.39
tblVehicleEF	MCY	44.88	60.73
tblVehicleEF	MCY	1.11	1.11
tblVehicleEF	MCY	0.31	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
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tblVehicleEF	MCY	1.0000e-003	1.0000e-003
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tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	2.62	2.66
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.10	1.88
tblVehicleEF	MCY	2.2800e-003	2.2106e-003

tblVehicleEF	MCY	6.7100e-004	6.0100e-004
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	3.26	3.28
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.29	2.05
tblVehicleEF	MDV	0.02	9.2696e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.56	1.64
tblVehicleEF	MDV	2.79	3.50
tblVehicleEF	MDV	528.65	449.45
tblVehicleEF	MDV	106.35	89.79
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.25	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.04	0.05

tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.22	0.50
tblVehicleEF	MDV	5.2990e-003	4.4442e-003
tblVehicleEF	MDV	1.1130e-003	8.8857e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.24	0.54
tblVehicleEF	MDV	0.02	9.7459e-003
tblVehicleEF	MDV	0.01	0.09
tblVehicleEF	MDV	1.69	1.77
tblVehicleEF	MDV	2.39	2.98
tblVehicleEF	MDV	551.85	463.58
tblVehicleEF	MDV	106.35	88.78
tblVehicleEF	MDV	0.15	0.14
tblVehicleEF	MDV	0.23	0.39
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.11	0.15

tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.19	0.44
tblVehicleEF	MDV	5.5330e-003	4.5840e-003
tblVehicleEF	MDV	1.1050e-003	8.7855e-004
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.21	0.48
tblVehicleEF	MDV	0.01	9.1128e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.52	1.59
tblVehicleEF	MDV	2.88	3.61
tblVehicleEF	MDV	520.14	444.29
tblVehicleEF	MDV	106.35	90.01
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.26	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003

tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.22	0.51
tblVehicleEF	MDV	5.2130e-003	4.3931e-003
tblVehicleEF	MDV	1.1140e-003	8.9074e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.24	0.56
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
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tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02

tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.36	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0577e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.85	1.97
tblVehicleEF	MH	6.02	2.27
tblVehicleEF	MH	1,135.33	1,557.88
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tblVehicleEF	MH	1.07	1.15
tblVehicleEF	MH	0.82	0.24

tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.35	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.1500e-004	2.0342e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.15	0.11
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.38	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
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tblVehicleEF	MH	1,135.33	1,557.79

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tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.37	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0615e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
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tblVehicleEF	MHD	5.7010e-003	9.4687e-003

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tblVehicleEF	MHD	1,155.79	1,129.05
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tblVehicleEF	MHD	2.8600e-004	2.2441e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.7300e-004	2.1470e-003
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tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
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tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.42	0.07

tblVehicleEF	MHD	1.2630e-003	6.6609e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7100e-004	1.2593e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
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tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	MHD	0.02	4.2175e-003
tblVehicleEF	MHD	5.7940e-003	9.5490e-003
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tblVehicleEF	MHD	0.28	0.31
tblVehicleEF	MHD	0.43	0.88
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tblVehicleEF	MHD	138.77	71.71
tblVehicleEF	MHD	1,155.79	1,129.06
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tblVehicleEF	MHD	2.4100e-004	1.8940e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004

tblVehicleEF	MHD	2.3000e-004	1.8121e-003
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tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
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tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
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tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.40	0.07
tblVehicleEF	MHD	1.3360e-003	6.8157e-004
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tblVehicleEF	MHD	7.6500e-004	1.2455e-004
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tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
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tblVehicleEF	MHD	0.42	0.86

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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	3.3300e-004	2.6095e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
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tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.1630e-003	6.4466e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7200e-004	1.2619e-004

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tblVehicleEF	MHD	7.7500e-004	4.8721e-004
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tblVehicleEF	OBUS	8.8720e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
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tblVehicleEF	OBUS	2.63	0.62
tblVehicleEF	OBUS	2.0400e-004	3.3787e-003
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tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
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tblVehicleEF	OBUS	1.9500e-004	3.2325e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003

tblVehicleEF	OBUS	8.3100e-003	0.05
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tblVehicleEF	OBUS	0.06	0.09
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tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.26
tblVehicleEF	OBUS	0.39	0.13
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tblVehicleEF	OBUS	1,266.65	1,458.61

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tblVehicleEF	OBUS	1.7200e-004	2.8530e-003
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tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
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tblVehicleEF	OBUS	1.6400e-004	2.7296e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
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tblVehicleEF	OBUS	0.05	0.09

tblVehicleEF	OBUS	1.1010e-003	1.3226e-003
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tblVehicleEF	OBUS	1,266.65	1,458.57
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tblVehicleEF	OBUS	2.64	0.62
tblVehicleEF	OBUS	2.4800e-004	4.1047e-003
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tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	2.3700e-004	3.9271e-003
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tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
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tblVehicleEF	OBUS	1.5180e-003	1.9793e-003

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tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
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tblVehicleEF	OBUS	7.8500e-004	1.9702e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.06	0.09
tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.28
tblVehicleEF	OBUS	0.40	0.14
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9517e-003
tblVehicleEF	SBUS	0.07	5.5911e-003
tblVehicleEF	SBUS	8.04	2.47
tblVehicleEF	SBUS	0.79	0.66
tblVehicleEF	SBUS	7.53	0.78
tblVehicleEF	SBUS	1,136.99	350.96
tblVehicleEF	SBUS	1,088.61	1,142.40
tblVehicleEF	SBUS	53.57	4.74
tblVehicleEF	SBUS	9.91	3.43
tblVehicleEF	SBUS	4.55	5.48

tblVehicleEF	SBUS	12.42	0.77
tblVehicleEF	SBUS	0.01	5.0981e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	4.8776e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	3.3870e-003	8.4800e-004
tblVehicleEF	SBUS	0.03	7.2494e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.3445e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.6600e-004	4.6882e-005
tblVehicleEF	SBUS	3.3870e-003	8.4800e-004
tblVehicleEF	SBUS	0.03	7.2494e-003
tblVehicleEF	SBUS	1.40	0.40
tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.01	0.05

tblVehicleEF	SBUS	0.43	0.04
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	8.0370e-003
tblVehicleEF	SBUS	0.06	4.9797e-003
tblVehicleEF	SBUS	7.92	2.43
tblVehicleEF	SBUS	0.80	0.67
tblVehicleEF	SBUS	6.11	0.64
tblVehicleEF	SBUS	1,188.84	360.21
tblVehicleEF	SBUS	1,088.61	1,142.41
tblVehicleEF	SBUS	53.57	4.49
tblVehicleEF	SBUS	10.22	3.51
tblVehicleEF	SBUS	4.29	5.17
tblVehicleEF	SBUS	12.39	0.77
tblVehicleEF	SBUS	9.0250e-003	4.3047e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	8.6350e-003	4.1185e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004

tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.35	0.03
tblVehicleEF	SBUS	0.01	3.4320e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.4200e-004	4.4468e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	1.39	0.40
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.38	0.03
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9268e-003
tblVehicleEF	SBUS	0.07	5.7268e-003
tblVehicleEF	SBUS	8.21	2.53
tblVehicleEF	SBUS	0.78	0.66
tblVehicleEF	SBUS	7.78	0.81
tblVehicleEF	SBUS	1,065.38	338.18
tblVehicleEF	SBUS	1,088.61	1,142.39
tblVehicleEF	SBUS	53.57	4.78
tblVehicleEF	SBUS	9.47	3.32
tblVehicleEF	SBUS	4.47	5.39
tblVehicleEF	SBUS	12.43	0.77
tblVehicleEF	SBUS	0.01	6.1938e-003
tblVehicleEF	SBUS	0.74	0.74

tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	5.9258e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.2238e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.7000e-004	4.7323e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	1.40	0.41
tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.44	0.04
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01

tblVehicleEF	UBUS	11.79	42.44
tblVehicleEF	UBUS	8.90	0.71
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.66
tblVehicleEF	UBUS	10.68	1.20
tblVehicleEF	UBUS	15.66	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0860e-003	8.5721e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	3.79	6.37
tblVehicleEF	UBUS	0.02	0.05

tblVehicleEF	UBUS	0.73	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.84	42.44
tblVehicleEF	UBUS	7.71	0.62
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.52
tblVehicleEF	UBUS	10.07	1.20
tblVehicleEF	UBUS	15.61	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	0.91	0.15
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.61	0.04
tblVehicleEF	UBUS	9.9300e-003	1.5961e-003
tblVehicleEF	UBUS	1.0650e-003	8.4268e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003

tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	3.80	6.37
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.77	42.44
tblVehicleEF	UBUS	9.11	0.72
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.69
tblVehicleEF	UBUS	10.47	1.20
tblVehicleEF	UBUS	15.67	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003

tblVehicleEF	UBUS	1.0900e-003	8.6004e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	3.78	6.37
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.75	0.05
tblWater	OutdoorWaterUseRate	79,233,509.75	0.00

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					
2020	106.8830	71.5831	46.0481	0.1004	96.4125	3.0061	99.3428	16.9332	2.7678	19.6293	0.0000	9,819.7566	9,819.7566	2.7796	0.0000	9,889.2465
Maximum	**106.8830**	**71.5831**	**46.0481**	**0.1004**	**96.4125**	**3.0061**	**99.3428**	**16.9332**	**2.7678**	**19.6293**	**0.0000**	**9,819.7566**	**9,819.7566**	**2.7796**	**0.0000**	**9,889.2465**

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					
2020	106.8830	71.5831	46.0481	0.1004	37.8657	3.0061	40.7960	6.6748	2.7678	9.3709	0.0000	9,819.7566	9,819.7566	2.7796	0.0000	9,889.2465
Maximum	**106.8830**	**71.5831**	**46.0481**	**0.1004**	**37.8657**	**3.0061**	**40.7960**	**6.6748**	**2.7678**	**9.3709**	**0.0000**	**9,819.7566**	**9,819.7566**	**2.7796**	**0.0000**	**9,889.2465**

	ROG	NOx	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**	**60.73**	**0.00**	**58.93**	**60.58**	**0.00**	**52.26**	**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	0.2261	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	6.2032	6.6165	49.2841	0.0949	9.1651	0.1062	9.2713	2.4413	0.0994	2.5407		9,671.0093	9,671.0093	0.7380		9,689.4588
Total	**6.4293**	**6.6166**	**49.2961**	**0.0949**	**9.1651**	**0.1062**	**9.2713**	**2.4413**	**0.0995**	**2.5407**		**9,671.0348**	**9,671.0348**	**0.7381**	**0.0000**	**9,689.4860**

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	0.2115	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	6.2032	6.6165	49.2841	0.0949	9.1651	0.1062	9.2713	2.4413	0.0994	2.5407		9,671.0093	9,671.0093	0.7380		9,689.4588
Total	**6.4147**	**6.6166**	**49.2961**	**0.0949**	**9.1651**	**0.1062**	**9.2713**	**2.4413**	**0.0995**	**2.5407**		**9,671.0348**	**9,671.0348**	**0.7381**	**0.0000**	**9,689.4860**

	ROG	NOx	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	**0.23**	**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	Demolition and Site Preparation	Demolition	1/1/2020	1/1/2020	5	1	
2	Grading and Excavation- option 1	Grading	1/2/2020	1/2/2020	5	1	
3	Grading and Excavation- option 2	Grading	1/3/2020	1/3/2020	5	1	
4	Drainage/Utilities/Subgrade	Trenching	1/6/2020	1/6/2020	5	1	
5	Building Construction	Building Construction	1/7/2020	1/7/2020	5	1	
6	Paving	Paving	1/8/2020	1/8/2020	5	1	
7	Architectural Coating	Architectural Coating	1/9/2020	1/9/2020	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.45

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 15,000; Non-Residential Outdoor: 5,000; Striped Parking Area: 3,000 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition and Site Preparation	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition and Site Preparation	Excavators	3	8.00	158	0.38
Demolition and Site Preparation	Rubber Tired Dozers	2	8.00	247	0.40

Demolition and Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading and Excavation- option 1	Cranes	1	7.00	231	0.29
Grading and Excavation- option 1	Excavators	2	8.00	158	0.38
Grading and Excavation- option 1	Graders	1	8.00	187	0.41
Grading and Excavation- option 1	Other Construction Equipment	2	8.00	172	0.42
Grading and Excavation- option 1	Rubber Tired Dozers	1	8.00	247	0.40
Grading and Excavation- option 1	Scrapers	2	8.00	367	0.48
Grading and Excavation- option 1	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading and Excavation- option 2	Bore/Drill Rigs	1	6.00	221	0.50
Grading and Excavation- option 2	Cement and Mortar Mixers	2	6.00	9	0.56
Grading and Excavation- option 2	Cranes	1	6.00	231	0.29
Grading and Excavation- option 2	Excavators	2	8.00	158	0.38
Grading and Excavation- option 2	Graders	1	8.00	187	0.41
Grading and Excavation- option 2	Other Construction Equipment	2	8.00	172	0.42
Grading and Excavation- option 2	Rubber Tired Dozers	1	8.00	247	0.40
Grading and Excavation- option 2	Scrapers	2	8.00	367	0.48
Grading and Excavation- option 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Drainage/Utilities/Subgrade	Bore/Drill Rigs	1	6.00	221	0.50
Drainage/Utilities/Subgrade	Excavators	2	8.00	158	0.38
Drainage/Utilities/Subgrade	Pumps	2	8.00	84	0.74
Drainage/Utilities/Subgrade	Trenchers	2	8.00	78	0.50
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42

Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition and Site Preparation	8	20.00	0.00	3.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Grading and Excavation- option 1	11	28.00	0.00	6.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Grading and Excavation- option 2	14	35.00	0.00	11.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Drainage/Utilities/Sub grade	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	30.00	15.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	7.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition and Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					64.1970	0.0000	64.1970	9.7200	0.0000	9.7200			0.0000			0.0000
Off-Road	3.7311	37.4113	26.3126	0.0450		1.9249	1.9249		1.7868	1.7868		4,349.2419	4,349.2419	1.2525		4,380.5544
Total	**3.7311**	**37.4113**	**26.3126**	**0.0450**	**64.1970**	**1.9249**	**66.1219**	**9.7200**	**1.7868**	**11.5068**		**4,349.2419**	**4,349.2419**	**1.2525**		**4,380.5544**

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	0.0301	0.9662	0.2270	2.6500e-003	0.0606	3.2000e-003	0.0638	0.0166	3.0600e-003	0.0197		286.7630	286.7630	0.0201		287.2643
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1022	0.0725	0.8020	2.2200e-003	0.2236	1.8700e-003	0.2254	0.0593	1.7200e-003	0.0610		221.4841	221.4841	6.9800e-003		221.6586
Total	**0.1323**	**1.0387**	**1.0290**	**4.8700e-003**	**0.2841**	**5.0700e-003**	**0.2892**	**0.0759**	**4.7800e-003**	**0.0807**		**508.2470**	**508.2470**	**0.0270**		**508.9229**

3.2 Demolition and Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0368	0.0000	25.0368	3.7908	0.0000	3.7908			0.0000			0.0000
Off-Road	3.7311	37.4113	26.3126	0.0450		1.9249	1.9249		1.7868	1.7868	0.0000	4,349.2419	4,349.2419	1.2525		4,380.5544
Total	**3.7311**	**37.4113**	**26.3126**	**0.0450**	**25.0368**	**1.9249**	**26.9618**	**3.7908**	**1.7868**	**5.5776**	**0.0000**	**4,349.2419**	**4,349.2419**	**1.2525**		**4,380.5544**

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	0.0301	0.9662	0.2270	2.6500e-003	0.0606	3.2000e-003	0.0638	0.0166	3.0600e-003	0.0197		286.7630	286.7630	0.0201		287.2643
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1022	0.0725	0.8020	2.2200e-003	0.2236	1.8700e-003	0.2254	0.0593	1.7200e-003	0.0610		221.4841	221.4841	6.9800e-003		221.6586
Total	**0.1323**	**1.0387**	**1.0290**	**4.8700e-003**	**0.2841**	**5.0700e-003**	**0.2892**	**0.0759**	**4.7800e-003**	**0.0807**		**508.2470**	**508.2470**	**0.0270**		**508.9229**

3.3 Grading and Excavation- option 1 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					95.9784	0.0000	95.9784	16.8170	0.0000	16.8170			0.0000			0.0000
Off-Road	5.8349	65.3933	42.0533	0.0794		2.9213	2.9213		2.6876	2.6876		7,692.4144	7,692.4144	2.4879		7,754.6114
Total	**5.8349**	**65.3933**	**42.0533**	**0.0794**	**95.9784**	**2.9213**	**98.8997**	**16.8170**	**2.6876**	**19.5046**		**7,692.4144**	**7,692.4144**	**2.4879**		**7,754.6114**

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	0.0602	1.9325	0.4540	5.2900e-003	0.1212	6.4100e-003	0.1276	0.0332	6.1300e-003	0.0393		573.5259	573.5259	0.0401		574.5287
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1431	0.1015	1.1228	3.1100e-003	0.3130	2.6200e-003	0.3156	0.0830	2.4100e-003	0.0854		310.0777	310.0777	9.7700e-003		310.3220
Total	**0.2033**	**2.0340**	**1.5769**	**8.4000e-003**	**0.4341**	**9.0300e-003**	**0.4431**	**0.1162**	**8.5400e-003**	**0.1247**		**883.6036**	**883.6036**	**0.0499**		**884.8507**

3.3 Grading and Excavation- option 1 - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					37.4316	0.0000	37.4316	6.5586	0.0000	6.5586			0.0000			0.0000
Off-Road	5.8349	65.3933	42.0533	0.0794		2.9213	2.9213		2.6876	2.6876	0.0000	7,692.4144	7,692.4144	2.4879		7,754.6114
Total	**5.8349**	**65.3933**	**42.0533**	**0.0794**	**37.4316**	**2.9213**	**40.3529**	**6.5586**	**2.6876**	**9.2462**	**0.0000**	**7,692.4144**	**7,692.4144**	**2.4879**		**7,754.6114**

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	0.0602	1.9325	0.4540	5.2900e-003	0.1212	6.4100e-003	0.1276	0.0332	6.1300e-003	0.0393		573.5259	573.5259	0.0401		574.5287
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1431	0.1015	1.1228	3.1100e-003	0.3130	2.6200e-003	0.3156	0.0830	2.4100e-003	0.0854		310.0777	310.0777	9.7700e-003		310.3220
Total	**0.2033**	**2.0340**	**1.5769**	**8.4000e-003**	**0.4341**	**9.0300e-003**	**0.4431**	**0.1162**	**8.5400e-003**	**0.1247**		**883.6036**	**883.6036**	**0.0499**		**884.8507**

3.4 Grading and Excavation- option 2 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					68.7239	0.0000	68.7239	12.6899	0.0000	12.6899			0.0000			0.0000
Off-Road	6.0745	67.9134	43.8122	0.0868		2.9911	2.9911		2.7535	2.7535		8,380.6953	8,380.6953	2.6939		8,448.0415
Total	**6.0745**	**67.9134**	**43.8122**	**0.0868**	**68.7239**	**2.9911**	**71.7149**	**12.6899**	**2.7535**	**15.4434**		**8,380.6953**	**8,380.6953**	**2.6939**		**8,448.0415**

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	0.1104	3.5429	0.8324	9.7000e-003	0.2221	0.0117	0.2339	0.0609	0.0112	0.0721		1,051.4642	1,051.4642	0.0735		1,053.3025
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1789	0.1269	1.4035	3.8900e-003	0.3912	3.2700e-003	0.3945	0.1038	3.0100e-003	0.1068		387.5971	387.5971	0.0122		387.9026
Total	**0.2893**	**3.6698**	**2.2360**	**0.0136**	**0.6133**	**0.0150**	**0.6283**	**0.1646**	**0.0142**	**0.1789**		**1,439.0613**	**1,439.0613**	**0.0858**		**1,441.2051**

3.4 Grading and Excavation- option 2 - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					26.8023	0.0000	26.8023	4.9491	0.0000	4.9491			0.0000			0.0000
Off-Road	6.0745	67.9134	43.8122	0.0868		2.9911	2.9911		2.7535	2.7535	0.0000	8,380.6953	8,380.6953	2.6939		8,448.0415
Total	**6.0745**	**67.9134**	**43.8122**	**0.0868**	**26.8023**	**2.9911**	**29.7934**	**4.9491**	**2.7535**	**7.7026**	**0.0000**	**8,380.6953**	**8,380.6953**	**2.6939**		**8,448.0415**

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	0.1104	3.5429	0.8324	9.7000e-003	0.2221	0.0117	0.2339	0.0609	0.0112	0.0721		1,051.4642	1,051.4642	0.0735		1,053.3025
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1789	0.1269	1.4035	3.8900e-003	0.3912	3.2700e-003	0.3945	0.1038	3.0100e-003	0.1068		387.5971	387.5971	0.0122		387.9026
Total	**0.2893**	**3.6698**	**2.2360**	**0.0136**	**0.6133**	**0.0150**	**0.6283**	**0.1646**	**0.0142**	**0.1789**		**1,439.0613**	**1,439.0613**	**0.0858**		**1,441.2051**

3.5 Drainage/Utilities/Subgrade - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3840	22.1182	20.8939	0.0373		1.2927	1.2927		1.2225	1.2225		3,582.2853	3,582.2853	0.8301		3,603.0385
Total	**2.3840**	**22.1182**	**20.8939**	**0.0373**		**1.2927**	**1.2927**		**1.2225**	**1.2225**		**3,582.2853**	**3,582.2853**	**0.8301**		**3,603.0385**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0652	0.7218	2.0000e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		199.3357	199.3357	6.2800e-003		199.4927
Total	**0.0920**	**0.0652**	**0.7218**	**2.0000e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**199.3357**	**199.3357**	**6.2800e-003**		**199.4927**

3.5 Drainage/Utilities/Subgrade - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3840	22.1182	20.8939	0.0373		1.2927	1.2927		1.2225	1.2225	0.0000	3,582.2853	3,582.2853	0.8301		3,603.0385
Total	**2.3840**	**22.1182**	**20.8939**	**0.0373**		**1.2927**	**1.2927**		**1.2225**	**1.2225**	**0.0000**	**3,582.2853**	**3,582.2853**	**0.8301**		**3,603.0385**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0652	0.7218	2.0000e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		199.3357	199.3357	6.2800e-003		199.4927
Total	**0.0920**	**0.0652**	**0.7218**	**2.0000e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**199.3357**	**199.3357**	**6.2800e-003**		**199.4927**

3.6 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

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	0.0558	1.5953	0.4611	3.7900e-003	0.0960	7.6300e-003	0.1037	0.0277	7.3000e-003	0.0350		404.1736	404.1736	0.0270		404.8493
Worker	0.1533	0.1087	1.2030	3.3400e-003	0.3353	2.8000e-003	0.3381	0.0889	2.5800e-003	0.0915		332.2261	332.2261	0.0105		332.4879
Total	**0.2091**	**1.7040**	**1.6641**	**7.1300e-003**	**0.4314**	**0.0104**	**0.4418**	**0.1166**	**9.8800e-003**	**0.1265**		**736.3997**	**736.3997**	**0.0375**		**737.3372**

3.6 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

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	0.0558	1.5953	0.4611	3.7900e-003	0.0960	7.6300e-003	0.1037	0.0277	7.3000e-003	0.0350		404.1736	404.1736	0.0270		404.8493
Worker	0.1533	0.1087	1.2030	3.3400e-003	0.3353	2.8000e-003	0.3381	0.0889	2.5800e-003	0.0915		332.2261	332.2261	0.0105		332.4879
Total	**0.2091**	**1.7040**	**1.6641**	**7.1300e-003**	**0.4314**	**0.0104**	**0.4418**	**0.1166**	**9.8800e-003**	**0.1265**		**736.3997**	**736.3997**	**0.0375**		**737.3372**

3.7 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.1790					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.5356**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**		**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0767	0.0544	0.6015	1.6700e-003	0.1677	1.4000e-003	0.1691	0.0445	1.2900e-003	0.0458		166.1131	166.1131	5.2400e-003		166.2440
Total	**0.0767**	**0.0544**	**0.6015**	**1.6700e-003**	**0.1677**	**1.4000e-003**	**0.1691**	**0.0445**	**1.2900e-003**	**0.0458**		**166.1131**	**166.1131**	**5.2400e-003**		**166.2440**

3.7 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.1790					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.5356**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**	**0.0000**	**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0767	0.0544	0.6015	1.6700e-003	0.1677	1.4000e-003	0.1691	0.0445	1.2900e-003	0.0458		166.1131	166.1131	5.2400e-003		166.2440
Total	**0.0767**	**0.0544**	**0.6015**	**1.6700e-003**	**0.1677**	**1.4000e-003**	**0.1691**	**0.0445**	**1.2900e-003**	**0.0458**		**166.1131**	**166.1131**	**5.2400e-003**		**166.2440**

3.8 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	106.6050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**106.8472**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0358	0.0254	0.2807	7.8000e-004	0.0782	6.5000e-004	0.0789	0.0208	6.0000e-004	0.0214		77.5194	77.5194	2.4400e-003		77.5805
Total	**0.0358**	**0.0254**	**0.2807**	**7.8000e-004**	**0.0782**	**6.5000e-004**	**0.0789**	**0.0208**	**6.0000e-004**	**0.0214**		**77.5194**	**77.5194**	**2.4400e-003**		**77.5805**

3.8 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	106.6050					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**106.8472**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0358	0.0254	0.2807	7.8000e-004	0.0782	6.5000e-004	0.0789	0.0208	6.0000e-004	0.0214		77.5194	77.5194	2.4400e-003		77.5805
Total	**0.0358**	**0.0254**	**0.2807**	**7.8000e-004**	**0.0782**	**6.5000e-004**	**0.0789**	**0.0208**	**6.0000e-004**	**0.0214**		**77.5194**	**77.5194**	**2.4400e-003**		**77.5805**

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	6.2032	6.6165	49.2841	0.0949	9.1651	0.1062	9.2713	2.4413	0.0994	2.5407		9,671.0093	9,671.0093	0.7380		9,689.4588
Unmitigated	6.2032	6.6165	49.2841	0.0949	9.1651	0.1062	9.2713	2.4413	0.0994	2.5407		9,671.0093	9,671.0093	0.7380		9,689.4588

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	125.69	1,512.88	1113.21	1,337,855	1,337,855
Parking Lot	0.00	0.00	0.00		
Total	125.69	1,512.88	1,113.21	1,337,855	1,337,855

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
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455
Parking Lot	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive 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	0.2115	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Unmitigated	0.2261	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272

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	0.0292					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1958					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1200e-003	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Total	**0.2262**	**1.1000e-004**	**0.0119**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0255**	**0.0255**	**7.0000e-005**		**0.0272**

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	0.0146					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1958					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1200e-003	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Total	**0.2115**	**1.1000e-004**	**0.0119**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0255**	**0.0255**	**7.0000e-005**		**0.0272**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

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

Los Cerritos Wetlands Restoration - Mitigated

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	50.00	Space	0.45	20,000.00	0
City Park	66.50	Acre	66.50	2,896,740.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**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 - Assume 1 day for daily emission estimates. Scaled in post-processing for schedule length.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - added tractor for site prep

Off-road Equipment - added drainage/utilities/subgrade phase

Off-road Equipment - additional phase

Off-road Equipment - added crane and other equipment to account for dredge

Off-road Equipment - Added cement mixer, crane, and drill rig for wall construction. Added other construction equipment for dredge.

Off-road Equipment -

Trips and VMT - reduced building construction and arch coating workers per scaling down from BOMP EIR, added vendor for cement/ piles for wall construction, hauling estimated per day and to Montebello disposal site

Demolition - scaled up from BOMP estimate

Grading - added cut/fill numbers from Project Description

Architectural Coating - restrict to 50 g/l low VOC

Vehicle Trips -

Sequestration -

Construction Off-road Equipment Mitigation - Mitigation to Tier 4 and water 3/day

Area Mitigation - Rule 1113 Low VOC paint < 50 g/l

Water Mitigation - 20% water conservation per Title 24

Operational Off-Road Equipment -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	1,000.00	5,000.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	3,000.00	15,000.00
tblArchitecturalCoating	ConstArea_Parking	1,200.00	3,000.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	50.00

tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	50.00
tblArchitecturalCoating	EF_Parking	100.00	50.00
tblAreaCoating	Area_Nonresidential_Exterior	1000	5000
tblAreaCoating	Area_Nonresidential_Interior	3000	15000
tblAreaCoating	Area_Parking	1200	3000
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	100	50
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstructionPhase	NumDays	75.00	1.00
tblConstructionPhase	NumDays	1,110.00	1.00
tblConstructionPhase	NumDays	70.00	1.00
tblConstructionPhase	NumDays	110.00	1.00
tblConstructionPhase	NumDays	110.00	1.00
tblConstructionPhase	NumDays	75.00	1.00
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDT1	0.05	0.06

tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MHD	0.02	0.01
tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblGrading	MaterialExported	0.00	494,000.00
tblGrading	MaterialExported	0.00	494,000.00
tblGrading	MaterialImported	0.00	278,000.00
tblGrading	MaterialImported	0.00	37,000.00
tblTripsAndVMT	HaulingTripLength	20.00	23.10
tblTripsAndVMT	HaulingTripLength	20.00	23.10

tblTripsAndVMT	HaulingTripLength	20.00	23.10
tblTripsAndVMT	HaulingTripNumber	297.00	3.00
tblTripsAndVMT	HaulingTripNumber	96,500.00	6.00
tblTripsAndVMT	HaulingTripNumber	66,375.00	11.00
tblTripsAndVMT	VendorTripNumber	478.00	15.00
tblTripsAndVMT	WorkerTripNumber	1,225.00	30.00
tblTripsAndVMT	WorkerTripNumber	245.00	7.00
tblVehicleEF	HHD	0.65	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3212e-007
tblVehicleEF	HHD	2.61	5.73
tblVehicleEF	HHD	1.16	0.77
tblVehicleEF	HHD	3.36	0.01
tblVehicleEF	HHD	4,729.35	1,160.01
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	21.63	6.50
tblVehicleEF	HHD	4.20	4.58
tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003

tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.1100e-004	1.0257e-005
tblVehicleEF	HHD	4.8720e-003	4.3163e-004
tblVehicleEF	HHD	0.65	0.47
tblVehicleEF	HHD	8.3000e-005	7.1733e-006
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.3200e-004	2.2097e-003
tblVehicleEF	HHD	0.09	2.8089e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0936e-006
tblVehicleEF	HHD	1.1100e-004	1.0257e-005
tblVehicleEF	HHD	4.8720e-003	4.3163e-004
tblVehicleEF	HHD	0.76	0.54
tblVehicleEF	HHD	8.3000e-005	7.1733e-006
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.3200e-004	2.2097e-003
tblVehicleEF	HHD	0.10	3.0754e-006
tblVehicleEF	HHD	0.61	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.08	5.0957e-007
tblVehicleEF	HHD	1.90	5.57
tblVehicleEF	HHD	1.17	0.77
tblVehicleEF	HHD	3.19	0.01
tblVehicleEF	HHD	5,008.69	1,160.72
tblVehicleEF	HHD	1,660.44	1,551.88

tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	22.32	6.36
tblVehicleEF	HHD	3.97	4.34
tblVehicleEF	HHD	19.56	1.76
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.7000e-004	1.6157e-005
tblVehicleEF	HHD	4.9980e-003	4.3835e-004
tblVehicleEF	HHD	0.61	0.49
tblVehicleEF	HHD	1.2100e-004	1.1037e-005
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.2100e-004	2.1847e-003
tblVehicleEF	HHD	0.08	2.6976e-006
tblVehicleEF	HHD	0.05	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.5800e-004	1.0850e-006
tblVehicleEF	HHD	1.7000e-004	1.6157e-005
tblVehicleEF	HHD	4.9980e-003	4.3835e-004
tblVehicleEF	HHD	0.72	0.56

tblVehicleEF	HHD	1.2100e-004	1.1037e-005
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.2100e-004	2.1847e-003
tblVehicleEF	HHD	0.09	2.9536e-006
tblVehicleEF	HHD	0.70	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3720e-007
tblVehicleEF	HHD	3.58	5.95
tblVehicleEF	HHD	1.16	0.77
tblVehicleEF	HHD	3.39	0.01
tblVehicleEF	HHD	4,343.58	1,159.03
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	20.67	6.69
tblVehicleEF	HHD	4.13	4.51
tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.1000e-004	1.0837e-005

tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.70	0.45
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.09	2.8334e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0953e-006
tblVehicleEF	HHD	1.1000e-004	1.0837e-005
tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.82	0.51
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.10	3.1023e-006
tblVehicleEF	LDA	5.9160e-003	4.0269e-003
tblVehicleEF	LDA	6.1880e-003	0.06
tblVehicleEF	LDA	0.71	0.86
tblVehicleEF	LDA	1.27	2.24
tblVehicleEF	LDA	285.63	286.85
tblVehicleEF	LDA	59.19	56.49
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003

tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	2.8620e-003	2.8378e-003
tblVehicleEF	LDA	6.1400e-004	5.5902e-004
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.09	0.30
tblVehicleEF	LDA	6.2800e-003	4.3047e-003
tblVehicleEF	LDA	5.4950e-003	0.05
tblVehicleEF	LDA	0.78	0.95
tblVehicleEF	LDA	1.09	1.90
tblVehicleEF	LDA	298.94	299.91
tblVehicleEF	LDA	59.19	55.86
tblVehicleEF	LDA	0.05	0.05
tblVehicleEF	LDA	0.07	0.19

tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.07	0.24
tblVehicleEF	LDA	2.9960e-003	2.9671e-003
tblVehicleEF	LDA	6.1000e-004	5.5280e-004
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	5.7950e-003	3.9414e-003
tblVehicleEF	LDA	6.3340e-003	0.06
tblVehicleEF	LDA	0.68	0.83
tblVehicleEF	LDA	1.31	2.31
tblVehicleEF	LDA	280.76	282.08

tblVehicleEF	LDA	59.19	56.63
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.28
tblVehicleEF	LDA	2.8130e-003	2.7906e-003
tblVehicleEF	LDA	6.1400e-004	5.6038e-004
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.31
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09

tblVehicleEF	LDT1	1.84	1.85
tblVehicleEF	LDT1	3.09	2.45
tblVehicleEF	LDT1	351.43	336.46
tblVehicleEF	LDT1	71.32	67.07
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.21	0.45
tblVehicleEF	LDT1	3.5380e-003	3.3294e-003
tblVehicleEF	LDT1	7.6700e-004	6.6374e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.18	0.83

tblVehicleEF	LDT1	0.24	0.49
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.01	0.08
tblVehicleEF	LDT1	1.99	2.01
tblVehicleEF	LDT1	2.62	2.08
tblVehicleEF	LDT1	366.73	349.70
tblVehicleEF	LDT1	71.32	66.31
tblVehicleEF	LDT1	0.15	0.14
tblVehicleEF	LDT1	0.16	0.28
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.05	0.05
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.19	0.39
tblVehicleEF	LDT1	3.6940e-003	3.4605e-003
tblVehicleEF	LDT1	7.5900e-004	6.5619e-004
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25

tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.21	0.43
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.79	1.79
tblVehicleEF	LDT1	3.19	2.53
tblVehicleEF	LDT1	345.81	331.61
tblVehicleEF	LDT1	71.32	67.24
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.22	0.46
tblVehicleEF	LDT1	3.4810e-003	3.2814e-003

tblVehicleEF	LDT1	7.6900e-004	6.6538e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.24	0.50
tblVehicleEF	LDT2	7.8740e-003	6.3478e-003
tblVehicleEF	LDT2	7.2440e-003	0.08
tblVehicleEF	LDT2	0.90	1.24
tblVehicleEF	LDT2	1.49	2.87
tblVehicleEF	LDT2	395.42	367.68
tblVehicleEF	LDT2	80.68	73.77
tblVehicleEF	LDT2	0.09	0.12
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.03

tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.10	0.38
tblVehicleEF	LDT2	3.9620e-003	3.6376e-003
tblVehicleEF	LDT2	8.3200e-004	7.3003e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.11	0.42
tblVehicleEF	LDT2	8.3450e-003	6.7606e-003
tblVehicleEF	LDT2	6.4440e-003	0.07
tblVehicleEF	LDT2	0.99	1.36
tblVehicleEF	LDT2	1.27	2.44
tblVehicleEF	LDT2	413.17	380.97
tblVehicleEF	LDT2	80.68	72.95
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.11	0.32
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.07	0.13

tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.34
tblVehicleEF	LDT2	4.1400e-003	3.7691e-003
tblVehicleEF	LDT2	8.2800e-004	7.2192e-004
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LDT2	7.7190e-003	6.2197e-003
tblVehicleEF	LDT2	7.4150e-003	0.08
tblVehicleEF	LDT2	0.87	1.20
tblVehicleEF	LDT2	1.54	2.96
tblVehicleEF	LDT2	388.90	362.81
tblVehicleEF	LDT2	80.68	73.95
tblVehicleEF	LDT2	0.09	0.11
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003

tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.39
tblVehicleEF	LDT2	3.8960e-003	3.5895e-003
tblVehicleEF	LDT2	8.3300e-004	7.3182e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.11	0.43
tblVehicleEF	LHD1	6.0120e-003	6.0724e-003
tblVehicleEF	LHD1	0.01	7.3245e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.04	1.27
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.09
tblVehicleEF	LHD1	34.52	13.36
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.05	0.84

tblVehicleEF	LHD1	1.07	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.29	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7874e-003
tblVehicleEF	LHD1	4.0200e-004	1.3218e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.32	0.64

tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD1	6.0120e-003	6.0856e-003
tblVehicleEF	LHD1	0.01	7.4711e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
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tblVehicleEF	LHD1	2.90	1.21
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.11
tblVehicleEF	LHD1	34.52	13.25
tblVehicleEF	LHD1	0.07	0.05
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tblVehicleEF	LHD1	1.03	0.36
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
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tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003

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tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
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tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
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tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.31	0.10
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tblVehicleEF	LHD1	3.06	1.28
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.08
tblVehicleEF	LHD1	34.52	13.37
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.03	0.83
tblVehicleEF	LHD1	1.08	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08

tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
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tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
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tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.30	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7873e-003
tblVehicleEF	LHD1	4.0200e-004	1.3235e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD2	4.3410e-003	4.3356e-003
tblVehicleEF	LHD2	5.0230e-003	5.0611e-003

tblVehicleEF	LHD2	9.9030e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.58
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tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
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tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.13	0.07

tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
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tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.15	0.07
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tblVehicleEF	LHD2	5.0980e-003	5.1274e-003
tblVehicleEF	LHD2	9.5540e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.40	0.58
tblVehicleEF	LHD2	1.44	0.84
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tblVehicleEF	LHD2	625.73	696.38
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tblVehicleEF	LHD2	0.72	1.05
tblVehicleEF	LHD2	0.58	0.26
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
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tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
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tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
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tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7498e-003
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tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.14	0.07
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tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.57

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tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
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tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.75	1.09
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
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tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
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tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
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tblVehicleEF	MCY	0.53	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.20	19.84
tblVehicleEF	MCY	9.64	8.48
tblVehicleEF	MCY	188.47	223.17
tblVehicleEF	MCY	44.88	60.40
tblVehicleEF	MCY	1.13	1.14
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	2.61	2.65

tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.06	1.84
tblVehicleEF	MCY	2.2780e-003	2.2085e-003
tblVehicleEF	MCY	6.6700e-004	5.9774e-004
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	3.25	3.27
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.24	2.00
tblVehicleEF	MCY	0.52	0.38
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.48	19.07
tblVehicleEF	MCY	8.82	7.74
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tblVehicleEF	MCY	44.88	58.50
tblVehicleEF	MCY	0.99	0.99
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
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tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.73	1.79

tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	2.55	2.58
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	1.84	1.63
tblVehicleEF	MCY	2.2640e-003	2.1939e-003
tblVehicleEF	MCY	6.4700e-004	5.7891e-004
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	3.17	3.18
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	2.00	1.77
tblVehicleEF	MCY	0.54	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.30	19.94
tblVehicleEF	MCY	9.78	8.61
tblVehicleEF	MCY	188.47	223.39
tblVehicleEF	MCY	44.88	60.73
tblVehicleEF	MCY	1.11	1.11
tblVehicleEF	MCY	0.31	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
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tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003

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tblVehicleEF	MCY	3.7290e-003	3.2525e-003
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tblVehicleEF	MCY	2.62	2.66
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.10	1.88
tblVehicleEF	MCY	2.2800e-003	2.2106e-003
tblVehicleEF	MCY	6.7100e-004	6.0100e-004
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	3.26	3.28
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.29	2.05
tblVehicleEF	MDV	0.02	9.2696e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.56	1.64
tblVehicleEF	MDV	2.79	3.50
tblVehicleEF	MDV	528.65	449.45
tblVehicleEF	MDV	106.35	89.79
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.25	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003

tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.04	0.05
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.22	0.50
tblVehicleEF	MDV	5.2990e-003	4.4442e-003
tblVehicleEF	MDV	1.1130e-003	8.8857e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.24	0.54
tblVehicleEF	MDV	0.02	9.7459e-003
tblVehicleEF	MDV	0.01	0.09
tblVehicleEF	MDV	1.69	1.77
tblVehicleEF	MDV	2.39	2.98
tblVehicleEF	MDV	551.85	463.58
tblVehicleEF	MDV	106.35	88.78
tblVehicleEF	MDV	0.15	0.14
tblVehicleEF	MDV	0.23	0.39

tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.19	0.44
tblVehicleEF	MDV	5.5330e-003	4.5840e-003
tblVehicleEF	MDV	1.1050e-003	8.7855e-004
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.21	0.48
tblVehicleEF	MDV	0.01	9.1128e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.52	1.59
tblVehicleEF	MDV	2.88	3.61
tblVehicleEF	MDV	520.14	444.29

tblVehicleEF	MDV	106.35	90.01
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.26	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.22	0.51
tblVehicleEF	MDV	5.2130e-003	4.3931e-003
tblVehicleEF	MDV	1.1140e-003	8.9074e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.24	0.56
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03

tblVehicleEF	MH	2.77	1.93
tblVehicleEF	MH	6.41	2.41
tblVehicleEF	MH	1,135.33	1,557.81
tblVehicleEF	MH	61.01	20.79
tblVehicleEF	MH	1.17	1.25
tblVehicleEF	MH	0.85	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.36	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0577e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.82

tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.85	1.97
tblVehicleEF	MH	6.02	2.27
tblVehicleEF	MH	1,135.33	1,557.88
tblVehicleEF	MH	61.01	20.56
tblVehicleEF	MH	1.07	1.15
tblVehicleEF	MH	0.82	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.35	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.1500e-004	2.0342e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07

tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.15	0.11
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.38	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	2.74	1.92
tblVehicleEF	MH	6.46	2.43
tblVehicleEF	MH	1,135.33	1,557.79
tblVehicleEF	MH	61.01	20.83
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tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.37	0.11
tblVehicleEF	MH	0.01	0.02

tblVehicleEF	MH	7.2200e-004	2.0615e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.40	0.12
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tblVehicleEF	MHD	5.7010e-003	9.4687e-003
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tblVehicleEF	MHD	0.39	0.40
tblVehicleEF	MHD	0.42	0.87
tblVehicleEF	MHD	6.85	1.61
tblVehicleEF	MHD	131.02	70.09
tblVehicleEF	MHD	1,155.79	1,129.05
tblVehicleEF	MHD	65.08	12.73
tblVehicleEF	MHD	0.52	0.62
tblVehicleEF	MHD	1.23	2.74
tblVehicleEF	MHD	9.82	1.00
tblVehicleEF	MHD	2.8600e-004	2.2441e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.7300e-004	2.1470e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003

tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
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tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.2630e-003	6.6609e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7100e-004	1.2593e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	MHD	0.02	4.2175e-003
tblVehicleEF	MHD	5.7940e-003	9.5490e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.28	0.31
tblVehicleEF	MHD	0.43	0.88
tblVehicleEF	MHD	6.50	1.53
tblVehicleEF	MHD	138.77	71.71
tblVehicleEF	MHD	1,155.79	1,129.06

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tblVehicleEF	MHD	2.4100e-004	1.8940e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.3000e-004	1.8121e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.40	0.07
tblVehicleEF	MHD	1.3360e-003	6.8157e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.6500e-004	1.2455e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03

tblVehicleEF	MHD	1.1240e-003	7.1030e-004
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tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.44	0.08
tblVehicleEF	MHD	0.02	4.7993e-003
tblVehicleEF	MHD	5.6760e-003	9.4448e-003
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tblVehicleEF	MHD	0.53	0.51
tblVehicleEF	MHD	0.42	0.86
tblVehicleEF	MHD	6.91	1.63
tblVehicleEF	MHD	120.30	67.85
tblVehicleEF	MHD	1,155.79	1,129.04
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tblVehicleEF	MHD	9.83	1.00
tblVehicleEF	MHD	3.4800e-004	2.7274e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	3.3300e-004	2.6095e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004

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tblVehicleEF	MHD	7.7500e-004	4.8721e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.1630e-003	6.4466e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7200e-004	1.2619e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
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tblVehicleEF	MHD	0.04	0.04
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
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tblVehicleEF	OBUS	0.01	0.01
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tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
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tblVehicleEF	SBUS	0.03	0.03
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tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.35	0.03
tblVehicleEF	SBUS	0.01	3.4320e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.4200e-004	4.4468e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	1.39	0.40
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.38	0.03
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9268e-003
tblVehicleEF	SBUS	0.07	5.7268e-003
tblVehicleEF	SBUS	8.21	2.53
tblVehicleEF	SBUS	0.78	0.66

tblVehicleEF	SBUS	7.78	0.81
tblVehicleEF	SBUS	1,065.38	338.18
tblVehicleEF	SBUS	1,088.61	1,142.39
tblVehicleEF	SBUS	53.57	4.78
tblVehicleEF	SBUS	9.47	3.32
tblVehicleEF	SBUS	4.47	5.39
tblVehicleEF	SBUS	12.43	0.77
tblVehicleEF	SBUS	0.01	6.1938e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	5.9258e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.2238e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.7000e-004	4.7323e-005

tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	1.40	0.41
tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.44	0.04
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.79	42.44
tblVehicleEF	UBUS	8.90	0.71
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.66
tblVehicleEF	UBUS	10.68	1.20
tblVehicleEF	UBUS	15.66	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	0.90	0.15

tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0860e-003	8.5721e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	3.79	6.37
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.73	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.84	42.44
tblVehicleEF	UBUS	7.71	0.62
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.52
tblVehicleEF	UBUS	10.07	1.20
tblVehicleEF	UBUS	15.61	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004

tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	0.91	0.15
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.61	0.04
tblVehicleEF	UBUS	9.9300e-003	1.5961e-003
tblVehicleEF	UBUS	1.0650e-003	8.4268e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	3.80	6.37
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.77	42.44
tblVehicleEF	UBUS	9.11	0.72
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.69
tblVehicleEF	UBUS	10.47	1.20
tblVehicleEF	UBUS	15.67	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003

tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0900e-003	8.6004e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	3.78	6.37
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.75	0.05

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					
2020	53.5769	71.5172	46.1337	0.1008	96.4125	3.0059	99.3428	16.9332	2.7676	19.6292	0.0000	9,860.0105	9,860.0105	2.7780	0.0000	9,929.4613
Maximum	**53.5769**	**71.5172**	**46.1337**	**0.1008**	**96.4125**	**3.0059**	**99.3428**	**16.9332**	**2.7676**	**19.6292**	**0.0000**	**9,860.0105**	**9,860.0105**	**2.7780**	**0.0000**	**9,929.4613**

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					
2020	53.3644	8.7291	50.3768	0.1008	37.8657	0.1770	38.0048	6.6748	0.1763	6.8135	0.0000	9,860.0105	9,860.0105	2.7780	0.0000	9,929.4613
Maximum	**53.3644**	**8.7291**	**50.3768**	**0.1008**	**37.8657**	**0.1770**	**38.0048**	**6.6748**	**0.1763**	**6.8135**	**0.0000**	**9,860.0105**	**9,860.0105**	**2.7780**	**0.0000**	**9,929.4613**

	ROG	NOx	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	**0.40**	**87.79**	**-9.20**	**0.00**	**60.73**	**94.11**	**61.74**	**60.58**	**93.63**	**65.29**	**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	0.2261	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	6.0539	6.1516	50.6583	0.0993	9.1651	0.1061	9.2712	2.4413	0.0993	2.5406		10,108.9867	10,108.9867	0.7142		10,126.8424
Total	**6.2801**	**6.1517**	**50.6702**	**0.0993**	**9.1651**	**0.1062**	**9.2712**	**2.4413**	**0.0994**	**2.5406**		**10,109.0122**	**10,109.0122**	**0.7143**	**0.0000**	**10,126.8696**

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	0.2115	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	6.0539	6.1516	50.6583	0.0993	9.1651	0.1061	9.2712	2.4413	0.0993	2.5406		10,108.9867	10,108.9867	0.7142		10,126.8424
Total	**6.2655**	**6.1517**	**50.6702**	**0.0993**	**9.1651**	**0.1062**	**9.2712**	**2.4413**	**0.0994**	**2.5406**		**10,109.0122**	**10,109.0122**	**0.7143**	**0.0000**	**10,126.8696**

	ROG	NOx	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	**0.23**	**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	Demolition and Site Preparation	Demolition	1/1/2020	1/1/2020	5	1	
2	Grading and Excavation- option 1	Grading	1/2/2020	1/2/2020	5	1	
3	Grading and Excavation- option 2	Grading	1/3/2020	1/3/2020	5	1	
4	Drainage/Utilities/Subgrade	Trenching	1/6/2020	1/6/2020	5	1	
5	Building Construction	Building Construction	1/7/2020	1/7/2020	5	1	
6	Paving	Paving	1/8/2020	1/8/2020	5	1	
7	Architectural Coating	Architectural Coating	1/9/2020	1/9/2020	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.45

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 15,000; Non-Residential Outdoor: 5,000; Striped Parking Area: 3,000 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition and Site Preparation	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition and Site Preparation	Excavators	3	8.00	158	0.38
Demolition and Site Preparation	Rubber Tired Dozers	2	8.00	247	0.40

Demolition and Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading and Excavation- option 1	Cranes	1	7.00	231	0.29
Grading and Excavation- option 1	Excavators	2	8.00	158	0.38
Grading and Excavation- option 1	Graders	1	8.00	187	0.41
Grading and Excavation- option 1	Other Construction Equipment	2	8.00	172	0.42
Grading and Excavation- option 1	Rubber Tired Dozers	1	8.00	247	0.40
Grading and Excavation- option 1	Scrapers	2	8.00	367	0.48
Grading and Excavation- option 1	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading and Excavation- option 2	Bore/Drill Rigs	1	6.00	221	0.50
Grading and Excavation- option 2	Cement and Mortar Mixers	2	6.00	9	0.56
Grading and Excavation- option 2	Cranes	1	6.00	231	0.29
Grading and Excavation- option 2	Excavators	2	8.00	158	0.38
Grading and Excavation- option 2	Graders	1	8.00	187	0.41
Grading and Excavation- option 2	Other Construction Equipment	2	8.00	172	0.42
Grading and Excavation- option 2	Rubber Tired Dozers	1	8.00	247	0.40
Grading and Excavation- option 2	Scrapers	2	8.00	367	0.48
Grading and Excavation- option 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Drainage/Utilities/Subgrade	Bore/Drill Rigs	1	6.00	221	0.50
Drainage/Utilities/Subgrade	Excavators	2	8.00	158	0.38
Drainage/Utilities/Subgrade	Pumps	2	8.00	84	0.74
Drainage/Utilities/Subgrade	Trenchers	2	8.00	78	0.50
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42

Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition and Site Preparation	8	20.00	0.00	3.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Grading and Excavation- option 1	11	28.00	0.00	6.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Grading and Excavation- option 2	14	35.00	0.00	11.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Drainage/Utilities/Sub grade	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	30.00	15.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	7.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Demolition and Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					64.1970	0.0000	64.1970	9.7200	0.0000	9.7200			0.0000			0.0000
Off-Road	3.7311	37.4113	26.3126	0.0450		1.9249	1.9249		1.7868	1.7868		4,349.2419	4,349.2419	1.2525		4,380.5544
Total	**3.7311**	**37.4113**	**26.3126**	**0.0450**	**64.1970**	**1.9249**	**66.1219**	**9.7200**	**1.7868**	**11.5068**		**4,349.2419**	**4,349.2419**	**1.2525**		**4,380.5544**

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	0.0295	0.9516	0.2152	2.6900e-003	0.0606	3.1600e-003	0.0637	0.0166	3.0200e-003	0.0196		291.1843	291.1843	0.0194		291.6698
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0655	0.8757	2.3600e-003	0.2236	1.8700e-003	0.2254	0.0593	1.7200e-003	0.0610		235.2226	235.2226	7.4200e-003		235.4080
Total	**0.1215**	**1.0171**	**1.0909**	**5.0500e-003**	**0.2841**	**5.0300e-003**	**0.2892**	**0.0759**	**4.7400e-003**	**0.0806**		**526.4069**	**526.4069**	**0.0268**		**527.0778**

3.2 Demolition and Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0368	0.0000	25.0368	3.7908	0.0000	3.7908			0.0000			0.0000
Off-Road	0.5382	2.3324	27.9640	0.0450		0.0718	0.0718		0.0718	0.0718	0.0000	4,349.2419	4,349.2419	1.2525		4,380.5544
Total	**0.5382**	**2.3324**	**27.9640**	**0.0450**	**25.0368**	**0.0718**	**25.1086**	**3.7908**	**0.0718**	**3.8626**	**0.0000**	**4,349.2419**	**4,349.2419**	**1.2525**		**4,380.5544**

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	0.0295	0.9516	0.2152	2.6900e-003	0.0606	3.1600e-003	0.0637	0.0166	3.0200e-003	0.0196		291.1843	291.1843	0.0194		291.6698
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0655	0.8757	2.3600e-003	0.2236	1.8700e-003	0.2254	0.0593	1.7200e-003	0.0610		235.2226	235.2226	7.4200e-003		235.4080
Total	**0.1215**	**1.0171**	**1.0909**	**5.0500e-003**	**0.2841**	**5.0300e-003**	**0.2892**	**0.0759**	**4.7400e-003**	**0.0806**		**526.4069**	**526.4069**	**0.0268**		**527.0778**

3.3 Grading and Excavation- option 1 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					95.9784	0.0000	95.9784	16.8170	0.0000	16.8170			0.0000			0.0000
Off-Road	5.8349	65.3933	42.0533	0.0794		2.9213	2.9213		2.6876	2.6876		7,692.4144	7,692.4144	2.4879		7,754.6114
Total	**5.8349**	**65.3933**	**42.0533**	**0.0794**	**95.9784**	**2.9213**	**98.8997**	**16.8170**	**2.6876**	**19.5046**		**7,692.4144**	**7,692.4144**	**2.4879**		**7,754.6114**

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	0.0590	1.9032	0.4304	5.3700e-003	0.1212	6.3200e-003	0.1275	0.0332	6.0500e-003	0.0393		582.3686	582.3686	0.0388		583.3396
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1289	0.0917	1.2260	3.3100e-003	0.3130	2.6200e-003	0.3156	0.0830	2.4100e-003	0.0854		329.3116	329.3116	0.0104		329.5712
Total	**0.1878**	**1.9949**	**1.6564**	**8.6800e-003**	**0.4341**	**8.9400e-003**	**0.4431**	**0.1162**	**8.4600e-003**	**0.1247**		**911.6802**	**911.6802**	**0.0492**		**912.9108**

3.3 Grading and Excavation- option 1 - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					37.4316	0.0000	37.4316	6.5586	0.0000	6.5586			0.0000			0.0000
Off-Road	0.9765	4.2314	44.7018	0.0794		0.1302	0.1302		0.1302	0.1302	0.0000	7,692.4144	7,692.4144	2.4879		7,754.6114
Total	**0.9765**	**4.2314**	**44.7018**	**0.0794**	**37.4316**	**0.1302**	**37.5618**	**6.5586**	**0.1302**	**6.6888**	**0.0000**	**7,692.4144**	**7,692.4144**	**2.4879**		**7,754.6114**

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	0.0590	1.9032	0.4304	5.3700e-003	0.1212	6.3200e-003	0.1275	0.0332	6.0500e-003	0.0393		582.3686	582.3686	0.0388		583.3396
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1289	0.0917	1.2260	3.3100e-003	0.3130	2.6200e-003	0.3156	0.0830	2.4100e-003	0.0854		329.3116	329.3116	0.0104		329.5712
Total	**0.1878**	**1.9949**	**1.6564**	**8.6800e-003**	**0.4341**	**8.9400e-003**	**0.4431**	**0.1162**	**8.4600e-003**	**0.1247**		**911.6802**	**911.6802**	**0.0492**		**912.9108**

3.4 Grading and Excavation- option 2 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					68.7239	0.0000	68.7239	12.6899	0.0000	12.6899			0.0000			0.0000
Off-Road	6.0745	67.9134	43.8122	0.0868		2.9911	2.9911		2.7535	2.7535		8,380.6953	8,380.6953	2.6939		8,448.0415
Total	**6.0745**	**67.9134**	**43.8122**	**0.0868**	**68.7239**	**2.9911**	**71.7149**	**12.6899**	**2.7535**	**15.4434**		**8,380.6953**	**8,380.6953**	**2.6939**		**8,448.0415**

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	0.1081	3.4892	0.7891	9.8500e-003	0.2221	0.0116	0.2337	0.0609	0.0111	0.0720		1,067.6757	1,067.6757	0.0712		1,069.4559
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1611	0.1146	1.5325	4.1300e-003	0.3912	3.2700e-003	0.3945	0.1038	3.0100e-003	0.1068		411.6395	411.6395	0.0130		411.9640
Total	**0.2692**	**3.6038**	**2.3215**	**0.0140**	**0.6133**	**0.0149**	**0.6282**	**0.1646**	**0.0141**	**0.1787**		**1,479.3152**	**1,479.3152**	**0.0842**		**1,481.4199**

3.4 Grading and Excavation- option 2 - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					26.8023	0.0000	26.8023	4.9491	0.0000	4.9491			0.0000			0.0000
Off-Road	1.1434	5.1253	48.0553	0.0868		0.1622	0.1622		0.1622	0.1622	0.0000	8,380.6953	8,380.6953	2.6939		8,448.0415
Total	**1.1434**	**5.1253**	**48.0553**	**0.0868**	**26.8023**	**0.1622**	**26.9645**	**4.9491**	**0.1622**	**5.1112**	**0.0000**	**8,380.6953**	**8,380.6953**	**2.6939**		**8,448.0415**

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	0.1081	3.4892	0.7891	9.8500e-003	0.2221	0.0116	0.2337	0.0609	0.0111	0.0720		1,067.6757	1,067.6757	0.0712		1,069.4559
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1611	0.1146	1.5325	4.1300e-003	0.3912	3.2700e-003	0.3945	0.1038	3.0100e-003	0.1068		411.6395	411.6395	0.0130		411.9640
Total	**0.2692**	**3.6038**	**2.3215**	**0.0140**	**0.6133**	**0.0149**	**0.6282**	**0.1646**	**0.0141**	**0.1787**		**1,479.3152**	**1,479.3152**	**0.0842**		**1,481.4199**

3.5 Drainage/Utilities/Subgrade - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3840	22.1182	20.8939	0.0373		1.2927	1.2927		1.2225	1.2225		3,582.2853	3,582.2853	0.8301		3,603.0385
Total	**2.3840**	**22.1182**	**20.8939**	**0.0373**		**1.2927**	**1.2927**		**1.2225**	**1.2225**		**3,582.2853**	**3,582.2853**	**0.8301**		**3,603.0385**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0828	0.0589	0.7881	2.1300e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		211.7003	211.7003	6.6700e-003		211.8672
Total	**0.0828**	**0.0589**	**0.7881**	**2.1300e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**211.7003**	**211.7003**	**6.6700e-003**		**211.8672**

3.5 Drainage/Utilities/Subgrade - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4289	1.8584	24.2545	0.0373		0.0572	0.0572		0.0572	0.0572	0.0000	3,582.2853	3,582.2853	0.8301		3,603.0385
Total	**0.4289**	**1.8584**	**24.2545**	**0.0373**		**0.0572**	**0.0572**		**0.0572**	**0.0572**	**0.0000**	**3,582.2853**	**3,582.2853**	**0.8301**		**3,603.0385**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0828	0.0589	0.7881	2.1300e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		211.7003	211.7003	6.6700e-003		211.8672
Total	**0.0828**	**0.0589**	**0.7881**	**2.1300e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**211.7003**	**211.7003**	**6.6700e-003**		**211.8672**

3.6 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

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	0.0534	1.5956	0.4181	3.8900e-003	0.0960	7.5100e-003	0.1035	0.0277	7.1800e-003	0.0348		415.5370	415.5370	0.0254		416.1710
Worker	0.1381	0.0982	1.3135	3.5400e-003	0.3353	2.8000e-003	0.3381	0.0889	2.5800e-003	0.0915		352.8339	352.8339	0.0111		353.1120
Total	**0.1914**	**1.6938**	**1.7316**	**7.4300e-003**	**0.4314**	**0.0103**	**0.4417**	**0.1166**	**9.7600e-003**	**0.1263**		**768.3709**	**768.3709**	**0.0365**		**769.2829**

3.6 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6261	2.8021	17.7304	0.0269		0.1248	0.1248		0.1248	0.1248	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**0.6261**	**2.8021**	**17.7304**	**0.0269**		**0.1248**	**0.1248**		**0.1248**	**0.1248**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

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	0.0534	1.5956	0.4181	3.8900e-003	0.0960	7.5100e-003	0.1035	0.0277	7.1800e-003	0.0348		415.5370	415.5370	0.0254		416.1710
Worker	0.1381	0.0982	1.3135	3.5400e-003	0.3353	2.8000e-003	0.3381	0.0889	2.5800e-003	0.0915		352.8339	352.8339	0.0111		353.1120
Total	**0.1914**	**1.6938**	**1.7316**	**7.4300e-003**	**0.4314**	**0.0103**	**0.4417**	**0.1166**	**9.7600e-003**	**0.1263**		**768.3709**	**768.3709**	**0.0365**		**769.2829**

3.7 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.1790					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.5356**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**		**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0690	0.0491	0.6568	1.7700e-003	0.1677	1.4000e-003	0.1691	0.0445	1.2900e-003	0.0458		176.4169	176.4169	5.5600e-003		176.5560
Total	**0.0690**	**0.0491**	**0.6568**	**1.7700e-003**	**0.1677**	**1.4000e-003**	**0.1691**	**0.0445**	**1.2900e-003**	**0.0458**		**176.4169**	**176.4169**	**5.5600e-003**		**176.5560**

3.7 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.1790					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4595**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0690	0.0491	0.6568	1.7700e-003	0.1677	1.4000e-003	0.1691	0.0445	1.2900e-003	0.0458		176.4169	176.4169	5.5600e-003		176.5560
Total	**0.0690**	**0.0491**	**0.6568**	**1.7700e-003**	**0.1677**	**1.4000e-003**	**0.1691**	**0.0445**	**1.2900e-003**	**0.0458**		**176.4169**	**176.4169**	**5.5600e-003**		**176.5560**

3.8 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	53.3025					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**53.5447**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0322	0.0229	0.3065	8.3000e-004	0.0782	6.5000e-004	0.0789	0.0208	6.0000e-004	0.0214		82.3279	82.3279	2.6000e-003		82.3928
Total	**0.0322**	**0.0229**	**0.3065**	**8.3000e-004**	**0.0782**	**6.5000e-004**	**0.0789**	**0.0208**	**6.0000e-004**	**0.0214**		**82.3279**	**82.3279**	**2.6000e-003**		**82.3928**

3.8 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	53.3025					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**53.3322**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0322	0.0229	0.3065	8.3000e-004	0.0782	6.5000e-004	0.0789	0.0208	6.0000e-004	0.0214		82.3279	82.3279	2.6000e-003		82.3928
Total	**0.0322**	**0.0229**	**0.3065**	**8.3000e-004**	**0.0782**	**6.5000e-004**	**0.0789**	**0.0208**	**6.0000e-004**	**0.0214**		**82.3279**	**82.3279**	**2.6000e-003**		**82.3928**

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	6.0539	6.1516	50.6583	0.0993	9.1651	0.1061	9.2712	2.4413	0.0993	2.5406		10,108.9867	10,108.9867	0.7142		10,126.8424
Unmitigated	6.0539	6.1516	50.6583	0.0993	9.1651	0.1061	9.2712	2.4413	0.0993	2.5406		10,108.9867	10,108.9867	0.7142		10,126.8424

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	125.69	1,512.88	1113.21	1,337,855	1,337,855
Parking Lot	0.00	0.00	0.00		
Total	125.69	1,512.88	1,113.21	1,337,855	1,337,855

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
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455
Parking Lot	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive 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	0.2115	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Unmitigated	0.2261	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272

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	0.0292					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1958					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1200e-003	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Total	**0.2262**	**1.1000e-004**	**0.0119**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0255**	**0.0255**	**7.0000e-005**		**0.0272**

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	0.0146					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1958					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1200e-003	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Total	**0.2115**	**1.1000e-004**	**0.0119**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0255**	**0.0255**	**7.0000e-005**		**0.0272**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

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

Los Cerritos Wetlands Restoration - Mitigated

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	50.00	Space	0.45	20,000.00	0
City Park	66.50	Acre	66.50	2,896,740.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**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 - Assume 1 day for daily emission estimates. Scaled in post-processing for schedule length.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - added tractor for site prep

Off-road Equipment - added drainage/utilities/subgrade phase

Off-road Equipment - additional phase

Off-road Equipment - added crane and other equipment to account for dredge

Off-road Equipment - Added cement mixer, crane, and drill rig for wall construction. Added other construction equipment for dredge.

Off-road Equipment -

Trips and VMT - reduced building construction and arch coating workers per scaling down from BOMP EIR, added vendor for cement/ piles for wall construction, hauling estimated per day and to Montebello disposal site

Demolition - scaled up from BOMP estimate

Grading - added cut/fill numbers from Project Description

Architectural Coating - restrict to 50 g/l low VOC

Vehicle Trips -

Sequestration -

Construction Off-road Equipment Mitigation - Mitigation to Tier 4 and water 3/day

Area Mitigation - Rule 1113 Low VOC paint < 50 g/l

Water Mitigation - 20% water conservation per Title 24

Operational Off-Road Equipment -

Table Name	Column Name	Default Value	New Value
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tblArchitecturalCoating	ConstArea_Nonresidential_Interior	3,000.00	15,000.00
tblArchitecturalCoating	ConstArea_Parking	1,200.00	3,000.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	50.00

tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	50.00
tblArchitecturalCoating	EF_Parking	100.00	50.00
tblAreaCoating	Area_Nonresidential_Exterior	1000	5000
tblAreaCoating	Area_Nonresidential_Interior	3000	15000
tblAreaCoating	Area_Parking	1200	3000
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	50
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True
tblAreaMitigation	UseLowVOCPaintParkingValue	100	50
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tblConstructionPhase	NumDays	75.00	1.00
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tblFleetMix	LDA	0.55	0.55
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tblFleetMix	LDT1	0.05	0.06
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tblFleetMix	LHD1	0.02	0.02
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tblFleetMix	MCY	5.0780e-003	0.02
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tblFleetMix	MDV	0.12	0.13
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tblFleetMix	MH	8.9100e-004	3.4552e-003
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tblFleetMix	MHD	0.02	0.01
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tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
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tblTripsAndVMT	VendorTripNumber	478.00	15.00
tblTripsAndVMT	WorkerTripNumber	1,225.00	30.00
tblTripsAndVMT	WorkerTripNumber	245.00	7.00
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tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.1000e-004	1.0837e-005

tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.70	0.45
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.09	2.8334e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0953e-006
tblVehicleEF	HHD	1.1000e-004	1.0837e-005
tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.82	0.51
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.10	3.1023e-006
tblVehicleEF	LDA	5.9160e-003	4.0269e-003
tblVehicleEF	LDA	6.1880e-003	0.06
tblVehicleEF	LDA	0.71	0.86
tblVehicleEF	LDA	1.27	2.24
tblVehicleEF	LDA	285.63	286.85
tblVehicleEF	LDA	59.19	56.49
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003

tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	2.8620e-003	2.8378e-003
tblVehicleEF	LDA	6.1400e-004	5.5902e-004
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.09	0.30
tblVehicleEF	LDA	6.2800e-003	4.3047e-003
tblVehicleEF	LDA	5.4950e-003	0.05
tblVehicleEF	LDA	0.78	0.95
tblVehicleEF	LDA	1.09	1.90
tblVehicleEF	LDA	298.94	299.91
tblVehicleEF	LDA	59.19	55.86
tblVehicleEF	LDA	0.05	0.05
tblVehicleEF	LDA	0.07	0.19

tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.07	0.24
tblVehicleEF	LDA	2.9960e-003	2.9671e-003
tblVehicleEF	LDA	6.1000e-004	5.5280e-004
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	5.7950e-003	3.9414e-003
tblVehicleEF	LDA	6.3340e-003	0.06
tblVehicleEF	LDA	0.68	0.83
tblVehicleEF	LDA	1.31	2.31
tblVehicleEF	LDA	280.76	282.08

tblVehicleEF	LDA	59.19	56.63
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.28
tblVehicleEF	LDA	2.8130e-003	2.7906e-003
tblVehicleEF	LDA	6.1400e-004	5.6038e-004
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.31
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09

tblVehicleEF	LDT1	1.84	1.85
tblVehicleEF	LDT1	3.09	2.45
tblVehicleEF	LDT1	351.43	336.46
tblVehicleEF	LDT1	71.32	67.07
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.21	0.45
tblVehicleEF	LDT1	3.5380e-003	3.3294e-003
tblVehicleEF	LDT1	7.6700e-004	6.6374e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.18	0.83

tblVehicleEF	LDT1	0.24	0.49
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.01	0.08
tblVehicleEF	LDT1	1.99	2.01
tblVehicleEF	LDT1	2.62	2.08
tblVehicleEF	LDT1	366.73	349.70
tblVehicleEF	LDT1	71.32	66.31
tblVehicleEF	LDT1	0.15	0.14
tblVehicleEF	LDT1	0.16	0.28
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.05	0.05
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.19	0.39
tblVehicleEF	LDT1	3.6940e-003	3.4605e-003
tblVehicleEF	LDT1	7.5900e-004	6.5619e-004
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25

tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.21	0.43
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.79	1.79
tblVehicleEF	LDT1	3.19	2.53
tblVehicleEF	LDT1	345.81	331.61
tblVehicleEF	LDT1	71.32	67.24
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.22	0.46
tblVehicleEF	LDT1	3.4810e-003	3.2814e-003

tblVehicleEF	LDT1	7.6900e-004	6.6538e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.24	0.50
tblVehicleEF	LDT2	7.8740e-003	6.3478e-003
tblVehicleEF	LDT2	7.2440e-003	0.08
tblVehicleEF	LDT2	0.90	1.24
tblVehicleEF	LDT2	1.49	2.87
tblVehicleEF	LDT2	395.42	367.68
tblVehicleEF	LDT2	80.68	73.77
tblVehicleEF	LDT2	0.09	0.12
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.03

tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.10	0.38
tblVehicleEF	LDT2	3.9620e-003	3.6376e-003
tblVehicleEF	LDT2	8.3200e-004	7.3003e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.11	0.42
tblVehicleEF	LDT2	8.3450e-003	6.7606e-003
tblVehicleEF	LDT2	6.4440e-003	0.07
tblVehicleEF	LDT2	0.99	1.36
tblVehicleEF	LDT2	1.27	2.44
tblVehicleEF	LDT2	413.17	380.97
tblVehicleEF	LDT2	80.68	72.95
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.11	0.32
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.07	0.13

tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.34
tblVehicleEF	LDT2	4.1400e-003	3.7691e-003
tblVehicleEF	LDT2	8.2800e-004	7.2192e-004
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LDT2	7.7190e-003	6.2197e-003
tblVehicleEF	LDT2	7.4150e-003	0.08
tblVehicleEF	LDT2	0.87	1.20
tblVehicleEF	LDT2	1.54	2.96
tblVehicleEF	LDT2	388.90	362.81
tblVehicleEF	LDT2	80.68	73.95
tblVehicleEF	LDT2	0.09	0.11
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003

tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.39
tblVehicleEF	LDT2	3.8960e-003	3.5895e-003
tblVehicleEF	LDT2	8.3300e-004	7.3182e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.11	0.43
tblVehicleEF	LHD1	6.0120e-003	6.0724e-003
tblVehicleEF	LHD1	0.01	7.3245e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.04	1.27
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.09
tblVehicleEF	LHD1	34.52	13.36
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.05	0.84

tblVehicleEF	LHD1	1.07	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.29	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7874e-003
tblVehicleEF	LHD1	4.0200e-004	1.3218e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.32	0.64

tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD1	6.0120e-003	6.0856e-003
tblVehicleEF	LHD1	0.01	7.4711e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.96	0.87
tblVehicleEF	LHD1	2.90	1.21
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.11
tblVehicleEF	LHD1	34.52	13.25
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	0.98	0.79
tblVehicleEF	LHD1	1.03	0.36
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003

tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.28	0.09
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0270e-003	6.7877e-003
tblVehicleEF	LHD1	3.9900e-004	1.3115e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.31	0.10
tblVehicleEF	LHD1	6.0120e-003	6.0700e-003
tblVehicleEF	LHD1	0.01	7.2867e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.06	1.28
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.08
tblVehicleEF	LHD1	34.52	13.37
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.03	0.83
tblVehicleEF	LHD1	1.08	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08

tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.30	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7873e-003
tblVehicleEF	LHD1	4.0200e-004	1.3235e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD2	4.3410e-003	4.3356e-003
tblVehicleEF	LHD2	5.0230e-003	5.0611e-003

tblVehicleEF	LHD2	9.9030e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.58
tblVehicleEF	LHD2	1.51	0.88
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.49
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.76	1.11
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.13	0.07

tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
tblVehicleEF	LHD2	3.1600e-004	1.0382e-004
tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3451e-003
tblVehicleEF	LHD2	5.0980e-003	5.1274e-003
tblVehicleEF	LHD2	9.5540e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.40	0.58
tblVehicleEF	LHD2	1.44	0.84
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.38
tblVehicleEF	LHD2	28.89	10.42
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.72	1.05
tblVehicleEF	LHD2	0.58	0.26
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004

tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7498e-003
tblVehicleEF	LHD2	3.1500e-004	1.0310e-004
tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.14	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3338e-003
tblVehicleEF	LHD2	5.0030e-003	5.0440e-003
tblVehicleEF	LHD2	9.9730e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.57

tblVehicleEF	LHD2	1.52	0.89
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.50
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.75	1.09
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
tblVehicleEF	LHD2	3.1700e-004	1.0394e-004

tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	MCY	0.53	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.20	19.84
tblVehicleEF	MCY	9.64	8.48
tblVehicleEF	MCY	188.47	223.17
tblVehicleEF	MCY	44.88	60.40
tblVehicleEF	MCY	1.13	1.14
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	2.61	2.65

tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.06	1.84
tblVehicleEF	MCY	2.2780e-003	2.2085e-003
tblVehicleEF	MCY	6.6700e-004	5.9774e-004
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	3.25	3.27
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.24	2.00
tblVehicleEF	MCY	0.52	0.38
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.48	19.07
tblVehicleEF	MCY	8.82	7.74
tblVehicleEF	MCY	188.47	221.70
tblVehicleEF	MCY	44.88	58.50
tblVehicleEF	MCY	0.99	0.99
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.73	1.79

tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	2.55	2.58
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	1.84	1.63
tblVehicleEF	MCY	2.2640e-003	2.1939e-003
tblVehicleEF	MCY	6.4700e-004	5.7891e-004
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	3.17	3.18
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	2.00	1.77
tblVehicleEF	MCY	0.54	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.30	19.94
tblVehicleEF	MCY	9.78	8.61
tblVehicleEF	MCY	188.47	223.39
tblVehicleEF	MCY	44.88	60.73
tblVehicleEF	MCY	1.11	1.11
tblVehicleEF	MCY	0.31	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003

tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	2.62	2.66
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.10	1.88
tblVehicleEF	MCY	2.2800e-003	2.2106e-003
tblVehicleEF	MCY	6.7100e-004	6.0100e-004
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	3.26	3.28
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.29	2.05
tblVehicleEF	MDV	0.02	9.2696e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.56	1.64
tblVehicleEF	MDV	2.79	3.50
tblVehicleEF	MDV	528.65	449.45
tblVehicleEF	MDV	106.35	89.79
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.25	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003

tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.04	0.05
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.22	0.50
tblVehicleEF	MDV	5.2990e-003	4.4442e-003
tblVehicleEF	MDV	1.1130e-003	8.8857e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.24	0.54
tblVehicleEF	MDV	0.02	9.7459e-003
tblVehicleEF	MDV	0.01	0.09
tblVehicleEF	MDV	1.69	1.77
tblVehicleEF	MDV	2.39	2.98
tblVehicleEF	MDV	551.85	463.58
tblVehicleEF	MDV	106.35	88.78
tblVehicleEF	MDV	0.15	0.14
tblVehicleEF	MDV	0.23	0.39

tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.19	0.44
tblVehicleEF	MDV	5.5330e-003	4.5840e-003
tblVehicleEF	MDV	1.1050e-003	8.7855e-004
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.21	0.48
tblVehicleEF	MDV	0.01	9.1128e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.52	1.59
tblVehicleEF	MDV	2.88	3.61
tblVehicleEF	MDV	520.14	444.29

tblVehicleEF	MDV	106.35	90.01
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.26	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.22	0.51
tblVehicleEF	MDV	5.2130e-003	4.3931e-003
tblVehicleEF	MDV	1.1140e-003	8.9074e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.24	0.56
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03

tblVehicleEF	MH	2.77	1.93
tblVehicleEF	MH	6.41	2.41
tblVehicleEF	MH	1,135.33	1,557.81
tblVehicleEF	MH	61.01	20.79
tblVehicleEF	MH	1.17	1.25
tblVehicleEF	MH	0.85	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.36	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0577e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.82

tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.85	1.97
tblVehicleEF	MH	6.02	2.27
tblVehicleEF	MH	1,135.33	1,557.88
tblVehicleEF	MH	61.01	20.56
tblVehicleEF	MH	1.07	1.15
tblVehicleEF	MH	0.82	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.35	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.1500e-004	2.0342e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07

tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.15	0.11
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.38	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	2.74	1.92
tblVehicleEF	MH	6.46	2.43
tblVehicleEF	MH	1,135.33	1,557.79
tblVehicleEF	MH	61.01	20.83
tblVehicleEF	MH	1.15	1.22
tblVehicleEF	MH	0.86	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.37	0.11
tblVehicleEF	MH	0.01	0.02

tblVehicleEF	MH	7.2200e-004	2.0615e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MHD	0.02	4.4568e-003
tblVehicleEF	MHD	5.7010e-003	9.4687e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.39	0.40
tblVehicleEF	MHD	0.42	0.87
tblVehicleEF	MHD	6.85	1.61
tblVehicleEF	MHD	131.02	70.09
tblVehicleEF	MHD	1,155.79	1,129.05
tblVehicleEF	MHD	65.08	12.73
tblVehicleEF	MHD	0.52	0.62
tblVehicleEF	MHD	1.23	2.74
tblVehicleEF	MHD	9.82	1.00
tblVehicleEF	MHD	2.8600e-004	2.2441e-003
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.7300e-004	2.1470e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003

tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.2630e-003	6.6609e-004
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tblVehicleEF	MHD	7.7100e-004	1.2593e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
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tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	MHD	0.02	4.2175e-003
tblVehicleEF	MHD	5.7940e-003	9.5490e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.28	0.31
tblVehicleEF	MHD	0.43	0.88
tblVehicleEF	MHD	6.50	1.53
tblVehicleEF	MHD	138.77	71.71
tblVehicleEF	MHD	1,155.79	1,129.06

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tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.40	0.07
tblVehicleEF	MHD	1.3360e-003	6.8157e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.6500e-004	1.2455e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03

tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.06	0.18
tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.44	0.08
tblVehicleEF	MHD	0.02	4.7993e-003
tblVehicleEF	MHD	5.6760e-003	9.4448e-003
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tblVehicleEF	MHD	0.53	0.51
tblVehicleEF	MHD	0.42	0.86
tblVehicleEF	MHD	6.91	1.63
tblVehicleEF	MHD	120.30	67.85
tblVehicleEF	MHD	1,155.79	1,129.04
tblVehicleEF	MHD	65.08	12.75
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tblVehicleEF	MHD	3.4800e-004	2.7274e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	3.3300e-004	2.6095e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004

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tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.1630e-003	6.4466e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7200e-004	1.2619e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
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tblVehicleEF	MHD	0.04	0.04
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
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tblVehicleEF	OBUS	8.8720e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
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tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	1.9500e-004	3.2325e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
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tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
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tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	1.0790e-003	9.3986e-004
tblVehicleEF	OBUS	0.01	0.01
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tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
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tblVehicleEF	OBUS	0.06	0.09
tblVehicleEF	OBUS	7.7800e-004	9.3362e-004
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.26

tblVehicleEF	OBUS	0.39	0.13
tblVehicleEF	OBUS	0.01	9.0475e-003
tblVehicleEF	OBUS	9.0250e-003	0.01
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tblVehicleEF	OBUS	1,266.65	1,458.61
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tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
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tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
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tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
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tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	1.1010e-003	1.3226e-003

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tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
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tblVehicleEF	OBUS	0.06	0.09
tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
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tblVehicleEF	SBUS	0.03	0.03
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tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
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tblVehicleEF	SBUS	0.01	7.9268e-003
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tblVehicleEF	SBUS	0.01	3.2238e-003
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tblVehicleEF	SBUS	6.7000e-004	4.7323e-005

tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
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tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
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tblVehicleEF	SBUS	0.44	0.04
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tblVehicleEF	UBUS	1,987.48	1,982.38
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tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	0.90	0.15

tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0860e-003	8.5721e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	3.79	6.37
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.73	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.84	42.44
tblVehicleEF	UBUS	7.71	0.62
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.52
tblVehicleEF	UBUS	10.07	1.20
tblVehicleEF	UBUS	15.61	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004

tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	0.91	0.15
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.61	0.04
tblVehicleEF	UBUS	9.9300e-003	1.5961e-003
tblVehicleEF	UBUS	1.0650e-003	8.4268e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	3.80	6.37
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.77	42.44
tblVehicleEF	UBUS	9.11	0.72
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.69
tblVehicleEF	UBUS	10.47	1.20
tblVehicleEF	UBUS	15.67	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003

tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0900e-003	8.6004e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	3.78	6.37
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.75	0.05

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					
2020	53.5805	71.5831	46.0481	0.1004	96.4125	3.0061	99.3428	16.9332	2.7678	19.6293	0.0000	9,819.7566	9,819.7566	2.7796	0.0000	9,889.2465
Maximum	**53.5805**	**71.5831**	**46.0481**	**0.1004**	**96.4125**	**3.0061**	**99.3428**	**16.9332**	**2.7678**	**19.6293**	**0.0000**	**9,819.7566**	**9,819.7566**	**2.7796**	**0.0000**	**9,889.2465**

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					
2020	53.3680	8.7950	50.2912	0.1004	37.8657	0.1772	38.0049	6.6748	0.1764	6.8136	0.0000	9,819.7566	9,819.7566	2.7796	0.0000	9,889.2465
Maximum	**53.3680**	**8.7950**	**50.2912**	**0.1004**	**37.8657**	**0.1772**	**38.0049**	**6.6748**	**0.1764**	**6.8136**	**0.0000**	**9,819.7566**	**9,819.7566**	**2.7796**	**0.0000**	**9,889.2465**

	ROG	NOx	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	**0.40**	**87.71**	**-9.21**	**0.00**	**60.73**	**94.11**	**61.74**	**60.58**	**93.63**	**65.29**	**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	0.2261	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	6.2032	6.6165	49.2841	0.0949	9.1651	0.1062	9.2713	2.4413	0.0994	2.5407		9,671.0093	9,671.0093	0.7380		9,689.4588
Total	**6.4293**	**6.6166**	**49.2961**	**0.0949**	**9.1651**	**0.1062**	**9.2713**	**2.4413**	**0.0995**	**2.5407**		**9,671.0348**	**9,671.0348**	**0.7381**	**0.0000**	**9,689.4860**

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	0.2115	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	6.2032	6.6165	49.2841	0.0949	9.1651	0.1062	9.2713	2.4413	0.0994	2.5407		9,671.0093	9,671.0093	0.7380		9,689.4588
Total	**6.4147**	**6.6166**	**49.2961**	**0.0949**	**9.1651**	**0.1062**	**9.2713**	**2.4413**	**0.0995**	**2.5407**		**9,671.0348**	**9,671.0348**	**0.7381**	**0.0000**	**9,689.4860**

	ROG	NOx	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	**0.23**	**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	Demolition and Site Preparation	Demolition	1/1/2020	1/1/2020	5	1	
2	Grading and Excavation- option 1	Grading	1/2/2020	1/2/2020	5	1	
3	Grading and Excavation- option 2	Grading	1/3/2020	1/3/2020	5	1	
4	Drainage/Utilities/Subgrade	Trenching	1/6/2020	1/6/2020	5	1	
5	Building Construction	Building Construction	1/7/2020	1/7/2020	5	1	
6	Paving	Paving	1/8/2020	1/8/2020	5	1	
7	Architectural Coating	Architectural Coating	1/9/2020	1/9/2020	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.45

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 15,000; Non-Residential Outdoor: 5,000; Striped Parking Area: 3,000 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition and Site Preparation	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition and Site Preparation	Excavators	3	8.00	158	0.38
Demolition and Site Preparation	Rubber Tired Dozers	2	8.00	247	0.40

Demolition and Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading and Excavation- option 1	Cranes	1	7.00	231	0.29
Grading and Excavation- option 1	Excavators	2	8.00	158	0.38
Grading and Excavation- option 1	Graders	1	8.00	187	0.41
Grading and Excavation- option 1	Other Construction Equipment	2	8.00	172	0.42
Grading and Excavation- option 1	Rubber Tired Dozers	1	8.00	247	0.40
Grading and Excavation- option 1	Scrapers	2	8.00	367	0.48
Grading and Excavation- option 1	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading and Excavation- option 2	Bore/Drill Rigs	1	6.00	221	0.50
Grading and Excavation- option 2	Cement and Mortar Mixers	2	6.00	9	0.56
Grading and Excavation- option 2	Cranes	1	6.00	231	0.29
Grading and Excavation- option 2	Excavators	2	8.00	158	0.38
Grading and Excavation- option 2	Graders	1	8.00	187	0.41
Grading and Excavation- option 2	Other Construction Equipment	2	8.00	172	0.42
Grading and Excavation- option 2	Rubber Tired Dozers	1	8.00	247	0.40
Grading and Excavation- option 2	Scrapers	2	8.00	367	0.48
Grading and Excavation- option 2	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Drainage/Utilities/Subgrade	Bore/Drill Rigs	1	6.00	221	0.50
Drainage/Utilities/Subgrade	Excavators	2	8.00	158	0.38
Drainage/Utilities/Subgrade	Pumps	2	8.00	84	0.74
Drainage/Utilities/Subgrade	Trenchers	2	8.00	78	0.50
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42

Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition and Site Preparation	8	20.00	0.00	3.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Grading and Excavation- option 1	11	28.00	0.00	6.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Grading and Excavation- option 2	14	35.00	0.00	11.00	14.70	6.90	23.10	LD_Mix	HDT_Mix	HHDT
Drainage/Utilities/Sub grade	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	30.00	15.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	7.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Demolition and Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					64.1970	0.0000	64.1970	9.7200	0.0000	9.7200			0.0000			0.0000
Off-Road	3.7311	37.4113	26.3126	0.0450		1.9249	1.9249		1.7868	1.7868		4,349.2419	4,349.2419	1.2525		4,380.5544
Total	**3.7311**	**37.4113**	**26.3126**	**0.0450**	**64.1970**	**1.9249**	**66.1219**	**9.7200**	**1.7868**	**11.5068**		**4,349.2419**	**4,349.2419**	**1.2525**		**4,380.5544**

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	0.0301	0.9662	0.2270	2.6500e-003	0.0606	3.2000e-003	0.0638	0.0166	3.0600e-003	0.0197		286.7630	286.7630	0.0201		287.2643
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1022	0.0725	0.8020	2.2200e-003	0.2236	1.8700e-003	0.2254	0.0593	1.7200e-003	0.0610		221.4841	221.4841	6.9800e-003		221.6586
Total	**0.1323**	**1.0387**	**1.0290**	**4.8700e-003**	**0.2841**	**5.0700e-003**	**0.2892**	**0.0759**	**4.7800e-003**	**0.0807**		**508.2470**	**508.2470**	**0.0270**		**508.9229**

3.2 Demolition and Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0368	0.0000	25.0368	3.7908	0.0000	3.7908			0.0000			0.0000
Off-Road	0.5382	2.3324	27.9640	0.0450		0.0718	0.0718		0.0718	0.0718	0.0000	4,349.2419	4,349.2419	1.2525		4,380.5544
Total	**0.5382**	**2.3324**	**27.9640**	**0.0450**	**25.0368**	**0.0718**	**25.1086**	**3.7908**	**0.0718**	**3.8626**	**0.0000**	**4,349.2419**	**4,349.2419**	**1.2525**		**4,380.5544**

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	0.0301	0.9662	0.2270	2.6500e-003	0.0606	3.2000e-003	0.0638	0.0166	3.0600e-003	0.0197		286.7630	286.7630	0.0201		287.2643
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1022	0.0725	0.8020	2.2200e-003	0.2236	1.8700e-003	0.2254	0.0593	1.7200e-003	0.0610		221.4841	221.4841	6.9800e-003		221.6586
Total	**0.1323**	**1.0387**	**1.0290**	**4.8700e-003**	**0.2841**	**5.0700e-003**	**0.2892**	**0.0759**	**4.7800e-003**	**0.0807**		**508.2470**	**508.2470**	**0.0270**		**508.9229**

3.3 Grading and Excavation- option 1 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					95.9784	0.0000	95.9784	16.8170	0.0000	16.8170			0.0000			0.0000
Off-Road	5.8349	65.3933	42.0533	0.0794		2.9213	2.9213		2.6876	2.6876		7,692.4144	7,692.4144	2.4879		7,754.6114
Total	**5.8349**	**65.3933**	**42.0533**	**0.0794**	**95.9784**	**2.9213**	**98.8997**	**16.8170**	**2.6876**	**19.5046**		**7,692.4144**	**7,692.4144**	**2.4879**		**7,754.6114**

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	0.0602	1.9325	0.4540	5.2900e-003	0.1212	6.4100e-003	0.1276	0.0332	6.1300e-003	0.0393		573.5259	573.5259	0.0401		574.5287
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1431	0.1015	1.1228	3.1100e-003	0.3130	2.6200e-003	0.3156	0.0830	2.4100e-003	0.0854		310.0777	310.0777	9.7700e-003		310.3220
Total	**0.2033**	**2.0340**	**1.5769**	**8.4000e-003**	**0.4341**	**9.0300e-003**	**0.4431**	**0.1162**	**8.5400e-003**	**0.1247**		**883.6036**	**883.6036**	**0.0499**		**884.8507**

3.3 Grading and Excavation- option 1 - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					37.4316	0.0000	37.4316	6.5586	0.0000	6.5586			0.0000			0.0000
Off-Road	0.9765	4.2314	44.7018	0.0794		0.1302	0.1302		0.1302	0.1302	0.0000	7,692.4144	7,692.4144	2.4879		7,754.6114
Total	**0.9765**	**4.2314**	**44.7018**	**0.0794**	**37.4316**	**0.1302**	**37.5618**	**6.5586**	**0.1302**	**6.6888**	**0.0000**	**7,692.4144**	**7,692.4144**	**2.4879**		**7,754.6114**

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	0.0602	1.9325	0.4540	5.2900e-003	0.1212	6.4100e-003	0.1276	0.0332	6.1300e-003	0.0393		573.5259	573.5259	0.0401		574.5287
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1431	0.1015	1.1228	3.1100e-003	0.3130	2.6200e-003	0.3156	0.0830	2.4100e-003	0.0854		310.0777	310.0777	9.7700e-003		310.3220
Total	**0.2033**	**2.0340**	**1.5769**	**8.4000e-003**	**0.4341**	**9.0300e-003**	**0.4431**	**0.1162**	**8.5400e-003**	**0.1247**		**883.6036**	**883.6036**	**0.0499**		**884.8507**

3.4 Grading and Excavation- option 2 - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					68.7239	0.0000	68.7239	12.6899	0.0000	12.6899			0.0000			0.0000
Off-Road	6.0745	67.9134	43.8122	0.0868		2.9911	2.9911		2.7535	2.7535		8,380.6953	8,380.6953	2.6939		8,448.0415
Total	**6.0745**	**67.9134**	**43.8122**	**0.0868**	**68.7239**	**2.9911**	**71.7149**	**12.6899**	**2.7535**	**15.4434**		**8,380.6953**	**8,380.6953**	**2.6939**		**8,448.0415**

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	0.1104	3.5429	0.8324	9.7000e-003	0.2221	0.0117	0.2339	0.0609	0.0112	0.0721		1,051.4642	1,051.4642	0.0735		1,053.3025
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1789	0.1269	1.4035	3.8900e-003	0.3912	3.2700e-003	0.3945	0.1038	3.0100e-003	0.1068		387.5971	387.5971	0.0122		387.9026
Total	**0.2893**	**3.6698**	**2.2360**	**0.0136**	**0.6133**	**0.0150**	**0.6283**	**0.1646**	**0.0142**	**0.1789**		**1,439.0613**	**1,439.0613**	**0.0858**		**1,441.2051**

3.4 Grading and Excavation- option 2 - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					26.8023	0.0000	26.8023	4.9491	0.0000	4.9491			0.0000			0.0000
Off-Road	1.1434	5.1253	48.0553	0.0868		0.1622	0.1622		0.1622	0.1622	0.0000	8,380.6953	8,380.6953	2.6939		8,448.0415
Total	**1.1434**	**5.1253**	**48.0553**	**0.0868**	**26.8023**	**0.1622**	**26.9645**	**4.9491**	**0.1622**	**5.1112**	**0.0000**	**8,380.6953**	**8,380.6953**	**2.6939**		**8,448.0415**

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	0.1104	3.5429	0.8324	9.7000e-003	0.2221	0.0117	0.2339	0.0609	0.0112	0.0721		1,051.4642	1,051.4642	0.0735		1,053.3025
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1789	0.1269	1.4035	3.8900e-003	0.3912	3.2700e-003	0.3945	0.1038	3.0100e-003	0.1068		387.5971	387.5971	0.0122		387.9026
Total	**0.2893**	**3.6698**	**2.2360**	**0.0136**	**0.6133**	**0.0150**	**0.6283**	**0.1646**	**0.0142**	**0.1789**		**1,439.0613**	**1,439.0613**	**0.0858**		**1,441.2051**

3.5 Drainage/Utilities/Subgrade - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3840	22.1182	20.8939	0.0373		1.2927	1.2927		1.2225	1.2225		3,582.2853	3,582.2853	0.8301		3,603.0385
Total	**2.3840**	**22.1182**	**20.8939**	**0.0373**		**1.2927**	**1.2927**		**1.2225**	**1.2225**		**3,582.2853**	**3,582.2853**	**0.8301**		**3,603.0385**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0652	0.7218	2.0000e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		199.3357	199.3357	6.2800e-003		199.4927
Total	**0.0920**	**0.0652**	**0.7218**	**2.0000e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**199.3357**	**199.3357**	**6.2800e-003**		**199.4927**

3.5 Drainage/Utilities/Subgrade - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4289	1.8584	24.2545	0.0373		0.0572	0.0572		0.0572	0.0572	0.0000	3,582.2853	3,582.2853	0.8301		3,603.0385
Total	**0.4289**	**1.8584**	**24.2545**	**0.0373**		**0.0572**	**0.0572**		**0.0572**	**0.0572**	**0.0000**	**3,582.2853**	**3,582.2853**	**0.8301**		**3,603.0385**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0920	0.0652	0.7218	2.0000e-003	0.2012	1.6800e-003	0.2029	0.0534	1.5500e-003	0.0549		199.3357	199.3357	6.2800e-003		199.4927
Total	**0.0920**	**0.0652**	**0.7218**	**2.0000e-003**	**0.2012**	**1.6800e-003**	**0.2029**	**0.0534**	**1.5500e-003**	**0.0549**		**199.3357**	**199.3357**	**6.2800e-003**		**199.4927**

3.6 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

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	0.0558	1.5953	0.4611	3.7900e-003	0.0960	7.6300e-003	0.1037	0.0277	7.3000e-003	0.0350		404.1736	404.1736	0.0270		404.8493
Worker	0.1533	0.1087	1.2030	3.3400e-003	0.3353	2.8000e-003	0.3381	0.0889	2.5800e-003	0.0915		332.2261	332.2261	0.0105		332.4879
Total	**0.2091**	**1.7040**	**1.6641**	**7.1300e-003**	**0.4314**	**0.0104**	**0.4418**	**0.1166**	**9.8800e-003**	**0.1265**		**736.3997**	**736.3997**	**0.0375**		**737.3372**

3.6 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6261	2.8021	17.7304	0.0269		0.1248	0.1248		0.1248	0.1248	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**0.6261**	**2.8021**	**17.7304**	**0.0269**		**0.1248**	**0.1248**		**0.1248**	**0.1248**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

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	0.0558	1.5953	0.4611	3.7900e-003	0.0960	7.6300e-003	0.1037	0.0277	7.3000e-003	0.0350		404.1736	404.1736	0.0270		404.8493
Worker	0.1533	0.1087	1.2030	3.3400e-003	0.3353	2.8000e-003	0.3381	0.0889	2.5800e-003	0.0915		332.2261	332.2261	0.0105		332.4879
Total	**0.2091**	**1.7040**	**1.6641**	**7.1300e-003**	**0.4314**	**0.0104**	**0.4418**	**0.1166**	**9.8800e-003**	**0.1265**		**736.3997**	**736.3997**	**0.0375**		**737.3372**

3.7 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926		2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.1790					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.5356**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**		**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0767	0.0544	0.6015	1.6700e-003	0.1677	1.4000e-003	0.1691	0.0445	1.2900e-003	0.0458		166.1131	166.1131	5.2400e-003		166.2440
Total	**0.0767**	**0.0544**	**0.6015**	**1.6700e-003**	**0.1677**	**1.4000e-003**	**0.1691**	**0.0445**	**1.2900e-003**	**0.0458**		**166.1131**	**166.1131**	**5.2400e-003**		**166.2440**

3.7 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2805	1.2154	17.2957	0.0228		0.0374	0.0374		0.0374	0.0374	0.0000	2,207.7334	2,207.7334	0.7140		2,225.5841
Paving	1.1790					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4595**	**1.2154**	**17.2957**	**0.0228**		**0.0374**	**0.0374**		**0.0374**	**0.0374**	**0.0000**	**2,207.7334**	**2,207.7334**	**0.7140**		**2,225.5841**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0767	0.0544	0.6015	1.6700e-003	0.1677	1.4000e-003	0.1691	0.0445	1.2900e-003	0.0458		166.1131	166.1131	5.2400e-003		166.2440
Total	**0.0767**	**0.0544**	**0.6015**	**1.6700e-003**	**0.1677**	**1.4000e-003**	**0.1691**	**0.0445**	**1.2900e-003**	**0.0458**		**166.1131**	**166.1131**	**5.2400e-003**		**166.2440**

3.8 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	53.3025					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109		281.4481	281.4481	0.0218		281.9928
Total	**53.5447**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**		**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0358	0.0254	0.2807	7.8000e-004	0.0782	6.5000e-004	0.0789	0.0208	6.0000e-004	0.0214		77.5194	77.5194	2.4400e-003		77.5805
Total	**0.0358**	**0.0254**	**0.2807**	**7.8000e-004**	**0.0782**	**6.5000e-004**	**0.0789**	**0.0208**	**6.0000e-004**	**0.0214**		**77.5194**	**77.5194**	**2.4400e-003**		**77.5805**

3.8 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	53.3025					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0218		281.9928
Total	**53.3322**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0218**		**281.9928**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0358	0.0254	0.2807	7.8000e-004	0.0782	6.5000e-004	0.0789	0.0208	6.0000e-004	0.0214		77.5194	77.5194	2.4400e-003		77.5805
Total	**0.0358**	**0.0254**	**0.2807**	**7.8000e-004**	**0.0782**	**6.5000e-004**	**0.0789**	**0.0208**	**6.0000e-004**	**0.0214**		**77.5194**	**77.5194**	**2.4400e-003**		**77.5805**

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	6.2032	6.6165	49.2841	0.0949	9.1651	0.1062	9.2713	2.4413	0.0994	2.5407		9,671.0093	9,671.0093	0.7380		9,689.4588
Unmitigated	6.2032	6.6165	49.2841	0.0949	9.1651	0.1062	9.2713	2.4413	0.0994	2.5407		9,671.0093	9,671.0093	0.7380		9,689.4588

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	125.69	1,512.88	1113.21	1,337,855	1,337,855
Parking Lot	0.00	0.00	0.00		
Total	125.69	1,512.88	1,113.21	1,337,855	1,337,855

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
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455
Parking Lot	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive 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	0.2115	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Unmitigated	0.2261	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272

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	0.0292					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1958					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1200e-003	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Total	**0.2262**	**1.1000e-004**	**0.0119**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0255**	**0.0255**	**7.0000e-005**		**0.0272**

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	0.0146					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1958					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.1200e-003	1.1000e-004	0.0119	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005		0.0255	0.0255	7.0000e-005		0.0272
Total	**0.2115**	**1.1000e-004**	**0.0119**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**		**0.0255**	**0.0255**	**7.0000e-005**		**0.0272**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

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

Los Cerritos Wetlands Restoration - Operations only

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 Office Building	2.00	1000sqft	0.05	2,000.00	0
City Park	503.00	Acre	503.00	21,910,680.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Summer

Project Characteristics -

Land Use -

Construction Phase - no construction - operation only run

Off-road Equipment -

Vehicle Trips - LU 411 Public Park trip rates used from ITE Manuel 10th Edition

Water And Wastewater - Assume no water is pumped into wetland.

Land Use Change -

Water Mitigation - CalGreen 20% water reduction

Waste Mitigation - AB341

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00
tblArchitecturalCoating	EF_Parking	100.00	250.00
tblArchitecturalCoating	EF_Residential_Exterior	50.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	50.00	250.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	250
tblAreaCoating	Area_EF_Nonresidential_Interior	100	250
tblAreaCoating	Area_EF_Parking	100	250
tblAreaCoating	Area_EF_Residential_Exterior	50	250
tblAreaCoating	Area_EF_Residential_Interior	50	250
tblConstructionPhase	NumDays	660.00	1.00
tblConstructionPhase	NumDays	9,300.00	1.00
tblConstructionPhase	NumDays	600.00	1.00
tblConstructionPhase	NumDays	930.00	1.00
tblConstructionPhase	NumDays	660.00	1.00
tblConstructionPhase	NumDays	360.00	1.00

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Summer

tblConsumerProducts	ROG_EF	1.98E-05	2.14E-05
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MHD	0.02	0.01
tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004

tblGrading	AcresOfGrading	2.50	2,325.00
tblLandscapeEquipment	NumberSummerDays	250	180
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblVehicleEF	HHD	0.65	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3212e-007
tblVehicleEF	HHD	2.61	5.73
tblVehicleEF	HHD	1.16	0.77
tblVehicleEF	HHD	3.36	0.01
tblVehicleEF	HHD	4,729.35	1,160.01
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	21.63	6.50
tblVehicleEF	HHD	4.20	4.58
tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01

tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.1100e-004	1.0257e-005
tblVehicleEF	HHD	4.8720e-003	4.3163e-004
tblVehicleEF	HHD	0.65	0.47
tblVehicleEF	HHD	8.3000e-005	7.1733e-006
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.3200e-004	2.2097e-003
tblVehicleEF	HHD	0.09	2.8089e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0936e-006
tblVehicleEF	HHD	1.1100e-004	1.0257e-005
tblVehicleEF	HHD	4.8720e-003	4.3163e-004
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tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.3200e-004	2.2097e-003
tblVehicleEF	HHD	0.10	3.0754e-006
tblVehicleEF	HHD	0.61	0.03

tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.08	5.0957e-007
tblVehicleEF	HHD	1.90	5.57
tblVehicleEF	HHD	1.17	0.77
tblVehicleEF	HHD	3.19	0.01
tblVehicleEF	HHD	5,008.69	1,160.72
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	22.32	6.36
tblVehicleEF	HHD	3.97	4.34
tblVehicleEF	HHD	19.56	1.76
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.7000e-004	1.6157e-005
tblVehicleEF	HHD	4.9980e-003	4.3835e-004
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tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.2100e-004	2.1847e-003

tblVehicleEF	HHD	0.08	2.6976e-006
tblVehicleEF	HHD	0.05	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.5800e-004	1.0850e-006
tblVehicleEF	HHD	1.7000e-004	1.6157e-005
tblVehicleEF	HHD	4.9980e-003	4.3835e-004
tblVehicleEF	HHD	0.72	0.56
tblVehicleEF	HHD	1.2100e-004	1.1037e-005
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.2100e-004	2.1847e-003
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tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3720e-007
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tblVehicleEF	HHD	3.39	0.01
tblVehicleEF	HHD	4,343.58	1,159.03
tblVehicleEF	HHD	1,660.44	1,551.88
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tblVehicleEF	HHD	4.13	4.51
tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06

tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
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tblVehicleEF	HHD	5.2380e-003	5.0906e-004
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tblVehicleEF	HHD	8.1000e-005	7.2029e-006
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tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.09	2.8334e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0953e-006
tblVehicleEF	HHD	1.1000e-004	1.0837e-005
tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.82	0.51
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.26	0.25
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tblVehicleEF	LDA	2.3010e-003	2.0724e-003
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tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
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tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.04	0.23
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tblVehicleEF	LDA	0.09	0.30
tblVehicleEF	LDA	6.2800e-003	4.3047e-003

tblVehicleEF	LDA	5.4950e-003	0.05
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tblVehicleEF	LDA	0.05	0.05
tblVehicleEF	LDA	0.07	0.19
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.22
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tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.03

tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	5.7950e-003	3.9414e-003
tblVehicleEF	LDA	6.3340e-003	0.06
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tblVehicleEF	LDA	1.31	2.31
tblVehicleEF	LDA	280.76	282.08
tblVehicleEF	LDA	59.19	56.63
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.28
tblVehicleEF	LDA	2.8130e-003	2.7906e-003
tblVehicleEF	LDA	6.1400e-004	5.6038e-004
tblVehicleEF	LDA	0.04	0.06

tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.31
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.84	1.85
tblVehicleEF	LDT1	3.09	2.45
tblVehicleEF	LDT1	351.43	336.46
tblVehicleEF	LDT1	71.32	67.07
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.21	0.45

tblVehicleEF	LDT1	3.5380e-003	3.3294e-003
tblVehicleEF	LDT1	7.6700e-004	6.6374e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.24	0.49
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.01	0.08
tblVehicleEF	LDT1	1.99	2.01
tblVehicleEF	LDT1	2.62	2.08
tblVehicleEF	LDT1	366.73	349.70
tblVehicleEF	LDT1	71.32	66.31
tblVehicleEF	LDT1	0.15	0.14
tblVehicleEF	LDT1	0.16	0.28
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18

tblVehicleEF	LDT1	0.05	0.05
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.19	0.39
tblVehicleEF	LDT1	3.6940e-003	3.4605e-003
tblVehicleEF	LDT1	7.5900e-004	6.5619e-004
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.21	0.43
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.79	1.79
tblVehicleEF	LDT1	3.19	2.53
tblVehicleEF	LDT1	345.81	331.61
tblVehicleEF	LDT1	71.32	67.24
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003

tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.22	0.46
tblVehicleEF	LDT1	3.4810e-003	3.2814e-003
tblVehicleEF	LDT1	7.6900e-004	6.6538e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.24	0.50
tblVehicleEF	LDT2	7.8740e-003	6.3478e-003
tblVehicleEF	LDT2	7.2440e-003	0.08
tblVehicleEF	LDT2	0.90	1.24
tblVehicleEF	LDT2	1.49	2.87
tblVehicleEF	LDT2	395.42	367.68
tblVehicleEF	LDT2	80.68	73.77
tblVehicleEF	LDT2	0.09	0.12
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02

tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.10	0.38
tblVehicleEF	LDT2	3.9620e-003	3.6376e-003
tblVehicleEF	LDT2	8.3200e-004	7.3003e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.11	0.42
tblVehicleEF	LDT2	8.3450e-003	6.7606e-003
tblVehicleEF	LDT2	6.4440e-003	0.07
tblVehicleEF	LDT2	0.99	1.36
tblVehicleEF	LDT2	1.27	2.44
tblVehicleEF	LDT2	413.17	380.97
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tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.11	0.32
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003

tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.34
tblVehicleEF	LDT2	4.1400e-003	3.7691e-003
tblVehicleEF	LDT2	8.2800e-004	7.2192e-004
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LDT2	7.7190e-003	6.2197e-003
tblVehicleEF	LDT2	7.4150e-003	0.08
tblVehicleEF	LDT2	0.87	1.20
tblVehicleEF	LDT2	1.54	2.96
tblVehicleEF	LDT2	388.90	362.81
tblVehicleEF	LDT2	80.68	73.95
tblVehicleEF	LDT2	0.09	0.11

tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.39
tblVehicleEF	LDT2	3.8960e-003	3.5895e-003
tblVehicleEF	LDT2	8.3300e-004	7.3182e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.11	0.43
tblVehicleEF	LHD1	6.0120e-003	6.0724e-003
tblVehicleEF	LHD1	0.01	7.3245e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20

tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.04	1.27
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.09
tblVehicleEF	LHD1	34.52	13.36
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.05	0.84
tblVehicleEF	LHD1	1.07	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.29	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7874e-003

tblVehicleEF	LHD1	4.0200e-004	1.3218e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD1	6.0120e-003	6.0856e-003
tblVehicleEF	LHD1	0.01	7.4711e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.96	0.87
tblVehicleEF	LHD1	2.90	1.21
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.11
tblVehicleEF	LHD1	34.52	13.25
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	0.98	0.79
tblVehicleEF	LHD1	1.03	0.36
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03

tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.28	0.09
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0270e-003	6.7877e-003
tblVehicleEF	LHD1	3.9900e-004	1.3115e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.31	0.10
tblVehicleEF	LHD1	6.0120e-003	6.0700e-003
tblVehicleEF	LHD1	0.01	7.2867e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.06	1.28
tblVehicleEF	LHD1	8.91	8.98

tblVehicleEF	LHD1	612.93	694.08
tblVehicleEF	LHD1	34.52	13.37
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.03	0.83
tblVehicleEF	LHD1	1.08	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.30	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7873e-003
tblVehicleEF	LHD1	4.0200e-004	1.3235e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11

tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD2	4.3410e-003	4.3356e-003
tblVehicleEF	LHD2	5.0230e-003	5.0611e-003
tblVehicleEF	LHD2	9.9030e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.58
tblVehicleEF	LHD2	1.51	0.88
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.49
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.76	1.11
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
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tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004

tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
tblVehicleEF	LHD2	3.1600e-004	1.0382e-004
tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3451e-003
tblVehicleEF	LHD2	5.0980e-003	5.1274e-003
tblVehicleEF	LHD2	9.5540e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.40	0.58
tblVehicleEF	LHD2	1.44	0.84
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.38
tblVehicleEF	LHD2	28.89	10.42
tblVehicleEF	LHD2	0.10	0.09

tblVehicleEF	LHD2	0.72	1.05
tblVehicleEF	LHD2	0.58	0.26
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
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tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7498e-003
tblVehicleEF	LHD2	3.1500e-004	1.0310e-004
tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.06	0.07

tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.14	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3338e-003
tblVehicleEF	LHD2	5.0030e-003	5.0440e-003
tblVehicleEF	LHD2	9.9730e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.57
tblVehicleEF	LHD2	1.52	0.89
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.50
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.75	1.09
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.02

tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
tblVehicleEF	LHD2	3.1700e-004	1.0394e-004
tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	MCY	0.53	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.20	19.84
tblVehicleEF	MCY	9.64	8.48
tblVehicleEF	MCY	188.47	223.17
tblVehicleEF	MCY	44.88	60.40
tblVehicleEF	MCY	1.13	1.14
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003

tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	2.61	2.65
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.06	1.84
tblVehicleEF	MCY	2.2780e-003	2.2085e-003
tblVehicleEF	MCY	6.6700e-004	5.9774e-004
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	3.25	3.27
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.24	2.00
tblVehicleEF	MCY	0.52	0.38
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.48	19.07
tblVehicleEF	MCY	8.82	7.74
tblVehicleEF	MCY	188.47	221.70
tblVehicleEF	MCY	44.88	58.50
tblVehicleEF	MCY	0.99	0.99
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003

tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	2.55	2.58
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	1.84	1.63
tblVehicleEF	MCY	2.2640e-003	2.1939e-003
tblVehicleEF	MCY	6.4700e-004	5.7891e-004
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	3.17	3.18
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	2.00	1.77
tblVehicleEF	MCY	0.54	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.30	19.94
tblVehicleEF	MCY	9.78	8.61
tblVehicleEF	MCY	188.47	223.39
tblVehicleEF	MCY	44.88	60.73
tblVehicleEF	MCY	1.11	1.11

tblVehicleEF	MCY	0.31	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	2.62	2.66
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.10	1.88
tblVehicleEF	MCY	2.2800e-003	2.2106e-003
tblVehicleEF	MCY	6.7100e-004	6.0100e-004
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	3.26	3.28
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.29	2.05
tblVehicleEF	MDV	0.02	9.2696e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.56	1.64
tblVehicleEF	MDV	2.79	3.50

tblVehicleEF	MDV	528.65	449.45
tblVehicleEF	MDV	106.35	89.79
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.25	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.04	0.05
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.22	0.50
tblVehicleEF	MDV	5.2990e-003	4.4442e-003
tblVehicleEF	MDV	1.1130e-003	8.8857e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.24	0.54
tblVehicleEF	MDV	0.02	9.7459e-003

tblVehicleEF	MDV	0.01	0.09
tblVehicleEF	MDV	1.69	1.77
tblVehicleEF	MDV	2.39	2.98
tblVehicleEF	MDV	551.85	463.58
tblVehicleEF	MDV	106.35	88.78
tblVehicleEF	MDV	0.15	0.14
tblVehicleEF	MDV	0.23	0.39
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.19	0.44
tblVehicleEF	MDV	5.5330e-003	4.5840e-003
tblVehicleEF	MDV	1.1050e-003	8.7855e-004
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.06	0.06

tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.21	0.48
tblVehicleEF	MDV	0.01	9.1128e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.52	1.59
tblVehicleEF	MDV	2.88	3.61
tblVehicleEF	MDV	520.14	444.29
tblVehicleEF	MDV	106.35	90.01
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.26	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.22	0.51
tblVehicleEF	MDV	5.2130e-003	4.3931e-003
tblVehicleEF	MDV	1.1140e-003	8.9074e-004
tblVehicleEF	MDV	0.07	0.09

tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.24	0.56
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	2.77	1.93
tblVehicleEF	MH	6.41	2.41
tblVehicleEF	MH	1,135.33	1,557.81
tblVehicleEF	MH	61.01	20.79
tblVehicleEF	MH	1.17	1.25
tblVehicleEF	MH	0.85	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.36	0.11

tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0577e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.85	1.97
tblVehicleEF	MH	6.02	2.27
tblVehicleEF	MH	1,135.33	1,557.88
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tblVehicleEF	MH	1.07	1.15
tblVehicleEF	MH	0.82	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62

tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.35	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.1500e-004	2.0342e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.15	0.11
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.38	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	2.74	1.92
tblVehicleEF	MH	6.46	2.43
tblVehicleEF	MH	1,135.33	1,557.79
tblVehicleEF	MH	61.01	20.83
tblVehicleEF	MH	1.15	1.22
tblVehicleEF	MH	0.86	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004

tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.37	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0615e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MHD	0.02	4.4568e-003
tblVehicleEF	MHD	5.7010e-003	9.4687e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.39	0.40
tblVehicleEF	MHD	0.42	0.87
tblVehicleEF	MHD	6.85	1.61
tblVehicleEF	MHD	131.02	70.09
tblVehicleEF	MHD	1,155.79	1,129.05
tblVehicleEF	MHD	65.08	12.73
tblVehicleEF	MHD	0.52	0.62
tblVehicleEF	MHD	1.23	2.74
tblVehicleEF	MHD	9.82	1.00
tblVehicleEF	MHD	2.8600e-004	2.2441e-003

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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.7300e-004	2.1470e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.2630e-003	6.6609e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7100e-004	1.2593e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	MHD	0.02	4.2175e-003

tblVehicleEF	MHD	5.7940e-003	9.5490e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.28	0.31
tblVehicleEF	MHD	0.43	0.88
tblVehicleEF	MHD	6.50	1.53
tblVehicleEF	MHD	138.77	71.71
tblVehicleEF	MHD	1,155.79	1,129.06
tblVehicleEF	MHD	65.08	12.59
tblVehicleEF	MHD	0.53	0.63
tblVehicleEF	MHD	1.16	2.58
tblVehicleEF	MHD	9.78	0.99
tblVehicleEF	MHD	2.4100e-004	1.8940e-003
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.3000e-004	1.8121e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.16

tblVehicleEF	MHD	0.40	0.07
tblVehicleEF	MHD	1.3360e-003	6.8157e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.6500e-004	1.2455e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.06	0.18
tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.44	0.08
tblVehicleEF	MHD	0.02	4.7993e-003
tblVehicleEF	MHD	5.6760e-003	9.4448e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.53	0.51
tblVehicleEF	MHD	0.42	0.86
tblVehicleEF	MHD	6.91	1.63
tblVehicleEF	MHD	120.30	67.85
tblVehicleEF	MHD	1,155.79	1,129.04
tblVehicleEF	MHD	65.08	12.75
tblVehicleEF	MHD	0.49	0.61
tblVehicleEF	MHD	1.21	2.69
tblVehicleEF	MHD	9.83	1.00
tblVehicleEF	MHD	3.4800e-004	2.7274e-003
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07

tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	3.3300e-004	2.6095e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.1630e-003	6.4466e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7200e-004	1.2619e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.04
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	OBUS	0.01	9.0528e-003
tblVehicleEF	OBUS	8.8720e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.29	0.61

tblVehicleEF	OBUS	0.60	1.25
tblVehicleEF	OBUS	5.75	2.54
tblVehicleEF	OBUS	111.80	98.82
tblVehicleEF	OBUS	1,266.65	1,458.58
tblVehicleEF	OBUS	68.32	19.86
tblVehicleEF	OBUS	0.58	0.71
tblVehicleEF	OBUS	1.73	2.50
tblVehicleEF	OBUS	2.63	0.62
tblVehicleEF	OBUS	2.0400e-004	3.3787e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	1.9500e-004	3.2325e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	7.7800e-004	9.3362e-004
tblVehicleEF	OBUS	0.07	0.14
tblVehicleEF	OBUS	0.04	0.26
tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	1.0790e-003	9.3986e-004
tblVehicleEF	OBUS	0.01	0.01

tblVehicleEF	OBUS	7.8400e-004	1.9655e-004
tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.06	0.09
tblVehicleEF	OBUS	7.7800e-004	9.3362e-004
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.26
tblVehicleEF	OBUS	0.39	0.13
tblVehicleEF	OBUS	0.01	9.0475e-003
tblVehicleEF	OBUS	9.0250e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.27	0.57
tblVehicleEF	OBUS	0.61	1.27
tblVehicleEF	OBUS	5.43	2.40
tblVehicleEF	OBUS	117.45	100.02
tblVehicleEF	OBUS	1,266.65	1,458.61
tblVehicleEF	OBUS	68.32	19.62
tblVehicleEF	OBUS	0.60	0.72
tblVehicleEF	OBUS	1.63	2.35
tblVehicleEF	OBUS	2.59	0.61
tblVehicleEF	OBUS	1.7200e-004	2.8530e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	1.6400e-004	2.7296e-003
tblVehicleEF	OBUS	0.06	0.06

tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	2.1550e-003	2.7285e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	1.1010e-003	1.3226e-003
tblVehicleEF	OBUS	0.07	0.15
tblVehicleEF	OBUS	0.04	0.25
tblVehicleEF	OBUS	0.35	0.12
tblVehicleEF	OBUS	1.1330e-003	9.5128e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.7900e-004	1.9419e-004
tblVehicleEF	OBUS	2.1550e-003	2.7285e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	1.1010e-003	1.3226e-003
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.25
tblVehicleEF	OBUS	0.38	0.13
tblVehicleEF	OBUS	0.01	9.0785e-003
tblVehicleEF	OBUS	8.8310e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.31	0.66
tblVehicleEF	OBUS	0.60	1.24
tblVehicleEF	OBUS	5.81	2.56
tblVehicleEF	OBUS	104.00	97.15

tblVehicleEF	OBUS	1,266.65	1,458.57
tblVehicleEF	OBUS	68.32	19.91
tblVehicleEF	OBUS	0.56	0.71
tblVehicleEF	OBUS	1.70	2.46
tblVehicleEF	OBUS	2.64	0.62
tblVehicleEF	OBUS	2.4800e-004	4.1047e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	2.3700e-004	3.9271e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
tblVehicleEF	OBUS	0.07	0.14
tblVehicleEF	OBUS	0.04	0.28
tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	1.0040e-003	9.2410e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.8500e-004	1.9702e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
tblVehicleEF	OBUS	0.02	0.02

tblVehicleEF	OBUS	0.06	0.09
tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.28
tblVehicleEF	OBUS	0.40	0.14
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9517e-003
tblVehicleEF	SBUS	0.07	5.5911e-003
tblVehicleEF	SBUS	8.04	2.47
tblVehicleEF	SBUS	0.79	0.66
tblVehicleEF	SBUS	7.53	0.78
tblVehicleEF	SBUS	1,136.99	350.96
tblVehicleEF	SBUS	1,088.61	1,142.40
tblVehicleEF	SBUS	53.57	4.74
tblVehicleEF	SBUS	9.91	3.43
tblVehicleEF	SBUS	4.55	5.48
tblVehicleEF	SBUS	12.42	0.77
tblVehicleEF	SBUS	0.01	5.0981e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	4.8776e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005

tblVehicleEF	SBUS	3.3870e-003	8.4800e-004
tblVehicleEF	SBUS	0.03	7.2494e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.3445e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.6600e-004	4.6882e-005
tblVehicleEF	SBUS	3.3870e-003	8.4800e-004
tblVehicleEF	SBUS	0.03	7.2494e-003
tblVehicleEF	SBUS	1.40	0.40
tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.43	0.04
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	8.0370e-003
tblVehicleEF	SBUS	0.06	4.9797e-003
tblVehicleEF	SBUS	7.92	2.43
tblVehicleEF	SBUS	0.80	0.67
tblVehicleEF	SBUS	6.11	0.64
tblVehicleEF	SBUS	1,188.84	360.21
tblVehicleEF	SBUS	1,088.61	1,142.41
tblVehicleEF	SBUS	53.57	4.49
tblVehicleEF	SBUS	10.22	3.51

tblVehicleEF	SBUS	4.29	5.17
tblVehicleEF	SBUS	12.39	0.77
tblVehicleEF	SBUS	9.0250e-003	4.3047e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	8.6350e-003	4.1185e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.35	0.03
tblVehicleEF	SBUS	0.01	3.4320e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.4200e-004	4.4468e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	1.39	0.40
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.13	0.13

tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.38	0.03
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9268e-003
tblVehicleEF	SBUS	0.07	5.7268e-003
tblVehicleEF	SBUS	8.21	2.53
tblVehicleEF	SBUS	0.78	0.66
tblVehicleEF	SBUS	7.78	0.81
tblVehicleEF	SBUS	1,065.38	338.18
tblVehicleEF	SBUS	1,088.61	1,142.39
tblVehicleEF	SBUS	53.57	4.78
tblVehicleEF	SBUS	9.47	3.32
tblVehicleEF	SBUS	4.47	5.39
tblVehicleEF	SBUS	12.43	0.77
tblVehicleEF	SBUS	0.01	6.1938e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	5.9258e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	0.97	0.28

tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.2238e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.7000e-004	4.7323e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	1.40	0.41
tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.44	0.04
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.79	42.44
tblVehicleEF	UBUS	8.90	0.71
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.66
tblVehicleEF	UBUS	10.68	1.20
tblVehicleEF	UBUS	15.66	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03

tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0860e-003	8.5721e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	3.79	6.37
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.73	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.84	42.44
tblVehicleEF	UBUS	7.71	0.62
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.52
tblVehicleEF	UBUS	10.07	1.20
tblVehicleEF	UBUS	15.61	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03

tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	0.91	0.15
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.61	0.04
tblVehicleEF	UBUS	9.9300e-003	1.5961e-003
tblVehicleEF	UBUS	1.0650e-003	8.4268e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	3.80	6.37
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.77	42.44
tblVehicleEF	UBUS	9.11	0.72
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.69
tblVehicleEF	UBUS	10.47	1.20

tblVehicleEF	UBUS	15.67	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0900e-003	8.6004e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	3.78	6.37
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.75	0.05
tblVehicleTrips	CC_TL	8.40	7.30
tblVehicleTrips	CC_TL	8.40	7.30
tblVehicleTrips	CNW_TL	6.90	7.30
tblVehicleTrips	CNW_TL	6.90	7.30

tblVehicleTrips	CW_TL	16.60	9.50
tblVehicleTrips	CW_TL	16.60	9.50
tblVehicleTrips	ST_TR	22.75	1.96
tblVehicleTrips	ST_TR	2.46	1.96
tblVehicleTrips	SU_TR	16.74	2.19
tblVehicleTrips	SU_TR	1.05	2.19
tblVehicleTrips	WD_TR	1.89	0.78
tblVehicleTrips	WD_TR	11.03	0.78
tblWater	OutdoorWaterUseRate	599,315,118.88	0.00

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					
2020	3.3673	33.2382	22.2516	0.0401	0.1232	1.6598	1.7830	0.0327	1.5428	1.5755	0.0000	3,878.2410	3,878.2410	1.0621	0.0000	3,904.7940
2022	3.2278	33.1198	20.2047	0.0395	18.2141	1.6138	19.8279	9.9699	1.4847	11.4546	0.0000	3,832.3995	3,832.3995	1.1962	0.0000	3,862.3055
2023	3.3818	34.5520	28.5696	0.0637	2,471.8498	1.4258	2,473.2755	269.5876	1.3117	270.8993	0.0000	6,168.1235	6,168.1235	1.9483	0.0000	6,216.8319
2027	30.9669	272.3474	269.9438	1.5607	99.9212	1.3340	101.2552	27.0548	1.2485	28.3033	0.0000	162,453.2255	162,453.2255	6.7826	0.0000	162,622.7898
2062	1.0112	3.6566	15.8177	0.0281	0.1071	0.1164	0.2235	0.0263	0.1164	0.1427	0.0000	2,656.5168	2,656.5168	0.0893	0.0000	2,658.7489
2065	92.8149	0.7270	1.7923	2.9700e-003	13.1436	7.4300e-003	13.1511	3.2262	7.4300e-003	3.2336	0.0000	281.4481	281.4481	9.9000e-003	0.0000	281.6957
Maximum	**92.8149**	**272.3474**	**269.9438**	**1.5607**	**2,471.8498**	**1.6598**	**2,473.2755**	**269.5876**	**1.5428**	**270.8993**	**0.0000**	**162,453.2255**	**162,453.2255**	**6.7826**	**0.0000**	**162,622.7898**

2.1 Overall Construction (Maximum Daily Emission)

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					
2020	3.3673	33.2382	22.2516	0.0401	0.1232	1.6598	1.7830	0.0327	1.5428	1.5755	0.0000	3,878.2410	3,878.2410	1.0621	0.0000	3,904.7940
2022	3.2278	33.1198	20.2047	0.0395	18.2141	1.6138	19.8279	9.9699	1.4847	11.4546	0.0000	3,832.3995	3,832.3995	1.1962	0.0000	3,862.3055
2023	3.3818	34.5520	28.5696	0.0637	2,471.8498	1.4258	2,473.2755	269.5876	1.3117	270.8993	0.0000	6,168.1235	6,168.1235	1.9483	0.0000	6,216.8318
2027	30.9669	272.3474	269.9438	1.5607	99.9212	1.3340	101.2552	27.0548	1.2485	28.3033	0.0000	162,453.2255	162,453.2255	6.7826	0.0000	162,622.7898
2062	1.0112	3.6566	15.8177	0.0281	0.1071	0.1164	0.2235	0.0263	0.1164	0.1427	0.0000	2,656.5168	2,656.5168	0.0893	0.0000	2,658.7489
2065	92.8149	0.7270	1.7923	2.9700e-003	13.1436	7.4300e-003	13.1511	3.2262	7.4300e-003	3.2336	0.0000	281.4481	281.4481	9.9000e-003	0.0000	281.6957
Maximum	**92.8149**	**272.3474**	**269.9438**	**1.5607**	**2,471.8498**	**1.6598**	**2,473.2755**	**269.5876**	**1.5428**	**270.8993**	**0.0000**	**162,453.2255**	**162,453.2255**	**6.7826**	**0.0000**	**162,622.7898**

	ROG	NOx	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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Energy	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Mobile	3.9903	3.5505	28.9319	0.0543	4.9730	0.0590	5.0320	1.3246	0.0552	1.3798		5,530.5871	5,530.5871	0.4278		5,541.2812
Total	**5.2355**	**3.5566**	**28.9884**	**0.0543**	**4.9730**	**0.0596**	**5.0326**	**1.3246**	**0.0558**	**1.3805**		**5,537.4084**	**5,537.4084**	**0.4282**	**1.2000e-004**	**5,548.1496**

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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Energy	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Mobile	3.9903	3.5505	28.9319	0.0543	4.9730	0.0590	5.0320	1.3246	0.0552	1.3798		5,530.5871	5,530.5871	0.4278		5,541.2812
Total	**5.2355**	**3.5566**	**28.9884**	**0.0543**	**4.9730**	**0.0596**	**5.0326**	**1.3246**	**0.0558**	**1.3805**		**5,537.4084**	**5,537.4084**	**0.4282**	**1.2000e-004**	**5,548.1496**

	ROG	NOx	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	Demolition	Demolition	1/1/2020	1/1/2020	5	1	
2	Site Preparation	Site Preparation	4/20/2022	4/20/2022	5	1	
3	Grading	Grading	9/6/2023	9/6/2023	5	1	
4	Building Construction	Building Construction	3/31/2027	3/31/2027	5	1	
5	Paving	Paving	11/22/2062	11/22/2062	5	1	
6	Architectural Coating	Architectural Coating	6/3/2065	6/3/2065	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2325

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 6,000; Non-Residential Outdoor: 2,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	9,203.00	3,591.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1,841.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**		**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

3.2 Demolition - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0372	0.4984	1.3100e-003	0.1232	1.0600e-003	0.1243	0.0327	9.7000e-004	0.0337		130.5361	130.5361	4.1700e-003		130.6404
Total	**0.0552**	**0.0372**	**0.4984**	**1.3100e-003**	**0.1232**	**1.0600e-003**	**0.1243**	**0.0327**	**9.7000e-004**	**0.0337**		**130.5361**	**130.5361**	**4.1700e-003**		**130.6404**

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	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**	**0.0000**	**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

3.2 Demolition - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0372	0.4984	1.3100e-003	0.1232	1.0600e-003	0.1243	0.0327	9.7000e-004	0.0337		130.5361	130.5361	4.1700e-003		130.6404
Total	**0.0552**	**0.0372**	**0.4984**	**1.3100e-003**	**0.1232**	**1.0600e-003**	**0.1243**	**0.0327**	**9.7000e-004**	**0.0337**		**130.5361**	**130.5361**	**4.1700e-003**		**130.6404**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**18.0663**	**1.6126**	**19.6788**	**9.9307**	**1.4836**	**11.4143**		**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0576	0.0363	0.5069	1.4700e-003	0.1479	1.1900e-003	0.1491	0.0392	1.0900e-003	0.0403		146.3377	146.3377	4.0900e-003		146.4400
Total	**0.0576**	**0.0363**	**0.5069**	**1.4700e-003**	**0.1479**	**1.1900e-003**	**0.1491**	**0.0392**	**1.0900e-003**	**0.0403**		**146.3377**	**146.3377**	**4.0900e-003**		**146.4400**

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836	0.0000	3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**18.0663**	**1.6126**	**19.6788**	**9.9307**	**1.4836**	**11.4143**	**0.0000**	**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0576	0.0363	0.5069	1.4700e-003	0.1479	1.1900e-003	0.1491	0.0392	1.0900e-003	0.0403		146.3377	146.3377	4.0900e-003		146.4400
Total	**0.0576**	**0.0363**	**0.5069**	**1.4700e-003**	**0.1479**	**1.1900e-003**	**0.1491**	**0.0392**	**1.0900e-003**	**0.0403**		**146.3377**	**146.3377**	**4.0900e-003**		**146.4400**

3.4 Grading - 2023

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					2,471.6855	0.0000	2,471.6855	269.5440	0.0000	269.5440			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105		6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**2,471.6855**	**1.4245**	**2,473.1100**	**269.5440**	**1.3105**	**270.8546**		**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.4 Grading - 2023

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0600	0.0364	0.5185	1.5700e-003	0.1643	1.2800e-003	0.1656	0.0436	1.1800e-003	0.0448		156.6458	156.6458	4.1000e-003		156.7483
Total	**0.0600**	**0.0364**	**0.5185**	**1.5700e-003**	**0.1643**	**1.2800e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**156.6458**	**156.6458**	**4.1000e-003**		**156.7483**

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					2,471.6855	0.0000	2,471.6855	269.5440	0.0000	269.5440			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105	0.0000	6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**2,471.6855**	**1.4245**	**2,473.1100**	**269.5440**	**1.3105**	**270.8546**	**0.0000**	**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.4 Grading - 2023

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0600	0.0364	0.5185	1.5700e-003	0.1643	1.2800e-003	0.1656	0.0436	1.1800e-003	0.0448		156.6458	156.6458	4.1000e-003		156.7483
Total	**0.0600**	**0.0364**	**0.5185**	**1.5700e-003**	**0.1643**	**1.2800e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**156.6458**	**156.6458**	**4.1000e-003**		**156.7483**

3.5 Building Construction - 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	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

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	7.1593	248.0142	73.0263	0.9047	24.3207	0.2862	24.6070	7.0021	0.2735	7.2756		97,155.0715	97,155.0715	4.8548		97,276.4405
Worker	22.4403	11.8635	180.8328	0.6291	75.6005	0.5202	76.1207	20.0528	0.4787	20.5314		62,741.6797	62,741.6797	1.3269		62,774.8513
Total	**29.5995**	**259.8777**	**253.8591**	**1.5338**	**99.9212**	**0.8064**	**100.7276**	**27.0548**	**0.7522**	**27.8070**		**159,896.7512**	**159,896.7512**	**6.1816**		**160,051.2918**

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	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

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	7.1593	248.0142	73.0263	0.9047	24.3207	0.2862	24.6070	7.0021	0.2735	7.2756		97,155.0715	97,155.0715	4.8548		97,276.4405
Worker	22.4403	11.8635	180.8328	0.6291	75.6005	0.5202	76.1207	20.0528	0.4787	20.5314		62,741.6797	62,741.6797	1.3269		62,774.8513
Total	**29.5995**	**259.8777**	**253.8591**	**1.5338**	**99.9212**	**0.8064**	**100.7276**	**27.0548**	**0.7522**	**27.8070**		**159,896.7512**	**159,896.7512**	**6.1816**		**160,051.2918**

3.6 Paving - 2062

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	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164		2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**		**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2062

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1071	0.0000	0.1071	0.0263	0.0000	0.0263			0.0000			0.0000
Total					**0.1071**	**0.0000**	**0.1071**	**0.0263**	**0.0000**	**0.0263**			**0.0000**			**0.0000**

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	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164	0.0000	2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**	**0.0000**	**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2062

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1071	0.0000	0.1071	0.0263	0.0000	0.0263			0.0000			0.0000
Total					**0.1071**	**0.0000**	**0.1071**	**0.0263**	**0.0000**	**0.0263**			**0.0000**			**0.0000**

3.7 Architectural Coating - 2065

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					
Archit. Coating	92.7000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003		281.4481	281.4481	9.9000e-003		281.6957
Total	**92.8149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**		**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2065

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					13.1436	0.0000	13.1436	3.2262	0.0000	3.2262			0.0000			0.0000
Total					**13.1436**	**0.0000**	**13.1436**	**3.2262**	**0.0000**	**3.2262**			**0.0000**			**0.0000**

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					
Archit. Coating	92.7000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.0000	281.4481	281.4481	9.9000e-003		281.6957
Total	**92.8149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.0000**	**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2065

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					13.1436	0.0000	13.1436	3.2262	0.0000	3.2262			0.0000			0.0000
Total					**13.1436**	**0.0000**	**13.1436**	**3.2262**	**0.0000**	**3.2262**			**0.0000**			**0.0000**

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	3.9903	3.5505	28.9319	0.0543	4.9730	0.0590	5.0320	1.3246	0.0552	1.3798		5,530.5871	5,530.5871	0.4278		5,541.2812
Unmitigated	3.9903	3.5505	28.9319	0.0543	4.9730	0.0590	5.0320	1.3246	0.0552	1.3798		5,530.5871	5,530.5871	0.4278		5,541.2812

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	392.34	985.88	1101.57	1,234,906	1,234,906
General Office Building	1.56	3.92	4.38	5,496	5,496
Total	393.90	989.80	1,105.95	1,240,402	1,240,402

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
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455
General Office Building	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455

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	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
NaturalGas Unmitigated	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	57.0411	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Total		**6.2000e-004**	**5.5900e-003**	**4.7000e-003**	**3.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.3000e-004**	**4.3000e-004**		**6.7107**	**6.7107**	**1.3000e-004**	**1.2000e-004**	**6.7506**

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	0.0570411	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Total		**6.2000e-004**	**5.5900e-003**	**4.7000e-003**	**3.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.3000e-004**	**4.3000e-004**		**6.7107**	**6.7107**	**1.3000e-004**	**1.2000e-004**	**6.7506**

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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Unmitigated	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179

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	0.0254					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2143					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.8300e-003	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Total	**1.2446**	**4.7000e-004**	**0.0518**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1105**	**0.1105**	**2.9000e-004**		**0.1179**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0254					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2143					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.8300e-003	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Total	**1.2446**	**4.7000e-004**	**0.0518**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1105**	**0.1105**	**2.9000e-004**		**0.1179**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

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

Los Cerritos Wetlands Restoration - Operations only

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 Office Building	2.00	1000sqft	0.05	2,000.00	0
City Park	503.00	Acre	503.00	21,910,680.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Winter

Project Characteristics -

Land Use -

Construction Phase - no construction - operation only run

Off-road Equipment -

Vehicle Trips - LU 411 Public Park trip rates used from ITE Manuel 10th Edition

Water And Wastewater - Assume no water is pumped into wetland.

Land Use Change -

Water Mitigation - CalGreen 20% water reduction

Waste Mitigation - AB341

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00
tblArchitecturalCoating	EF_Parking	100.00	250.00
tblArchitecturalCoating	EF_Residential_Exterior	50.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	50.00	250.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	250
tblAreaCoating	Area_EF_Nonresidential_Interior	100	250
tblAreaCoating	Area_EF_Parking	100	250
tblAreaCoating	Area_EF_Residential_Exterior	50	250
tblAreaCoating	Area_EF_Residential_Interior	50	250
tblConstructionPhase	NumDays	660.00	1.00
tblConstructionPhase	NumDays	9,300.00	1.00
tblConstructionPhase	NumDays	600.00	1.00
tblConstructionPhase	NumDays	930.00	1.00
tblConstructionPhase	NumDays	660.00	1.00
tblConstructionPhase	NumDays	360.00	1.00

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Winter

tblConsumerProducts	ROG_EF	1.98E-05	2.14E-05
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MHD	0.02	0.01
tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004

tblGrading	AcresOfGrading	2.50	2,325.00
tblLandscapeEquipment	NumberSummerDays	250	180
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblVehicleEF	HHD	0.65	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3212e-007
tblVehicleEF	HHD	2.61	5.73
tblVehicleEF	HHD	1.16	0.77
tblVehicleEF	HHD	3.36	0.01
tblVehicleEF	HHD	4,729.35	1,160.01
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	21.63	6.50
tblVehicleEF	HHD	4.20	4.58
tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01

tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.1100e-004	1.0257e-005
tblVehicleEF	HHD	4.8720e-003	4.3163e-004
tblVehicleEF	HHD	0.65	0.47
tblVehicleEF	HHD	8.3000e-005	7.1733e-006
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.3200e-004	2.2097e-003
tblVehicleEF	HHD	0.09	2.8089e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0936e-006
tblVehicleEF	HHD	1.1100e-004	1.0257e-005
tblVehicleEF	HHD	4.8720e-003	4.3163e-004
tblVehicleEF	HHD	0.76	0.54
tblVehicleEF	HHD	8.3000e-005	7.1733e-006
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.3200e-004	2.2097e-003
tblVehicleEF	HHD	0.10	3.0754e-006
tblVehicleEF	HHD	0.61	0.03

tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.08	5.0957e-007
tblVehicleEF	HHD	1.90	5.57
tblVehicleEF	HHD	1.17	0.77
tblVehicleEF	HHD	3.19	0.01
tblVehicleEF	HHD	5,008.69	1,160.72
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	22.32	6.36
tblVehicleEF	HHD	3.97	4.34
tblVehicleEF	HHD	19.56	1.76
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.7000e-004	1.6157e-005
tblVehicleEF	HHD	4.9980e-003	4.3835e-004
tblVehicleEF	HHD	0.61	0.49
tblVehicleEF	HHD	1.2100e-004	1.1037e-005
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.2100e-004	2.1847e-003

tblVehicleEF	HHD	0.08	2.6976e-006
tblVehicleEF	HHD	0.05	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.5800e-004	1.0850e-006
tblVehicleEF	HHD	1.7000e-004	1.6157e-005
tblVehicleEF	HHD	4.9980e-003	4.3835e-004
tblVehicleEF	HHD	0.72	0.56
tblVehicleEF	HHD	1.2100e-004	1.1037e-005
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.2100e-004	2.1847e-003
tblVehicleEF	HHD	0.09	2.9536e-006
tblVehicleEF	HHD	0.70	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3720e-007
tblVehicleEF	HHD	3.58	5.95
tblVehicleEF	HHD	1.16	0.77
tblVehicleEF	HHD	3.39	0.01
tblVehicleEF	HHD	4,343.58	1,159.03
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	20.67	6.69
tblVehicleEF	HHD	4.13	4.51
tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06

tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.1000e-004	1.0837e-005
tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.70	0.45
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.09	2.8334e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0953e-006
tblVehicleEF	HHD	1.1000e-004	1.0837e-005
tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.82	0.51
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.10	3.1023e-006
tblVehicleEF	LDA	5.9160e-003	4.0269e-003
tblVehicleEF	LDA	6.1880e-003	0.06
tblVehicleEF	LDA	0.71	0.86
tblVehicleEF	LDA	1.27	2.24

tblVehicleEF	LDA	285.63	286.85
tblVehicleEF	LDA	59.19	56.49
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	2.8620e-003	2.8378e-003
tblVehicleEF	LDA	6.1400e-004	5.5902e-004
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.09	0.30
tblVehicleEF	LDA	6.2800e-003	4.3047e-003

tblVehicleEF	LDA	5.4950e-003	0.05
tblVehicleEF	LDA	0.78	0.95
tblVehicleEF	LDA	1.09	1.90
tblVehicleEF	LDA	298.94	299.91
tblVehicleEF	LDA	59.19	55.86
tblVehicleEF	LDA	0.05	0.05
tblVehicleEF	LDA	0.07	0.19
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.07	0.24
tblVehicleEF	LDA	2.9960e-003	2.9671e-003
tblVehicleEF	LDA	6.1000e-004	5.5280e-004
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.03

tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	5.7950e-003	3.9414e-003
tblVehicleEF	LDA	6.3340e-003	0.06
tblVehicleEF	LDA	0.68	0.83
tblVehicleEF	LDA	1.31	2.31
tblVehicleEF	LDA	280.76	282.08
tblVehicleEF	LDA	59.19	56.63
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.28
tblVehicleEF	LDA	2.8130e-003	2.7906e-003
tblVehicleEF	LDA	6.1400e-004	5.6038e-004
tblVehicleEF	LDA	0.04	0.06

tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.31
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.84	1.85
tblVehicleEF	LDT1	3.09	2.45
tblVehicleEF	LDT1	351.43	336.46
tblVehicleEF	LDT1	71.32	67.07
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.21	0.45

tblVehicleEF	LDT1	3.5380e-003	3.3294e-003
tblVehicleEF	LDT1	7.6700e-004	6.6374e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.24	0.49
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.01	0.08
tblVehicleEF	LDT1	1.99	2.01
tblVehicleEF	LDT1	2.62	2.08
tblVehicleEF	LDT1	366.73	349.70
tblVehicleEF	LDT1	71.32	66.31
tblVehicleEF	LDT1	0.15	0.14
tblVehicleEF	LDT1	0.16	0.28
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18

tblVehicleEF	LDT1	0.05	0.05
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.19	0.39
tblVehicleEF	LDT1	3.6940e-003	3.4605e-003
tblVehicleEF	LDT1	7.5900e-004	6.5619e-004
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.21	0.43
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.79	1.79
tblVehicleEF	LDT1	3.19	2.53
tblVehicleEF	LDT1	345.81	331.61
tblVehicleEF	LDT1	71.32	67.24
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003

tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.22	0.46
tblVehicleEF	LDT1	3.4810e-003	3.2814e-003
tblVehicleEF	LDT1	7.6900e-004	6.6538e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.24	0.50
tblVehicleEF	LDT2	7.8740e-003	6.3478e-003
tblVehicleEF	LDT2	7.2440e-003	0.08
tblVehicleEF	LDT2	0.90	1.24
tblVehicleEF	LDT2	1.49	2.87
tblVehicleEF	LDT2	395.42	367.68
tblVehicleEF	LDT2	80.68	73.77
tblVehicleEF	LDT2	0.09	0.12
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02

tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.10	0.38
tblVehicleEF	LDT2	3.9620e-003	3.6376e-003
tblVehicleEF	LDT2	8.3200e-004	7.3003e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.11	0.42
tblVehicleEF	LDT2	8.3450e-003	6.7606e-003
tblVehicleEF	LDT2	6.4440e-003	0.07
tblVehicleEF	LDT2	0.99	1.36
tblVehicleEF	LDT2	1.27	2.44
tblVehicleEF	LDT2	413.17	380.97
tblVehicleEF	LDT2	80.68	72.95
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.11	0.32
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003

tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.34
tblVehicleEF	LDT2	4.1400e-003	3.7691e-003
tblVehicleEF	LDT2	8.2800e-004	7.2192e-004
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LDT2	7.7190e-003	6.2197e-003
tblVehicleEF	LDT2	7.4150e-003	0.08
tblVehicleEF	LDT2	0.87	1.20
tblVehicleEF	LDT2	1.54	2.96
tblVehicleEF	LDT2	388.90	362.81
tblVehicleEF	LDT2	80.68	73.95
tblVehicleEF	LDT2	0.09	0.11

tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.39
tblVehicleEF	LDT2	3.8960e-003	3.5895e-003
tblVehicleEF	LDT2	8.3300e-004	7.3182e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.11	0.43
tblVehicleEF	LHD1	6.0120e-003	6.0724e-003
tblVehicleEF	LHD1	0.01	7.3245e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20

tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.04	1.27
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.09
tblVehicleEF	LHD1	34.52	13.36
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.05	0.84
tblVehicleEF	LHD1	1.07	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.29	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7874e-003

tblVehicleEF	LHD1	4.0200e-004	1.3218e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.32	0.11
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tblVehicleEF	LHD1	0.01	7.4711e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.96	0.87
tblVehicleEF	LHD1	2.90	1.21
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.11
tblVehicleEF	LHD1	34.52	13.25
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	0.98	0.79
tblVehicleEF	LHD1	1.03	0.36
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03

tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
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tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.28	0.09
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tblVehicleEF	LHD1	6.0270e-003	6.7877e-003
tblVehicleEF	LHD1	3.9900e-004	1.3115e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.31	0.10
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tblVehicleEF	LHD1	0.01	7.2867e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.06	1.28
tblVehicleEF	LHD1	8.91	8.98

tblVehicleEF	LHD1	612.93	694.08
tblVehicleEF	LHD1	34.52	13.37
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tblVehicleEF	LHD1	1.03	0.83
tblVehicleEF	LHD1	1.08	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.30	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7873e-003
tblVehicleEF	LHD1	4.0200e-004	1.3235e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11

tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD2	4.3410e-003	4.3356e-003
tblVehicleEF	LHD2	5.0230e-003	5.0611e-003
tblVehicleEF	LHD2	9.9030e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.58
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tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
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tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
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tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
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tblVehicleEF	LHD2	4.6500e-004	1.7440e-004

tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
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tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.13	0.07
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tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
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tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3451e-003
tblVehicleEF	LHD2	5.0980e-003	5.1274e-003
tblVehicleEF	LHD2	9.5540e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.40	0.58
tblVehicleEF	LHD2	1.44	0.84
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.38
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tblVehicleEF	LHD2	0.58	0.26
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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
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tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
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tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
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tblVehicleEF	LHD2	0.13	0.07
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tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
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tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
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tblVehicleEF	LHD2	0.39	0.57
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tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.50
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.75	1.09
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.02

tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
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tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
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tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	MCY	0.53	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.20	19.84
tblVehicleEF	MCY	9.64	8.48
tblVehicleEF	MCY	188.47	223.17
tblVehicleEF	MCY	44.88	60.40
tblVehicleEF	MCY	1.13	1.14
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003

tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	2.61	2.65
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.06	1.84
tblVehicleEF	MCY	2.2780e-003	2.2085e-003
tblVehicleEF	MCY	6.6700e-004	5.9774e-004
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	3.25	3.27
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.24	2.00
tblVehicleEF	MCY	0.52	0.38
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.48	19.07
tblVehicleEF	MCY	8.82	7.74
tblVehicleEF	MCY	188.47	221.70
tblVehicleEF	MCY	44.88	58.50
tblVehicleEF	MCY	0.99	0.99
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003

tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
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tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	2.55	2.58
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	1.84	1.63
tblVehicleEF	MCY	2.2640e-003	2.1939e-003
tblVehicleEF	MCY	6.4700e-004	5.7891e-004
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	3.17	3.18
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	2.00	1.77
tblVehicleEF	MCY	0.54	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.30	19.94
tblVehicleEF	MCY	9.78	8.61
tblVehicleEF	MCY	188.47	223.39
tblVehicleEF	MCY	44.88	60.73
tblVehicleEF	MCY	1.11	1.11

tblVehicleEF	MCY	0.31	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
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tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.16	1.20
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tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	2.62	2.66
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.10	1.88
tblVehicleEF	MCY	2.2800e-003	2.2106e-003
tblVehicleEF	MCY	6.7100e-004	6.0100e-004
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	3.26	3.28
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.29	2.05
tblVehicleEF	MDV	0.02	9.2696e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.56	1.64
tblVehicleEF	MDV	2.79	3.50

tblVehicleEF	MDV	528.65	449.45
tblVehicleEF	MDV	106.35	89.79
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.25	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.04	0.05
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.22	0.50
tblVehicleEF	MDV	5.2990e-003	4.4442e-003
tblVehicleEF	MDV	1.1130e-003	8.8857e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.24	0.54
tblVehicleEF	MDV	0.02	9.7459e-003

tblVehicleEF	MDV	0.01	0.09
tblVehicleEF	MDV	1.69	1.77
tblVehicleEF	MDV	2.39	2.98
tblVehicleEF	MDV	551.85	463.58
tblVehicleEF	MDV	106.35	88.78
tblVehicleEF	MDV	0.15	0.14
tblVehicleEF	MDV	0.23	0.39
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
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tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.19	0.44
tblVehicleEF	MDV	5.5330e-003	4.5840e-003
tblVehicleEF	MDV	1.1050e-003	8.7855e-004
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.06	0.06

tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.21	0.48
tblVehicleEF	MDV	0.01	9.1128e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.52	1.59
tblVehicleEF	MDV	2.88	3.61
tblVehicleEF	MDV	520.14	444.29
tblVehicleEF	MDV	106.35	90.01
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.26	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.22	0.51
tblVehicleEF	MDV	5.2130e-003	4.3931e-003
tblVehicleEF	MDV	1.1140e-003	8.9074e-004
tblVehicleEF	MDV	0.07	0.09

tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.24	0.56
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	2.77	1.93
tblVehicleEF	MH	6.41	2.41
tblVehicleEF	MH	1,135.33	1,557.81
tblVehicleEF	MH	61.01	20.79
tblVehicleEF	MH	1.17	1.25
tblVehicleEF	MH	0.85	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.36	0.11

tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0577e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.85	1.97
tblVehicleEF	MH	6.02	2.27
tblVehicleEF	MH	1,135.33	1,557.88
tblVehicleEF	MH	61.01	20.56
tblVehicleEF	MH	1.07	1.15
tblVehicleEF	MH	0.82	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62

tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.35	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.1500e-004	2.0342e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.15	0.11
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.38	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	2.74	1.92
tblVehicleEF	MH	6.46	2.43
tblVehicleEF	MH	1,135.33	1,557.79
tblVehicleEF	MH	61.01	20.83
tblVehicleEF	MH	1.15	1.22
tblVehicleEF	MH	0.86	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004

tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.37	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0615e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MHD	0.02	4.4568e-003
tblVehicleEF	MHD	5.7010e-003	9.4687e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.39	0.40
tblVehicleEF	MHD	0.42	0.87
tblVehicleEF	MHD	6.85	1.61
tblVehicleEF	MHD	131.02	70.09
tblVehicleEF	MHD	1,155.79	1,129.05
tblVehicleEF	MHD	65.08	12.73
tblVehicleEF	MHD	0.52	0.62
tblVehicleEF	MHD	1.23	2.74
tblVehicleEF	MHD	9.82	1.00
tblVehicleEF	MHD	2.8600e-004	2.2441e-003

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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.7300e-004	2.1470e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.2630e-003	6.6609e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7100e-004	1.2593e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	MHD	0.02	4.2175e-003

tblVehicleEF	MHD	5.7940e-003	9.5490e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.28	0.31
tblVehicleEF	MHD	0.43	0.88
tblVehicleEF	MHD	6.50	1.53
tblVehicleEF	MHD	138.77	71.71
tblVehicleEF	MHD	1,155.79	1,129.06
tblVehicleEF	MHD	65.08	12.59
tblVehicleEF	MHD	0.53	0.63
tblVehicleEF	MHD	1.16	2.58
tblVehicleEF	MHD	9.78	0.99
tblVehicleEF	MHD	2.4100e-004	1.8940e-003
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.3000e-004	1.8121e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.16

tblVehicleEF	MHD	0.40	0.07
tblVehicleEF	MHD	1.3360e-003	6.8157e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.6500e-004	1.2455e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.06	0.18
tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.44	0.08
tblVehicleEF	MHD	0.02	4.7993e-003
tblVehicleEF	MHD	5.6760e-003	9.4448e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.53	0.51
tblVehicleEF	MHD	0.42	0.86
tblVehicleEF	MHD	6.91	1.63
tblVehicleEF	MHD	120.30	67.85
tblVehicleEF	MHD	1,155.79	1,129.04
tblVehicleEF	MHD	65.08	12.75
tblVehicleEF	MHD	0.49	0.61
tblVehicleEF	MHD	1.21	2.69
tblVehicleEF	MHD	9.83	1.00
tblVehicleEF	MHD	3.4800e-004	2.7274e-003
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07

tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	3.3300e-004	2.6095e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.1630e-003	6.4466e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7200e-004	1.2619e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.04
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
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tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	OBUS	0.01	9.0528e-003
tblVehicleEF	OBUS	8.8720e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.29	0.61

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tblVehicleEF	OBUS	1.73	2.50
tblVehicleEF	OBUS	2.63	0.62
tblVehicleEF	OBUS	2.0400e-004	3.3787e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	1.9500e-004	3.2325e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
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tblVehicleEF	OBUS	7.7800e-004	9.3362e-004
tblVehicleEF	OBUS	0.07	0.14
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tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	1.0790e-003	9.3986e-004
tblVehicleEF	OBUS	0.01	0.01

tblVehicleEF	OBUS	7.8400e-004	1.9655e-004
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tblVehicleEF	OBUS	7.7800e-004	9.3362e-004
tblVehicleEF	OBUS	0.08	0.18
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tblVehicleEF	OBUS	0.39	0.13
tblVehicleEF	OBUS	0.01	9.0475e-003
tblVehicleEF	OBUS	9.0250e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.27	0.57
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tblVehicleEF	OBUS	117.45	100.02
tblVehicleEF	OBUS	1,266.65	1,458.61
tblVehicleEF	OBUS	68.32	19.62
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tblVehicleEF	OBUS	2.59	0.61
tblVehicleEF	OBUS	1.7200e-004	2.8530e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
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tblVehicleEF	OBUS	1.6400e-004	2.7296e-003
tblVehicleEF	OBUS	0.06	0.06

tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
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tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
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tblVehicleEF	OBUS	1.1010e-003	1.3226e-003
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tblVehicleEF	OBUS	0.05	0.09
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tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
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tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
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tblVehicleEF	OBUS	7.8500e-004	1.9702e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
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tblVehicleEF	SBUS	0.03	0.03
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tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
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tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.3445e-003
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tblVehicleEF	SBUS	6.6600e-004	4.6882e-005
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tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
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tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	8.0370e-003
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tblVehicleEF	SBUS	10.22	3.51

tblVehicleEF	SBUS	4.29	5.17
tblVehicleEF	SBUS	12.39	0.77
tblVehicleEF	SBUS	9.0250e-003	4.3047e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	8.6350e-003	4.1185e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.35	0.03
tblVehicleEF	SBUS	0.01	3.4320e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.4200e-004	4.4468e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	1.39	0.40
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.13	0.13

tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.38	0.03
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9268e-003
tblVehicleEF	SBUS	0.07	5.7268e-003
tblVehicleEF	SBUS	8.21	2.53
tblVehicleEF	SBUS	0.78	0.66
tblVehicleEF	SBUS	7.78	0.81
tblVehicleEF	SBUS	1,065.38	338.18
tblVehicleEF	SBUS	1,088.61	1,142.39
tblVehicleEF	SBUS	53.57	4.78
tblVehicleEF	SBUS	9.47	3.32
tblVehicleEF	SBUS	4.47	5.39
tblVehicleEF	SBUS	12.43	0.77
tblVehicleEF	SBUS	0.01	6.1938e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	5.9258e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	0.97	0.28

tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.2238e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.7000e-004	4.7323e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	1.40	0.41
tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.44	0.04
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.79	42.44
tblVehicleEF	UBUS	8.90	0.71
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.66
tblVehicleEF	UBUS	10.68	1.20
tblVehicleEF	UBUS	15.66	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03

tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0860e-003	8.5721e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	3.79	6.37
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.73	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.84	42.44
tblVehicleEF	UBUS	7.71	0.62
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.52
tblVehicleEF	UBUS	10.07	1.20
tblVehicleEF	UBUS	15.61	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03

tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	0.91	0.15
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.61	0.04
tblVehicleEF	UBUS	9.9300e-003	1.5961e-003
tblVehicleEF	UBUS	1.0650e-003	8.4268e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	3.80	6.37
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.77	42.44
tblVehicleEF	UBUS	9.11	0.72
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.69
tblVehicleEF	UBUS	10.47	1.20

tblVehicleEF	UBUS	15.67	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0900e-003	8.6004e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	3.78	6.37
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.75	0.05
tblVehicleTrips	CC_TL	8.40	7.30
tblVehicleTrips	CC_TL	8.40	7.30
tblVehicleTrips	CNW_TL	6.90	7.30
tblVehicleTrips	CNW_TL	6.90	7.30

tblVehicleTrips	CW_TL	16.60	9.50
tblVehicleTrips	CW_TL	16.60	9.50
tblVehicleTrips	ST_TR	22.75	1.96
tblVehicleTrips	ST_TR	2.46	1.96
tblVehicleTrips	SU_TR	16.74	2.19
tblVehicleTrips	SU_TR	1.05	2.19
tblVehicleTrips	WD_TR	1.89	0.78
tblVehicleTrips	WD_TR	11.03	0.78
tblWater	OutdoorWaterUseRate	599,315,118.88	0.00

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					
2020	3.3726	33.2422	22.2141	0.0400	0.1232	1.6598	1.7830	0.0327	1.5428	1.5755	0.0000	3,870.6523	3,870.6523	1.0619	0.0000	3,897.1997
2022	3.2335	33.1236	20.1647	0.0394	18.2141	1.6138	19.8279	9.9699	1.4847	11.4546	0.0000	3,823.8963	3,823.8963	1.1960	0.0000	3,853.7965
2023	3.3880	34.5559	28.5278	0.0636	2,471.8498	1.4258	2,473.2755	269.5876	1.3117	270.8993	0.0000	6,159.0262	6,159.0262	1.9481	0.0000	6,207.7286
2027	33.9269	272.6953	260.8646	1.5015	99.9212	1.3435	101.2647	27.0548	1.2575	28.3124	0.0000	156,340.2157	156,340.2157	6.9537	0.0000	156,514.0577
2062	1.0112	3.6566	15.8177	0.0281	0.1071	0.1164	0.2235	0.0263	0.1164	0.1427	0.0000	2,656.5168	2,656.5168	0.0893	0.0000	2,658.7489
2065	92.8149	0.7270	1.7923	2.9700e-003	13.1436	7.4300e-003	13.1511	3.2262	7.4300e-003	3.2336	0.0000	281.4481	281.4481	9.9000e-003	0.0000	281.6957
Maximum	**92.8149**	**272.6953**	**260.8646**	**1.5015**	**2,471.8498**	**1.6598**	**2,473.2755**	**269.5876**	**1.5428**	**270.8993**	**0.0000**	**156,340.2157**	**156,340.2157**	**6.9537**	**0.0000**	**156,514.0577**

2.1 Overall Construction (Maximum Daily Emission)

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					
2020	3.3726	33.2422	22.2141	0.0400	0.1232	1.6598	1.7830	0.0327	1.5428	1.5755	0.0000	3,870.6523	3,870.6523	1.0619	0.0000	3,897.1997
2022	3.2335	33.1236	20.1647	0.0394	18.2141	1.6138	19.8279	9.9699	1.4847	11.4546	0.0000	3,823.8963	3,823.8963	1.1960	0.0000	3,853.7965
2023	3.3880	34.5559	28.5278	0.0636	2,471.8498	1.4258	2,473.2755	269.5876	1.3117	270.8993	0.0000	6,159.0262	6,159.0262	1.9481	0.0000	6,207.7286
2027	33.9269	272.6953	260.8646	1.5015	99.9212	1.3435	101.2647	27.0548	1.2575	28.3124	0.0000	156,340.2157	156,340.2157	6.9537	0.0000	156,514.0577
2062	1.0112	3.6566	15.8177	0.0281	0.1071	0.1164	0.2235	0.0263	0.1164	0.1427	0.0000	2,656.5168	2,656.5168	0.0893	0.0000	2,658.7489
2065	92.8149	0.7270	1.7923	2.9700e-003	13.1436	7.4300e-003	13.1511	3.2262	7.4300e-003	3.2336	0.0000	281.4481	281.4481	9.9000e-003	0.0000	281.6957
Maximum	**92.8149**	**272.6953**	**260.8646**	**1.5015**	**2,471.8498**	**1.6598**	**2,473.2755**	**269.5876**	**1.5428**	**270.8993**	**0.0000**	**156,340.2157**	**156,340.2157**	**6.9537**	**0.0000**	**156,514.0577**

	ROG	NOx	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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Energy	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Mobile	4.0980	3.8191	28.4744	0.0520	4.9730	0.0591	5.0321	1.3246	0.0553	1.3799		5,293.4442	5,293.4442	0.4462		5,304.6001
Total	**5.3432**	**3.8252**	**28.5309**	**0.0520**	**4.9730**	**0.0597**	**5.0327**	**1.3246**	**0.0559**	**1.3805**		**5,300.2654**	**5,300.2654**	**0.4467**	**1.2000e-004**	**5,311.4686**

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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Energy	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Mobile	4.0980	3.8191	28.4744	0.0520	4.9730	0.0591	5.0321	1.3246	0.0553	1.3799		5,293.4442	5,293.4442	0.4462		5,304.6001
Total	**5.3432**	**3.8252**	**28.5309**	**0.0520**	**4.9730**	**0.0597**	**5.0327**	**1.3246**	**0.0559**	**1.3805**		**5,300.2654**	**5,300.2654**	**0.4467**	**1.2000e-004**	**5,311.4686**

	ROG	NOx	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	Demolition	Demolition	1/1/2020	1/1/2020	5	1	
2	Site Preparation	Site Preparation	4/20/2022	4/20/2022	5	1	
3	Grading	Grading	9/6/2023	9/6/2023	5	1	
4	Building Construction	Building Construction	3/31/2027	3/31/2027	5	1	
5	Paving	Paving	11/22/2062	11/22/2062	5	1	
6	Architectural Coating	Architectural Coating	6/3/2065	6/3/2065	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2325

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 6,000; Non-Residential Outdoor: 2,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	9,203.00	3,591.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1,841.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**		**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

3.2 Demolition - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0604	0.0412	0.4609	1.2300e-003	0.1232	1.0600e-003	0.1243	0.0327	9.7000e-004	0.0337		122.9474	122.9474	3.9500e-003		123.0461
Total	**0.0604**	**0.0412**	**0.4609**	**1.2300e-003**	**0.1232**	**1.0600e-003**	**0.1243**	**0.0327**	**9.7000e-004**	**0.0337**		**122.9474**	**122.9474**	**3.9500e-003**		**123.0461**

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	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**	**0.0000**	**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

3.2 Demolition - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0604	0.0412	0.4609	1.2300e-003	0.1232	1.0600e-003	0.1243	0.0327	9.7000e-004	0.0337		122.9474	122.9474	3.9500e-003		123.0461
Total	**0.0604**	**0.0412**	**0.4609**	**1.2300e-003**	**0.1232**	**1.0600e-003**	**0.1243**	**0.0327**	**9.7000e-004**	**0.0337**		**122.9474**	**122.9474**	**3.9500e-003**		**123.0461**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**18.0663**	**1.6126**	**19.6788**	**9.9307**	**1.4836**	**11.4143**		**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0634	0.0401	0.4670	1.3800e-003	0.1479	1.1900e-003	0.1491	0.0392	1.0900e-003	0.0403		137.8344	137.8344	3.8600e-003		137.9309
Total	**0.0634**	**0.0401**	**0.4670**	**1.3800e-003**	**0.1479**	**1.1900e-003**	**0.1491**	**0.0392**	**1.0900e-003**	**0.0403**		**137.8344**	**137.8344**	**3.8600e-003**		**137.9309**

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836	0.0000	3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**18.0663**	**1.6126**	**19.6788**	**9.9307**	**1.4836**	**11.4143**	**0.0000**	**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0634	0.0401	0.4670	1.3800e-003	0.1479	1.1900e-003	0.1491	0.0392	1.0900e-003	0.0403		137.8344	137.8344	3.8600e-003		137.9309
Total	**0.0634**	**0.0401**	**0.4670**	**1.3800e-003**	**0.1479**	**1.1900e-003**	**0.1491**	**0.0392**	**1.0900e-003**	**0.0403**		**137.8344**	**137.8344**	**3.8600e-003**		**137.9309**

3.4 Grading - 2023

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					2,471.6855	0.0000	2,471.6855	269.5440	0.0000	269.5440			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105		6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**2,471.6855**	**1.4245**	**2,473.1100**	**269.5440**	**1.3105**	**270.8546**		**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.4 Grading - 2023

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0662	0.0403	0.4766	1.4800e-003	0.1643	1.2800e-003	0.1656	0.0436	1.1800e-003	0.0448		147.5485	147.5485	3.8600e-003		147.6450
Total	**0.0662**	**0.0403**	**0.4766**	**1.4800e-003**	**0.1643**	**1.2800e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**147.5485**	**147.5485**	**3.8600e-003**		**147.6450**

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					2,471.6855	0.0000	2,471.6855	269.5440	0.0000	269.5440			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105	0.0000	6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**2,471.6855**	**1.4245**	**2,473.1100**	**269.5440**	**1.3105**	**270.8546**	**0.0000**	**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.4 Grading - 2023

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0662	0.0403	0.4766	1.4800e-003	0.1643	1.2800e-003	0.1656	0.0436	1.1800e-003	0.0448		147.5485	147.5485	3.8600e-003		147.6450
Total	**0.0662**	**0.0403**	**0.4766**	**1.4800e-003**	**0.1643**	**1.2800e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**147.5485**	**147.5485**	**3.8600e-003**		**147.6450**

3.5 Building Construction - 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	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

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	7.5085	247.1141	79.3309	0.8820	24.3207	0.2957	24.6164	7.0021	0.2826	7.2847		94,685.2576	94,685.2576	5.1078		94,812.9522
Worker	25.0511	13.1115	165.4491	0.5925	75.6005	0.5202	76.1207	20.0528	0.4787	20.5314		59,098.4838	59,098.4838	1.2449		59,129.6073
Total	**32.5595**	**260.2256**	**244.7800**	**1.4746**	**99.9212**	**0.8159**	**100.7371**	**27.0548**	**0.7613**	**27.8161**		**153,783.7414**	**153,783.7414**	**6.3527**		**153,942.5596**

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	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

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	7.5085	247.1141	79.3309	0.8820	24.3207	0.2957	24.6164	7.0021	0.2826	7.2847		94,685.2576	94,685.2576	5.1078		94,812.9522
Worker	25.0511	13.1115	165.4491	0.5925	75.6005	0.5202	76.1207	20.0528	0.4787	20.5314		59,098.4838	59,098.4838	1.2449		59,129.6073
Total	**32.5595**	**260.2256**	**244.7800**	**1.4746**	**99.9212**	**0.8159**	**100.7371**	**27.0548**	**0.7613**	**27.8161**		**153,783.7414**	**153,783.7414**	**6.3527**		**153,942.5596**

3.6 Paving - 2062

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	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164		2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**		**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2062

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1071	0.0000	0.1071	0.0263	0.0000	0.0263			0.0000			0.0000
Total					**0.1071**	**0.0000**	**0.1071**	**0.0263**	**0.0000**	**0.0263**			**0.0000**			**0.0000**

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	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164	0.0000	2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**	**0.0000**	**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2062

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1071	0.0000	0.1071	0.0263	0.0000	0.0263			0.0000			0.0000
Total					**0.1071**	**0.0000**	**0.1071**	**0.0263**	**0.0000**	**0.0263**			**0.0000**			**0.0000**

3.7 Architectural Coating - 2065

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					
Archit. Coating	92.7000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003		281.4481	281.4481	9.9000e-003		281.6957
Total	**92.8149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**		**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2065

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					13.1436	0.0000	13.1436	3.2262	0.0000	3.2262			0.0000			0.0000
Total					**13.1436**	**0.0000**	**13.1436**	**3.2262**	**0.0000**	**3.2262**			**0.0000**			**0.0000**

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					
Archit. Coating	92.7000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.0000	281.4481	281.4481	9.9000e-003		281.6957
Total	**92.8149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.0000**	**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2065

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					13.1436	0.0000	13.1436	3.2262	0.0000	3.2262			0.0000			0.0000
Total					**13.1436**	**0.0000**	**13.1436**	**3.2262**	**0.0000**	**3.2262**			**0.0000**			**0.0000**

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	4.0980	3.8191	28.4744	0.0520	4.9730	0.0591	5.0321	1.3246	0.0553	1.3799		5,293.4442	5,293.4442	0.4462		5,304.6001
Unmitigated	4.0980	3.8191	28.4744	0.0520	4.9730	0.0591	5.0321	1.3246	0.0553	1.3799		5,293.4442	5,293.4442	0.4462		5,304.6001

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	392.34	985.88	1101.57	1,234,906	1,234,906
General Office Building	1.56	3.92	4.38	5,496	5,496
Total	393.90	989.80	1,105.95	1,240,402	1,240,402

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
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455
General Office Building	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455

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	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
NaturalGas Unmitigated	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	57.0411	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Total		**6.2000e-004**	**5.5900e-003**	**4.7000e-003**	**3.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.3000e-004**	**4.3000e-004**		**6.7107**	**6.7107**	**1.3000e-004**	**1.2000e-004**	**6.7506**

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	0.0570411	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Total		**6.2000e-004**	**5.5900e-003**	**4.7000e-003**	**3.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.3000e-004**	**4.3000e-004**		**6.7107**	**6.7107**	**1.3000e-004**	**1.2000e-004**	**6.7506**

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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Unmitigated	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179

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	0.0254					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2143					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.8300e-003	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Total	**1.2446**	**4.7000e-004**	**0.0518**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1105**	**0.1105**	**2.9000e-004**		**0.1179**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0254					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2143					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.8300e-003	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Total	**1.2446**	**4.7000e-004**	**0.0518**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1105**	**0.1105**	**2.9000e-004**		**0.1179**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

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 C
Biological Resources

ESA

Supplemental Biological Surveys and Mapping for the Los Cerritos Wetlands

Prepared by:

Coastal Restoration Consultants

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Ventura, CA 93003

Prepared for:

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April 2020

SECTION 1. INTRODUCTION

This report contains detailed information about some of the existing biological and jurisdictional resources within the Los Cerritos Wetlands (LCW) program area. The entire LCW complex includes some areas that were not mapped, specifically the Southern and Northern Synergy Oil Field Site properties and most of the Pumpkin Patch Site (Figure 1). Information was collected in order to supplement other studies, especially the Los Cerritos Wetlands Conceptual Restoration Plan (CRP). The scope of these supplemental efforts was focused on filling specific data gaps, updating and supplementing previous studies (Tidal Influence 2012, City of Long Beach 2017), and updating mapping to be more consistent with recent agency guidance.

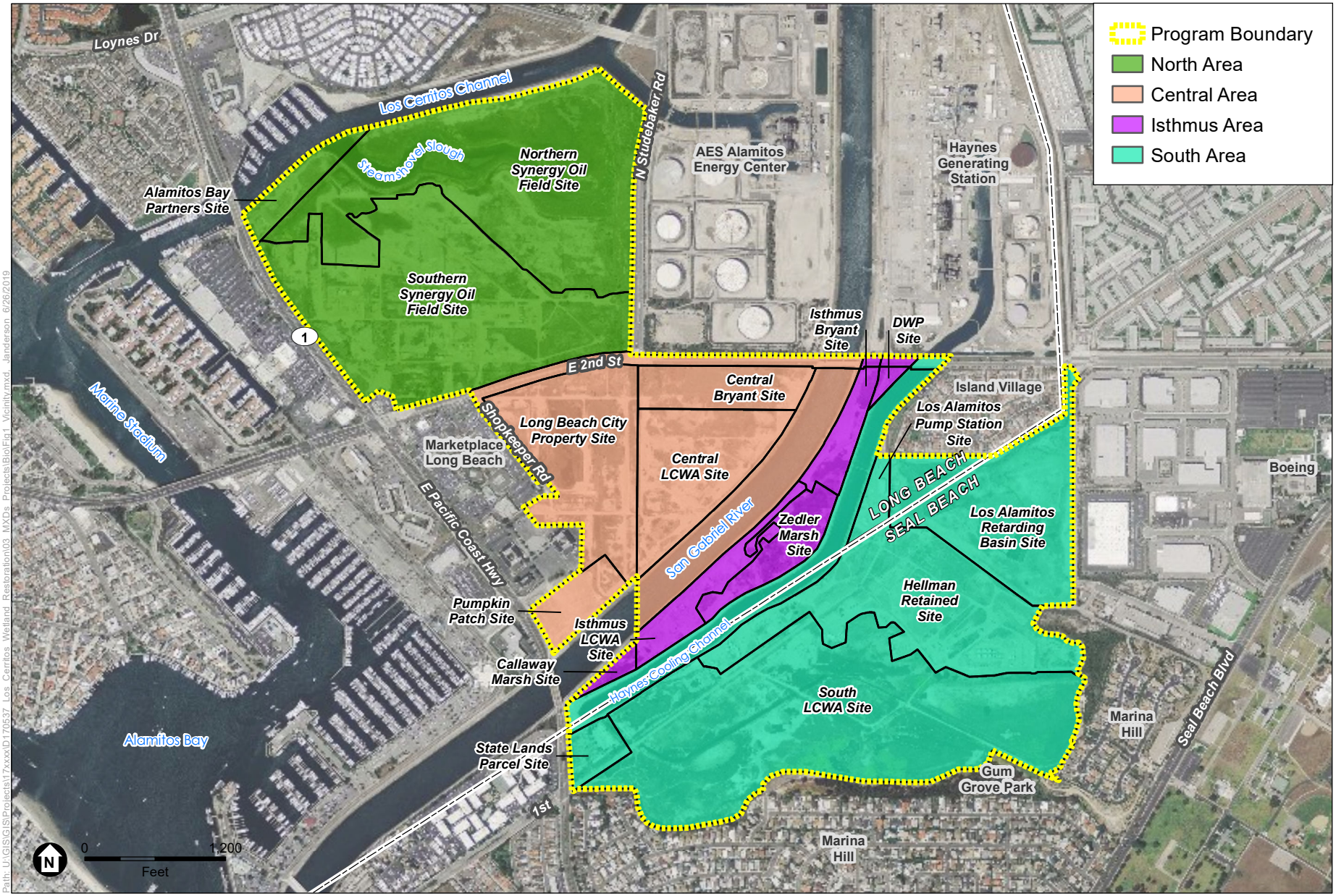
1.1 Methods

Large areas of the program area were accessible (Figure 2) and were surveyed on foot by CRC Principal Biologists Dave Hubbard and Matt James in Spring 2018 (Figure 3). Some of the inaccessible areas (Figure 2) were mapped using aerial photos, data contained in previous studies (*see* Tidal Influence 2012), and in limited cases, looking through fences. Mapping was done in the field using printed high-resolution aerial photos and hand-held GPS units.

The supplemental information in this report includes mapping of vegetation by community type along with other land cover types, likely jurisdictional wetlands and waters, California Coastal Commission (CCC) Environmentally Sensitive Habitat Areas (ESHA), and distributions of a few special status annual plants. Opportunistic observations of birds allowed for the expansion of the species list for the sites as well. The mapping of likely jurisdictional wetlands and waters was based primarily on vegetation patterns and observations of hydrologic indicators in the field. A formal jurisdictional delineation was not completed (one will be needed later in the planning process), but rather an attempt to estimate likely jurisdictional areas and acreages to assist in the restoration planning and environmental review process. The ESHA mapping includes areas that are likely jurisdictional and areas that were determined to support special status species. More details on methods as they relate to the different surveys and mapping efforts can be found in the introductory material for those sections below.

1.2 Summary of findings

The following overview provides general descriptions of the four geographic areas of the program area and general results of the field studies, especially in how they pertain to developing restoration priorities and actions. This should provide context and background for readers unfamiliar with the program area. This summary includes rough acreages for various mapping activities; the following sections should be consulted for more detailed and complete data. The remaining sections of this report also provide detailed methods and discussions of the field studies and are written to more directly support environmental review and permitting.



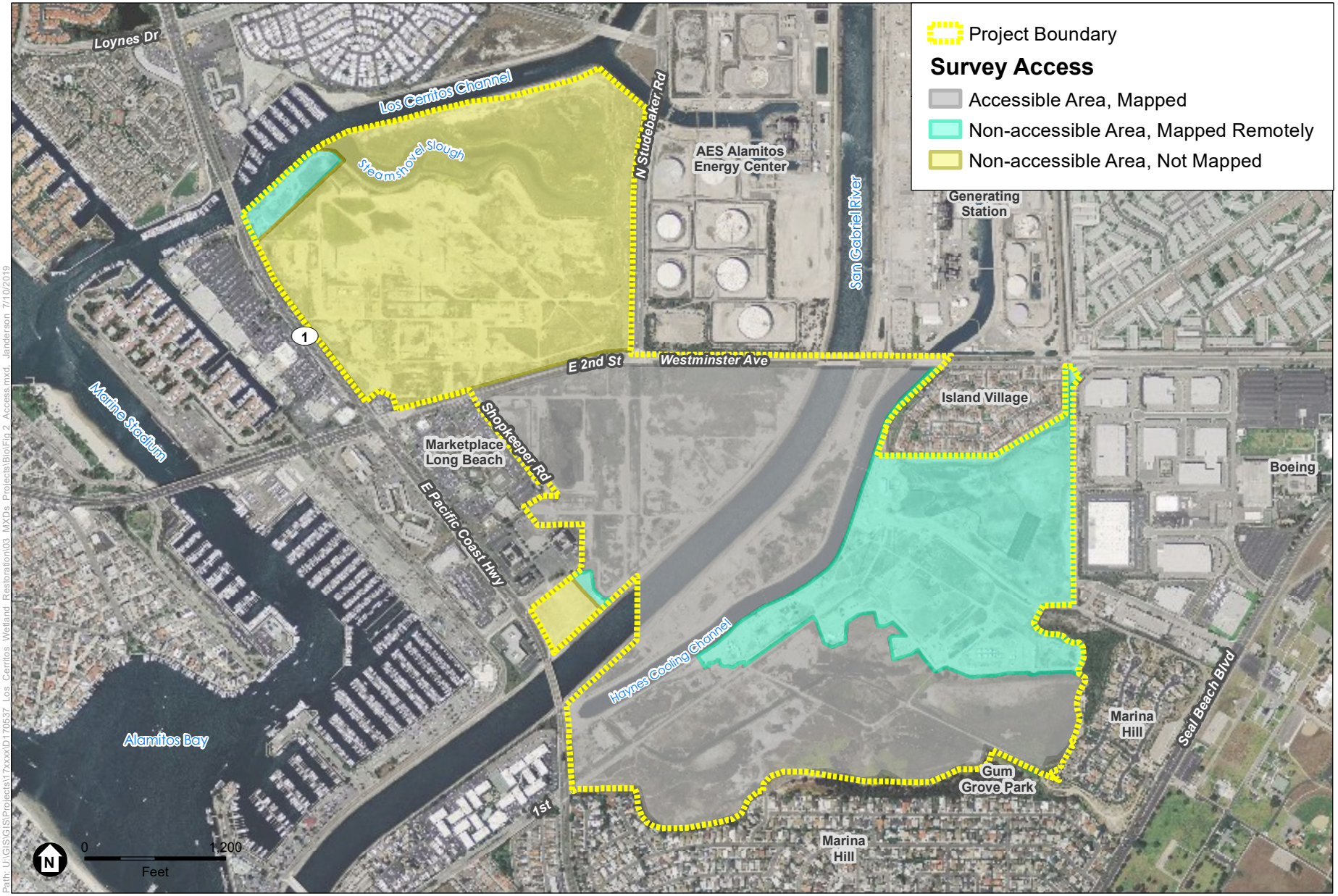
SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 1

Project Site and Local Vicinity

ESA



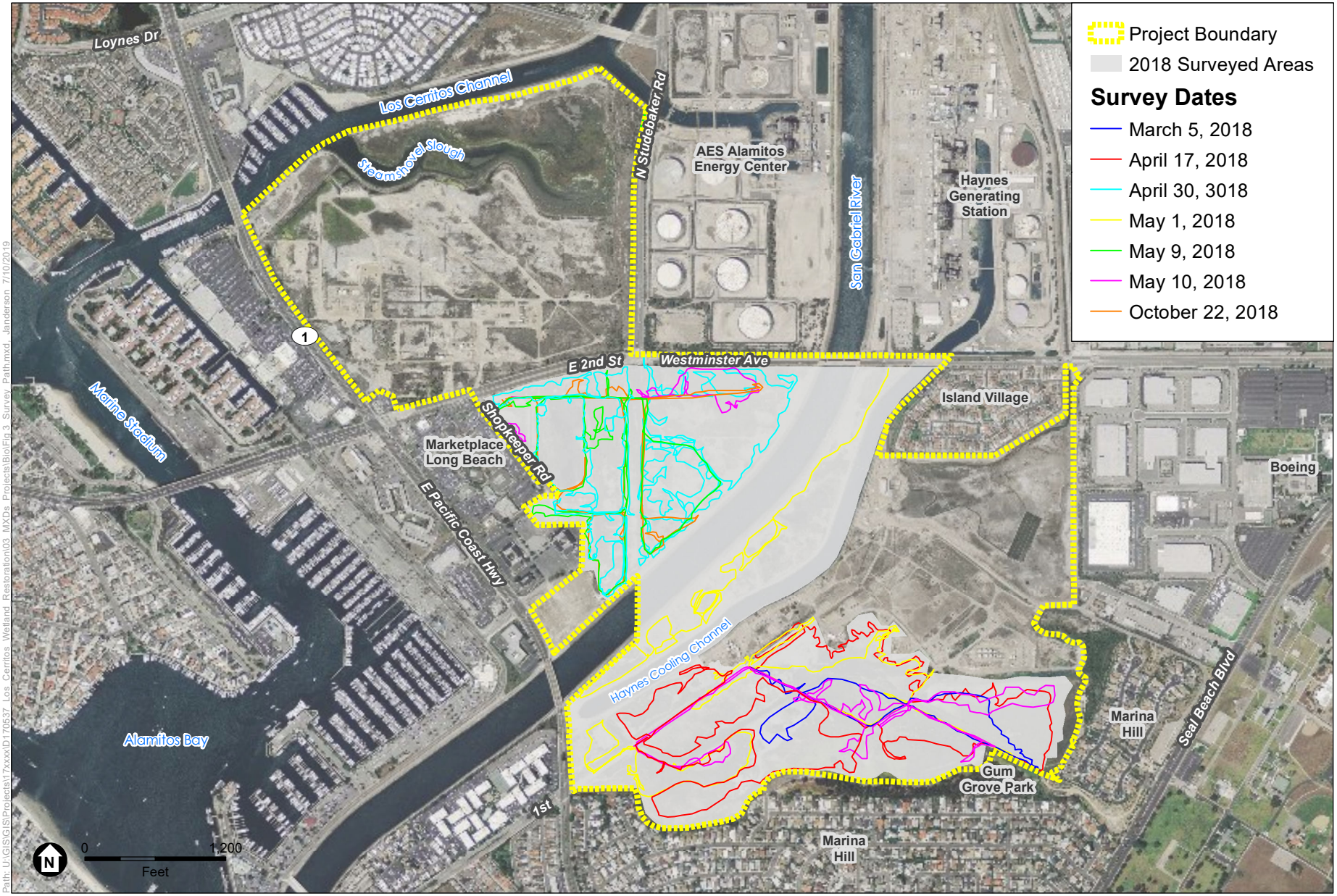
SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 2

Field Mapping Survey Access

ESA



SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 3

Field Mapping Survey Paths

ESA

For planning purposes, the program area is divided into Southern, Central and Isthmus areas consistent with the rest of the Program Environmental Impact Report (PEIR) (Figure 1). In addition, there is a short description of a parcel in the northern area of the site (North), Los Alamitos Bay Partners, which was not surveyed on the ground by CRC, for which data was obtained remotely. The program area has a long and complicated land use history. Readers are referred to the CRP (Moffat and Nichol 2015) for descriptions of land ownership and land use practices within these different areas.

South Area

The South area extends over about 207 acres, approximately 93 of which are mostly unvegetated due to development or regular mowing and disking. Vegetated areas are mostly weedy uplands (57 acres) or tidal and non-tidal pickleweed (*Salicornia pacifica)* wetland (20 acres). Weedy upland areas are generally dominated by non-native invasive plant species (mustards, grasses, ice plants, and in some areas, weedy species tolerant of salty soils). Likely jurisdictional wetlands and waters and potential Environmentally Sensitive Habitat Areas (ESHA) cover about 25% of the South area (about 54 and 60 acres respectively), though more of these types of areas may occur in areas that were not surveyed (Figure 2).

The South area supports the largest expanse of tidally influenced wetlands within the surveyed areas. Tidewater enters the site via a culvert from the San Gabriel River and flows through tidal channels and inundates mud flat, salt marsh and salt flat habitats. The intertidal areas support a wide range of native salt marsh plants, invertebrates, birds and a breeding population of the state-endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*).

Potential for wetland restoration is very high in the South area. About 70% of the area is heavily disturbed or developed upland (70 acres), managed for fuel breaks (23 acres), or weedy upland (57 acres). There are opportunities for: 1) improving hydrology by removing impediments to tidal flow in order to increase the tide range, 2) removing fill (including contaminated soil) to increase the area of tidal influence, 3) ecological restoration to increase native plant cover and habitat values for fish, invertebrates, and wildlife (especially birds), 4) converting low ecological functioning uplands to high-functioning wetlands, 5) restoring transition and upland habitats adjacent to tidal wetlands, and 6) building in long-term adaptation to sea level rise (because of the presence of large relief slopes at the site).

Isthmus Area

The Isthmus area is long and narrow with a relatively small total area (about 27 acres). It is highly constrained by complex ownership, flood control structures (the San Gabriel River levee), and other human-made features including the Haynes Cooling Channel, roadways, oil operations, and fuel breaks around oil operations (Figure 1). About one third of the Isthmus (9 acres) is developed (roads and oil operations). The vegetated portions of the site are somewhat fragmented and include mainly restoration/mitigation areas (6.1 acres), pickleweed marsh (4.8 acres), and weedy upland dominated by five-horn smotherweed (*Bassia hyssopifolia)* (1.9 acres). Other intertidal habitats occur adjacent to the pickleweed marsh and are supported by limited tidal flows delivered via culverts from the San Gabriel River. There are about 11 acres of likely wetlands and waters and almost 18 acres of potential ESHA in the Isthmus area. The rare annual

species southern tarplant (*Centromadia parryi* ssp. *australis*) is prevalent throughout the Isthmus area.

Potential for wetland restoration is good due to the presence of soils that would likely support wetlands with minor grading and hydrologic improvements, but acreage and landscape diversity is limited compared to other areas within LCW complex. There are opportunities for: 1) improving hydrology (removal of impediments to tidal flow and fuller tide range), 2) increasing native plant cover, fish and invertebrate habitat, and bird foraging area through increased tidal action, 3) decreasing cover of weedy plants by increasing inundation and salinity to favor natives, 4) improving transition and upland habitats adjacent to tidal wetlands (restoration is already in progress).

Central Area

The Central area is a relatively large area (about 95 acres) with a low relief landscape divided into shallow basins by roads, berms and pipeline corridors. Oil extraction infrastructure and fuel breaks limit the amount of vegetation to about 19 acres of the Central area. The most widespread vegetation types on site are wetlands dominated by pickleweed (27 acres) and salt grass (*Distichlis spicata*) (10 acres) and uplands dominated by non-native annual grasses (4 acres). The wetland communities are probably relatively high in salinity but are non-tidal. They are mostly supported by rainfall and perhaps a shallow watertable. A brackish marsh on site dominated by California bulrush (*Schoenoplectus californicus*) and cattail (*Typha* spp.) is fed by runoff from adjacent properties and covers about four acres.

The Central area supports about 69 acres of likely wetlands and waters and potential ESHA (73% of the area). The existing brackish marsh at the northwestern portion of the area provides habitat and nesting areas for many bird species. Seasonal (non-tidal) wetlands in the topographic basins currently support shorebirds, waterfowl, herons, and egrets in good rain years. A very small area at the south end of the site receives high tide flows of seawater during spring tides. Non-tidal pickleweed habitat provides many wetland functions, but it is not usually ideal for nesting Belding's savannah sparrow and we did not observe them during our fieldwork in the area.

Potential for wetland restoration is very high in the Central area despite the existing high ratio of wetlands, waters and ESHA to weedy uplands and developed areas. Restoration actions could substantially improve the functioning of existing sensitive areas in the Central area. There are opportunities for: 1) improving hydrology (*e.g.,* introduction of tidal flow to large portions of the site, increasing the area of seasonal wetlands, or managed hydrology), 2) increasing native plant cover and fish, invertebrate, and bird habitat through increased tidal action or seasonal ponding, 3) converting low functioning uplands to wetlands through removal of fill and hydrologic improvements, and 4) restoring transition and upland habitats adjacent to tidal wetlands that can also provide resilience as sea level rises.

North Area

The assessment of the North area was limited to one small parcel (about six acres) that was not accessible during fieldwork. Interpretation of aerial photographs suggested that vegetation was composed mostly of weedy non-native annual species like five-horn smotherweed (1.6 acres) with some pickleweed (one acre) and non-native ornamental plants (0.3 acres). About 2.2 acres of the parcel were developed. No jurisdictional or ESHA assessment was performed for this site, but based on vegetation patterns it seems likely that areas supporting pickleweed, five-

horn smotherweed (both potential wetland indicators), or showing signs of occasional flooding might be considered to be jurisdictional and/or ESHA.

Potential for wetland restoration in this small portion of the North area is moderate, but acreage and landscape diversity are limited at this site. There are opportunities for: 1) improving hydrology (*e.g.*, removal of impediments to tidal flow), 2) increasing native plant cover and enhancing fish, invertebrate, and bird habitat through increased tidal action, and 3) decreasing cover of weedy plants by increasing inundation and salinity to favor natives. Hydrologic and ecological connectivity to adjacent sites may be important considerations as the site lies between tidal waters and low-lying non-tidal areas.

SECTION 2. VEGETATION ALLIANCES AND LAND COVER TYPES

This section lists the categories used for mapping vegetation and other land cover types within parts of the LCW program area. CRC biologists conducted mapping of vegetation associations and other land cover types in accessible parts of the program area (Figure 3) in spring 2018. The information on the dominant vegetation and other cover classes was used in assessing wetland and ESHA status.

The mapped area is a complicated mosaic with multiple parcels divided by channelized tidal waterways and roads. It supports oil production, open space, and related land management and restoration activities. Overall, the mapped area includes more than 50 acres of open water, 78 acres likely to be considered as wetland by at least some agencies plus 12 acres of tidal salt marsh and salt flats, 8 acres of upland with native species dominant, 68 acres of weedy upland habitat, 17 acres under restoration, and 37 acres of disturbed or managed upland. Figure 4 presents the final mapping and Table 1 presents the total acreages for each mapping category.

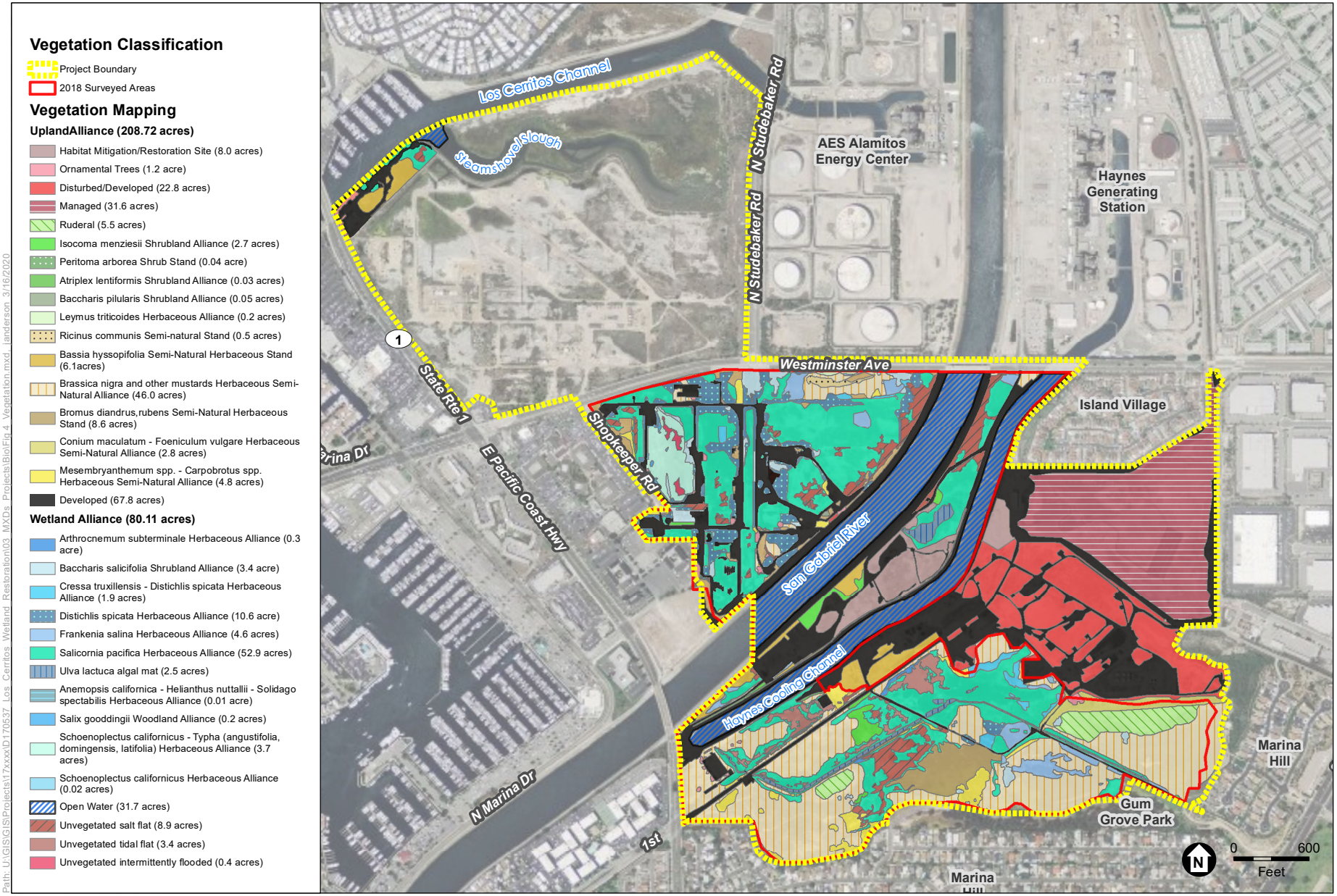
Each of the vegetation and land cover types are shown in Figure 4 along with the corresponding area in acres. There are short descriptions of the cover classes below. CRC has used three types of cover classes: vegetation alliances, vegetation stands and other land cover types.

Vegetation Alliances. Most of the vegetated cover classes are alliances from the Manual of California Vegetation (MCV), where an alliance is defined as a category of vegetation classification, which describes repeating patterns of plants across a landscape. Each alliance is defined by plant species composition, and reflects the effects of local climate, soil, water, disturbance, and other environmental factors (Sawyer et al 2009).

Vegetation Stands. Some of the vegetated cover classes use terminology including the word stand. These are consistent with MCV methods but include novel plant assemblages not described in the MCV. Where possible, CRC has used stand categories previously used in mapping areas of the LCW (City of Long Beach 2017).

Other land cover types. For unvegetated cover types and for restoration sites, CRC mapped using descriptions based on management, disturbance and hydrology.

Natural Communities considered by the California Department of Fish and Wildlife to be sensitive are marked with an asterisk (*) below (*see* CDFW 2018). Land cover types that we considered as potentially occurring in jurisdictional areas are marked with a pound sign (#) below (*see* Section 3). See Appendix 2 of this report for representative photos of many of the different alliances and stands.



SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 4

Vegetation Mapping 2018

ESA

Table 1. Acreages by mapping class for the program area

MAPPING CLASS	Grand Total
NATIVE WETLAND CLASSES	
Anemopsis californica - Helianthus nuttallii - Solidago spectabilis Herbaceous Alliance	0.01
Arthrocnemum subterminale Herbaceous Alliance	0.32
Baccharis salicifolia Shrubland Alliance	3.33
Cressa truxillensis - Distichlis spicata Herbaceous Alliance	1.87
Distichlis spicata Herbaceous Alliance	10.58
Frankenia salina Herbaceous Alliance	4.61
Salicornia pacifica Herbaceous Alliance	52.89
Salix gooddingii Woodland Alliance	0.22
Schoenoplectus californicus - Typha (angustifolia, domingensis, latifolia) Herbaceous Alliance	3.71
Schoenoplectus californicus Herbaceous Alliance	0.02
Ulva lactuca algal mat	2.55
NATIVE UPLAND CLASSES	
Atriplex lentiformis Shrubland Alliance	0.03
Baccharis pilularis Shrubland Alliance	0.05
Isocoma menziesii Shrubland Alliance	2.66
Peritoma arborea shrub stand	0.04
Leymus triticoides Herbaceous Alliance	0.18
NON-NATIVE CLASSES	
Bassia hyssopifolia Semi-Natural Herbaceous Stand	6.13
Brassica nigra and other mustards Herbaceous Semi-Natural Alliance	45.59
Bromus diandrus,rubens Semi-Natural Herbaceous Stand	8.68
Conium maculatum - Foeniculum vulgare Herbaceous Semi-Natural Alliance	2.79
Mesembryanthemum spp. - *Carpobrotus* spp. Herbaceous Semi-Natural Alliance	0.9
Ricinus communis Semi-natural Stand	0.49
OTHER CLASSES	
Open Water	31.72
Active Habitat Mitigation/Restoration Site (non-wetland)	8.02
Disturbed - mowed/disked fire break	30.27
Managed	31.60
Ornamental	1.19
Ruderal	5.49
Unvegetated salt flat	8.71
Unvegetated tidal flat	3.80
NON NATURAL AREAS	
Developed	68.20

2.1 Cover Class Descriptions

***Anemopsis californica - Helianthus nuttallii - Solidago spectabilis* Herbaceous Alliance*#.** Yerba mansa (*Anemopsis californica*) occurs in low-salinity soils that are moist more or less year-round, possibly associated with seeps or urban runoff. Yerba mansa occurs as a nearly-monotypic stand.

***Arthrocnemum subterminale* Herbaceous Alliance*#**. Parish's glasswort (*Arthrocnemum subterminale*) is a plant that is most common in high marsh areas with seasonally hypersaline soils. This species often forms monocultures. Other species that are sometimes associated with it include common pickleweed, alkali heath (*Frankenia salina*), salt grass, shore grass (*Distichlis littoralis*), and sea lavender (*Limonium californicum*).

***Atriplex lentiformis* Shrubland Alliance**. Quailbush (*Atriplex lentiformis*) is a large evergreen shrub and is dominant in the shrub canopy. The canopy is open to intermittent, and the herbaceous layer is variable. Stands occur on heavy salt-affected soils that may be upland, transition, or wetlands. The understory in these areas typically consists of non-native grasses and forbs.

***Baccharis pilularis* Shrubland Alliance**. Coyote brush (*Baccharis pilularis*) is a large drought-tolerant evergreen shrub that tolerates seasonally waterlogged soils. A few small, scattered patches of the vegetation type occur in upland areas. The patches are dominated by coyote brush and the understory typically consists of non-native grasses and forbs.

***Baccharis salicifolia* Shrubland Alliance#**. Mulefat (*Baccharis salicifolia*) is a large evergreen shrub that occurs along creeks and rivers, in and adjacent to freshwater wetlands, and in uplands. Most of the mulefat at the site occurs in small to medium patches, often in areas that receive runoff from developed areas. This alliance consists of generally small thickets of mulefat with understory that varies from location to location but may include one or more of the following species: salt grass, seaside heliotrope (*Heliotropum curassivicum*), small-flowered ice plant (*Mesembryanthemum nodiflorum*), five-horn smotherweed , and non-native upland grasses.

***Bassia hyssopifolia* Semi-Natural Herbaceous Stand#**. Five-horn smotherweed is a non-native annual species that occurs on disturbed, often saline, soils. In the program area, stands occur in areas that are probably seasonally mowed and consist of locally dense thickets, typically adjacent to oil operations. This species is also a common weed as understory in other associations. [The MCV II does not have a description for this alliance, it was used here for consistency with City of Long Beach (2017) mapping.]

***Brassica nigra* and other mustards Herbaceous Semi-Natural Alliance.** This alliance includes herbaceous vegetation dominated by various nonnative mustards, mostly annual and biennial species, including black mustard (*Brassica nigra*), summer mustard (*Hirschfeldia incana*), or wild radish (*Raphanus sativus*). Most of these species are invasive exotics. Native shrubs may be present but only at low relative and absolute cover. The nonnative herbs clearly dominate the landscape. This alliance occurs primarily on soils with a history or disturbance.

***Bromus diandrus, rubens* Semi-Natural Herbaceous Stand**. Non-native annual upland grasses in the genera *Bromus* (bromes) and *Avena* (wild oats) dominate these areas. They are typically upland areas that have a history of soil disturbance. Dominant species include red brome (*Bromus madritensis*), rip gut brome (*Bromus diandrus*), slender wild oats (*Avena barbata*), smilo grass (*Stipa miliacea*), as well as locally dense patches of non-native forbs including small-flowered ice plant, five-horn smotherweed, Australian saltbush (*Atriplex semibaccata*), tocalote (*Centaurea melitensis*), London rocket (*Sisymbrium irio*), and summer mustard. [Note that two categories of MCV II "brome grasslands" have been combined for simplification.]

***Conium maculatum* - *Foeniculum vulgare* Herbaceous Semi-Natural Alliance**. Poison hemlock (*Conium maculatum*) is a biannual invasive exotic species that is dominant (or co-dominant with other non-native plants) in the herbaceous layer. This alliance occurs in uplands on disturbed soil. Other species include a wide variety of annual non-native grasses and annual mustards (*Brassica* spp.).

***Cressa truxillensis* - *Distichlis spicata* Herbaceous Alliance*#**. Alkali weed (*Cressa truxillensis*) is a native perennial herbaceous plant that occurs in salt-affected seasonal wetlands, high marsh and transition zone habitats, and occasionally in uplands at the site. Other species that co-occur with alkali weed at the site include salt grass, non-native annual grasses, and alkali heath.

Developed. This class includes buildings, concrete pads, infrastructure, roads, sidewalks, parking areas, other pavement, constructed drainage and erosion control structures, barriers, berms, sumps and levees.

***Distichlis spicata* Herbaceous Alliance*#**. Salt grass is a perennial rhizomatous grass that occurs in salt-affected seasonal wetlands, high marsh and transition zone habitats, and occasionally in uplands at the site. Salt grass is common in a variety of alliances throughout the site, though it dominates in these areas. Other species commonly associated with this alliance include common pickleweed, alkali heath, non-native annual grasses, alkali weed, small-flowered ice plant, and five-horn smotherweed.

Disturbed - mowed/disked firebreak. These areas are associated with areas disturbed by current oil operations where vegetation is managed by regular disking or mowing. Most of these areas are bare soil or are sparsely vegetated. Vegetation, where it is associated with these areas, is essentially all non-native with species such as small flowered ice plant, five-horn smotherweed and non-native grasses being most common.

***Frankenia salina* Herbaceous Alliance*#**. Alkali heath is a low-growing, woody, rhizomatous halophyte that occurs in salt-affected seasonal wetlands, high marsh and transition zone habitats, and occasionally in uplands at the site. It is common in a variety of alliances at the site but occasionally forms unbroken stands that constitute a separate alliance. Other species commonly found in this alliance include salt grass, common pickleweed, alkali weed, and non-native annual grasses.

Habitat Mitigation/Restoration site. These areas are the subject of ongoing management as restoration or mitigation sites. The vegetation includes various upland and wetland herbs, shrubs and trees. Non-native species are being managed by weeding. Irrigation may be ongoing.

Isocoma menziesii* Shrubland Alliance. Menzie's goldenbush (*Isocoma menziesii)* is an upland shrub that is found in transition zone habitats around salt marshes, on coastal bluffs, and in coastal sage scrub. It is tolerant of occasional flooding and tolerates higher salinity than most upland shrubs. It is a good colonist on disturbed soils, and is often found with a non-native understory that includes small-flowered ice plant and non-native grasses.

***Peritoma arborea* shrub stand**. Bladderpod (*Peritoma arborea*) is a native woody shrub that is growing with non-native mustards and annual grasses on disturbed upland soils.

***Leymus cinereus - Leymus triticoides* Herbaceous Alliance*#.** Alkali rye grass (*Leymus triticoides*) is a rhizomatous perennial grass that typically occurs on saline or alkaline soils with a shallow water table. It forms nearly monotypic stands.

Managed. These areas are the subject of ongoing management as part of the operation of the Los Alamitos Retarding Basin. The vegetation includes various upland and wetland herbs and shrubs.

***Mesembryanthemum* spp. - *Carpobrotus* spp. Herbaceous Semi-Natural Alliance**. Non-native annual iceplant species (*Mesembryanthemum* spp.*)* occur in wetland and upland areas typically on disturbed, saline soils. Perennial iceplant species (*Carpobrotus* spp.) form large mats in uplands in the South area. Where this alliance is dominated by small-flowered ice plant and/or crystalline ice plant (*Mesembryanthemum crystallinum*) other species are very sparse or absent. Where sea fig (*Carpobrotus edulis)* is the dominant, it co-occurs with annual grasses.

Open Water#. These areas are permanently flooded tidal areas. They may support patches of rooted eelgrass (*Zostera spp.),* however this species was not mapped in this effort.

Ornamental Tree. The site supports scattered areas of non-native invasive trees. The diversity of non-native trees scattered across the site is substantially higher than captured by any MCV II alliance so these trees were mapped as "Ornamental Trees". These include a range of non-native trees, including Myoporum (*Myoporum laetum*), Canary Island Palm (*Phoenix canariensis*), Mexican Fan Palm (*Washingtonia robusta*), Shamel Ash (*Fraxinus uhdei*), Bluegum Eucalyptus (*Eucalyptus globulus*), Sydney golden wattle (*Acacia longifolia*), and Brazilian pepper (*Schinus terebinthifolius*). Some of these have various annual non-natives as understory species.

***Ricinus communis* Semi-natural Stand.** Castor bean (*Ricinus communis*) is a large invasive non-native woody shrub that occurs primarily on disturbed upland soils. It grows with tree tobacco (*Nicotiana glauca*) and non-native annual grasses (*Avena* and *Bromus* spp.).

Ruderal. Ruderal areas are dominated by telegraph weed (*Heterotheca grandiflora*) is a native annual or short-lived perennial herbaceous species that grows on disturbed upland soils. It grows on site in low densities on sandy soils (likely dredge material as mollusk shells characteristic of salt marsh and beach habitats are common on the soil surface). It grows with scattered annual grasses, heron's bill (*Erodium* spp.) and Lewis' evening primrose (*Camissoniopsis lewisii*).

***Salix gooddingii* Woodland Alliance*#**. Black willow (*Salix gooddingii*) is a native tree found along streams and rivers and in wetlands. It occurs along some edges of Marketplace Marsh. The understory varies but typically included natives like salt grass, tall nut sedge (*Cyperus eragrostis*), and seaside heliotrope, or with non-natives such as curly dock (*Rumex crispus*).

***Salicornia pacifica* Herbaceous Alliance*#**. Common pickleweed is a herbaceous perennial native wetland species that occurs in tidal salt marshes and salt-affected seasonal wetlands. It is the most common wetland alliance in the program area. Other common species that co-occur with common pickleweed include alkali heath, Parish's glasswort, salt grass, sea lavender, and alkali weed.

***Schoenoplectus californicus - Typha* (*angustifolia, domingensis, latifolia*) Herbaceous Alliance*#.** California bulrush grows with cattails in seasonally flooded or saturated brackish or freshwater wetlands. It grows with trees such as black willow and herbaceous species such as curly dock in basins that are augmented by artificial dry season inflows.

***Schoenoplectus californicus* Herbaceous Alliance#.** California bulrush is a large perennial grass like herb that occurs along freshwater water sources in wetlands. This alliance occurs in a small patch, in an area that receives runoff from developed areas. This alliance consists of generally small, monotypic thickets of California bulrush with little to no understory or other dominant species.

***Ulva lactuca* algal mat#.** Sea lettuce (*Ulva lactuca*) is a green seaweed that occurs in mid to low intertidal areas and tide pools. This cover class represents areas of low elevation mudflat and tidal channel that have moderate to high cover of algal mats. The mats may occur seasonally or intermittently and may be associated with poor water quality (*i.e.*, high nutrient loads).

Unvegetated salt flat#. This habitat type occurs in non- tidal areas that do not have vegetation. The lack of vegetation is likely due to hypersalinity of soils. High soil salinity may be from very rare or historic tidal inundation or as a legacy (*i.e.*, soil dredged from tidal or sub-tidal habitats and placed on site).

Unvegetated tidal flat#. This habitat type occurs in tidal areas that do not have emergent vegetation. The lack of vegetation may be due to more or less constant ponding of water (shallow depressions on the marsh plain). They may support algal mats seasonally though they were not observed during out mapping.

SECTION 3. WETLAND ASSESSMENT

CRC conducted an analysis to identify and map potential waters and wetlands that are likely to be considered jurisdictional by the US Army Corp of Engineers (Corp) (non-wetland waters of the US and wetland waters of the US), State Water Resources Control Board (SWRCB) (non-wetland waters of the State and wetland waters of the State), and the California Coastal Commission (CCC) (CCC wetlands and CCC jurisdiction) within the program area. The California Department of Fish and Wildlife (CDFW) may take jurisdiction of some areas but we did not attempt to map it in this effort. In very general terms, CDFW takes jurisdiction over rivers, creeks, and other waterways and riparian habitat. The San Gabriel River (SGR) and other channels in the program area are salt water tidal as opposed to traditional waterways that CDFW typically takes jurisdiction over. Willow trees in Marketplace Marsh may be considered riparian habitat, but they are located in a stormwater-fed basin, not along a traditional water way. As part of a future wetland delineation, CDFW, the Corp, SWRCB, and CCC should all be consulted to determine the extent to which they will take jurisdiction over different areas within the program area.

This wetland assessment is meant to help guide the development of restoration and public access alternatives for the program and is not sufficient for permitting or other regulatory use. This is not a jurisdictional delineation. The jurisdictional classifications we used (below) are largely based on the vegetation mapping done in 2018 (*see* Section 2). Certain vegetation alliances and stands and unvegetated habitats were assumed to be strongly associated with jurisdictional areas (see Section 2 of this report for the list). We also considered whether or not the wetland-associated habitats had sufficient wetland plant cover to meet jurisdictional standards, or in some cases might be considered "problematic" per Corp guidance (*e.g.*, areas such as salt flats that do not meet Corp criteria for vegetation but that they may consider wetlands anyway). We assessed all areas for signs of hydrology in the field and in aerial photos. Soils were not analyzed.

The minimum mapping unit was approximately one-tenth of an acre; smaller scale variation exists throughout the program area that was not mapped. Our analysis (Figure 5) shows that a large proportion of the site (Table 2) is likely federal and/or state wetland or waters. We identified five different potential types of jurisdictional areas on site along with four other types of areas that are likely not jurisdictional:

Probable Non-wetland Waters of the US/State and CCC Jurisdiction – these include areas that the Corp would likely consider Waters of the US, the SWRCB would consider Waters of the State, and CCC might take jurisdiction of. These are predominantly unvegetated salt water tidal channels in the program area.

Probable Intertidal Jurisdiction of the US, State and CCC – generally rocky intertidal areas that are neither waters nor wetlands but would likely fall under the jurisdiction of the Corp, SWRCB, and CCC.

Probable Wetland Waters of the US/State and CCC Wetland – these include all areas that likely meet the three-parameter wetland criteria of the Corp (hydrology, vegetation, and soil). In meeting the criteria for the Corp, they would also meet wetland criteria for SWRCB and CCC.

Potential Wetland Waters of the US/State and Probable CCC Wetland – these are areas that have obvious indications of at least one of the three Corp wetland indicators but may not have all three. In general, they were dominated by wetland-indicator plants, but lacked obvious hydrology. CCC would very likely consider these wetlands as they meet the so-called "one-parameter test."

Potential CCC Wetland – these are areas that may have at least one wetland indicator but obviously lack at least one. CCC might consider these wetlands as they might meet the so-called "one-parameter test."

Habitat Mitigation/Restoration Site – these are areas under active or very recent management (some combination of irrigation, planting, weeding, etc.) as of 2018; some may be jurisdictional now or in the future, but they were not analyzed.

Not Assessed - Potentially Jurisdictional – These include areas that were not accessible during our field work but based on aerial photography, might be jurisdictional.

Developed– these are areas that are actively used as roads (paved or dirt) or for commercial uses (some of the dirt areas may be considered ESHA by CCC due to the presence of sensitive plant species but were not classified as potential CCC wetland because they did not appear to meet any of the three wetland criteria).

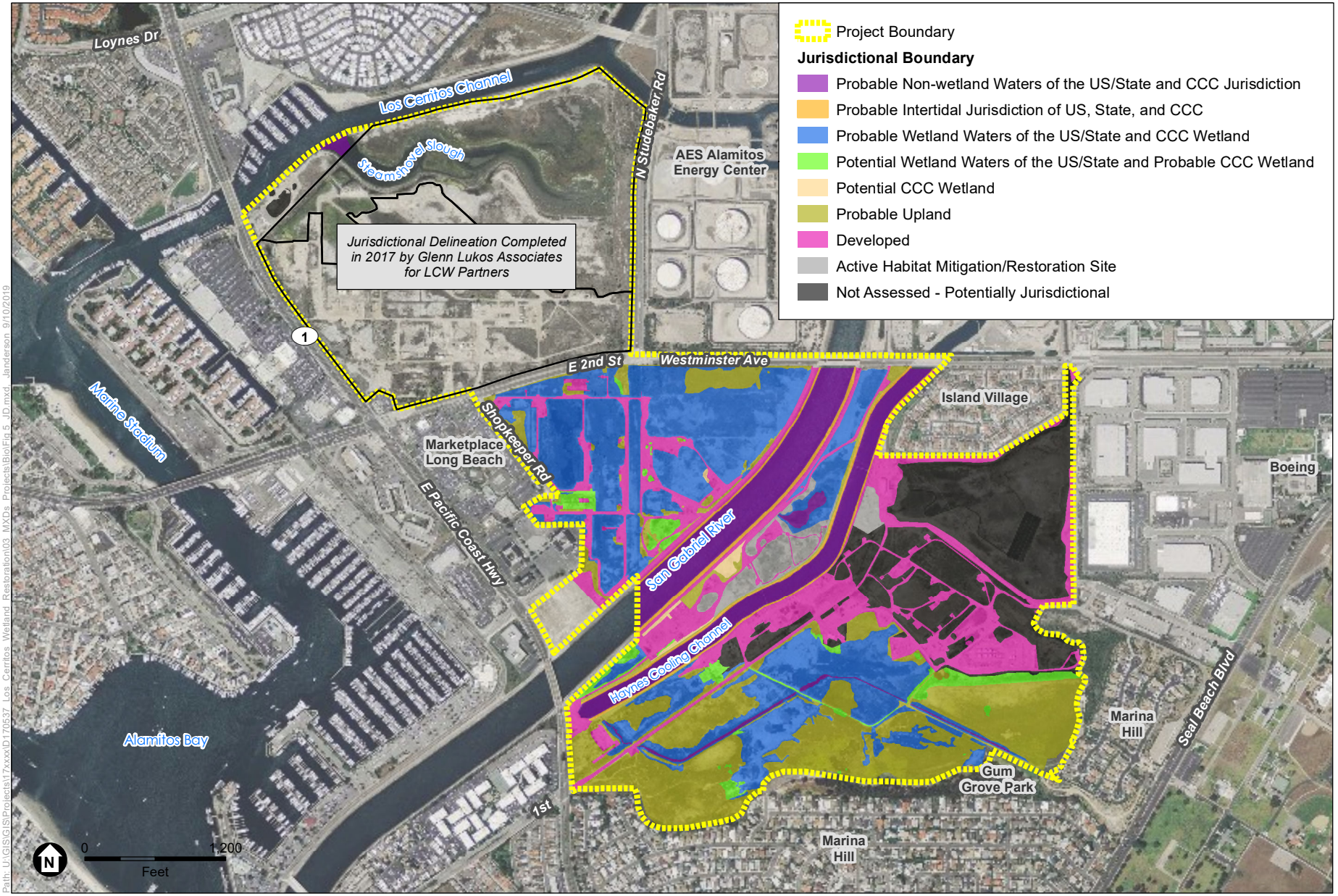
Probable Upland – areas that probably will not qualify as wetlands or waters (though some of these area are likely to be considered ESHA by CCC due to the presence of sensitive plant species and/or communities).

A large portion of the program area (at least 134 acres) will likely fall under state and/or federal jurisdiction. During the development of restoration alternatives, it will be important to consider approaches that are at least self-mitigating to the extent that different types of jurisdictional areas might be altered. This analysis may also be useful in the development of public access alternatives to the extent that trails and other features might impact jurisdictional areas.

The mapping scheme employed in this study does not allow for spatial overlap between different classes (*i.e.,* any point on the map falls in exactly one category).

Table 2. Results of jurisdictional mapping (acres)

Jurisdictional Assessment Class	Central	Isthmus	North	South	Total
Probable Non-wetland Waters of the US/State and CCC Jurisdiction	17.15	1.00	0.73	15.04	33.91
Probable Intertidal Jurisdiction of the US, State and CCC	1.61	0.04		1.58	3.23
Probable Wetland Waters of the US/State and CCC Wetland	48.44	7.18		31.78	87.40
Potential Wetland Waters of the US/State and Probable CCC Wetland	2.44	1.00		5.10	8.54
Potential CCC Wetland	0.08	1.04		0.16	1.28
Active Habitat Mitigation/Restoration Site		6.45		1.76	8.21
Not Assessed - Potentially Jurisdictional			0.72	57.07	57.79
Developed	16.36	8.62	2.30	33.48	60.77
Probable Upland	8.17	1.62	0.38	60.58	70.74



SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 5
Jurisdictional Boundaries

ESA

SECTION 4. ENVIRONMENTALLY SENSITIVE HABITAT AREAS ASSESSMENT

This section summarizes methods and results for the mapping of potential CCC ESHA within parts of the LCW complex. Potential ESHA was mapped in the Isthmus, South, and Central Areas and on the Los Alamitos Bay Partners site in the North area only. The assessment is based on fieldwork performed by CRC in spring 2018 to map vegetation, rare plants, and wetlands and waters, as well as being informed by previous studies (Tidal Influence 2012).

The mapping was done following CCC guidance. The CCC defines ESHA as:

> *"Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments*".

The CCC (Dixon 2003) has identified three primary elements to the definition of ESHA. First, there must be a geographic area that can be designated ESHA either because of the presence of individual species of plants or animals or because of the presence of a particular habitat. Second, in order for an area to be designated as ESHA, the species or habitat must be either rare or it must be especially valuable. Finally, the area must be easily disturbed or degraded by human activities.

The first test of ESHA is whether a habitat or species is rare. Under CCC guidance, rarity can take several forms. Many rare species or habitats are globally rare, but locally abundant. They have suffered severe historical declines in overall abundance and currently are reduced to a small fraction of their original range, but where present may occur in relatively large numbers or cover large local areas. Some other habitats are geographically widespread, but occur everywhere in low abundance. In the context of the LCW, salt marsh and other wetlands likely fall in either of these categories. Species listed as rare, threatened, or endangered by public agencies or the California Native Plant Society may fall in to either category as well. The LCW complex supports numerous such species in wetland and upland areas.

A second test for ESHA is whether a habitat or species is especially valuable. Areas may be valuable because of their "special nature," such as being an unusually pristine example of a habitat type, containing an unusual mix of species, supporting species at the edge of their range, or containing species with extreme variation. With the exception of Steamshovel Slough, most of the habitats in the LCW complex probably do not meet this test. However, habitats or species are considered valuable if they have a special "role in the ecosystem." For example, wetlands and some uplands in the LCW complex may meet this test because they provide habitat for rare, threatened, and endangered species, protect water quality, provide corridors linking sensitive habitats, or support important trophic connections to a wider ecosystem. The CCC has acknowledged that because all species play a role in their ecosystem, all are arguably "special." However, the Coastal Act requires that this role be "especially valuable." This test is likely met for the mapped areas within the LCW complex because they are demonstrably rare and have an extraordinarily special nature in the context of the massive loss of similar habitats in the region due to urbanization.

Finally, ESHAs are those areas that could be easily disturbed or degraded by human activities and developments. Within the LCW complex, as in most areas of southern California

affected by urbanization, all natural habitats are in grave danger of direct loss or significant degradation as a result of many factors related to anthropogenic changes. Limited areas within the LCW are at direct threat of development, however, degradation of existing habitats by alterations to hydrology and improvements to adjacent infrastructure (e.g., levees, roads, oil pipelines and wells, etc.) is an ongoing and significant risk.

Final ESHA determinations can only be made by the CCC. For planning purposes we have been conservative in this mapping of ESHA. Some of these areas may not ultimately meet the CCC test. For this analysis, all potentially jurisdictional wetlands and waters, areas with wetland plant communities, areas that support rare, threatened, or endangered plants and/or animals, and mitigation sites were all mapped as potential ESHA (Figure 6, Table 3). Mitigation sites were included as they all typically support, or will support in the near future, populations of the rare southern tarplant (*Centromadia parryi* ssp. *australis*). Potential ESHA in inaccessible parts of the South area were mapped but were not assessed on the ground (Figure 6). ESHA mapping in these areas is very tentative but follows logically from the mapping of potential wetlands and rare plants from previous studies (Tidal Influence 2012).

ESHA was recently mapped in the North Area in the LCW Oil Consolidation and Restoration Project EIR (City of Long Beach 2017). The mapping criteria for that effort were different than for this program. They mapped ESHA primarily based on the presence of a rare plant community or rare plants. Our approach used the above guidance (regional rarity of habitats, ecosystem services, etc.), which we believe is more in line with CCC policy. Our approach was to be conservative and include all potential areas. Our approach is more in line with a recent ESHA determination by the CCC at Banning Ranch in Newport Beach (Engel 2015), which we believe is a reasonable model for mapping ESHA at the LCW.

The CCC may consider a large portion of the site to be ESHA. As such, restoration actions that alter habitats and disturb ESHA will need to mitigate those impacts. Restored wetland, wetland-upland transition, grassland, and coastal sage scrub habitats for instance would likely be considered ESHA and contribute to mitigating impacts to existing ESHA. Flood control structures, roads, and paths would very likely not be considered ESHA. During the development of restoration alternatives, it will be important to consider approaches that are at least self-mitigating to the extent that ESHA's might be altered. This analysis may also be useful in the development of public access alternatives to the extent that trails and other features might impact ESHAs.

Table 3. Areas of potential ESHA by area (acres)

ESHA Classification	Central	Isthmus	North	South	Grand Total
Potential ESHA	69.09	17.71		59.99	146.79
Not Assessed - Potential ESHA			2.68	56.92	59.60
Totals	69.09	17.71	2.68	116.91	206.39

Path: U:\GIS\GIS\Projects\17xxxx\D170537_Los_Cerritos_Wetland_Restoration\03_MXDs_Projects\Bio\Fig 6_ESHA.mxd Janderson 7/10/2019

SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 6

California Coastal Commission Environmentally Sensitive Habitat Areas

ESA

SECTION 5. ASSESSMENT OF THREE SPECIAL STATUS SPECIES

This assessment of special status plant and animal species is based on limited fieldwork in the spring and fall 2018 and is meant to be a supplement to a thorough report produced as part of the CRP. The primary focus of this report is to update the mapping of known populations of three rare annual plant species. Annual plant species vary in their abundance and spatial distribution between years, primarily due to differences in the amount and timing of rainfall. This additional mapping effort was undertaken in order to provide a potentially more complete representation of where these species occur within the program area and to document potential new locations. CRC principles Matt James and David Hubbard, who both have extensive experience with the target species, carried out the searches and did the mapping. Properties not owned and/or managed by LCWA and their partners were not searched.

5.1 Methods

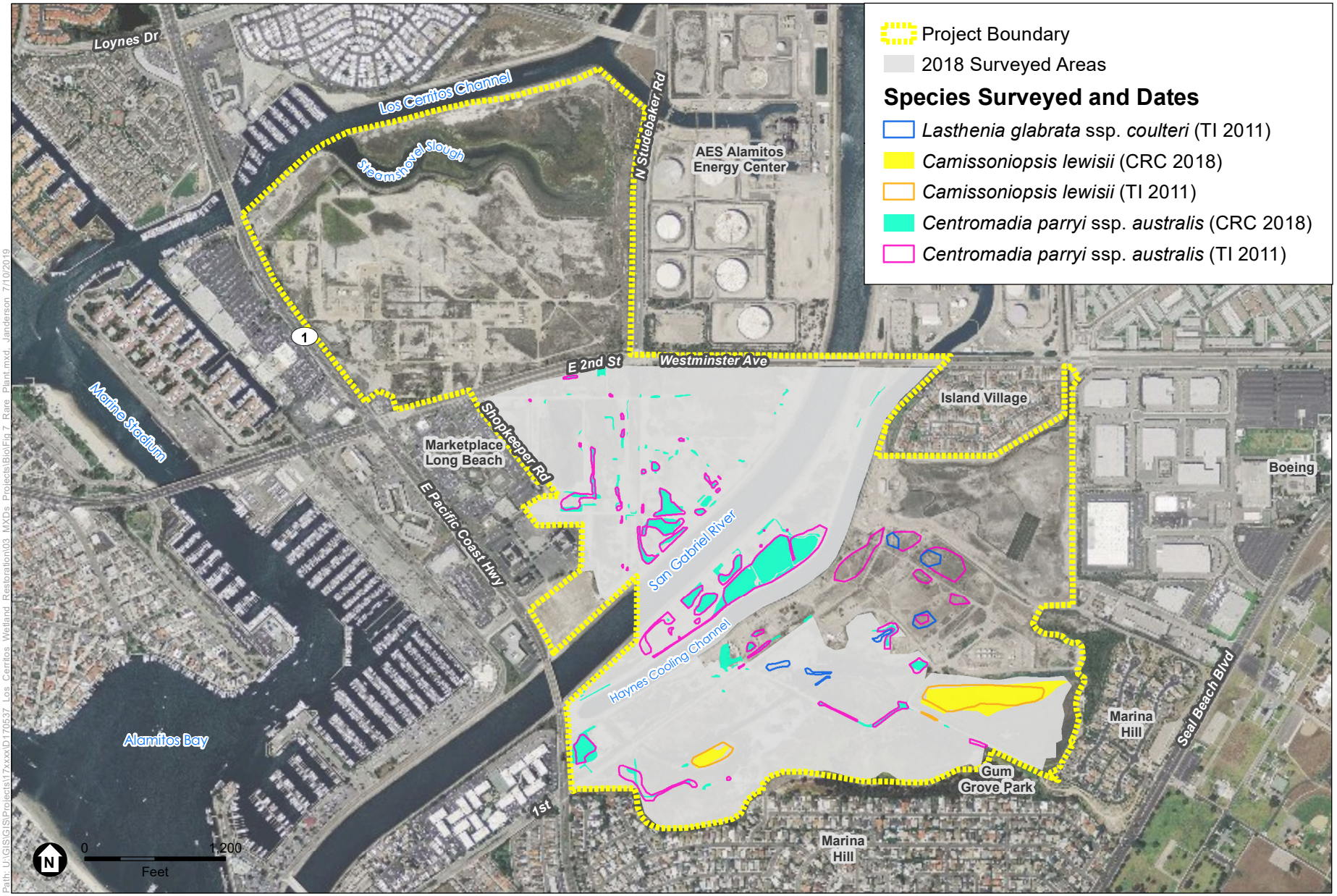
Rare plant mapping efforts focused on three annual plant species, southern tarplant (*Centromadia parryi* ssp. *australis*), Lewis' evening primrose (*Camissoniopsis lewisii*), and Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*). All three species are known to occur within the program area (Tidal Influence 2012) but their abundance and distribution vary between years depending mainly on rainfall timing and amount. Rainfall measured at a nearby weather station in Long Beach averages 11.32 inches (288 mm) per year. In the 2017-18 rainfall season, only 3.65 inches (93 mm) of rain fell. Lack of rain greatly limited germination and establishment of annual plants. In the 2016-17 rainfall season, 19.98 inches (507 mm) of rain fell, resulting in abundant germination and establishment of annual plants. We were able to identify the dead remains of the target plant species that germinated and established in this above-average rainfall year. Plants from both years were mapped but not distinguished as dead or alive.

Rare plant surveys were carried out during vegetation mapping efforts throughout the accessible areas of the program (Figure 2). Locations with historic populations (Tidal Influence 2012) were searched carefully. Additional focused searches were carried out in areas with sandy soil (for Lewis' evening primrose), tidal areas (for Coulter's goldfields), and open areas with little or no other vegetation (for southern tarplant). We mapped individuals and groups of plants using polygons in order to identify the specific areas where the target plants were detected and did not count individual plants. Polygons were drawn on paper aerial photos in the field, digitized in Google Earth Pro, and then imported to ArcGIS to produce the final maps. The error in polygon locations is estimated to be less than six feet (~2 m).

Both surveyors have considerable experience with Coulter's goldfields and southern tarplant throughout the species' ranges and plants were identified by sight. Parts of several individual plants of Lewis' evening primrose were collected and keyed out using the Digital Jepson Manual (Greenhouse et. al 2012) to confirm the identification of this species.

5.2 Results

Two of the three target species were found in 2018. The current mapping effort included a mixture of live plants and dead plants from the previous season. Overall there was significant site fidelity for southern tarplant and Lewis' evening primrose between different years (Figure 7).



SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 7

Rare Plant Surveys

ESA

Southern Tarplant

Less than five live southern tarplant plants were found outside of irrigated restoration/mitigation sites, presumably due to the low rainfall in the winter of 2017-18. However, significant numbers (many thousands) of dead plants from the previous growing season were identified and mapped (Figure 7). The Southern and Central areas supported many hundreds of plants each, generally along the edges or roads and paths. The Isthmus supported thousands of live plants that presumably sprouted due to irrigation. The status of southern tarplant in the Alamitos Bay Partners parcel is not known. Virtually all of the plants were found in areas with very low cover of other species but adjacent to perennial salt marsh vegetation. Soils were typically heavy clay and often compacted (*e.g.*, road edges). Soil salinity was not measured, but based on the scarcity of typical glycophytic weeds, we assume the soil salinity is moderately high at least seasonally. These are typical growing conditions for this species throughout most of its range. There are large areas within the program area where this species was absent that could nevertheless potentially support this species. Therefore, opportunities to mitigate potential impacts to existing populations are plentiful on site.

Coulter's Goldfields

Coulter's goldfields was not seen in any of the previously mapped areas on LCWA land in 2018. Historic locations on other properties were not searched during this study due to lack of access. All of the intertidal areas with low perennial plant cover (its preferred habitat) were searched during the blooming period for this species. The apparent absence of this species this year is not surprising due to the very low rainfall. Coulter's goldfields typically germinates in the winter after enough rain falls to temporarily lower soil surface salinities in high marsh areas. It should be assumed that the areas where this species was found in 2011 (Figure 7) contain a valuable seed bank and in more favorable rain years, this species would reappear in those areas and possibly others. If restoration plans call for disturbance of soils or changes in hydrology in areas where this species is known to occur, pre-construction efforts should be made to collect seed on site to assure the genetics of this isolated population are preserved through post-construction re-introduction on site.

Lewis' Evening Primrose

Lewis' evening primrose was found in all three of the previous locations where it was mapped in 2011 (Figure 7). Despite the very low rainfall in 2017-18, this species was found throughout two large areas with very sandy soil on the Hellman Property. Each of these areas was supporting several hundred individual plants, distributed widely and somewhat sparsely. A single individual was found on the dirt road toward the eastern end of the Hellman Property; this was likely a larger population in 2011. The ecology of this species is more poorly understood than the other two species discussed in this report. It generally prefers very sandy soils (though the "road population" is on hard-packed heavy soils). It occurs in areas with very low cover of other plant species. It appears to be capable of germinating and establishing with very low amounts of rainfall – 2018 plants were much smaller than dead 2017 plants but were nearly as abundant. More study of this species is needed in order to develop realistic strategies for mitigating potential impacts to this species.

5.3 Implications for Restoration Planning

Restoration alternatives that expand the area of intertidal wetlands and transition zone habitats would likely support expansion of Coulter's goldfields and southern tarplant populations. These types of alternatives will likely call for significant alterations and disturbance in areas that are known to support these species currently and would trigger the need for mitigation that could be done on-site in newly restored habitats. Establishing southern tarplant on restoration sites is generally easy, as it grows readily on disturbed soils with low plant cover (especially if irrigation is used) by hand-dispersing seed. Restoring Coulter's goldfields on restoration sites is more challenging. The restoration site should be designed to support high marsh areas with low perennial plant cover and seasonally dynamic soil salinity (*e.g*., salt flats). Such areas might support introduction of this species. However, population sizes would be expected to vary greatly between years (due to amount and timing of rainfall).

Restoration alternatives that convert the areas where Lewis' evening primrose occurs to intertidal salt marsh or transition zone habitats will trigger mitigation measures for this species. On-site mitigation for this species may be difficult if all of the current populations are extirpated. The species currently occurs on human-placed soils that are essentially beach sand. In order to create a mitigation area (or areas), the existing sandy soil would need to be stockpiled and placed in the new area(s) or beach sand from another source could be used in order to re-create appropriate growing conditions. If one of the main populations is preserved, the remaining sandy area could be suitable as a mitigation site for the loss of habitat at the other site. It is also possible that an off-site mitigation site could be identified for this species (*e.g.,* El Segundo Dunes).

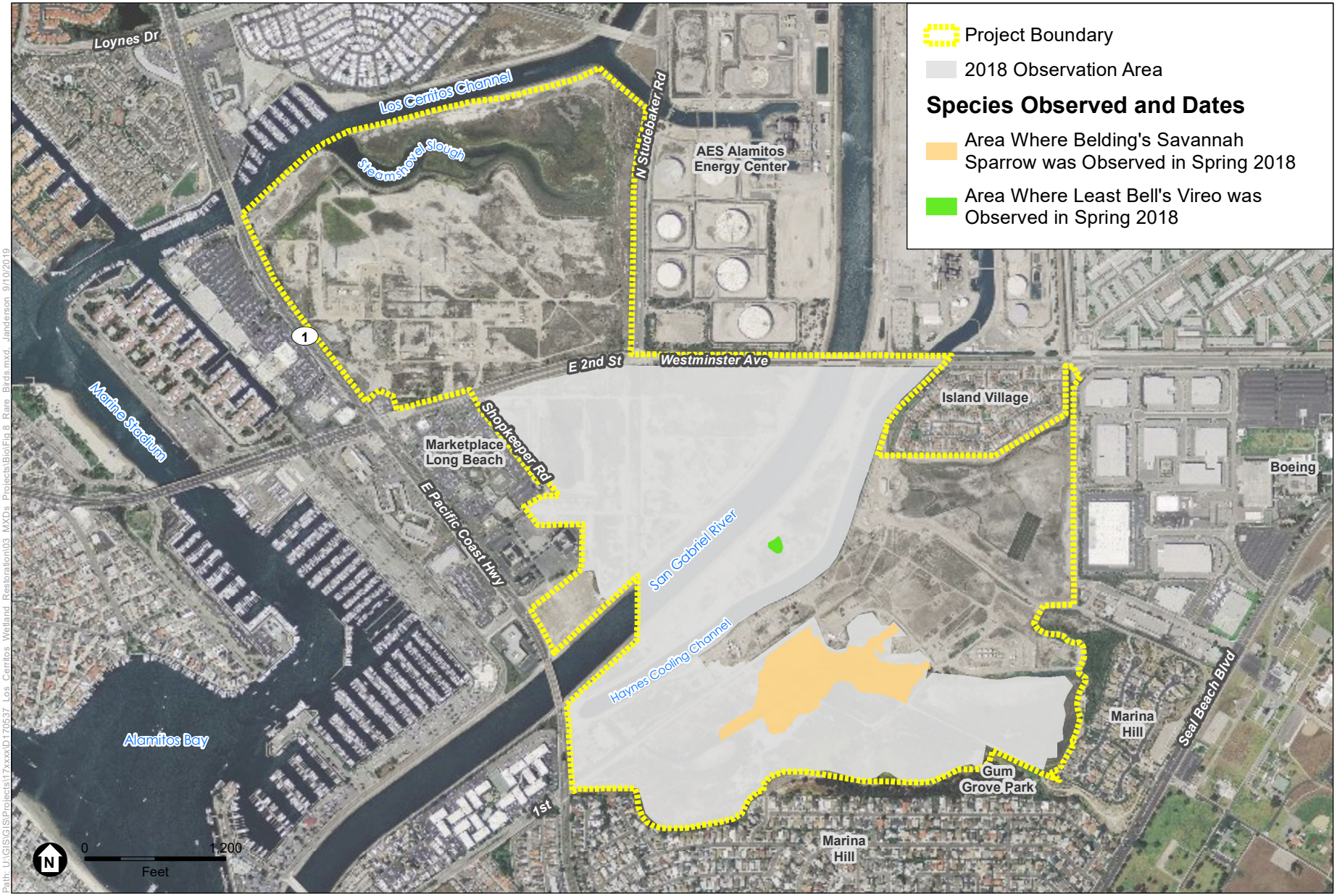
Appropriate amounts of seed should be collected for all three species prior to construction. Seed collection efforts should focus on wet years and not necessarily be delayed until the year before restoration begins.

SECTION 6. BIRD OBSERVATIONS

This section presents data on bird use of the LCW program area that is supplemental to the bird use analysis in the CRP, which was prepared by Tidal Influence (2012). CRC biologists collected incidental observations of bird use within the accessible portions of the site (South, Isthmus and Central) while doing vegetation surveys, rare plant surveys and wetland assessment work in between March 5 and May 10, 2018. Additional observations were made on a visit to the site on March 21, 2019 when wetland basins in the Central area were flooded. Appendix 1 summarizes bird records for the site from the CRP and CRC observations.

The birds observed on the list represent a diverse mix of resident and migrant species including groups associated with upland, wetland, and open water habitats. Four special status bird taxa were reported from the program area during the preparation of the CRP (Belding's savannah sparrow, burrowing owl [*Athene cunicularia*], loggerhead shrike [*Lanius ludovicianus*] and northern harrier [*Circus hudsonius*]) with two additional taxa occurring in other areas of the wetland complex (black skimmer [*Rynchops niger*] and California least tern [*Sterna antillarum* ssp. *browni*]). CRC biologists confirmed the presence of an additional special status species, least Bell's vireo [*Vireo bellii* ssp. *pusillus*], in spring of 2018 (Figure 8). Numerous Belding's savannah sparrows were observed in muted tidal wetlands in the program area in 2018 as well (Figure 8).

These sensitive taxa depend on a broad range of habitat types ranging from: open water (foraging for black skimmers and California least terns), tidal wetland (Belding's savannah sparrow), open or marsh habitat (northern harrier), grassland or open habitat (loggerhead shrike, burrowing owl), and riparian or scrub habitat (least Bell's vireo).



SOURCE: Mapbox, LCWA, CRC

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 8

Rare Bird Observations

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Appendix D

Cultural Resources Assessment Report

[Confidential: Not for Public Distribution]

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Appendix E

Paleontological Resources Assessment

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Appendix F

Greenhouse Gas Emissions Technical Report

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LOS CERRITOS WETLANDS RESTORATION PROGRAM

Greenhouse Gas Emissions Technical Report

Prepared for
Los Cerritos Wetlands Authority

April 2020

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OUR COMMITMENT TO SUSTAINABILITY | ESA helps a variety of public and private sector clients plan and prepare for climate change and emerging regulations that limit GHG emissions. ESA is a registered assessor with the California Climate Action Registry, a Climate Leader, and founding reporter for the Climate Registry. ESA is also a corporate member of the U.S. Green Building Council and the Business Council on Climate Change (BC3). Internally, ESA has adopted a Sustainability Vision and Policy Statement and a plan to reduce waste and energy within our operations. This document was produced using recycled paper.

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LOS CERRITOS WETLANDS RESTORATION PROGRAM

Greenhouse Gas Emissions Technical Report

1.0 Introduction

ESA has conducted a greenhouse gas (GHG) emissions assessment to evaluate the potential GHG impacts associated with construction activities, mobile sources, and other aspects of Los Cerritos Wetlands Restoration Program's (program) construction and operations that have the potential to generate GHG emissions. The objectives of this Greenhouse Gas Emissions Technical Report are to:

- Evaluate the construction and operational GHG emissions associated with program level restoration process and the potential for GHG impacts based on applicable standards and thresholds;
- Identify GHG benefits from improving habitat areas and restoring wetlands;
- Provide, if needed, GHG mitigation measures as required to meet applicable GHG standards and thresholds.

The program area is approximately 503 acres of land located in an urbanized and industrialized area in the North Seal Beach area and East Long Beach, straddling the border of Orange County and Los Angeles County in southern California (see **Figure 1,** *Program Area and Local Vicinity*). Regional access to the program area is provided by Interstate 405 (I-405) and Interstate 605 (I-605) as well as State Route 22 (SR-22), which terminates as 7th Street. Pacific Coast Highway (SR-1) traverses the western boundary of the program area. The program area is located on four individual areas (South, Isthmus, Central, and North), as described in Chapter 2, *Project Description*, of the Los Cerritos Wetlands Restoration Plan Program Environmental Impact Report (EIR). The proposed program would restore wetland, transition, and upland habitats throughout the program area. This would involve remediation of contaminated soil and groundwater, grading, revegetation, construction of new public access opportunities (including trails, visitor center, parking lot, and viewpoints), construction of flood management facilities (including earthen levees and berms, and/or walls), and modification of existing infrastructure and utilities.

SOURCE: ESRI

Los Cerritos Wetlands Restoration Plan

Figure 1

Program Area and Local Vicinity

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2.0 Environmental Setting

Global Climate Change and Greenhouse Gases

Global climate change refers to changes in average climatic conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation and storms. Historical records indicate that global climate changes have occurred in the past due to natural phenomena; however, current data increasingly indicate that the current global conditions differ from past climate changes in rate and magnitude. Global climate change attributable to anthropogenic (human) GHG emissions is currently one of the most important and widely debated scientific, economic and political issues in the United States and the world. The extent to which increased concentrations of GHGs have caused or will cause climate change and the appropriate actions to limit and/or respond to climate change are the subject of significant and rapidly evolving regulatory efforts at the federal and state levels of government.

GHGs are compounds in the Earth's atmosphere which play a critical role in determining temperature near the Earth's surface. More specifically, these gases allow high-frequency shortwave solar radiation to enter the Earth's atmosphere, but retain some of the low frequency infrared energy which is radiated back from the Earth towards space, resulting in a warming of the atmosphere. Not all GHGs possess the same ability to induce climate change; as a result, GHG contributions are commonly quantified in the units of equivalent mass of carbon dioxide (CO_2e). Mass emissions are calculated by converting pollutant specific emissions to CO_2e emissions by applying the proper global warming potential (GWP) value.[1] These GWP ratios are provided by the Intergovernmental Panel on Climate Change (IPCC) in its Fourth Assessment Report (AR4) (IPCC, 2017). By applying the GWP ratios, program-related CO_2e emissions can be tabulated in metric tons per year. Typically, the GWP ratio corresponding to the warming potential of CO_2 over a 100-year period is used as a baseline. The CO_2e values are calculated for construction years as well as existing and program build-out conditions in order to generate a net change in GHG emissions for construction and operation. Compounds that are regulated by the State of California as GHGs are discussed below.

- **Carbon Dioxide (CO_2):** CO_2 is the most abundant anthropogenic GHG in the atmosphere and is primarily generated from fossil fuel combustion from stationary and mobile sources. CO_2 is the reference gas (GWP of 1) for determining the GWPs of other GHGs.
- **Methane (CH_4):** CH_4 is emitted from biogenic sources (i.e., resulting from the activity of living organisms), incomplete combustion in forest fires, anaerobic decomposition of organic matter in landfills, manure management, and leaks in natural gas pipelines. The GWP of CH_4 is 21 in the IPCC SAR and 25 in the IPCC AR4.

[1] GWPs and associated CO_2e values were developed by the Intergovernmental Panel on Climate Change (IPCC), and published in its Second Assessment Report (SAR) in 1996. Historically, GHG emission inventories have been calculated using the GWPs from the IPCC's SAR. The IPCC updated the GWP values based on the latest science in its Fourth Assessment Report (AR4). The California Air Resources Board (CARB) reports GHG emission inventories for California using the GWP values from the IPCC AR4. Therefore, the analysis below reflected the GWP values from IPCC AR4. Although the IPCC has released AR5 with updated GWPs, CARB reports the statewide GHG inventory using the AR4 GWPs, which is consistent with international reporting standards.

- **Nitrous Oxide (N_2O):** N_2O produced by human-related sources including agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of N_2O is 310 in the IPCC SAR and 298 in the IPCC AR4.
- **Hydrofluorocarbons (HFCs):** HFCs are fluorinated compounds consisting of hydrogen, carbon, and fluorine. They are typically used as refrigerants in both stationary refrigeration and mobile air conditioning systems. The GWPs of HFCs range from 140 for HFC-152a to 11,700 for HFC-23 in the IPCC SAR and 124 for HFC-152a to 14,800 for HFC-23 in the IPCC AR4.
- **Perfluorocarbons (PFCs):** PFCs are fluorinated compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. The GWPs of PFCs range from 6,500 to 9,200 in the IPCC SAR and 7,390 to 17,700 in the IPCC AR4.
- **Sulfur Hexafluoride (SF_6):** SF_6 is a fluorinated compound consisting of sulfur and fluoride. It is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF_6 has a GWP of 23,900 in the IPCC SAR and 22,800 in the IPCC AR4.

The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain significant scientific uncertainties in, for example, predictions of local effects of climate change, occurrence, frequency, and magnitude of extreme weather events, effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the Earth's climate system and inability to accurately model it, the uncertainty surrounding climate change may never be completely eliminated. Nonetheless, the IPCC's Fifth Assessment Report, Summary for Policy Makers states that, "it is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings together" (IPCC, 2014, p. 5). A report from the National Academy of Sciences concluded that 97 to 98 percent of the climate researchers most actively publishing in the field support the tenets of the IPCC in that climate change is very likely caused by human (i.e., anthropogenic) activity.

According to the California Air Resources Board (CARB), the potential impacts in California due to global climate change may include: loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, more drought years, increased erosion of California's coastlines and sea water intrusion into the Sacramento and San Joaquin Deltas and associated levee systems, and increased pest infestation.

Adaptation

Adaptation refers to program's resiliency to potential climate change impacts. Global warming is already having a profound impact on water resources. Climate change already altered the weather patterns and water supply in California leading to increased water shortages (i.e., a dwindling snowpack, bigger flood flows, rising sea levels, longer and harsher droughts). Water supplies are also at risk from rising sea levels. Risks may include degradation of California's estuaries,

wetlands, and groundwater aquifers that would threaten the quality and reliability of the major California fresh water supply.

Climate change could potentially affect: the amount of snowfall, rainfall and snow pack, the intensity and frequency of storms, flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events), sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes: expansion of seawater as the oceans warm, and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Adaptation includes the responses to the changing climate and policies to minimize the predicted impacts (e.g., building better coastal defenses to sea level rise). Adaptation strategies are not included in this report directly, but the project design did consider sea level rise. It should be noted that adaptation is not mitigation. Mitigation includes intervention or policies to reduce GHG emissions or to enhance the sinks of GHGs.

Greenhouse Gas Emission Inventories

Global

To put perspective on the emissions generated by a program and to better understand the sources of GHGs, it is important to look at global emission inventories. The Global Carbon Project has been tracking greenhouse gases and the global carbon cycle since its establishment in 2001. The Global Carbon Project estimate for CO_2 emissions for the world and for the top ten CO_2 producing countries is presented in **Table 1**.

TABLE 1
TOP TEN CO_2 PRODUCING NATIONS IN 2017
(MILLION METRIC TONS (MMT) CO_2)

Country	Emissions	Percent of Global
1. China	9,839	27%
2. United States	5,270	15%
3. India	2,467	7%
4. Russian Federation	1,693	5%
5. Japan	1,205	3%
6. Germany	799	2%
7. Iran	672	2%
8. Saudi Arabia	635	2%
9. South Korea	616	2%
10. Canada	573	2%
Remaining Countries	*12,384*	*34%*
Total Global	**36,153**	**100%**

SOURCE: Global Carbon Atlas,
http://www.globalcarbonatlas.org/en/CO2-emissions, accessed April 2019.

Global CO_2 emissions totaled about 36,153 $MMTCO_2$ in 2017. China released more than a quarter of the global CO_2 emissions. The United States was second and has historical significance for releasing GHG emissions, but it has been slowly decreasing its annual emissions since its peak in 2007 (Global Carbon Atlas, 2019). The data in **Table 1** emphasize the major role that the United States and China play in climate change with the two countries accounting for 42% of the emissions. India has increased its emissions at an annual rate of 5 percent from 2004 to 2014 as the population grew and improved their living standards (Global Carbon Atlas, 2019).

State of California

CARB compiles GHG inventories for the State of California. Based on the 2017 GHG inventory data prepared by CARB in 2019, California emitted 429.1 million metric tons of CO_2e ($MMTCO_2e$) including emissions resulting from imported electrical power (CARB, 2019). Between 1990 and 2017, the population of California grew by approximately 9.7 million (from 29.8 to 39.5 million) (US Census Bureau, 2017. California Department of Finance, 2018). This represents an increase of approximately 33 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from $773 billion in 1990 to $2.75 trillion in 2017 representing an increase of approximately three times the 1990 gross state product) (California Department of Finance, 2019). Despite the population and economic growth, California's net GHG emissions were reduced to below 1990 levels in 2017 (California's 2016 GHG emissions were also below 1990 levels). According to CARB, the declining trend coupled with the state's GHG reduction programs (such as the Renewables Portfolio Standard, Low Carbon Fuel Standard, vehicle efficiency standards, and declining caps under the Cap and Trade Program) demonstrate that California has met the 2020 GHG reduction target codified in California Health and Safety Code (HSC), Division 25.5, also known as The Global Warming Solutions Act of 2006 (AB 32) (CARB, 2017). **Table 2**, *State of California Greenhouse Gas Emissions,* identifies and quantifies statewide anthropogenic GHG emissions and sinks (e.g., carbon sequestration due to forest growth) in 1990 and 2017. As shown in the table, the transportation sector is the largest contributor to statewide GHG emissions at approximately 40 percent in 2017.

TABLE 2
STATE OF CALIFORNIA GREENHOUSE GAS EMISSIONS

Category	Total 1990 Emissions using IPCC SAR ($MMTCO_2e$)	Percent of Total 1990 Emissions	Total 2017 Emissions using IPCC AR4 ($MMTCO_2e$)	Percent of Total 2017 Emissions
Transportation	150.7	35%	169.9	40%
Electric Power	110.6	26%	62.4	15%
Commercial	14.4	3%	15.1	4%
Residential	29.7	7%	26.0	6%
Industrial	103.0	24%	89.4	21%
Recycling and Waste [a]	–	–	8.9	2%
High GWP/Non-Specified [b]	1.3	<1%	20.0	5%
Agriculture/Forestry	23.6	6%	32.4	8%
Forestry Sinks	-6.7		-- [c]	--
Net Total (IPCC SAR)	**426.6**	**100%**	--	--
Net Total (IPCC AR4) [d]	**431**	**100%**	**429.1**	**100%**

[a] Included in other categories for the 1990 emissions inventory.

[b] High GWP gases are not specifically called out in the 1990 emissions inventory.

[c] Revised methodology under development (not reported for 2017).

[d] CARB revised the State's 1990 level GHG emissions using GWPs from the IPCC AR4.

SOURCES: CARB, 2019.

These categories are broadly defined as (CARB, 2018):

- **Transportation** includes the combustion of fuels sold in-state that are used by on-road and off-road vehicles, aviation, rail, and water-borne vehicles, as well as a few other smaller sources.
- **Industrial** GHG emissions are produced from many industrial activities. Major contributors include oil and natural gas extraction, refineries, cement manufacturing, chemical manufacturing, and a portion of cogeneration emissions attributed to thermal energy output.
- **Electric generation** includes both emissions from in-state power generation (including the portion of cogeneration emissions attributed to electricity generation) and emissions from imported electricity
- **Agriculture** includes enteric fermentation and manure management from livestock, crop production (fertilizer use, soil preparation and disturbance, and crop residue burning), and fuel combustion associated with agricultural activities (water pumping, cooling or heating buildings, and processing commodities).
- **Commercial and residential** uses generate GHG emissions primarily from the combustion of natural gas and other fuels for space and water heating, cooking, or steam generation.
- **Recycling and waste** includes primarily landfills and a small fraction from compost production facilities.
- **High (GWP)** emissions consist of releases of ozone depleting substance substitutes and electricity losses from the transmission and distribution system.

3.0 Regulatory Framework

Federal

Voluntary Programs

The United States Environmental Protection Agency (USEPA) is responsible for implementing federal policy to address GHGs. The federal government administers a wide array of public-private partnerships to reduce the GHG intensity generated in the United States. These programs focus on energy efficiency, renewable energy, methane and other non-CO2 gases, agricultural practices, and implementation of technologies to achieve GHG reductions. The USEPA implements numerous voluntary programs that contribute to the reduction of GHG emissions. These programs (e.g., the ENERGY STAR labeling system for energy-efficient products) play a significant role in encouraging voluntary reductions from large corporations, consumers, industrial and commercial buildings, and many major industrial sectors.

Light Duty Vehicle GHG and Fuel Efficiency Standards

In August 2012, the USEPA and USDOT adopted standards for model year 2017 through 2025 for passenger cars and light-duty trucks. By 2020, vehicles are required to achieve a combined standard of 41.7 mpg and 213 grams of CO_2 per mile. By 2025, vehicles are required to achieve 54.5 mpg (if GHG reductions are achieved exclusively through fuel economy improvements) and 163 grams of CO2 per mile. According to the USEPA, a model year 2025 vehicle would emit one-half of the GHG emissions from a model year 2010 vehicle (USEPA, 2012). In 2017, the USEPA recommended no change to the GHG standards for light-duty vehicles for model years 2022-2025. In August 2018, the USEPA and NHTSA proposed the Safer Affordable Fuel-Efficient Vehicles Rule that would, if adopted, maintain the CAFE and CO_2 standards applicable in model year 2020 for model years 2021 through 2026. The estimated CAFE and CO_2 standards for model year 2020 are 43.7 mpg and 204 grams of CO_2 per mile for passenger cars and 31.3 mpg and 284 grams of CO_2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. The proposal, if adopted, would also exclude CO_2-equivalent emission improvements associated with air conditioning refrigerants and leakage (and, optionally, offsets for nitrous oxide and methane emissions) after model year 2020 (NHTSA and USEPA, 2018).

Medium and Heavy-Duty GHG Standards

GHG emissions and fuel efficiency standards for medium- and heavy-duty trucks have been jointly developed by the USEPA and the National Highway Traffic Safety Administration (NHTSA). For vocational vehicles, which consist of a variety of work vehicles including dump trucks, the Phase 1 Heavy-Duty Vehicle Greenhouse Gas Regulation started with model year 2014 and the standard requires up to a 10 percent reduction in CO_2 emissions by model year 2017 over the 2010 baseline. The Phase 2 standards start in model year 2021 and require the phase-in of a 12 to 24 percent reduction in CO_2 emission reduction from vocational vehicles by model year 2027 over the 2017 baseline.

Energy Independence and Security Act.

The Energy Independence and Security Act of 2007 (EISA) facilitates the reduction of national GHG emissions by requiring the following:

- Increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) that requires fuel producers to use at least 36 billion gallons of biofuel in 2022;
- Prescribing or revising standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances;
- Requiring approximately 25 percent greater efficiency for light bulbs by phasing out incandescent light bulbs between 2012 and 2014; requiring approximately 200 percent greater efficiency for light bulbs, or similar energy savings, by 2020; and
- While superseded by the USEPA and NHTSA actions described above, (i) establishing miles per gallon targets for cars and light trucks and (ii) directing the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for trucks.

Additional provisions of EISA address energy savings in government and public institutions, promote research for alternative energy, additional research in carbon capture, international energy programs, and the creation of green jobs.[3]

State

Executive Order S-3-05, Executive Order B-30-15, and Executive Order B-55-18

In June, 2005, through Executive Order S-3-05, the following GHG emission reduction targets were established:

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and
- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

In April, 2015, Governor Brown issued Executive Order B-30-15 that:

- Established a new interim Statewide reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030.
- Ordered all state agencies with jurisdiction over sources of GHG emissions to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 reduction targets.
- Directed CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent.

[3] A green job, as defined by the United States Department of Labor, is a job in business that produces goods or provides services that benefit the environment or conserve natural resources.

In September 2018, Governor Brown issued Executive Order B-55-18, which establishes a statewide goal of achieving carbon neutrality as soon as possible and no later than 2045.

California Global Warming Solutions Act of 2006 (Health and Safety Code § 38500 et seq.)

In September 2006, Governor Arnold Schwarzenegger signed Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. In general, CARB is required to adopt rules and regulations directing state actions that would achieve GHG emissions reductions equivalent to 1990 statewide levels by 2020.

AB 32 takes into account the relative contribution of each source or source category to protect adverse impacts on small businesses and others by requiring CARB to recommend a *de minimis* (minimal importance) threshold of GHG emissions below which emissions reduction requirements would not apply. AB 32 also allows the Governor to adjust the deadlines mentioned above for individual regulations or the entire state to the earliest feasible date in the event of extraordinary circumstances, catastrophic events, or threat of significant economic harm.

In 2016, the California State Legislature adopted Senate Bill (SB) 32 and its companion bill AB 197, and both were signed by Governor Brown. SB 32 and AB 197 amend HSC Division 25.5, establish a new climate pollution reduction target of 40 percent below 1990 levels by 2030 and include provisions to ensure that the benefits of state climate policies reach into disadvantaged communities.

The Climate Change Scoping Plan was first approved by CARB in 2008. The First Update to the Climate Change Scoping Plan was approved by the Board on May 22, 2014. CARB published the latest 2017 Climate Change Scoping Plan to reflect the 2030 target established in Executive Order B-30-15.

CARB Mandatory Reporting Regulations

Under AB 32, CARB propounded regulations to govern mandatory greenhouse gas emissions reporting for certain sectors of the economy, most dealing with approximately 94 percent of the industrial and commercial stationary sources of emissions. Regulated entities include electricity generating facilities, electricity retail providers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and industrial sources that emit over 25,000 metric tons of CO_2 from stationary source combustion.

Assembly Bill 1493 (2002) (Health and Safety Code § 43018.5)

AB 1493 required CARB to develop and adopt the nation's first GHG emission standards for automobiles. Not only have litigants challenged their legality in federal court, but also USEPA initially denied California's request for a Clean Air Act waiver to implement its regulations in 2008, but a June 2009 decision overturned the denial. AB 1493 reduces GHG emissions in new passenger vehicles from model year 2012 through 2016 (Phase I) and model years 2017–2025 (Phase II). AB 1493 also reduces gasoline consumption to a rate of 31 percent of 1990 gasoline consumption (and associated GHG emissions) by 2020.

Executive Order S-01-07

Executive Order S-01-07 was enacted on January 18, 2007. The order mandates the following: (1) that a Statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020; and (2) that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established in California. In the proposed 2017 Climate Change Scoping Plan Update, CARB's preferred recommendation includes increasing the stringency of the LCFS by reducing the carbon intensity of transportation fuels by 18 percent by 2030, up from the current target of 10 percent by 2020. In April 2017, the LCFS was brought before the Court of Appeal challenging the analysis of potential nitrogen dioxide impacts from biodiesel fuels. The Court directed CARB to conduct an analysis of nitrogen dioxide impacts from biodiesel fuels and froze the carbon intensity targets for diesel and biodiesel fuel provisions at 2017 levels until CARB has completed this analysis. On March 6, 2018 CARB issued its *Draft Supplemental Disclosure Discussion of Oxides of Nitrogen Potentially Caused by the Low Carbon Fuel Standard Regulation*. CARB posted modifications to the amendments on August 13, 2018. Final approval of regulatory changes from CARB's analysis of nitrogen dioxide impacts from biodiesel fuels was made on January 4, 2019.

Senate Bill 375

In September 2008, SB 375 was signed by Governor Schwarzenegger. SB 375 is a comprehensive global warming bill that helps to achieve the goals of AB32. Under SB 375, CARB is required, in consultation with the State's Metropolitan Planning Organizations, to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035. In February 2011, CARB adopted the final GHG emissions reduction targets for the State's Metropolitan Planning Organizations, including the Southern California Association of Governments (SCAG), which is the Metropolitan Planning Organization for the region including both Los Angeles County and Orange County; CARB updated these targets in 2018 (CARB, 2018). Of note, the reduction targets explicitly exclude emission reductions expected from the AB 1493 and the low carbon fuel standard regulations. SB 375 requires MPOs, such as SCAG, to incorporate a "sustainable communities strategy" (SCS) in their regional transportation plans (RTPs) that will achieve GHG emission reduction targets set by CARB. Certain transportation planning and programming activities would then need to be consistent with the RTP/SCS; however, SB 375 expressly provides that the SCS does not regulate the use of land, and further provides that local land use plans and policies (e.g., general plan) are not required to be consistent with either the RTP or SCS.

Title 24, Part 6, California Code of Regulations

The California Energy Commission first adopted the Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the state. Although not originally intended to reduce GHG emissions, increased energy efficiency, and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to the standard. The standards are updated periodically to allow for the consideration and inclusion of new energy efficiency technologies and methods.

Title 24, Part 11, California Code of Regulations

Part 11 of the Title 24 Building Energy Efficiency Standards is referred to as the California Green Building Standards (CALGreen) Code. The purpose of the CALGreen Code is to "improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) Planning and design; (2) Energy efficiency; (3) Water efficiency and conservation; (4) Material conservation and resource efficiency; and (5) Environmental air quality" (California Building Standards Commission, 2010). The CALGreen Code was updated in 2016 to include new mandatory measures for residential and nonresidential uses including energy efficiency, water conservation, material conservation, planning and design, and overall environmental quality. These new measures took effect on January 1, 2017. The CALGreen code was most recently updated in 2019, with new measures taking effect on January 1, 2020.

Senate Bill 1368

SB 1368 required the California Public Utilities Commission ("PUC") to establish a "GHG emission performance standard" by February 1, 2007, for all electricity providers under its jurisdiction, including the state's three largest privately owned utilities. These utilities provide approximately 30 percent of the state's electric power. After the PUC acted, the California Energy Commission (CEC) adopted a performance standard "consistent with" the PUC performance standard and applied it to local publicly-owned utilities on May 23, 2007 (over one month ahead of its June 30, 2007 deadline). Cal. Pub. Res. Code § 8341(e)(1). However, the California Office of Administrative Law ("OAL") found four alleged flaws in the CEC's rulemaking. The CEC overcame these alleged flaws and adopted reformulating regulations in August 2007.

Renewables Portfolio Standard

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, Executive Order S-14-08 was signed, which expands the State's Renewables Portfolio Standard (RPS) to 33 percent renewable power by 2020. Pursuant to Executive Order S-21-09, CARB was also preparing regulations to supplement the RPS with a Renewable Energy Standard that would result in a total renewable energy requirement for utilities of 33 percent by 2020. On April 12, 2011, SB X1-2 was signed to increase California's RPS to 33 percent by 2020. SB 350 (Chapter 547, Statues of 2015) further increased the RPS to 50 percent by 2030. The legislation also included interim targets of 40 percent by 2024 and 45 percent by 2027. SB 350 was signed into law on October 7, 2015.

On September 10, 2018, Governor Jerry Brown signed SB 100, which further increased California's Renewables Portfolio Standard and requires retail sellers and local publicly owned electric utilities to procure eligible renewable electricity for 44 percent of retail sales by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030,

and that CARB should plan for 100 percent eligible renewable energy resources and zero-carbon resources by December 31, 2045.

California Air Resource Board Cap-and-Trade Regulation

The California Air Resource Board has implemented a cap-and-trade type program, pursuant to the AB-32 directed Scoping Plan, applicable to specific industries that emit more than 25,000 MTCO2e. The AB 32 Scoping Plan identifies a Cap-and-Trade program as one of the strategies California will employ to reduce the greenhouse gas (GHG) emissions that cause climate change. Under Cap-and-Trade, an overall limit on GHG emissions from capped sectors will be established by the Cap-and-Trade program and facilities subject to the cap will be able to trade permits (allowances) to emit GHGs. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions for GHG emissions from stationary sources. The petroleum and natural gas systems sector is covered starting in 2013 for stationary and related combustion, process vents and flare emissions if the total emissions from these sources exceed 25,000 MTCO2e per year. Suppliers of natural gas and transportation fuels are covered beginning in 2015 for combustion emissions from the total volume of natural gas delivered to non-covered entity or for transportation fuels.

Cap-and-Trade is designed to reduce the emissions from a substantial percentage of GHG sources (about 80% of GHG emissions will come under the program) within California through a market trading system. The system would reduce GHG emissions by reducing the available GHG "allowances" over time up until the year 2020. The program beyond the year 2020 has not been designed yet, but the program is intended to extend beyond that timeframe through 2030. Facilities are required to obtain an "allowance", either through purchasing on auction or through freely allocated "industry assistance" allowances from CARB, for each MTCO2e of GHG they emit. CARB issues the "industry assistance" allocations for free for a number of industries. These are based, in part, on a pre-defined "benchmark" of GHG emissions per unit of production.

For the oil recovery production sector, allowances are provided as a function of the amount of crude oil produced, thereby establishing, in effect, a level of efficiency in regards to GHG emissions for that sector. Other sectors are also allocated allowances based on their own respective activities. If an operation within the sector operates less efficiently than the specified "benchmark", thereby receiving an insufficient number of "free" allowances to cover their emissions, they would be required to implement efficiency improvements or purchase additional allowances from the CARB auction. Some availability of "offsets" is also included in the program which can be obtained from specific, allowable offset programs, such as GHG reduction projects related to forestry, livestock and ozone depleting chemicals. Offsets outside of these three options are not allowed at this time. The first group of sectors began trading in allowances in 2012. That group includes the oil and gas sector as well as most stationary sources. Compliance obligation began for distributers of transportation fuels, natural gas and other fuels in 2015. Under Cap-and-Trade program, an overall limit is established for GHG emissions from capped sectors (e.g., electricity generation) and declines over time, and facilities subject to the cap can trade permits to emit GHGs. The Statewide cap for GHG emissions from the capped sectors commenced in 2013 and declines over time, achieving GHG emission reductions

throughout the Program's duration and on July 17, 2017 the California legislature passed Assembly Bill 398, extending the Cap-and-Trade program through 2030.

2017 Climate Change Scoping Plan Update

CARB adopted the 2017 Climate Change Scoping Plan at a public meeting held in December 2017 (CARB, 2017b). The 2017 Scoping Plan outlines the strategies the State will implement to achieve the 2030 GHG reduction target of 40 percent below 1990 levels by 2030 established by SB 32. The 2017 Scoping Plan is also intended to "substantially advance" toward the EO S-3-05 2050 climate goal to reduce GHG emissions by 80 percent below 1990 levels by 2050.

The 2017 Scoping Plan builds on the Cap-and-Trade Regulation, the Low Carbon Fuel Standard (LCFS), improved vehicle, truck and freight movement emissions standards, increasing renewable energy, and strategies to reduce methane emissions from agricultural and other wastes by using it to meet our energy needs. The 2017 Scoping Plan also comprehensively addresses GHG emissions from natural and working lands of California, including the agriculture and forestry sectors. The 2017 Scoping Plan considered a number of different alternatives to achieve the 2030 GHG reduction goal. The "Scoping Plan Scenario" was ultimately adopted and relies on the continuation of ongoing and statutorily required programs and continuation of the Cap-and-Trade Program. The Scoping Plan Scenario was modified from the January 2017 Proposed Scoping Plan to reflect AB 398, including removal of the 20 percent GHG reduction measure for refineries (CARB, 2017b).

CARB states that the Scoping Plan Scenario "is the best choice to achieve the State's climate and clean air goals" (CARB, 2017b). Under the Scoping Plan Scenario, the majority of the reductions would result from continuation of the Cap-and-Trade regulation. Additional reductions are achieved from electricity sector standards (i.e., utility providers to supply 50 percent renewable electricity by 2030), doubling the energy efficiency savings at end uses, additional reductions from the LCFS, implementing the short-lived climate pollutant strategy (e.g., hydrofluorocarbons), and implementing the mobile source strategy and sustainable freight action plan.

Regional

The program area is located in the South Coast Air Basin (Air Basin), which consists of Orange County, Los Angeles County (excluding the Antelope Valley portion), and the western, non-desert portions of San Bernardino and Riverside Counties, in addition to the San Gorgonio Pass area in Riverside County. The South Coast Air Quality Management District (SCAQMD) is responsible for air quality planning in the Air Basin and developing rules and regulations to bring the area into attainment of the ambient air quality standards. This is accomplished through air quality monitoring, evaluation, education, implementation of control measures to reduce emissions from stationary sources, permitting and inspection of pollution sources, enforcement of air quality regulations, and by supporting and implementing measures to reduce emissions from motor vehicles.

In 2008, SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds (CARB, 2008). On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for stationary source/industrial projects where the SCAQMD is Lead Agency. A GHG Significance Threshold Working Group was formed to further evaluate potential GHG significance thresholds (SCAQMD, 2008). The aforementioned Working Group has been inactive since 2011 and the SCAQMD has not formally adopted any GHG significance threshold.

Local

City of Long Beach

The City of Long Beach adopted an "Air Quality Element," (adopted December 3, 1996). The Element does not contain specific control strategies for greenhouse gases except a policy to support reduced energy consumption through conservation improvements that would reduce greenhouse gas emissions (Policy 7.1.7).

The City is in the process of developing a Climate Action and Adaptation Plan (CAAP). The City released a working draft of the CAAP on May 31, 2019. The CAAP will be incorporated into the City of Long Beach General Plan as a mitigation measure to the Land Use Element. The CAAP goals include:

- Distinguish Long Beach as a leader in climate mitigation and adaptation planning
- Be inclusive of the entire community while prioritizing vulnerable and disproportionately impacted populations
- Create a healthier community by addressing climate change
- Consider social, environmental, and economic co-benefits holistically
- Empower young people to be leaders in creating a most sustainable community
- Invoke personal sense of responsibility among residents and businesses
- Be an actionable plan (right balance of innovation and practicality)

It is anticipated that the CAAP will be adopted by City Council by the Fall of 2019 (http://www.longbeach.gov/lbds/planning/caap/).

City of Seal Beach

The City of Seal Beach General Plan, adopted in December 2003, does not contain a stand-alone air quality element or a Climate Action Plan.

4.0 Significance Thresholds and Methodology

Significance Thresholds

For the purposes of this PEIR and consistency with Appendix G of the CEQA Guidelines, the program would have a significant impact on GHG emissions if it would:

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

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

The State *CEQA Guidelines* Section 15064.4 was recently amended to assist lead agencies in determining the significance of the impacts of GHG emissions. Section 15064.4 gives lead agencies the discretion to determine whether to assess those emissions quantitatively and/or qualitatively. This section recommends certain factors that should be used in the determination of significance (i.e., extent to which the program may increase or reduce GHG emissions compared to the existing environment; whether the program exceeds an applicable significance threshold; and extent to which the program complies with regulations or requirements adopted to implement a statewide, regional, or local plan for reduction or mitigation of GHGs). The amendments do not establish a threshold of significance; rather, lead agencies are granted discretion to establish significance thresholds for their respective jurisdictions, including looking to thresholds developed by other public agencies, or suggested by other experts, such as CAPCOA, so long as any threshold chosen is supported by substantial evidence (see Guidelines Section 15064.7(c)).

The California Natural Resources Agency has also clarified that the CEQA Guidelines amendments focus on the effects of GHG emissions as cumulative impacts, and that they should be analyzed in the context of CEQA's requirements for cumulative impact analysis (see Section 15064(h)(3)) (CNRA, 2009).

Per State *CEQA Guidelines* Section 15064.4(b), "in determining the significance of a project's greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national or global emissions" Significance of impacts shall consider the project's impact as compared to the existing environmental setting, whether the project exceeds a threshold of significance, and compliance with relevant GHG-related plans.[4] Per State *CEQA Guidelines* Section 15064.4(b)(3), "the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions (see, e.g., section 15183.5(b)). Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions."

On December 5, 2008, the SCAQMD adopted an interim GHG significance threshold for projects where the SCAQMD is lead agency. The threshold utilizes a tiered approach, with a screening

4 California Code of Regulations (CCR), Title 14, Section 15064.4(b).

significance threshold of 10,000 $MTCO_2e$ per year for industrial projects. Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA. Tier 2 consists of determining whether or not the project is consistent with a GHG reduction plan. If the proposed project is consistent with the qualifying local GHG reduction plan, it is not significant for GHG emissions. If the project is not consistent with a local GHG reduction plan, there is no approved plan, or the GHG reduction plan does not consist of all the required components, then the project would move to Tier 3. Tier 3 establishes a screening significance threshold level that is intended to have a 90 percent emission capture rate approach. If the project exceeds the GHG screening significance threshold level and GHG emissions cannot be mitigated to less than the screening level, the project would move to Tier 4. Tier 4 is a decision tree approach to achieve compliance, but is not recommended for approval by SCAQMD. Tier 5 requires the project proponent to implement offsite mitigation to reduce GHG emission impacts to below the proposed screening level. For this program, the most appropriate threshold to use is the 10,000 $MTCO_2e$ per year because it is a program level evaluation of a wetlands restoration program with eventual removal of oil fields and oil operation infrastructure. The SCAQMD's working group is currently inactive and has not set a date for finalizing these recommendations.

Methodology

Existing Emissions

For the purposes of this program-level analysis, it is conservatively assumed that the program activities would result in all net new emissions. Most of the program area is either vacant or an active oil field. Existing emissions from oil fields within the boundaries of the Los Cerritos Wetlands Oil Consolidation and Restoration Project, located in the northern portion of the program area, have already been addressed in a previously certified EIR. As the program activities would restore habitats and eventually decommission and remove existing oil operations, the net change for emissions in the long term could be negative. However, this cannot be accurately quantified at this program-level since the timing and commitments to cease oil operations in the future is unknown. As a conservative approach, no existing emissions were subtracted from estimated program emissions before comparison to emission thresholds.

Construction

GHG emissions have been quantified using the California Emissions Estimator Model (CalEEMod) version 2016.3.2 software, an emissions inventory software, which is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professions to quantify potential criteria pollutant and GHG emissions from a variety of land use projects. CalEEMod was developed in collaboration with the air districts of California. Regional data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is considered to be an accurate and comprehensive tool for quantifying GHG emissions from land use projects throughout California and is recommended by the SCAQMD.

The input values used in this analysis were adjusted to account for the nature of wetlands restoration activities and referenced the equipment and assumptions used for the Los Cerritos Wetlands Oil Consolidation and Restoration Project for consistency (Table 3). Specialized construction equipment was added as appropriate according to the activities listed in Chapter 2, *Project Description*, of the Los Cerritos Wetlands Restoration Plan PEIR.

TABLE 3
OFF-ROAD EQUIPMENT LIST

Construction Subphase	Equipment	Number	Hours/ Day
Demolition and Site Preparation	Concrete saws	1	8
Demolition and Site Preparation	Excavators	3	8
Demolition and Site Preparation	Rubber Tired Dozers	2	8
Demolition and Site Preparation	Tractors/Loaders/Backhoes (Low ground pressure equipment)*	2	8
Grading/Excavation	Excavators	2	8
Grading/Excavation	Graders	1	8
Grading/Excavation	Rubber Tired Dozers	1	8
Grading/Excavation	Scrapers	2	8
Grading/Excavation	Tractors/Loaders/Backhoes	2	8
Grading/Excavation	Other Construction Equipment (Hydraulic Dredge)*	2	8
Grading/Excavation	Cranes (Clamshell and dragline crane)*	1	7
Drainage/Utilities/Subgrade	Excavators (Amphibious excavator)*	2	8
Drainage/Utilities/Subgrade	Trenchers (rotary ditcher)*	2	2
Drainage/Utilities/Subgrade	Pumps	2	8
Drainage/Utilities/Subgrade	Bore/drill rig	1	6
Building Construction	Cranes	1	7
Building Construction	Forklifts	3	8
Building Construction	Generator Sets	1	8
Building Construction	Tractors/Loaders/Backhoes	3	7
Building Construction	Welders	1	8
Paving	Pavers	2	8
Paving	Paving Equipment	2	8
Paving	Rollers	2	8
Architectural Coating	Air Compressors	1	6

*Note: Surrogates were used in place of special equipment for CalEEMod.

For on-road vehicle emissions, CalEEMod uses the emission factors and fleet mix based on the CARB on-road vehicle emissions model (EMFAC), which is incorporated into CalEEMod. On-road vehicle emission factors from the USEPA-approved EMFAC2017 model were used for the analysis. Subphases of construction would include demolition and site preparation, grading/excavation for levees, drainage/utilities/subgrade, building construction for the visitor centers, paving for access roads and parking, and architectural coating for the visitor centers and traffic markings. The demolition and site preparation includes removal of pipelines, tanks, and other oil infrastructure. Waste is assumed to be hauled to the Montebello landfill located approximately 23 miles away. The main wetland restoration activities are covered in the grading/excavation subphase, which includes construction, modifying, and removing berms as well as establishing tidal channels. It is assumed that a tugboat would be used to pull the barges for soil transport and that there would be two crew/survey boats at most on any given day. Tugboat emissions were calculated using emission factors from USEPA marine engine rules for Tier 2 engines. Emission factors were multiplied by the number of vessels and estimated hours of operation per day for usage and travel to and from the program area. Calculations are included in Appendix A. These off-shore emissions were added to the on-shore emissions for the grading/excavation subphase. For building construction and paving, for the purposes of this program-level air quality analysis, it is estimated that approximately 2,000 SF of visitor center space and 50 parking spaces would be required to serve the program area. Emissions from these activities are estimated by construction subphase.

Construction is phased by location (South, Isthmus, Central, and North Areas) and by time (Near-Term, Mid-Term, and Long-Term). In order to calculate a conservative emissions estimate and because the sequence of restoration is uncertain, a worst-case year in the Near-Term (2020) was formulated. Emission factors decline in later years because of the requirement and development of cleaner and more efficient equipment. Potential near-term activities include soil remediation, grading, berms/flood walls, visitor center construction, habitat restoration, removal of invasive species, and construction of trails. Potential mid-term activities include decommissioning the Haynes Cooling Channel, excavating a new channel, enhancing the habitat at the Los Alamitos Retarding Basin, grading, removing invasive species and planting native vegetation. Potential long term activities include grading, construction and deconstruction of levees, channel excavation, soil remediation, construction of public access points, trails, and viewpoints, and access road and culvert removal. Maximum daily GHG emissions were calculated by subphase using CalEEMod and then multiplied by a conservatively estimated maximum total number of days for that construction subphase to obtain an estimated total construction GHG emissions for the entire program restoration activities (**Table 4**).

TABLE 4
ANTICIPATED MAXIMUM CONSTRUCTION SCHEDULE

Construction Subphase	Maximum Number of Days/Year	Maximum Years
Demolition and Site Preparation	130	12
Grading/Excavation	260	22
Drainage/Utilities/Subgrade	130	12
Building Construction	130	2
Paving	40	2
Architectural Coating	20	2

Per SCAQMD methodology, the total construction emissions were amortized over a 30-year period and added to annual operational GHG emissions. Modeling input and output files are provided in Appendix A of this Technical Report.

Operation

Similar to construction, GHG emissions have been quantified using CalEEMod version 2016.3.2. CalEEMod was used to forecast the annual emissions from mobile sources that would occur during long-term program operations. The operational year was set to 2021 for a conservative emissions estimate. This consists mostly of truck trips for maintenance of the trails and wetlands and emissions from passenger vehicles from visitors. The analysis relied on the Institute of Transportation Engineers (ITE) Manual, 10th Edition "Public Park" category trip rates (i.e., denoted in the ITE Manual as "Land Use [LU] 411").

Area source emissions are based on natural gas (building heating and water heaters), landscaping equipment, and consumer product usage (including paints) rates provided in CalEEMod for the visitor center building. Most of the emissions would be associated with passenger cars traveling to and from the visitor center. Painting and re-painting of this facility will contribute to emissions. Additional emissions will come from maintenance of the wetlands and trails.

Operational GHG impacts are presented as net new emissions and added to amortized construction emissions. Modeling input and output files are provided in Appendix A of this Technical Report.

The proposed program's GHG emissions are also evaluated by assessing consistency with applicable GHG reduction strategies. As discussed previously, the GHG regulations have been adopted primarily at the federal and state levels to reduce emissions of GHGs from program sources, such as trucks and energy, under the Clean Air Act and the State's GHG regulatory framework under HSC Division 25.5 (AB 32). In addition, the SCAG 2016 RTP/SCS outlines goals for improving air quality and encouraging active transportation to reduce per capita vehicle miles traveled and associated transportation GHG emissions. Impacts are evaluated based on consistency with these applicable GHG regulations and plans.

5.0 Program Impacts and Mitigation Measures

Impact GHG-1: The program would result in a significant impact if the program would generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

Construction

Construction of the program would generate GHG emissions from multiple sources (**Table 5**). GHG emissions would be generated from tailpipe emissions of heavy duty construction equipment and mobile trips for maintenance. The program would require special equipment such as low ground pressure equipment, mats, long reach excavators, clamshell and dragline crane, amphibious excavator, rotary ditcher, floating equipment, and a hydraulic dredge. Complete equipment lists are shown in **Table 3**.

TABLE 5
PROGRAM CONSTRUCTION GHG EMISSIONS

Construction Subphase	Total Program $MTCO_2e$
Demolition/Site Preparation	3,426
Grading/Excavation	22,191
Drainage/Utilities/Subgrade	2,682
Building Construction	379
Paving	86
Architectural Coating	6
Total	*28,772*
Amortized over 30 years ($MTCO_2e$/year)	959

SOURCE: Appendix A, ESA, 2019.

Operation

Operational emissions would be generated at the visitor center by electric consumption for lighting and natural gas consumption for space heating. In addition, there would be emissions from motor vehicles traveling to and from the visitor center and other trailheads. A minimal amount of emissions is anticipated for periodic maintenance activities. It is anticipated that no water would be pumped into the wetland so the only water use would be to serve the visitor center. Annual operational emissions were calculated using CalEEMod and shown in **Table 6** below. Emissions were then compared to the SCAQMD GHG threshold of 10,000 $MTCO_2e$/year for industrial projects. The program annual emissions would be below the 10,000 $MTCO_2e$/year threshold. Because CalEEMod has a default assumption of 0 $MTCO_2$/acre for the wetland land use category, no carbon sequestration from the increase in wetland vegetation is incorporated into the GHG emissions analysis. Impacts from the program GHG emissions would be less than significant and mitigation measures would not be required.

TABLE 6
PROGRAM OPERATIONAL GHG EMISSIONS

Phase	Program $MTCO_2e$/year
Area	<0.1
Energy	9.43
Mobile	464.88
Waste	17.02
Water	2.19
Operational Total	*493.5*
Amortized over 30 years ($MTCO_2e$/year)	959
Total	**1,453**

SOURCE: Appendix A, ESA, 2019.

Mitigation Measure

None

Significance After Mitigation

Less than Significant

Impact GHG-2: The program would result in a significant impact if the program would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Construction Emissions

The proposed program would utilize construction contractors that would be in compliance with regulations including the USEPA Heavy Duty Vehicle Greenhouse Gas Regulation and the CARB ACTM that limits heavy-duty diesel motor vehicle idling. For vocational vehicles, which consist of a variety of work vehicles including dump trucks, the Phase 1 Heavy-Duty Vehicle Greenhouse Gas Regulation requires up to a 10 percent reduction in CO_2 emissions by model year 2017 over the 2010 baseline. The Phase 2 standards require the phase-in of a 12 to 24 percent reduction in CO_2 emission reduction from vocational vehicles by model year 2027 over the 2017 baseline. Compliance with anti-idling provisions would minimize unnecessary GHG emissions. Implementation of these measures would ensure that GHG-efficient equipment and practices in accordance with applicable plans, policies, and regulations would be used. Therefore, the program would not conflict with applicable regulations to reduce GHG emissions and construction impacts would be less than significant.

Operation

GHG emissions associated with mobile sources would only occur from periodic vehicle trips by workers for inspection and maintenance purposes and recreational visitors accessing the program area, which would not generate substantial emissions. Nonetheless, workers and visitors to the site would utilize vehicles that comply with State motor vehicle emissions standards.

The Seal Beach visitor center and any other new facilities would be built to the CALGREEN standards, which would reduce water consumption, improve energy efficiency, and decrease waste. The program would be compliant to all state and City codes and regulatory requirements. As of June 2019, the City of Long Beach and City of Seal Beach do not have any certified GHG-related policies, plans, or regulations. The City of Long Beach CAAP is expected to be certified by City Council in the Fall of 2019. The CAAP will serve as a guidance document for future climate change planning for the City of Long Beach and address both mitigation and adaptation. The program is expected to align with these strategies since its design considered sea level rise to adapt to a warming climate.

While the program is not a transportation project or a residential, commercial, or mixed-use project that would generate substantial numbers of vehicle trips, the program would contribute to the Cities' non-automotive transportation network. The program would provide improved public access to the wetlands both on foot and by bicycle within a populated urban area in the City of Long Beach and the City of Seal Beach that would be accessible to local area residents, employees, and visitors. These recreational opportunities for City of Long Beach and City of Seal Beach residents, employees, and visitors would reduce transportation-related air pollutants and GHG emissions by providing nearby recreational amenities including visitor centers and trails. Therefore, the proposed program would not conflict with the SCAG 2016 RTP/SCS goals of improving air quality, increasing accessibility to natural areas, preserving open space, and encouraging active transportation (e.g., bicycling and walking).

Therefore, impacts from the program's GHG emissions would be less than significant with regard to a conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Mitigation Measure

None

Significance After Mitigation

Less than Significant

6.0 Cumulative Impacts

The emissions of a single project will not cause or exacerbate global climate change. Climate change is a global phenomenon and the significance of a project's GHG emissions is inherently cumulative in nature. CEQA requires that lead agencies consider evaluating the cumulative impacts of GHGs from even relatively small (on a global basis) increases in GHG emissions. Small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable and therefore significant. A cumulatively considerable impact is the impact of a proposed project in addition to impacts of the related projects. However, in the case of global climate change, the proximity of the project to other GHG-generating activities is not directly relevant to the determination of global GHG cumulative impacts.

As shown in **Table 6**, the program would not exceed the SCAQMD screening level threshold of 10,000 $MTCO_2e$/year. The program would be consistent with the goals in the SCAG 2016 RTP/SCS, USEPA Heavy Duty Vehicle Greenhouse Gas Regulation, the CARB ACTM, and CALGREEN. Because GHG emissions are considered cumulative in nature, the program would not result in GHG emission that are cumulatively considerable.

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Appendix A

Greenhouse Gas Emissions Appendix

ESA

CONSTRUCTION (MT CO2e/year)

Phase	Days/year	Total number of years	Total Days over entire construction period	Max Emissions per day - unmitigated (lb/day)	Max Emissions per day - mitigated (lb/day)	Total Construction Emissions unmitigated (tpy)	Total Construction Emissions mitigated (tpy)
Demolition and site prep	130	12	1560	4842.31	4842.31	3426	3426
Grading/Excavation -option 1	260	22	5720	8552.95	8552.95	22191	22191
Drainage/Utilities/Subgrade	130	12	1560	3790.82	3790.82	2682	2682
Building Construction	130	2	260	3213.18	3213.18	379	379
Paving	40	2	80	2382.06	2382.06	86	86
Architectural Coating	20	2	40	355.02	355.02	6	6
						28772	28772

Construction emissions amoritized over 30 years -unmitigated (tpy)	959.1
Construction emissions amoritized over 30 years -mitigated (tpy)	959.1

OPERATION	Unmitigated	Mitigated
	MT CO2e/year	MT CO2e/year
Area	0.01	0.01
Energy	9.43	9.43
Mobile	464.88	464.88
Waste	17.02	17.02
Water	2.19	2.19
Operational total (tpy)	493.5	493.5
Amoritized construction total (tpy)	959.1	959.1
Total (tpy)	1,453	1,453

Unmitigated Maximum Yearly Emissions

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
	maximum ton/year									
Demolition and Site Preparation	0.2	2.2	1.6	0.0	1.5	0.1	1.6	0.2	0.1	0.3
Grading and Excavation - option 1	0.7	7.9	5.1	0.0	4.5	0.3	4.8	0.8	0.3	1.1
Grading and Excavation - option 2	0.8	8.4	5.4	0.0	3.2	0.4	3.6	0.6	0.3	0.9
Drainage/utilities/subgrade	0.1	1.3	1.3	0.0	0.0	0.1	0.1	0.0	0.1	0.1
Building Construction	0.1	1.2	1.1	0.0	0.0	0.1	0.1	0.0	0.1	0.1
Paving	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Architectural Coating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Offshore unmitigated emissions	1.3	12.4	8.6	3.3			0.4			0.4

Mitigated Maximum Yearly Emissions

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
	maximum ton/year									
Demolition and Site Preparation	0.0	0.2	1.7	0.0	1.5	0.0	1.5	0.2	0.0	0.2
Grading and Excavation - option 1	0.1	0.7	5.4	0.0	4.5	0.0	4.5	0.8	0.0	0.8
Grading and Excavation - option 2	0.2	1.0	5.9	0.0	3.2	0.0	3.3	0.6	0.0	0.6
Drainage/utilities/subgrade	0.0	0.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Building Construction	0.0	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paving	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Architectural Coating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Offshore mitigated emissions	1.3	7.6	8.6	3.3			0.2			0.4

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	2.00	1000sqft	0.05	2,000.00	0
City Park	503.00	Acre	503.00	21,910,680.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

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Project Characteristics -

Land Use -

Construction Phase - no construction - operation only run

Off-road Equipment -

Vehicle Trips - LU 411 Public Park trip rates used from ITE Manuel 10th Edition

Water And Wastewater - Assume no water is pumped into wetland.

Land Use Change -

Water Mitigation - CalGreen 20% water reduction

Waste Mitigation - AB341

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00
tblArchitecturalCoating	EF_Parking	100.00	250.00
tblArchitecturalCoating	EF_Residential_Exterior	50.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	50.00	250.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	250
tblAreaCoating	Area_EF_Nonresidential_Interior	100	250
tblAreaCoating	Area_EF_Parking	100	250
tblAreaCoating	Area_EF_Residential_Exterior	50	250
tblAreaCoating	Area_EF_Residential_Interior	50	250
tblConstructionPhase	NumDays	660.00	1.00
tblConstructionPhase	NumDays	9,300.00	1.00
tblConstructionPhase	NumDays	600.00	1.00
tblConstructionPhase	NumDays	930.00	1.00
tblConstructionPhase	NumDays	660.00	1.00
tblConstructionPhase	NumDays	360.00	1.00

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tblConsumerProducts	ROG_EF	1.98E-05	2.14E-05
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MHD	0.02	0.01
tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004

tblGrading	AcresOfGrading	2.50	2,325.00
tblLandscapeEquipment	NumberSummerDays	250	180
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
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tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3212e-007
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tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01

tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
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tblVehicleEF	HHD	0.03	0.03
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tblVehicleEF	HHD	0.09	2.8089e-006
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tblVehicleEF	HHD	19.56	1.76
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tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
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tblVehicleEF	HHD	8.1000e-005	2.5341e-006
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tblVehicleEF	HHD	19.57	1.76
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tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06

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tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
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tblVehicleEF	LDA	2.0000e-003	2.0000e-003
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tblVehicleEF	LDA	2.1160e-003	1.9056e-003
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tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.04	0.23
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tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
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tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.22
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tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.03

tblVehicleEF	LDA	0.04	0.22
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tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
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tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
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tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
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tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.21	0.45

tblVehicleEF	LDT1	3.5380e-003	3.3294e-003
tblVehicleEF	LDT1	7.6700e-004	6.6374e-004
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tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.24	0.49
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.01	0.08
tblVehicleEF	LDT1	1.99	2.01
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tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
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tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18

tblVehicleEF	LDT1	0.05	0.05
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.19	0.39
tblVehicleEF	LDT1	3.6940e-003	3.4605e-003
tblVehicleEF	LDT1	7.5900e-004	6.5619e-004
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.21	0.43
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.79	1.79
tblVehicleEF	LDT1	3.19	2.53
tblVehicleEF	LDT1	345.81	331.61
tblVehicleEF	LDT1	71.32	67.24
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003

tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.22	0.46
tblVehicleEF	LDT1	3.4810e-003	3.2814e-003
tblVehicleEF	LDT1	7.6900e-004	6.6538e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.24	0.50
tblVehicleEF	LDT2	7.8740e-003	6.3478e-003
tblVehicleEF	LDT2	7.2440e-003	0.08
tblVehicleEF	LDT2	0.90	1.24
tblVehicleEF	LDT2	1.49	2.87
tblVehicleEF	LDT2	395.42	367.68
tblVehicleEF	LDT2	80.68	73.77
tblVehicleEF	LDT2	0.09	0.12
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02

tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.10	0.38
tblVehicleEF	LDT2	3.9620e-003	3.6376e-003
tblVehicleEF	LDT2	8.3200e-004	7.3003e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.11	0.42
tblVehicleEF	LDT2	8.3450e-003	6.7606e-003
tblVehicleEF	LDT2	6.4440e-003	0.07
tblVehicleEF	LDT2	0.99	1.36
tblVehicleEF	LDT2	1.27	2.44
tblVehicleEF	LDT2	413.17	380.97
tblVehicleEF	LDT2	80.68	72.95
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.11	0.32
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003

tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.34
tblVehicleEF	LDT2	4.1400e-003	3.7691e-003
tblVehicleEF	LDT2	8.2800e-004	7.2192e-004
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LDT2	7.7190e-003	6.2197e-003
tblVehicleEF	LDT2	7.4150e-003	0.08
tblVehicleEF	LDT2	0.87	1.20
tblVehicleEF	LDT2	1.54	2.96
tblVehicleEF	LDT2	388.90	362.81
tblVehicleEF	LDT2	80.68	73.95
tblVehicleEF	LDT2	0.09	0.11

tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.39
tblVehicleEF	LDT2	3.8960e-003	3.5895e-003
tblVehicleEF	LDT2	8.3300e-004	7.3182e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.11	0.43
tblVehicleEF	LHD1	6.0120e-003	6.0724e-003
tblVehicleEF	LHD1	0.01	7.3245e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20

tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.04	1.27
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.09
tblVehicleEF	LHD1	34.52	13.36
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.05	0.84
tblVehicleEF	LHD1	1.07	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.29	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7874e-003

tblVehicleEF	LHD1	4.0200e-004	1.3218e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD1	6.0120e-003	6.0856e-003
tblVehicleEF	LHD1	0.01	7.4711e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.96	0.87
tblVehicleEF	LHD1	2.90	1.21
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.11
tblVehicleEF	LHD1	34.52	13.25
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	0.98	0.79
tblVehicleEF	LHD1	1.03	0.36
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03

tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.28	0.09
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0270e-003	6.7877e-003
tblVehicleEF	LHD1	3.9900e-004	1.3115e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.31	0.10
tblVehicleEF	LHD1	6.0120e-003	6.0700e-003
tblVehicleEF	LHD1	0.01	7.2867e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.06	1.28
tblVehicleEF	LHD1	8.91	8.98

tblVehicleEF	LHD1	612.93	694.08
tblVehicleEF	LHD1	34.52	13.37
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.03	0.83
tblVehicleEF	LHD1	1.08	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.30	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7873e-003
tblVehicleEF	LHD1	4.0200e-004	1.3235e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11

tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD2	4.3410e-003	4.3356e-003
tblVehicleEF	LHD2	5.0230e-003	5.0611e-003
tblVehicleEF	LHD2	9.9030e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.58
tblVehicleEF	LHD2	1.51	0.88
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.49
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.76	1.11
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004

tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
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tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3451e-003
tblVehicleEF	LHD2	5.0980e-003	5.1274e-003
tblVehicleEF	LHD2	9.5540e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.40	0.58
tblVehicleEF	LHD2	1.44	0.84
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.38
tblVehicleEF	LHD2	28.89	10.42
tblVehicleEF	LHD2	0.10	0.09

tblVehicleEF	LHD2	0.72	1.05
tblVehicleEF	LHD2	0.58	0.26
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7498e-003
tblVehicleEF	LHD2	3.1500e-004	1.0310e-004
tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.06	0.07

tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.14	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3338e-003
tblVehicleEF	LHD2	5.0030e-003	5.0440e-003
tblVehicleEF	LHD2	9.9730e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.57
tblVehicleEF	LHD2	1.52	0.89
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.50
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.75	1.09
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.02

tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
tblVehicleEF	LHD2	3.1700e-004	1.0394e-004
tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	MCY	0.53	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.20	19.84
tblVehicleEF	MCY	9.64	8.48
tblVehicleEF	MCY	188.47	223.17
tblVehicleEF	MCY	44.88	60.40
tblVehicleEF	MCY	1.13	1.14
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003

tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	2.61	2.65
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.06	1.84
tblVehicleEF	MCY	2.2780e-003	2.2085e-003
tblVehicleEF	MCY	6.6700e-004	5.9774e-004
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	3.25	3.27
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.24	2.00
tblVehicleEF	MCY	0.52	0.38
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.48	19.07
tblVehicleEF	MCY	8.82	7.74
tblVehicleEF	MCY	188.47	221.70
tblVehicleEF	MCY	44.88	58.50
tblVehicleEF	MCY	0.99	0.99
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003

tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	2.55	2.58
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	1.84	1.63
tblVehicleEF	MCY	2.2640e-003	2.1939e-003
tblVehicleEF	MCY	6.4700e-004	5.7891e-004
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	3.17	3.18
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	2.00	1.77
tblVehicleEF	MCY	0.54	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.30	19.94
tblVehicleEF	MCY	9.78	8.61
tblVehicleEF	MCY	188.47	223.39
tblVehicleEF	MCY	44.88	60.73
tblVehicleEF	MCY	1.11	1.11

tblVehicleEF	MCY	0.31	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	2.62	2.66
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.10	1.88
tblVehicleEF	MCY	2.2800e-003	2.2106e-003
tblVehicleEF	MCY	6.7100e-004	6.0100e-004
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	3.26	3.28
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.29	2.05
tblVehicleEF	MDV	0.02	9.2696e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.56	1.64
tblVehicleEF	MDV	2.79	3.50

tblVehicleEF	MDV	528.65	449.45
tblVehicleEF	MDV	106.35	89.79
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.25	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.04	0.05
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.22	0.50
tblVehicleEF	MDV	5.2990e-003	4.4442e-003
tblVehicleEF	MDV	1.1130e-003	8.8857e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.24	0.54
tblVehicleEF	MDV	0.02	9.7459e-003

tblVehicleEF	MDV	0.01	0.09
tblVehicleEF	MDV	1.69	1.77
tblVehicleEF	MDV	2.39	2.98
tblVehicleEF	MDV	551.85	463.58
tblVehicleEF	MDV	106.35	88.78
tblVehicleEF	MDV	0.15	0.14
tblVehicleEF	MDV	0.23	0.39
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.19	0.44
tblVehicleEF	MDV	5.5330e-003	4.5840e-003
tblVehicleEF	MDV	1.1050e-003	8.7855e-004
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.06	0.06

tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.21	0.48
tblVehicleEF	MDV	0.01	9.1128e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.52	1.59
tblVehicleEF	MDV	2.88	3.61
tblVehicleEF	MDV	520.14	444.29
tblVehicleEF	MDV	106.35	90.01
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.26	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.22	0.51
tblVehicleEF	MDV	5.2130e-003	4.3931e-003
tblVehicleEF	MDV	1.1140e-003	8.9074e-004
tblVehicleEF	MDV	0.07	0.09

tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.24	0.56
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
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tblVehicleEF	MH	0.85	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.36	0.11

tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0577e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.02
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tblVehicleEF	MH	1,135.33	1,557.88
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tblVehicleEF	MH	1.07	1.15
tblVehicleEF	MH	0.82	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
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tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62

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tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.35	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.1500e-004	2.0342e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.15	0.11
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.38	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
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tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
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tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004

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tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.37	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0615e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.40	0.12
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tblVehicleEF	MHD	5.7010e-003	9.4687e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.39	0.40
tblVehicleEF	MHD	0.42	0.87
tblVehicleEF	MHD	6.85	1.61
tblVehicleEF	MHD	131.02	70.09
tblVehicleEF	MHD	1,155.79	1,129.05
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tblVehicleEF	MHD	9.82	1.00
tblVehicleEF	MHD	2.8600e-004	2.2441e-003

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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.7300e-004	2.1470e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.2630e-003	6.6609e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7100e-004	1.2593e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
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tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	MHD	0.02	4.2175e-003

tblVehicleEF	MHD	5.7940e-003	9.5490e-003
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tblVehicleEF	MHD	0.28	0.31
tblVehicleEF	MHD	0.43	0.88
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tblVehicleEF	MHD	138.77	71.71
tblVehicleEF	MHD	1,155.79	1,129.06
tblVehicleEF	MHD	65.08	12.59
tblVehicleEF	MHD	0.53	0.63
tblVehicleEF	MHD	1.16	2.58
tblVehicleEF	MHD	9.78	0.99
tblVehicleEF	MHD	2.4100e-004	1.8940e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	2.3000e-004	1.8121e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
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tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
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tblVehicleEF	MHD	0.02	0.16

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tblVehicleEF	MHD	1.3360e-003	6.8157e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.6500e-004	1.2455e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.06	0.18
tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.44	0.08
tblVehicleEF	MHD	0.02	4.7993e-003
tblVehicleEF	MHD	5.6760e-003	9.4448e-003
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tblVehicleEF	MHD	0.53	0.51
tblVehicleEF	MHD	0.42	0.86
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tblVehicleEF	MHD	120.30	67.85
tblVehicleEF	MHD	1,155.79	1,129.04
tblVehicleEF	MHD	65.08	12.75
tblVehicleEF	MHD	0.49	0.61
tblVehicleEF	MHD	1.21	2.69
tblVehicleEF	MHD	9.83	1.00
tblVehicleEF	MHD	3.4800e-004	2.7274e-003
tblVehicleEF	MHD	0.13	0.13
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07

tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	3.3300e-004	2.6095e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.1630e-003	6.4466e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7200e-004	1.2619e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.04
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	OBUS	0.01	9.0528e-003
tblVehicleEF	OBUS	8.8720e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.29	0.61

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tblVehicleEF	OBUS	111.80	98.82
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tblVehicleEF	OBUS	68.32	19.86
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tblVehicleEF	OBUS	2.63	0.62
tblVehicleEF	OBUS	2.0400e-004	3.3787e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	1.9500e-004	3.2325e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	7.7800e-004	9.3362e-004
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tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	1.0790e-003	9.3986e-004
tblVehicleEF	OBUS	0.01	0.01

tblVehicleEF	OBUS	7.8400e-004	1.9655e-004
tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.06	0.09
tblVehicleEF	OBUS	7.7800e-004	9.3362e-004
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.26
tblVehicleEF	OBUS	0.39	0.13
tblVehicleEF	OBUS	0.01	9.0475e-003
tblVehicleEF	OBUS	9.0250e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.27	0.57
tblVehicleEF	OBUS	0.61	1.27
tblVehicleEF	OBUS	5.43	2.40
tblVehicleEF	OBUS	117.45	100.02
tblVehicleEF	OBUS	1,266.65	1,458.61
tblVehicleEF	OBUS	68.32	19.62
tblVehicleEF	OBUS	0.60	0.72
tblVehicleEF	OBUS	1.63	2.35
tblVehicleEF	OBUS	2.59	0.61
tblVehicleEF	OBUS	1.7200e-004	2.8530e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	1.6400e-004	2.7296e-003
tblVehicleEF	OBUS	0.06	0.06

tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	2.1550e-003	2.7285e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	1.1010e-003	1.3226e-003
tblVehicleEF	OBUS	0.07	0.15
tblVehicleEF	OBUS	0.04	0.25
tblVehicleEF	OBUS	0.35	0.12
tblVehicleEF	OBUS	1.1330e-003	9.5128e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.7900e-004	1.9419e-004
tblVehicleEF	OBUS	2.1550e-003	2.7285e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	1.1010e-003	1.3226e-003
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.25
tblVehicleEF	OBUS	0.38	0.13
tblVehicleEF	OBUS	0.01	9.0785e-003
tblVehicleEF	OBUS	8.8310e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.31	0.66
tblVehicleEF	OBUS	0.60	1.24
tblVehicleEF	OBUS	5.81	2.56
tblVehicleEF	OBUS	104.00	97.15

tblVehicleEF	OBUS	1,266.65	1,458.57
tblVehicleEF	OBUS	68.32	19.91
tblVehicleEF	OBUS	0.56	0.71
tblVehicleEF	OBUS	1.70	2.46
tblVehicleEF	OBUS	2.64	0.62
tblVehicleEF	OBUS	2.4800e-004	4.1047e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	2.3700e-004	3.9271e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
tblVehicleEF	OBUS	0.07	0.14
tblVehicleEF	OBUS	0.04	0.28
tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	1.0040e-003	9.2410e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.8500e-004	1.9702e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
tblVehicleEF	OBUS	0.02	0.02

tblVehicleEF	OBUS	0.06	0.09
tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.28
tblVehicleEF	OBUS	0.40	0.14
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9517e-003
tblVehicleEF	SBUS	0.07	5.5911e-003
tblVehicleEF	SBUS	8.04	2.47
tblVehicleEF	SBUS	0.79	0.66
tblVehicleEF	SBUS	7.53	0.78
tblVehicleEF	SBUS	1,136.99	350.96
tblVehicleEF	SBUS	1,088.61	1,142.40
tblVehicleEF	SBUS	53.57	4.74
tblVehicleEF	SBUS	9.91	3.43
tblVehicleEF	SBUS	4.55	5.48
tblVehicleEF	SBUS	12.42	0.77
tblVehicleEF	SBUS	0.01	5.0981e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	4.8776e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005

tblVehicleEF	SBUS	3.3870e-003	8.4800e-004
tblVehicleEF	SBUS	0.03	7.2494e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.3445e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.6600e-004	4.6882e-005
tblVehicleEF	SBUS	3.3870e-003	8.4800e-004
tblVehicleEF	SBUS	0.03	7.2494e-003
tblVehicleEF	SBUS	1.40	0.40
tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.43	0.04
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	8.0370e-003
tblVehicleEF	SBUS	0.06	4.9797e-003
tblVehicleEF	SBUS	7.92	2.43
tblVehicleEF	SBUS	0.80	0.67
tblVehicleEF	SBUS	6.11	0.64
tblVehicleEF	SBUS	1,188.84	360.21
tblVehicleEF	SBUS	1,088.61	1,142.41
tblVehicleEF	SBUS	53.57	4.49
tblVehicleEF	SBUS	10.22	3.51

tblVehicleEF	SBUS	4.29	5.17
tblVehicleEF	SBUS	12.39	0.77
tblVehicleEF	SBUS	9.0250e-003	4.3047e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	8.6350e-003	4.1185e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.35	0.03
tblVehicleEF	SBUS	0.01	3.4320e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.4200e-004	4.4468e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	1.39	0.40
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.13	0.13

tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.38	0.03
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9268e-003
tblVehicleEF	SBUS	0.07	5.7268e-003
tblVehicleEF	SBUS	8.21	2.53
tblVehicleEF	SBUS	0.78	0.66
tblVehicleEF	SBUS	7.78	0.81
tblVehicleEF	SBUS	1,065.38	338.18
tblVehicleEF	SBUS	1,088.61	1,142.39
tblVehicleEF	SBUS	53.57	4.78
tblVehicleEF	SBUS	9.47	3.32
tblVehicleEF	SBUS	4.47	5.39
tblVehicleEF	SBUS	12.43	0.77
tblVehicleEF	SBUS	0.01	6.1938e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	5.9258e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	0.97	0.28

tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.2238e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.7000e-004	4.7323e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	1.40	0.41
tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.44	0.04
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.79	42.44
tblVehicleEF	UBUS	8.90	0.71
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.66
tblVehicleEF	UBUS	10.68	1.20
tblVehicleEF	UBUS	15.66	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03

tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0860e-003	8.5721e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	3.79	6.37
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.73	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.84	42.44
tblVehicleEF	UBUS	7.71	0.62
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.52
tblVehicleEF	UBUS	10.07	1.20
tblVehicleEF	UBUS	15.61	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03

tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	0.91	0.15
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.61	0.04
tblVehicleEF	UBUS	9.9300e-003	1.5961e-003
tblVehicleEF	UBUS	1.0650e-003	8.4268e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	3.80	6.37
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.77	42.44
tblVehicleEF	UBUS	9.11	0.72
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.69
tblVehicleEF	UBUS	10.47	1.20

tblVehicleEF	UBUS	15.67	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0900e-003	8.6004e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	3.78	6.37
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.75	0.05
tblVehicleTrips	CC_TL	8.40	7.30
tblVehicleTrips	CC_TL	8.40	7.30
tblVehicleTrips	CNW_TL	6.90	7.30
tblVehicleTrips	CNW_TL	6.90	7.30

tblVehicleTrips	CW_TL	16.60	9.50
tblVehicleTrips	CW_TL	16.60	9.50
tblVehicleTrips	ST_TR	22.75	1.96
tblVehicleTrips	ST_TR	2.46	1.96
tblVehicleTrips	SU_TR	16.74	2.19
tblVehicleTrips	SU_TR	1.05	2.19
tblVehicleTrips	WD_TR	1.89	0.78
tblVehicleTrips	WD_TR	11.03	0.78
tblWater	OutdoorWaterUseRate	599,315,118.88	0.00

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					
2020	1.6800e-003	0.0166	0.0111	2.0000e-005	6.0000e-005	8.3000e-004	8.9000e-004	2.0000e-005	7.7000e-004	7.9000e-004	0.0000	1.7566	1.7566	4.8000e-004	0.0000	1.7687
2022	1.6100e-003	0.0166	0.0101	2.0000e-005	9.1100e-003	8.1000e-004	9.9100e-003	4.9800e-003	7.4000e-004	5.7300e-003	0.0000	1.7355	1.7355	5.4000e-004	0.0000	1.7491
2023	1.6900e-003	0.0173	0.0143	3.0000e-005	1.2359	7.1000e-004	1.2366	0.1348	6.6000e-004	0.1355	0.0000	2.7948	2.7948	8.8000e-004	0.0000	2.8169
2027	0.0156	0.1384	0.1311	7.6000e-004	0.0490	6.7000e-004	0.0497	0.0133	6.3000e-004	0.0139	0.0000	72.0080	72.0080	3.1000e-003	0.0000	72.0855
2062	5.1000e-004	1.8300e-003	7.9100e-003	1.0000e-005	5.0000e-005	6.0000e-005	1.1000e-004	1.0000e-005	6.0000e-005	7.0000e-005	0.0000	1.2050	1.2050	4.0000e-005	0.0000	1.2060
2065	0.0464	3.6000e-004	9.0000e-004	0.0000	6.4200e-003	0.0000	6.4300e-003	1.5800e-003	0.0000	1.5800e-003	0.0000	0.1277	0.1277	0.0000	0.0000	0.1278
Maximum	**0.0464**	**0.1384**	**0.1311**	**7.6000e-004**	**1.2359**	**8.3000e-004**	**1.2366**	**0.1348**	**7.7000e-004**	**0.1355**	**0.0000**	**72.0080**	**72.0080**	**3.1000e-003**	**0.0000**	**72.0855**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	1.6800e-003	0.0166	0.0111	2.0000e-005	6.0000e-005	8.3000e-004	8.9000e-004	2.0000e-005	7.7000e-004	7.9000e-004	0.0000	1.7566	1.7566	4.8000e-004	0.0000	1.7687
2022	1.6100e-003	0.0166	0.0101	2.0000e-005	9.1100e-003	8.1000e-004	9.9100e-003	4.9800e-003	7.4000e-004	5.7300e-003	0.0000	1.7355	1.7355	5.4000e-004	0.0000	1.7491
2023	1.6900e-003	0.0173	0.0143	3.0000e-005	1.2359	7.1000e-004	1.2366	0.1348	6.6000e-004	0.1355	0.0000	2.7948	2.7948	8.8000e-004	0.0000	2.8169
2027	0.0156	0.1384	0.1311	7.6000e-004	0.0490	6.7000e-004	0.0497	0.0133	6.3000e-004	0.0139	0.0000	72.0080	72.0080	3.1000e-003	0.0000	72.0855
2062	5.1000e-004	1.8300e-003	7.9100e-003	1.0000e-005	5.0000e-005	6.0000e-005	1.1000e-004	1.0000e-005	6.0000e-005	7.0000e-005	0.0000	1.2050	1.2050	4.0000e-005	0.0000	1.2060
2065	0.0464	3.6000e-004	9.0000e-004	0.0000	6.4200e-003	0.0000	6.4300e-003	1.5800e-003	0.0000	1.5800e-003	0.0000	0.1277	0.1277	0.0000	0.0000	0.1278
Maximum	**0.0464**	**0.1384**	**0.1311**	**7.6000e-004**	**1.2359**	**8.3000e-004**	**1.2366**	**0.1348**	**7.7000e-004**	**0.1355**	**0.0000**	**72.0080**	**72.0080**	**3.1000e-003**	**0.0000**	**72.0855**

	ROG	NOx	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	**1-1-2020**	**3-31-2020**	0.0131	0.0131
10	**4-1-2022**	**6-30-2022**	0.0130	0.0130
15	**7-1-2023**	**9-30-2023**	0.0135	0.0135
29	**1-1-2027**	**3-31-2027**	0.1095	0.1095
172	**10-1-2062**	**12-31-2062**	0.0017	0.0017

182	**4-1-2065**	**6-30-2065**	0.0334	0.0334
		Highest	0.1095	0.1095

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2267	4.0000e-005	4.6600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.0200e-003	9.0200e-003	2.0000e-005	0.0000	9.6200e-003
Energy	1.1000e-004	1.0200e-003	8.6000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	9.3888	9.3888	3.6000e-004	9.0000e-005	9.4250
Mobile	0.3732	0.3700	2.7430	5.0200e-003	0.4660	5.6300e-003	0.4716	0.1243	5.2700e-003	0.1296	0.0000	463.9228	463.9228	0.0384	0.0000	464.8829
Waste						0.0000	0.0000		0.0000	0.0000	9.1590	0.0000	9.1590	0.5413	0.0000	22.6909
Water						0.0000	0.0000		0.0000	0.0000	0.1128	2.2460	2.3588	0.0117	2.9000e-004	2.7379
Total	**0.6000**	**0.3711**	**2.7485**	**5.0300e-003**	**0.4660**	**5.7300e-003**	**0.4717**	**0.1243**	**5.3700e-003**	**0.1297**	**9.2717**	**475.5666**	**484.8383**	**0.5918**	**3.8000e-004**	**499.7464**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2267	4.0000e-005	4.6600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.0200e-003	9.0200e-003	2.0000e-005	0.0000	9.6200e-003
Energy	1.1000e-004	1.0200e-003	8.6000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	9.3888	9.3888	3.6000e-004	9.0000e-005	9.4250
Mobile	0.3732	0.3700	2.7430	5.0200e-003	0.4660	5.6300e-003	0.4716	0.1243	5.2700e-003	0.1296	0.0000	463.9228	463.9228	0.0384	0.0000	464.8829
Waste						0.0000	0.0000		0.0000	0.0000	6.8692	0.0000	6.8692	0.4060	0.0000	17.0182
Water						0.0000	0.0000		0.0000	0.0000	0.0902	1.7968	1.8870	9.3400e-003	2.3000e-004	2.1903
Total	**0.6000**	**0.3711**	**2.7485**	**5.0300e-003**	**0.4660**	**5.7300e-003**	**0.4717**	**0.1243**	**5.3700e-003**	**0.1297**	**6.9594**	**475.1174**	**482.0768**	**0.4541**	**3.2000e-004**	**493.5261**

	ROG	NOx	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**	**24.94**	**0.09**	**0.57**	**23.26**	**15.79**	**1.24**

3.0 Construction Detail

Construction Phase

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/1/2020	5	1	
2	Site Preparation	Site Preparation	4/20/2022	4/20/2022	5	1	
3	Grading	Grading	9/6/2023	9/6/2023	5	1	
4	Building Construction	Building Construction	3/31/2027	3/31/2027	5	1	
5	Paving	Paving	11/22/2062	11/22/2062	5	1	
6	Architectural Coating	Architectural Coating	6/3/2065	6/3/2065	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2325

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 6,000; Non-Residential Outdoor: 2,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	9,203.00	3,591.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1,841.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.6600e-003	0.0166	0.0109	2.0000e-005		8.3000e-004	8.3000e-004		7.7000e-004	7.7000e-004	0.0000	1.6999	1.6999	4.8000e-004	0.0000	1.7119
Total	**1.6600e-003**	**0.0166**	**0.0109**	**2.0000e-005**		**8.3000e-004**	**8.3000e-004**		**7.7000e-004**	**7.7000e-004**	**0.0000**	**1.6999**	**1.6999**	**4.8000e-004**	**0.0000**	**1.7119**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0567	0.0567	0.0000	0.0000	0.0567
Total	**3.0000e-005**	**2.0000e-005**	**2.4000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0567**	**0.0567**	**0.0000**	**0.0000**	**0.0567**

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	1.6600e-003	0.0166	0.0109	2.0000e-005		8.3000e-004	8.3000e-004		7.7000e-004	7.7000e-004	0.0000	1.6999	1.6999	4.8000e-004	0.0000	1.7119
Total	**1.6600e-003**	**0.0166**	**0.0109**	**2.0000e-005**		**8.3000e-004**	**8.3000e-004**		**7.7000e-004**	**7.7000e-004**	**0.0000**	**1.6999**	**1.6999**	**4.8000e-004**	**0.0000**	**1.7119**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0567	0.0567	0.0000	0.0000	0.0567
Total	**3.0000e-005**	**2.0000e-005**	**2.4000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0567**	**0.0567**	**0.0000**	**0.0000**	**0.0567**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.0300e-003	0.0000	9.0300e-003	4.9700e-003	0.0000	4.9700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5900e-003	0.0165	9.8500e-003	2.0000e-005		8.1000e-004	8.1000e-004		7.4000e-004	7.4000e-004	0.0000	1.6720	1.6720	5.4000e-004	0.0000	1.6855
Total	**1.5900e-003**	**0.0165**	**9.8500e-003**	**2.0000e-005**	**9.0300e-003**	**8.1000e-004**	**9.8400e-003**	**4.9700e-003**	**7.4000e-004**	**5.7100e-003**	**0.0000**	**1.6720**	**1.6720**	**5.4000e-004**	**0.0000**	**1.6855**

3.3 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.4000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0636	0.0636	0.0000	0.0000	0.0636
Total	**3.0000e-005**	**2.0000e-005**	**2.4000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0636**	**0.0636**	**0.0000**	**0.0000**	**0.0636**

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					9.0300e-003	0.0000	9.0300e-003	4.9700e-003	0.0000	4.9700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5900e-003	0.0165	9.8500e-003	2.0000e-005		8.1000e-004	8.1000e-004		7.4000e-004	7.4000e-004	0.0000	1.6720	1.6720	5.4000e-004	0.0000	1.6855
Total	**1.5900e-003**	**0.0165**	**9.8500e-003**	**2.0000e-005**	**9.0300e-003**	**8.1000e-004**	**9.8400e-003**	**4.9700e-003**	**7.4000e-004**	**5.7100e-003**	**0.0000**	**1.6720**	**1.6720**	**5.4000e-004**	**0.0000**	**1.6855**

3.3 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.4000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0636	0.0636	0.0000	0.0000	0.0636
Total	**3.0000e-005**	**2.0000e-005**	**2.4000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0636**	**0.0636**	**0.0000**	**0.0000**	**0.0636**

3.4 Grading - 2023

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					1.2358	0.0000	1.2358	0.1348	0.0000	0.1348	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6600e-003	0.0173	0.0140	3.0000e-005		7.1000e-004	7.1000e-004		6.6000e-004	6.6000e-004	0.0000	2.7268	2.7268	8.8000e-004	0.0000	2.7488
Total	**1.6600e-003**	**0.0173**	**0.0140**	**3.0000e-005**	**1.2358**	**7.1000e-004**	**1.2366**	**0.1348**	**6.6000e-004**	**0.1354**	**0.0000**	**2.7268**	**2.7268**	**8.8000e-004**	**0.0000**	**2.7488**

3.4 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.4000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0680	0.0680	0.0000	0.0000	0.0681
Total	**3.0000e-005**	**2.0000e-005**	**2.4000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0680**	**0.0680**	**0.0000**	**0.0000**	**0.0681**

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					1.2358	0.0000	1.2358	0.1348	0.0000	0.1348	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6600e-003	0.0173	0.0140	3.0000e-005		7.1000e-004	7.1000e-004		6.6000e-004	6.6000e-004	0.0000	2.7268	2.7268	8.8000e-004	0.0000	2.7488
Total	**1.6600e-003**	**0.0173**	**0.0140**	**3.0000e-005**	**1.2358**	**7.1000e-004**	**1.2366**	**0.1348**	**6.6000e-004**	**0.1354**	**0.0000**	**2.7268**	**2.7268**	**8.8000e-004**	**0.0000**	**2.7488**

3.4 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	2.4000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0680	0.0680	0.0000	0.0000	0.0681
Total	**3.0000e-005**	**2.0000e-005**	**2.4000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0680**	**0.0680**	**0.0000**	**0.0000**	**0.0681**

3.5 Building Construction - 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	6.8000e-004	6.2300e-003	8.0400e-003	1.0000e-005		2.6000e-004	2.6000e-004		2.5000e-004	2.5000e-004	0.0000	1.1596	1.1596	2.7000e-004	0.0000	1.1664
Total	**6.8000e-004**	**6.2300e-003**	**8.0400e-003**	**1.0000e-005**		**2.6000e-004**	**2.6000e-004**		**2.5000e-004**	**2.5000e-004**	**0.0000**	**1.1596**	**1.1596**	**2.7000e-004**	**0.0000**	**1.1664**

3.5 Building Construction - 2027

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	3.6600e-003	0.1254	0.0382	4.5000e-004	0.0120	1.5000e-004	0.0121	3.4500e-003	1.4000e-004	3.5900e-003	0.0000	43.5983	43.5983	2.2500e-003	0.0000	43.6546
Worker	0.0112	6.7300e-003	0.0849	3.0000e-004	0.0371	2.6000e-004	0.0373	9.8400e-003	2.4000e-004	0.0101	0.0000	27.2501	27.2501	5.7000e-004	0.0000	27.2644
Total	**0.0149**	**0.1322**	**0.1231**	**7.5000e-004**	**0.0490**	**4.1000e-004**	**0.0494**	**0.0133**	**3.8000e-004**	**0.0137**	**0.0000**	**70.8484**	**70.8484**	**2.8200e-003**	**0.0000**	**70.9190**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.8000e-004	6.2300e-003	8.0400e-003	1.0000e-005		2.6000e-004	2.6000e-004		2.5000e-004	2.5000e-004	0.0000	1.1596	1.1596	2.7000e-004	0.0000	1.1664
Total	**6.8000e-004**	**6.2300e-003**	**8.0400e-003**	**1.0000e-005**		**2.6000e-004**	**2.6000e-004**		**2.5000e-004**	**2.5000e-004**	**0.0000**	**1.1596**	**1.1596**	**2.7000e-004**	**0.0000**	**1.1664**

3.5 Building Construction - 2027

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	3.6600e-003	0.1254	0.0382	4.5000e-004	0.0120	1.5000e-004	0.0121	3.4500e-003	1.4000e-004	3.5900e-003	0.0000	43.5983	43.5983	2.2500e-003	0.0000	43.6546
Worker	0.0112	6.7300e-003	0.0849	3.0000e-004	0.0371	2.6000e-004	0.0373	9.8400e-003	2.4000e-004	0.0101	0.0000	27.2501	27.2501	5.7000e-004	0.0000	27.2644
Total	**0.0149**	**0.1322**	**0.1231**	**7.5000e-004**	**0.0490**	**4.1000e-004**	**0.0494**	**0.0133**	**3.8000e-004**	**0.0137**	**0.0000**	**70.8484**	**70.8484**	**2.8200e-003**	**0.0000**	**70.9190**

3.6 Paving - 2062

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	5.1000e-004	1.8300e-003	7.9100e-003	1.0000e-005		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	1.2050	1.2050	4.0000e-005	0.0000	1.2060
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.1000e-004**	**1.8300e-003**	**7.9100e-003**	**1.0000e-005**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**1.2050**	**1.2050**	**4.0000e-005**	**0.0000**	**1.2060**

3.6 Paving - 2062

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**5.0000e-005**	**0.0000**	**5.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	5.1000e-004	1.8300e-003	7.9100e-003	1.0000e-005		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	1.2050	1.2050	4.0000e-005	0.0000	1.2060
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**5.1000e-004**	**1.8300e-003**	**7.9100e-003**	**1.0000e-005**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**1.2050**	**1.2050**	**4.0000e-005**	**0.0000**	**1.2060**

3.6 Paving - 2062

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**5.0000e-005**	**0.0000**	**5.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Architectural Coating - 2065

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					
Archit. Coating	0.0464					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.0000e-005	3.6000e-004	9.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.1277	0.1277	0.0000	0.0000	0.1278
Total	**0.0464**	**3.6000e-004**	**9.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.1277**	**0.1277**	**0.0000**	**0.0000**	**0.1278**

3.7 Architectural Coating - 2065

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					6.4200e-003	0.0000	6.4200e-003	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**6.4200e-003**	**0.0000**	**6.4200e-003**	**1.5800e-003**	**0.0000**	**1.5800e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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					
Archit. Coating	0.0464					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.0000e-005	3.6000e-004	9.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.1277	0.1277	0.0000	0.0000	0.1278
Total	**0.0464**	**3.6000e-004**	**9.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.1277**	**0.1277**	**0.0000**	**0.0000**	**0.1278**

3.7 Architectural Coating - 2065

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					6.4200e-003	0.0000	6.4200e-003	1.5800e-003	0.0000	1.5800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**6.4200e-003**	**0.0000**	**6.4200e-003**	**1.5800e-003**	**0.0000**	**1.5800e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.3732	0.3700	2.7430	5.0200e-003	0.4660	5.6300e-003	0.4716	0.1243	5.2700e-003	0.1296	0.0000	463.9228	463.9228	0.0384	0.0000	464.8829
Unmitigated	0.3732	0.3700	2.7430	5.0200e-003	0.4660	5.6300e-003	0.4716	0.1243	5.2700e-003	0.1296	0.0000	463.9228	463.9228	0.0384	0.0000	464.8829

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	392.34	985.88	1101.57	1,234,906	1,234,906
General Office Building	1.56	3.92	4.38	5,496	5,496
Total	393.90	989.80	1,105.95	1,240,402	1,240,402

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
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455
General Office Building	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455

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	8.2778	8.2778	3.4000e-004	7.0000e-005	8.3074
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	8.2778	8.2778	3.4000e-004	7.0000e-005	8.3074
NaturalGas Mitigated	1.1000e-004	1.0200e-003	8.6000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.1110	1.1110	2.0000e-005	2.0000e-005	1.1176
NaturalGas Unmitigated	1.1000e-004	1.0200e-003	8.6000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.1110	1.1110	2.0000e-005	2.0000e-005	1.1176

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	20820	1.1000e-004	1.0200e-003	8.6000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.1110	1.1110	2.0000e-005	2.0000e-005	1.1176
Total		**1.1000e-004**	**1.0200e-003**	**8.6000e-004**	**1.0000e-005**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**1.1110**	**1.1110**	**2.0000e-005**	**2.0000e-005**	**1.1176**

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	20820	1.1000e-004	1.0200e-003	8.6000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.1110	1.1110	2.0000e-005	2.0000e-005	1.1176
Total		**1.1000e-004**	**1.0200e-003**	**8.6000e-004**	**1.0000e-005**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**1.1110**	**1.1110**	**2.0000e-005**	**2.0000e-005**	**1.1176**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
General Office Building	25980	8.2778	3.4000e-004	7.0000e-005	8.3074
Total		**8.2778**	**3.4000e-004**	**7.0000e-005**	**8.3074**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
General Office Building	25980	8.2778	3.4000e-004	7.0000e-005	8.3074
Total		**8.2778**	**3.4000e-004**	**7.0000e-005**	**8.3074**

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	0.2267	4.0000e-005	4.6600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.0200e-003	9.0200e-003	2.0000e-005	0.0000	9.6200e-003
Unmitigated	0.2267	4.0000e-005	4.6600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.0200e-003	9.0200e-003	2.0000e-005	0.0000	9.6200e-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	tons/yr										MT/yr					
Architectural Coating	4.6400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2216					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.4000e-004	4.0000e-005	4.6600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.0200e-003	9.0200e-003	2.0000e-005	0.0000	9.6200e-003
Total	**0.2267**	**4.0000e-005**	**4.6600e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**9.0200e-003**	**9.0200e-003**	**2.0000e-005**	**0.0000**	**9.6200e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.6400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2216					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.4000e-004	4.0000e-005	4.6600e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	9.0200e-003	9.0200e-003	2.0000e-005	0.0000	9.6200e-003
Total	**0.2267**	**4.0000e-005**	**4.6600e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**9.0200e-003**	**9.0200e-003**	**2.0000e-005**	**0.0000**	**9.6200e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.8870	9.3400e-003	2.3000e-004	2.1903
Unmitigated	2.3588	0.0117	2.9000e-004	2.7379

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	0.355467 / 0.217867	2.3588	0.0117	2.9000e-004	2.7379
Total		**2.3588**	**0.0117**	**2.9000e-004**	**2.7379**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
General Office Building	0.284374 / 0.174294	1.8870	9.3400e-003	2.3000e-004	2.1903
Total		**1.8870**	**9.3400e-003**	**2.3000e-004**	**2.1903**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	6.8692	0.4060	0.0000	17.0182
Unmitigated	9.1590	0.5413	0.0000	22.6909

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	43.26	8.7814	0.5190	0.0000	21.7555
General Office Building	1.86	0.3776	0.0223	0.0000	0.9354
Total		**9.1590**	**0.5413**	**0.0000**	**22.6909**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	32.445	6.5860	0.3892	0.0000	16.3166
General Office Building	1.395	0.2832	0.0167	0.0000	0.7016
Total		**6.8692**	**0.4060**	**0.0000**	**17.0182**

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

Los Cerritos Wetlands Restoration - Operations only

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 Office Building	2.00	1000sqft	0.05	2,000.00	0
City Park	503.00	Acre	503.00	21,910,680.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Summer

Project Characteristics -

Land Use -

Construction Phase - no construction - operation only run

Off-road Equipment -

Vehicle Trips - LU 411 Public Park trip rates used from ITE Manuel 10th Edition

Water And Wastewater - Assume no water is pumped into wetland.

Land Use Change -

Water Mitigation - CalGreen 20% water reduction

Waste Mitigation - AB341

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00
tblArchitecturalCoating	EF_Parking	100.00	250.00
tblArchitecturalCoating	EF_Residential_Exterior	50.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	50.00	250.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	250
tblAreaCoating	Area_EF_Nonresidential_Interior	100	250
tblAreaCoating	Area_EF_Parking	100	250
tblAreaCoating	Area_EF_Residential_Exterior	50	250
tblAreaCoating	Area_EF_Residential_Interior	50	250
tblConstructionPhase	NumDays	660.00	1.00
tblConstructionPhase	NumDays	9,300.00	1.00
tblConstructionPhase	NumDays	600.00	1.00
tblConstructionPhase	NumDays	930.00	1.00
tblConstructionPhase	NumDays	660.00	1.00
tblConstructionPhase	NumDays	360.00	1.00

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Summer

tblConsumerProducts	ROG_EF	1.98E-05	2.14E-05
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MHD	0.02	0.01
tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004

tblGrading	AcresOfGrading	2.50	2,325.00
tblLandscapeEquipment	NumberSummerDays	250	180
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblVehicleEF	HHD	0.65	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3212e-007
tblVehicleEF	HHD	2.61	5.73
tblVehicleEF	HHD	1.16	0.77
tblVehicleEF	HHD	3.36	0.01
tblVehicleEF	HHD	4,729.35	1,160.01
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	21.63	6.50
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tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01

tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
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tblVehicleEF	HHD	4.3200e-004	2.2097e-003
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tblVehicleEF	HHD	0.02	0.01
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tblVehicleEF	HHD	4.3200e-004	2.2097e-003
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tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.08	5.0957e-007
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tblVehicleEF	HHD	1.17	0.77
tblVehicleEF	HHD	3.19	0.01
tblVehicleEF	HHD	5,008.69	1,160.72
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	22.32	6.36
tblVehicleEF	HHD	3.97	4.34
tblVehicleEF	HHD	19.56	1.76
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
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tblVehicleEF	HHD	4.2100e-004	2.1847e-003

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tblVehicleEF	HHD	1.2100e-004	1.1037e-005
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tblVehicleEF	HHD	4.2100e-004	2.1847e-003
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tblVehicleEF	HHD	0.09	0.08
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tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06

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tblVehicleEF	HHD	0.03	0.03
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tblVehicleEF	HHD	0.02	0.01
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tblVehicleEF	HHD	5.2380e-003	5.0906e-004
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tblVehicleEF	LDA	2.3010e-003	2.0724e-003
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tblVehicleEF	LDA	2.1160e-003	1.9056e-003
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tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.08	0.27
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tblVehicleEF	LDA	0.07	0.19
tblVehicleEF	LDA	0.04	0.04
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tblVehicleEF	LDA	2.3010e-003	2.0724e-003
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tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
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tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.22
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tblVehicleEF	LDA	0.02	0.03

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tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
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tblVehicleEF	LDT1	0.02	0.09
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tblVehicleEF	LDT1	0.18	0.31
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tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.21	0.45

tblVehicleEF	LDT1	3.5380e-003	3.3294e-003
tblVehicleEF	LDT1	7.6700e-004	6.6374e-004
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tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.24	0.49
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.01	0.08
tblVehicleEF	LDT1	1.99	2.01
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tblVehicleEF	LDT1	0.16	0.28
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18

tblVehicleEF	LDT1	0.05	0.05
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.19	0.39
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tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.21	0.43
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tblVehicleEF	LDT1	0.02	0.09
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tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003

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tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.22	0.46
tblVehicleEF	LDT1	3.4810e-003	3.2814e-003
tblVehicleEF	LDT1	7.6900e-004	6.6538e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.24	0.50
tblVehicleEF	LDT2	7.8740e-003	6.3478e-003
tblVehicleEF	LDT2	7.2440e-003	0.08
tblVehicleEF	LDT2	0.90	1.24
tblVehicleEF	LDT2	1.49	2.87
tblVehicleEF	LDT2	395.42	367.68
tblVehicleEF	LDT2	80.68	73.77
tblVehicleEF	LDT2	0.09	0.12
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02

tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.10	0.38
tblVehicleEF	LDT2	3.9620e-003	3.6376e-003
tblVehicleEF	LDT2	8.3200e-004	7.3003e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.11	0.42
tblVehicleEF	LDT2	8.3450e-003	6.7606e-003
tblVehicleEF	LDT2	6.4440e-003	0.07
tblVehicleEF	LDT2	0.99	1.36
tblVehicleEF	LDT2	1.27	2.44
tblVehicleEF	LDT2	413.17	380.97
tblVehicleEF	LDT2	80.68	72.95
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.11	0.32
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003

tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.34
tblVehicleEF	LDT2	4.1400e-003	3.7691e-003
tblVehicleEF	LDT2	8.2800e-004	7.2192e-004
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LDT2	7.7190e-003	6.2197e-003
tblVehicleEF	LDT2	7.4150e-003	0.08
tblVehicleEF	LDT2	0.87	1.20
tblVehicleEF	LDT2	1.54	2.96
tblVehicleEF	LDT2	388.90	362.81
tblVehicleEF	LDT2	80.68	73.95
tblVehicleEF	LDT2	0.09	0.11

tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.39
tblVehicleEF	LDT2	3.8960e-003	3.5895e-003
tblVehicleEF	LDT2	8.3300e-004	7.3182e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.11	0.43
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tblVehicleEF	LHD1	0.01	7.3245e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20

tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.04	1.27
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.09
tblVehicleEF	LHD1	34.52	13.36
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.05	0.84
tblVehicleEF	LHD1	1.07	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.29	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7874e-003

tblVehicleEF	LHD1	4.0200e-004	1.3218e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.32	0.11
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tblVehicleEF	LHD1	0.01	7.4711e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.96	0.87
tblVehicleEF	LHD1	2.90	1.21
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.11
tblVehicleEF	LHD1	34.52	13.25
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	0.98	0.79
tblVehicleEF	LHD1	1.03	0.36
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03

tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.28	0.09
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0270e-003	6.7877e-003
tblVehicleEF	LHD1	3.9900e-004	1.3115e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.31	0.10
tblVehicleEF	LHD1	6.0120e-003	6.0700e-003
tblVehicleEF	LHD1	0.01	7.2867e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.06	1.28
tblVehicleEF	LHD1	8.91	8.98

tblVehicleEF	LHD1	612.93	694.08
tblVehicleEF	LHD1	34.52	13.37
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.03	0.83
tblVehicleEF	LHD1	1.08	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.30	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7873e-003
tblVehicleEF	LHD1	4.0200e-004	1.3235e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11

tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD2	4.3410e-003	4.3356e-003
tblVehicleEF	LHD2	5.0230e-003	5.0611e-003
tblVehicleEF	LHD2	9.9030e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.58
tblVehicleEF	LHD2	1.51	0.88
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
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tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
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tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
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tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
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tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
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tblVehicleEF	LHD2	0.02	0.02
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tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
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tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
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tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
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tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3451e-003
tblVehicleEF	LHD2	5.0980e-003	5.1274e-003
tblVehicleEF	LHD2	9.5540e-003	0.01
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tblVehicleEF	LHD2	625.73	696.38
tblVehicleEF	LHD2	28.89	10.42
tblVehicleEF	LHD2	0.10	0.09

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tblVehicleEF	LHD2	0.01	0.01
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tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
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tblVehicleEF	LHD2	0.09	0.42
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tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.06	0.07

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tblVehicleEF	LHD2	1.52	0.89
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
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tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.75	1.09
tblVehicleEF	LHD2	0.61	0.27
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tblVehicleEF	LHD2	0.01	0.01
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tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
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tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
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tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.02

tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
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tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
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tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	MCY	0.53	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.20	19.84
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tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003

tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	2.61	2.65
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.06	1.84
tblVehicleEF	MCY	2.2780e-003	2.2085e-003
tblVehicleEF	MCY	6.6700e-004	5.9774e-004
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	3.25	3.27
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.24	2.00
tblVehicleEF	MCY	0.52	0.38
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.48	19.07
tblVehicleEF	MCY	8.82	7.74
tblVehicleEF	MCY	188.47	221.70
tblVehicleEF	MCY	44.88	58.50
tblVehicleEF	MCY	0.99	0.99
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003

tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	2.55	2.58
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	1.84	1.63
tblVehicleEF	MCY	2.2640e-003	2.1939e-003
tblVehicleEF	MCY	6.4700e-004	5.7891e-004
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	3.17	3.18
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	2.00	1.77
tblVehicleEF	MCY	0.54	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.30	19.94
tblVehicleEF	MCY	9.78	8.61
tblVehicleEF	MCY	188.47	223.39
tblVehicleEF	MCY	44.88	60.73
tblVehicleEF	MCY	1.11	1.11

tblVehicleEF	MCY	0.31	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.16	1.20
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tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	2.62	2.66
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.10	1.88
tblVehicleEF	MCY	2.2800e-003	2.2106e-003
tblVehicleEF	MCY	6.7100e-004	6.0100e-004
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	3.26	3.28
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.29	2.05
tblVehicleEF	MDV	0.02	9.2696e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.56	1.64
tblVehicleEF	MDV	2.79	3.50

tblVehicleEF	MDV	528.65	449.45
tblVehicleEF	MDV	106.35	89.79
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.25	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.04	0.05
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.22	0.50
tblVehicleEF	MDV	5.2990e-003	4.4442e-003
tblVehicleEF	MDV	1.1130e-003	8.8857e-004
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.24	0.54
tblVehicleEF	MDV	0.02	9.7459e-003

tblVehicleEF	MDV	0.01	0.09
tblVehicleEF	MDV	1.69	1.77
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tblVehicleEF	MDV	106.35	88.78
tblVehicleEF	MDV	0.15	0.14
tblVehicleEF	MDV	0.23	0.39
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	0.08	0.44
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tblVehicleEF	MDV	5.5330e-003	4.5840e-003
tblVehicleEF	MDV	1.1050e-003	8.7855e-004
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.06	0.06

tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.21	0.48
tblVehicleEF	MDV	0.01	9.1128e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.52	1.59
tblVehicleEF	MDV	2.88	3.61
tblVehicleEF	MDV	520.14	444.29
tblVehicleEF	MDV	106.35	90.01
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.26	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
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tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.04
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tblVehicleEF	MDV	0.22	0.51
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tblVehicleEF	MDV	0.07	0.09

tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.06	0.06
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tblVehicleEF	MH	0.02	0.02
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tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
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tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.36	0.11

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tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.82
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tblVehicleEF	MH	0.04	0.01
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tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
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tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62

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tblVehicleEF	MH	0.08	0.07
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tblVehicleEF	MH	0.15	0.11
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.38	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
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tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004

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tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.92
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tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0615e-004
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tblVehicleEF	MH	0.09	0.09
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tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
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tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.2630e-003	6.6609e-004
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tblVehicleEF	MHD	7.7100e-004	1.2593e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
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tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	MHD	0.02	4.2175e-003

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tblVehicleEF	MHD	2.4100e-004	1.8940e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
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tblVehicleEF	MHD	5.3920e-003	0.07
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tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
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tblVehicleEF	MHD	0.02	0.16

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tblVehicleEF	MHD	1.1240e-003	7.1030e-004
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07

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tblVehicleEF	MHD	3.0000e-003	3.0000e-003
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tblVehicleEF	MHD	0.03	0.18
tblVehicleEF	MHD	0.42	0.07
tblVehicleEF	MHD	1.1630e-003	6.4466e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7200e-004	1.2619e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.04
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
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tblVehicleEF	OBUS	0.01	0.01
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tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	1.9500e-004	3.2325e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
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tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
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tblVehicleEF	OBUS	1.6400e-004	2.7296e-003
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tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	2.1550e-003	2.7285e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	1.1010e-003	1.3226e-003
tblVehicleEF	OBUS	0.07	0.15
tblVehicleEF	OBUS	0.04	0.25
tblVehicleEF	OBUS	0.35	0.12
tblVehicleEF	OBUS	1.1330e-003	9.5128e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.7900e-004	1.9419e-004
tblVehicleEF	OBUS	2.1550e-003	2.7285e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.09
tblVehicleEF	OBUS	1.1010e-003	1.3226e-003
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.25
tblVehicleEF	OBUS	0.38	0.13
tblVehicleEF	OBUS	0.01	9.0785e-003
tblVehicleEF	OBUS	8.8310e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.31	0.66
tblVehicleEF	OBUS	0.60	1.24
tblVehicleEF	OBUS	5.81	2.56
tblVehicleEF	OBUS	104.00	97.15

tblVehicleEF	OBUS	1,266.65	1,458.57
tblVehicleEF	OBUS	68.32	19.91
tblVehicleEF	OBUS	0.56	0.71
tblVehicleEF	OBUS	1.70	2.46
tblVehicleEF	OBUS	2.64	0.62
tblVehicleEF	OBUS	2.4800e-004	4.1047e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	2.3700e-004	3.9271e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
tblVehicleEF	OBUS	0.07	0.14
tblVehicleEF	OBUS	0.04	0.28
tblVehicleEF	OBUS	0.36	0.12
tblVehicleEF	OBUS	1.0040e-003	9.2410e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.8500e-004	1.9702e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
tblVehicleEF	OBUS	0.02	0.02

tblVehicleEF	OBUS	0.06	0.09
tblVehicleEF	OBUS	7.5800e-004	9.2118e-004
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.28
tblVehicleEF	OBUS	0.40	0.14
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9517e-003
tblVehicleEF	SBUS	0.07	5.5911e-003
tblVehicleEF	SBUS	8.04	2.47
tblVehicleEF	SBUS	0.79	0.66
tblVehicleEF	SBUS	7.53	0.78
tblVehicleEF	SBUS	1,136.99	350.96
tblVehicleEF	SBUS	1,088.61	1,142.40
tblVehicleEF	SBUS	53.57	4.74
tblVehicleEF	SBUS	9.91	3.43
tblVehicleEF	SBUS	4.55	5.48
tblVehicleEF	SBUS	12.42	0.77
tblVehicleEF	SBUS	0.01	5.0981e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	4.8776e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005

tblVehicleEF	SBUS	3.3870e-003	8.4800e-004
tblVehicleEF	SBUS	0.03	7.2494e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.3445e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.6600e-004	4.6882e-005
tblVehicleEF	SBUS	3.3870e-003	8.4800e-004
tblVehicleEF	SBUS	0.03	7.2494e-003
tblVehicleEF	SBUS	1.40	0.40
tblVehicleEF	SBUS	1.7160e-003	4.2965e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.43	0.04
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	8.0370e-003
tblVehicleEF	SBUS	0.06	4.9797e-003
tblVehicleEF	SBUS	7.92	2.43
tblVehicleEF	SBUS	0.80	0.67
tblVehicleEF	SBUS	6.11	0.64
tblVehicleEF	SBUS	1,188.84	360.21
tblVehicleEF	SBUS	1,088.61	1,142.41
tblVehicleEF	SBUS	53.57	4.49
tblVehicleEF	SBUS	10.22	3.51

tblVehicleEF	SBUS	4.29	5.17
tblVehicleEF	SBUS	12.39	0.77
tblVehicleEF	SBUS	9.0250e-003	4.3047e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	8.6350e-003	4.1185e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	0.97	0.28
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.35	0.03
tblVehicleEF	SBUS	0.01	3.4320e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.4200e-004	4.4468e-005
tblVehicleEF	SBUS	4.9940e-003	1.2331e-003
tblVehicleEF	SBUS	0.03	7.3700e-003
tblVehicleEF	SBUS	1.39	0.40
tblVehicleEF	SBUS	2.4540e-003	6.0281e-004
tblVehicleEF	SBUS	0.13	0.13

tblVehicleEF	SBUS	0.01	0.05
tblVehicleEF	SBUS	0.38	0.03
tblVehicleEF	SBUS	0.86	0.06
tblVehicleEF	SBUS	0.01	7.9268e-003
tblVehicleEF	SBUS	0.07	5.7268e-003
tblVehicleEF	SBUS	8.21	2.53
tblVehicleEF	SBUS	0.78	0.66
tblVehicleEF	SBUS	7.78	0.81
tblVehicleEF	SBUS	1,065.38	338.18
tblVehicleEF	SBUS	1,088.61	1,142.39
tblVehicleEF	SBUS	53.57	4.78
tblVehicleEF	SBUS	9.47	3.32
tblVehicleEF	SBUS	4.47	5.39
tblVehicleEF	SBUS	12.43	0.77
tblVehicleEF	SBUS	0.01	6.1938e-003
tblVehicleEF	SBUS	0.74	0.74
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	7.8000e-004	4.1339e-005
tblVehicleEF	SBUS	0.01	5.9258e-003
tblVehicleEF	SBUS	0.32	0.32
tblVehicleEF	SBUS	2.6770e-003	2.7073e-003
tblVehicleEF	SBUS	0.02	0.03
tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	0.97	0.28

tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.11	0.11
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.2238e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.7000e-004	4.7323e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
tblVehicleEF	SBUS	0.03	7.8209e-003
tblVehicleEF	SBUS	1.40	0.41
tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
tblVehicleEF	SBUS	0.13	0.13
tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.44	0.04
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.79	42.44
tblVehicleEF	UBUS	8.90	0.71
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.66
tblVehicleEF	UBUS	10.68	1.20
tblVehicleEF	UBUS	15.66	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03

tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0860e-003	8.5721e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	3.79	6.37
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.73	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.84	42.44
tblVehicleEF	UBUS	7.71	0.62
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.52
tblVehicleEF	UBUS	10.07	1.20
tblVehicleEF	UBUS	15.61	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03

tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	0.91	0.15
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.61	0.04
tblVehicleEF	UBUS	9.9300e-003	1.5961e-003
tblVehicleEF	UBUS	1.0650e-003	8.4268e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	3.80	6.37
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.77	42.44
tblVehicleEF	UBUS	9.11	0.72
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.69
tblVehicleEF	UBUS	10.47	1.20

tblVehicleEF	UBUS	15.67	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0900e-003	8.6004e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	3.78	6.37
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.75	0.05
tblVehicleTrips	CC_TL	8.40	7.30
tblVehicleTrips	CC_TL	8.40	7.30
tblVehicleTrips	CNW_TL	6.90	7.30
tblVehicleTrips	CNW_TL	6.90	7.30

tblVehicleTrips	CW_TL	16.60	9.50
tblVehicleTrips	CW_TL	16.60	9.50
tblVehicleTrips	ST_TR	22.75	1.96
tblVehicleTrips	ST_TR	2.46	1.96
tblVehicleTrips	SU_TR	16.74	2.19
tblVehicleTrips	SU_TR	1.05	2.19
tblVehicleTrips	WD_TR	1.89	0.78
tblVehicleTrips	WD_TR	11.03	0.78
tblWater	OutdoorWaterUseRate	599,315,118.88	0.00

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					
2020	3.3673	33.2382	22.2516	0.0401	0.1232	1.6598	1.7830	0.0327	1.5428	1.5755	0.0000	3,878.2410	3,878.2410	1.0621	0.0000	3,904.7940
2022	3.2278	33.1198	20.2047	0.0395	18.2141	1.6138	19.8279	9.9699	1.4847	11.4546	0.0000	3,832.3995	3,832.3995	1.1962	0.0000	3,862.3055
2023	3.3818	34.5520	28.5696	0.0637	2,471.8498	1.4258	2,473.2755	269.5876	1.3117	270.8993	0.0000	6,168.1235	6,168.1235	1.9483	0.0000	6,216.8319
2027	30.9669	272.3474	269.9438	1.5607	99.9212	1.3340	101.2552	27.0548	1.2485	28.3033	0.0000	162,453.2255	162,453.2255	6.7826	0.0000	162,622.7898
2062	1.0112	3.6566	15.8177	0.0281	0.1071	0.1164	0.2235	0.0263	0.1164	0.1427	0.0000	2,656.5168	2,656.5168	0.0893	0.0000	2,658.7489
2065	92.8149	0.7270	1.7923	2.9700e-003	13.1436	7.4300e-003	13.1511	3.2262	7.4300e-003	3.2336	0.0000	281.4481	281.4481	9.9000e-003	0.0000	281.6957
Maximum	**92.8149**	**272.3474**	**269.9438**	**1.5607**	**2,471.8498**	**1.6598**	**2,473.2755**	**269.5876**	**1.5428**	**270.8993**	**0.0000**	**162,453.2255**	**162,453.2255**	**6.7826**	**0.0000**	**162,622.7898**

2.1 Overall Construction (Maximum Daily Emission)

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					
2020	3.3673	33.2382	22.2516	0.0401	0.1232	1.6598	1.7830	0.0327	1.5428	1.5755	0.0000	3,878.2410	3,878.2410	1.0621	0.0000	3,904.7940
2022	3.2278	33.1198	20.2047	0.0395	18.2141	1.6138	19.8279	9.9699	1.4847	11.4546	0.0000	3,832.3995	3,832.3995	1.1962	0.0000	3,862.3055
2023	3.3818	34.5520	28.5696	0.0637	2,471.8498	1.4258	2,473.2755	269.5876	1.3117	270.8993	0.0000	6,168.1235	6,168.1235	1.9483	0.0000	6,216.8318
2027	30.9669	272.3474	269.9438	1.5607	99.9212	1.3340	101.2552	27.0548	1.2485	28.3033	0.0000	162,453.2255	162,453.2255	6.7826	0.0000	162,622.7898
2062	1.0112	3.6566	15.8177	0.0281	0.1071	0.1164	0.2235	0.0263	0.1164	0.1427	0.0000	2,656.5168	2,656.5168	0.0893	0.0000	2,658.7489
2065	92.8149	0.7270	1.7923	2.9700e-003	13.1436	7.4300e-003	13.1511	3.2262	7.4300e-003	3.2336	0.0000	281.4481	281.4481	9.9000e-003	0.0000	281.6957
Maximum	**92.8149**	**272.3474**	**269.9438**	**1.5607**	**2,471.8498**	**1.6598**	**2,473.2755**	**269.5876**	**1.5428**	**270.8993**	**0.0000**	**162,453.2255**	**162,453.2255**	**6.7826**	**0.0000**	**162,622.7898**

	ROG	NOx	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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Energy	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Mobile	3.9903	3.5505	28.9319	0.0543	4.9730	0.0590	5.0320	1.3246	0.0552	1.3798		5,530.5871	5,530.5871	0.4278		5,541.2812
Total	**5.2355**	**3.5566**	**28.9884**	**0.0543**	**4.9730**	**0.0596**	**5.0326**	**1.3246**	**0.0558**	**1.3805**		**5,537.4084**	**5,537.4084**	**0.4282**	**1.2000e-004**	**5,548.1496**

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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Energy	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Mobile	3.9903	3.5505	28.9319	0.0543	4.9730	0.0590	5.0320	1.3246	0.0552	1.3798		5,530.5871	5,530.5871	0.4278		5,541.2812
Total	**5.2355**	**3.5566**	**28.9884**	**0.0543**	**4.9730**	**0.0596**	**5.0326**	**1.3246**	**0.0558**	**1.3805**		**5,537.4084**	**5,537.4084**	**0.4282**	**1.2000e-004**	**5,548.1496**

	ROG	NOx	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	Demolition	Demolition	1/1/2020	1/1/2020	5	1	
2	Site Preparation	Site Preparation	4/20/2022	4/20/2022	5	1	
3	Grading	Grading	9/6/2023	9/6/2023	5	1	
4	Building Construction	Building Construction	3/31/2027	3/31/2027	5	1	
5	Paving	Paving	11/22/2062	11/22/2062	5	1	
6	Architectural Coating	Architectural Coating	6/3/2065	6/3/2065	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2325

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 6,000; Non-Residential Outdoor: 2,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	9,203.00	3,591.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1,841.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**		**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

3.2 Demolition - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0372	0.4984	1.3100e-003	0.1232	1.0600e-003	0.1243	0.0327	9.7000e-004	0.0337		130.5361	130.5361	4.1700e-003		130.6404
Total	**0.0552**	**0.0372**	**0.4984**	**1.3100e-003**	**0.1232**	**1.0600e-003**	**0.1243**	**0.0327**	**9.7000e-004**	**0.0337**		**130.5361**	**130.5361**	**4.1700e-003**		**130.6404**

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	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**	**0.0000**	**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

3.2 Demolition - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0372	0.4984	1.3100e-003	0.1232	1.0600e-003	0.1243	0.0327	9.7000e-004	0.0337		130.5361	130.5361	4.1700e-003		130.6404
Total	**0.0552**	**0.0372**	**0.4984**	**1.3100e-003**	**0.1232**	**1.0600e-003**	**0.1243**	**0.0327**	**9.7000e-004**	**0.0337**		**130.5361**	**130.5361**	**4.1700e-003**		**130.6404**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**18.0663**	**1.6126**	**19.6788**	**9.9307**	**1.4836**	**11.4143**		**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0576	0.0363	0.5069	1.4700e-003	0.1479	1.1900e-003	0.1491	0.0392	1.0900e-003	0.0403		146.3377	146.3377	4.0900e-003		146.4400
Total	**0.0576**	**0.0363**	**0.5069**	**1.4700e-003**	**0.1479**	**1.1900e-003**	**0.1491**	**0.0392**	**1.0900e-003**	**0.0403**		**146.3377**	**146.3377**	**4.0900e-003**		**146.4400**

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836	0.0000	3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**18.0663**	**1.6126**	**19.6788**	**9.9307**	**1.4836**	**11.4143**	**0.0000**	**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0576	0.0363	0.5069	1.4700e-003	0.1479	1.1900e-003	0.1491	0.0392	1.0900e-003	0.0403		146.3377	146.3377	4.0900e-003		146.4400
Total	**0.0576**	**0.0363**	**0.5069**	**1.4700e-003**	**0.1479**	**1.1900e-003**	**0.1491**	**0.0392**	**1.0900e-003**	**0.0403**		**146.3377**	**146.3377**	**4.0900e-003**		**146.4400**

3.4 Grading - 2023

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					2,471.6855	0.0000	2,471.6855	269.5440	0.0000	269.5440			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105		6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**2,471.6855**	**1.4245**	**2,473.1100**	**269.5440**	**1.3105**	**270.8546**		**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.4 Grading - 2023

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0600	0.0364	0.5185	1.5700e-003	0.1643	1.2800e-003	0.1656	0.0436	1.1800e-003	0.0448		156.6458	156.6458	4.1000e-003		156.7483
Total	**0.0600**	**0.0364**	**0.5185**	**1.5700e-003**	**0.1643**	**1.2800e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**156.6458**	**156.6458**	**4.1000e-003**		**156.7483**

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					2,471.6855	0.0000	2,471.6855	269.5440	0.0000	269.5440			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105	0.0000	6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**2,471.6855**	**1.4245**	**2,473.1100**	**269.5440**	**1.3105**	**270.8546**	**0.0000**	**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.4 Grading - 2023

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0600	0.0364	0.5185	1.5700e-003	0.1643	1.2800e-003	0.1656	0.0436	1.1800e-003	0.0448		156.6458	156.6458	4.1000e-003		156.7483
Total	**0.0600**	**0.0364**	**0.5185**	**1.5700e-003**	**0.1643**	**1.2800e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**156.6458**	**156.6458**	**4.1000e-003**		**156.7483**

3.5 Building Construction - 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	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

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	7.1593	248.0142	73.0263	0.9047	24.3207	0.2862	24.6070	7.0021	0.2735	7.2756		97,155.0715	97,155.0715	4.8548		97,276.4405
Worker	22.4403	11.8635	180.8328	0.6291	75.6005	0.5202	76.1207	20.0528	0.4787	20.5314		62,741.6797	62,741.6797	1.3269		62,774.8513
Total	**29.5995**	**259.8777**	**253.8591**	**1.5338**	**99.9212**	**0.8064**	**100.7276**	**27.0548**	**0.7522**	**27.8070**		**159,896.7512**	**159,896.7512**	**6.1816**		**160,051.2918**

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	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

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	7.1593	248.0142	73.0263	0.9047	24.3207	0.2862	24.6070	7.0021	0.2735	7.2756		97,155.0715	97,155.0715	4.8548		97,276.4405
Worker	22.4403	11.8635	180.8328	0.6291	75.6005	0.5202	76.1207	20.0528	0.4787	20.5314		62,741.6797	62,741.6797	1.3269		62,774.8513
Total	**29.5995**	**259.8777**	**253.8591**	**1.5338**	**99.9212**	**0.8064**	**100.7276**	**27.0548**	**0.7522**	**27.8070**		**159,896.7512**	**159,896.7512**	**6.1816**		**160,051.2918**

3.6 Paving - 2062

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	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164		2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**		**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2062

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1071	0.0000	0.1071	0.0263	0.0000	0.0263			0.0000			0.0000
Total					**0.1071**	**0.0000**	**0.1071**	**0.0263**	**0.0000**	**0.0263**			**0.0000**			**0.0000**

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	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164	0.0000	2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**	**0.0000**	**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2062

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1071	0.0000	0.1071	0.0263	0.0000	0.0263			0.0000			0.0000
Total					**0.1071**	**0.0000**	**0.1071**	**0.0263**	**0.0000**	**0.0263**			**0.0000**			**0.0000**

3.7 Architectural Coating - 2065

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					
Archit. Coating	92.7000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003		281.4481	281.4481	9.9000e-003		281.6957
Total	**92.8149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**		**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2065

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					13.1436	0.0000	13.1436	3.2262	0.0000	3.2262			0.0000			0.0000
Total					**13.1436**	**0.0000**	**13.1436**	**3.2262**	**0.0000**	**3.2262**			**0.0000**			**0.0000**

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					
Archit. Coating	92.7000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.0000	281.4481	281.4481	9.9000e-003		281.6957
Total	**92.8149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.0000**	**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2065

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					13.1436	0.0000	13.1436	3.2262	0.0000	3.2262			0.0000			0.0000
Total					**13.1436**	**0.0000**	**13.1436**	**3.2262**	**0.0000**	**3.2262**			**0.0000**			**0.0000**

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	3.9903	3.5505	28.9319	0.0543	4.9730	0.0590	5.0320	1.3246	0.0552	1.3798		5,530.5871	5,530.5871	0.4278		5,541.2812
Unmitigated	3.9903	3.5505	28.9319	0.0543	4.9730	0.0590	5.0320	1.3246	0.0552	1.3798		5,530.5871	5,530.5871	0.4278		5,541.2812

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	392.34	985.88	1101.57	1,234,906	1,234,906
General Office Building	1.56	3.92	4.38	5,496	5,496
Total	393.90	989.80	1,105.95	1,240,402	1,240,402

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
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455
General Office Building	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455

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	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
NaturalGas Unmitigated	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	57.0411	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Total		**6.2000e-004**	**5.5900e-003**	**4.7000e-003**	**3.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.3000e-004**	**4.3000e-004**		**6.7107**	**6.7107**	**1.3000e-004**	**1.2000e-004**	**6.7506**

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	0.0570411	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Total		**6.2000e-004**	**5.5900e-003**	**4.7000e-003**	**3.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.3000e-004**	**4.3000e-004**		**6.7107**	**6.7107**	**1.3000e-004**	**1.2000e-004**	**6.7506**

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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Unmitigated	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179

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	0.0254					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2143					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.8300e-003	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Total	**1.2446**	**4.7000e-004**	**0.0518**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1105**	**0.1105**	**2.9000e-004**		**0.1179**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0254					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2143					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.8300e-003	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Total	**1.2446**	**4.7000e-004**	**0.0518**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1105**	**0.1105**	**2.9000e-004**		**0.1179**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

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

Los Cerritos Wetlands Restoration - Operations only

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 Office Building	2.00	1000sqft	0.05	2,000.00	0
City Park	503.00	Acre	503.00	21,910,680.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Winter

Project Characteristics -

Land Use -

Construction Phase - no construction - operation only run

Off-road Equipment -

Vehicle Trips - LU 411 Public Park trip rates used from ITE Manuel 10th Edition

Water And Wastewater - Assume no water is pumped into wetland.

Land Use Change -

Water Mitigation - CalGreen 20% water reduction

Waste Mitigation - AB341

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00
tblArchitecturalCoating	EF_Parking	100.00	250.00
tblArchitecturalCoating	EF_Residential_Exterior	50.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	50.00	250.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	250
tblAreaCoating	Area_EF_Nonresidential_Interior	100	250
tblAreaCoating	Area_EF_Parking	100	250
tblAreaCoating	Area_EF_Residential_Exterior	50	250
tblAreaCoating	Area_EF_Residential_Interior	50	250
tblConstructionPhase	NumDays	660.00	1.00
tblConstructionPhase	NumDays	9,300.00	1.00
tblConstructionPhase	NumDays	600.00	1.00
tblConstructionPhase	NumDays	930.00	1.00
tblConstructionPhase	NumDays	660.00	1.00
tblConstructionPhase	NumDays	360.00	1.00

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Winter

tblConsumerProducts	ROG_EF	1.98E-05	2.14E-05
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	HHD	0.03	7.9665e-003
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDA	0.55	0.55
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT1	0.05	0.06
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	LHD2	6.1430e-003	5.5430e-003
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MCY	5.0780e-003	0.02
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MDV	0.12	0.13
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MH	8.9100e-004	3.4552e-003
tblFleetMix	MHD	0.02	0.01
tblFleetMix	MHD	0.02	0.01
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	OBUS	2.4790e-003	9.6716e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	SBUS	6.8200e-004	6.8104e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004
tblFleetMix	UBUS	2.2700e-003	6.3170e-004

tblGrading	AcresOfGrading	2.50	2,325.00
tblLandscapeEquipment	NumberSummerDays	250	180
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	VendorTripLength	6.90	7.30
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblTripsAndVMT	WorkerTripLength	14.70	10.80
tblVehicleEF	HHD	0.65	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3212e-007
tblVehicleEF	HHD	2.61	5.73
tblVehicleEF	HHD	1.16	0.77
tblVehicleEF	HHD	3.36	0.01
tblVehicleEF	HHD	4,729.35	1,160.01
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	21.63	6.50
tblVehicleEF	HHD	4.20	4.58
tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01

tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.1100e-004	1.0257e-005
tblVehicleEF	HHD	4.8720e-003	4.3163e-004
tblVehicleEF	HHD	0.65	0.47
tblVehicleEF	HHD	8.3000e-005	7.1733e-006
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.3200e-004	2.2097e-003
tblVehicleEF	HHD	0.09	2.8089e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0936e-006
tblVehicleEF	HHD	1.1100e-004	1.0257e-005
tblVehicleEF	HHD	4.8720e-003	4.3163e-004
tblVehicleEF	HHD	0.76	0.54
tblVehicleEF	HHD	8.3000e-005	7.1733e-006
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.3200e-004	2.2097e-003
tblVehicleEF	HHD	0.10	3.0754e-006
tblVehicleEF	HHD	0.61	0.03

tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.08	5.0957e-007
tblVehicleEF	HHD	1.90	5.57
tblVehicleEF	HHD	1.17	0.77
tblVehicleEF	HHD	3.19	0.01
tblVehicleEF	HHD	5,008.69	1,160.72
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	22.32	6.36
tblVehicleEF	HHD	3.97	4.34
tblVehicleEF	HHD	19.56	1.76
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.7000e-004	1.6157e-005
tblVehicleEF	HHD	4.9980e-003	4.3835e-004
tblVehicleEF	HHD	0.61	0.49
tblVehicleEF	HHD	1.2100e-004	1.1037e-005
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.2100e-004	2.1847e-003

tblVehicleEF	HHD	0.08	2.6976e-006
tblVehicleEF	HHD	0.05	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.5800e-004	1.0850e-006
tblVehicleEF	HHD	1.7000e-004	1.6157e-005
tblVehicleEF	HHD	4.9980e-003	4.3835e-004
tblVehicleEF	HHD	0.72	0.56
tblVehicleEF	HHD	1.2100e-004	1.1037e-005
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.2100e-004	2.1847e-003
tblVehicleEF	HHD	0.09	2.9536e-006
tblVehicleEF	HHD	0.70	0.03
tblVehicleEF	HHD	0.09	0.08
tblVehicleEF	HHD	0.09	5.3720e-007
tblVehicleEF	HHD	3.58	5.95
tblVehicleEF	HHD	1.16	0.77
tblVehicleEF	HHD	3.39	0.01
tblVehicleEF	HHD	4,343.58	1,159.03
tblVehicleEF	HHD	1,660.44	1,551.88
tblVehicleEF	HHD	10.55	0.11
tblVehicleEF	HHD	20.67	6.69
tblVehicleEF	HHD	4.13	4.51
tblVehicleEF	HHD	19.57	1.76
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	0.02	0.06

tblVehicleEF	HHD	8.8000e-005	2.7341e-006
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.8360e-003	8.8946e-003
tblVehicleEF	HHD	0.02	0.06
tblVehicleEF	HHD	8.1000e-005	2.5341e-006
tblVehicleEF	HHD	1.1000e-004	1.0837e-005
tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.70	0.45
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.15	0.15
tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.09	2.8334e-006
tblVehicleEF	HHD	0.04	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	1.6100e-004	1.0953e-006
tblVehicleEF	HHD	1.1000e-004	1.0837e-005
tblVehicleEF	HHD	5.2380e-003	5.0906e-004
tblVehicleEF	HHD	0.82	0.51
tblVehicleEF	HHD	8.1000e-005	7.2029e-006
tblVehicleEF	HHD	0.26	0.25
tblVehicleEF	HHD	4.6800e-004	2.3389e-003
tblVehicleEF	HHD	0.10	3.1023e-006
tblVehicleEF	LDA	5.9160e-003	4.0269e-003
tblVehicleEF	LDA	6.1880e-003	0.06
tblVehicleEF	LDA	0.71	0.86
tblVehicleEF	LDA	1.27	2.24

tblVehicleEF	LDA	285.63	286.85
tblVehicleEF	LDA	59.19	56.49
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	2.8620e-003	2.8378e-003
tblVehicleEF	LDA	6.1400e-004	5.5902e-004
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.23
tblVehicleEF	LDA	0.09	0.30
tblVehicleEF	LDA	6.2800e-003	4.3047e-003

tblVehicleEF	LDA	5.4950e-003	0.05
tblVehicleEF	LDA	0.78	0.95
tblVehicleEF	LDA	1.09	1.90
tblVehicleEF	LDA	298.94	299.91
tblVehicleEF	LDA	59.19	55.86
tblVehicleEF	LDA	0.05	0.05
tblVehicleEF	LDA	0.07	0.19
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.07	0.24
tblVehicleEF	LDA	2.9960e-003	2.9671e-003
tblVehicleEF	LDA	6.1000e-004	5.5280e-004
tblVehicleEF	LDA	0.07	0.10
tblVehicleEF	LDA	0.11	0.12
tblVehicleEF	LDA	0.06	0.08
tblVehicleEF	LDA	0.02	0.03

tblVehicleEF	LDA	0.04	0.22
tblVehicleEF	LDA	0.08	0.27
tblVehicleEF	LDA	5.7950e-003	3.9414e-003
tblVehicleEF	LDA	6.3340e-003	0.06
tblVehicleEF	LDA	0.68	0.83
tblVehicleEF	LDA	1.31	2.31
tblVehicleEF	LDA	280.76	282.08
tblVehicleEF	LDA	59.19	56.63
tblVehicleEF	LDA	0.06	0.05
tblVehicleEF	LDA	0.08	0.21
tblVehicleEF	LDA	0.04	0.04
tblVehicleEF	LDA	8.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.2290e-003	2.0424e-003
tblVehicleEF	LDA	2.3010e-003	2.0724e-003
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	2.0000e-003	2.0000e-003
tblVehicleEF	LDA	2.0560e-003	1.8821e-003
tblVehicleEF	LDA	2.1160e-003	1.9056e-003
tblVehicleEF	LDA	0.04	0.06
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.01	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.28
tblVehicleEF	LDA	2.8130e-003	2.7906e-003
tblVehicleEF	LDA	6.1400e-004	5.6038e-004
tblVehicleEF	LDA	0.04	0.06

tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.04	0.05
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.09	0.31
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.84	1.85
tblVehicleEF	LDT1	3.09	2.45
tblVehicleEF	LDT1	351.43	336.46
tblVehicleEF	LDT1	71.32	67.07
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.21	0.45

tblVehicleEF	LDT1	3.5380e-003	3.3294e-003
tblVehicleEF	LDT1	7.6700e-004	6.6374e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.28	0.24
tblVehicleEF	LDT1	0.11	0.13
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.18	0.83
tblVehicleEF	LDT1	0.24	0.49
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.01	0.08
tblVehicleEF	LDT1	1.99	2.01
tblVehicleEF	LDT1	2.62	2.08
tblVehicleEF	LDT1	366.73	349.70
tblVehicleEF	LDT1	71.32	66.31
tblVehicleEF	LDT1	0.15	0.14
tblVehicleEF	LDT1	0.16	0.28
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18

tblVehicleEF	LDT1	0.05	0.05
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.19	0.39
tblVehicleEF	LDT1	3.6940e-003	3.4605e-003
tblVehicleEF	LDT1	7.5900e-004	6.5619e-004
tblVehicleEF	LDT1	0.21	0.24
tblVehicleEF	LDT1	0.30	0.25
tblVehicleEF	LDT1	0.16	0.18
tblVehicleEF	LDT1	0.07	0.07
tblVehicleEF	LDT1	0.17	0.77
tblVehicleEF	LDT1	0.21	0.43
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	0.02	0.09
tblVehicleEF	LDT1	1.79	1.79
tblVehicleEF	LDT1	3.19	2.53
tblVehicleEF	LDT1	345.81	331.61
tblVehicleEF	LDT1	71.32	67.24
tblVehicleEF	LDT1	0.17	0.16
tblVehicleEF	LDT1	0.18	0.31
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	8.0000e-003	8.0000e-003
tblVehicleEF	LDT1	3.7390e-003	3.2489e-003
tblVehicleEF	LDT1	3.5990e-003	3.0888e-003
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	2.0000e-003	2.0000e-003
tblVehicleEF	LDT1	3.4440e-003	2.9904e-003
tblVehicleEF	LDT1	3.3100e-003	2.8404e-003

tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.22	0.46
tblVehicleEF	LDT1	3.4810e-003	3.2814e-003
tblVehicleEF	LDT1	7.6900e-004	6.6538e-004
tblVehicleEF	LDT1	0.14	0.16
tblVehicleEF	LDT1	0.32	0.27
tblVehicleEF	LDT1	0.11	0.12
tblVehicleEF	LDT1	0.06	0.07
tblVehicleEF	LDT1	0.21	0.98
tblVehicleEF	LDT1	0.24	0.50
tblVehicleEF	LDT2	7.8740e-003	6.3478e-003
tblVehicleEF	LDT2	7.2440e-003	0.08
tblVehicleEF	LDT2	0.90	1.24
tblVehicleEF	LDT2	1.49	2.87
tblVehicleEF	LDT2	395.42	367.68
tblVehicleEF	LDT2	80.68	73.77
tblVehicleEF	LDT2	0.09	0.12
tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02

tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.10	0.38
tblVehicleEF	LDT2	3.9620e-003	3.6376e-003
tblVehicleEF	LDT2	8.3200e-004	7.3003e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.45
tblVehicleEF	LDT2	0.11	0.42
tblVehicleEF	LDT2	8.3450e-003	6.7606e-003
tblVehicleEF	LDT2	6.4440e-003	0.07
tblVehicleEF	LDT2	0.99	1.36
tblVehicleEF	LDT2	1.27	2.44
tblVehicleEF	LDT2	413.17	380.97
tblVehicleEF	LDT2	80.68	72.95
tblVehicleEF	LDT2	0.08	0.10
tblVehicleEF	LDT2	0.11	0.32
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003

tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.09	0.34
tblVehicleEF	LDT2	4.1400e-003	3.7691e-003
tblVehicleEF	LDT2	8.2800e-004	7.2192e-004
tblVehicleEF	LDT2	0.07	0.13
tblVehicleEF	LDT2	0.11	0.15
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.06	0.42
tblVehicleEF	LDT2	0.10	0.37
tblVehicleEF	LDT2	7.7190e-003	6.2197e-003
tblVehicleEF	LDT2	7.4150e-003	0.08
tblVehicleEF	LDT2	0.87	1.20
tblVehicleEF	LDT2	1.54	2.96
tblVehicleEF	LDT2	388.90	362.81
tblVehicleEF	LDT2	80.68	73.95
tblVehicleEF	LDT2	0.09	0.11

tblVehicleEF	LDT2	0.12	0.35
tblVehicleEF	LDT2	0.04	0.04
tblVehicleEF	LDT2	8.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.1620e-003	2.1343e-003
tblVehicleEF	LDT2	2.3490e-003	2.0993e-003
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	2.0000e-003	2.0000e-003
tblVehicleEF	LDT2	1.9880e-003	1.9642e-003
tblVehicleEF	LDT2	2.1600e-003	1.9304e-003
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.10	0.39
tblVehicleEF	LDT2	3.8960e-003	3.5895e-003
tblVehicleEF	LDT2	8.3300e-004	7.3182e-004
tblVehicleEF	LDT2	0.05	0.08
tblVehicleEF	LDT2	0.12	0.15
tblVehicleEF	LDT2	0.04	0.08
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.07	0.52
tblVehicleEF	LDT2	0.11	0.43
tblVehicleEF	LHD1	6.0120e-003	6.0724e-003
tblVehicleEF	LHD1	0.01	7.3245e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20

tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.04	1.27
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.09
tblVehicleEF	LHD1	34.52	13.36
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.05	0.84
tblVehicleEF	LHD1	1.07	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.29	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7874e-003

tblVehicleEF	LHD1	4.0200e-004	1.3218e-004
tblVehicleEF	LHD1	3.3130e-003	2.9887e-003
tblVehicleEF	LHD1	0.11	0.09
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9910e-003	1.7702e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.32	0.64
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD1	6.0120e-003	6.0856e-003
tblVehicleEF	LHD1	0.01	7.4711e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.96	0.87
tblVehicleEF	LHD1	2.90	1.21
tblVehicleEF	LHD1	8.91	8.98
tblVehicleEF	LHD1	612.93	694.11
tblVehicleEF	LHD1	34.52	13.25
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	0.98	0.79
tblVehicleEF	LHD1	1.03	0.36
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03

tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.28	0.09
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0270e-003	6.7877e-003
tblVehicleEF	LHD1	3.9900e-004	1.3115e-004
tblVehicleEF	LHD1	4.9680e-003	4.5016e-003
tblVehicleEF	LHD1	0.11	0.10
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.8120e-003	2.5256e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.31	0.62
tblVehicleEF	LHD1	0.31	0.10
tblVehicleEF	LHD1	6.0120e-003	6.0700e-003
tblVehicleEF	LHD1	0.01	7.2867e-003
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.16	0.20
tblVehicleEF	LHD1	0.94	0.86
tblVehicleEF	LHD1	3.06	1.28
tblVehicleEF	LHD1	8.91	8.98

tblVehicleEF	LHD1	612.93	694.08
tblVehicleEF	LHD1	34.52	13.37
tblVehicleEF	LHD1	0.07	0.05
tblVehicleEF	LHD1	1.03	0.83
tblVehicleEF	LHD1	1.08	0.38
tblVehicleEF	LHD1	8.1600e-004	6.8425e-004
tblVehicleEF	LHD1	0.08	0.08
tblVehicleEF	LHD1	9.9780e-003	9.5325e-003
tblVehicleEF	LHD1	9.4020e-003	7.1252e-003
tblVehicleEF	LHD1	1.0850e-003	3.3330e-004
tblVehicleEF	LHD1	7.8100e-004	6.5465e-004
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.4950e-003	2.3831e-003
tblVehicleEF	LHD1	8.9670e-003	6.7842e-003
tblVehicleEF	LHD1	9.9800e-004	3.0689e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.30	0.10
tblVehicleEF	LHD1	9.0000e-005	8.7406e-005
tblVehicleEF	LHD1	6.0260e-003	6.7873e-003
tblVehicleEF	LHD1	4.0200e-004	1.3235e-004
tblVehicleEF	LHD1	3.5020e-003	3.1837e-003
tblVehicleEF	LHD1	0.12	0.11

tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.9650e-003	1.7527e-003
tblVehicleEF	LHD1	0.09	0.08
tblVehicleEF	LHD1	0.34	0.70
tblVehicleEF	LHD1	0.32	0.11
tblVehicleEF	LHD2	4.3410e-003	4.3356e-003
tblVehicleEF	LHD2	5.0230e-003	5.0611e-003
tblVehicleEF	LHD2	9.9030e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.58
tblVehicleEF	LHD2	1.51	0.88
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.49
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.76	1.11
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004

tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
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tblVehicleEF	LHD2	1.2670e-003	1.8884e-003
tblVehicleEF	LHD2	0.04	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	8.0900e-004	1.1221e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.43
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3451e-003
tblVehicleEF	LHD2	5.0980e-003	5.1274e-003
tblVehicleEF	LHD2	9.5540e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.40	0.58
tblVehicleEF	LHD2	1.44	0.84
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.38
tblVehicleEF	LHD2	28.89	10.42
tblVehicleEF	LHD2	0.10	0.09

tblVehicleEF	LHD2	0.72	1.05
tblVehicleEF	LHD2	0.58	0.26
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7498e-003
tblVehicleEF	LHD2	3.1500e-004	1.0310e-004
tblVehicleEF	LHD2	1.8880e-003	2.8213e-003
tblVehicleEF	LHD2	0.04	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.1340e-003	1.5879e-003
tblVehicleEF	LHD2	0.06	0.07

tblVehicleEF	LHD2	0.09	0.42
tblVehicleEF	LHD2	0.14	0.07
tblVehicleEF	LHD2	4.3410e-003	4.3338e-003
tblVehicleEF	LHD2	5.0030e-003	5.0440e-003
tblVehicleEF	LHD2	9.9730e-003	0.01
tblVehicleEF	LHD2	0.13	0.16
tblVehicleEF	LHD2	0.39	0.57
tblVehicleEF	LHD2	1.52	0.89
tblVehicleEF	LHD2	13.55	13.48
tblVehicleEF	LHD2	625.73	696.37
tblVehicleEF	LHD2	28.89	10.50
tblVehicleEF	LHD2	0.10	0.09
tblVehicleEF	LHD2	0.75	1.09
tblVehicleEF	LHD2	0.61	0.27
tblVehicleEF	LHD2	1.1760e-003	1.1845e-003
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.3050e-003	0.01
tblVehicleEF	LHD2	5.0600e-004	1.8968e-004
tblVehicleEF	LHD2	1.1250e-003	1.1333e-003
tblVehicleEF	LHD2	0.04	0.04
tblVehicleEF	LHD2	2.6430e-003	2.6034e-003
tblVehicleEF	LHD2	8.8870e-003	0.01
tblVehicleEF	LHD2	4.6500e-004	1.7440e-004
tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.02

tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.05	0.06
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.13	0.07
tblVehicleEF	LHD2	1.3300e-004	1.2943e-004
tblVehicleEF	LHD2	6.1010e-003	6.7497e-003
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tblVehicleEF	LHD2	1.3050e-003	1.9885e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.8800e-004	1.0961e-003
tblVehicleEF	LHD2	0.06	0.07
tblVehicleEF	LHD2	0.10	0.47
tblVehicleEF	LHD2	0.15	0.07
tblVehicleEF	MCY	0.53	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.20	19.84
tblVehicleEF	MCY	9.64	8.48
tblVehicleEF	MCY	188.47	223.17
tblVehicleEF	MCY	44.88	60.40
tblVehicleEF	MCY	1.13	1.14
tblVehicleEF	MCY	0.31	0.26
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003

tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	2.61	2.65
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.06	1.84
tblVehicleEF	MCY	2.2780e-003	2.2085e-003
tblVehicleEF	MCY	6.6700e-004	5.9774e-004
tblVehicleEF	MCY	1.07	1.10
tblVehicleEF	MCY	0.65	0.70
tblVehicleEF	MCY	0.65	0.69
tblVehicleEF	MCY	3.25	3.27
tblVehicleEF	MCY	0.62	2.17
tblVehicleEF	MCY	2.24	2.00
tblVehicleEF	MCY	0.52	0.38
tblVehicleEF	MCY	0.13	0.21
tblVehicleEF	MCY	18.48	19.07
tblVehicleEF	MCY	8.82	7.74
tblVehicleEF	MCY	188.47	221.70
tblVehicleEF	MCY	44.88	58.50
tblVehicleEF	MCY	0.99	0.99
tblVehicleEF	MCY	0.29	0.25
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003

tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	2.55	2.58
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	1.84	1.63
tblVehicleEF	MCY	2.2640e-003	2.1939e-003
tblVehicleEF	MCY	6.4700e-004	5.7891e-004
tblVehicleEF	MCY	1.73	1.79
tblVehicleEF	MCY	0.71	0.77
tblVehicleEF	MCY	1.08	1.13
tblVehicleEF	MCY	3.17	3.18
tblVehicleEF	MCY	0.58	2.04
tblVehicleEF	MCY	2.00	1.77
tblVehicleEF	MCY	0.54	0.38
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	19.30	19.94
tblVehicleEF	MCY	9.78	8.61
tblVehicleEF	MCY	188.47	223.39
tblVehicleEF	MCY	44.88	60.73
tblVehicleEF	MCY	1.11	1.11

tblVehicleEF	MCY	0.31	0.27
tblVehicleEF	MCY	0.01	0.01
tblVehicleEF	MCY	4.0000e-003	4.0000e-003
tblVehicleEF	MCY	2.3830e-003	2.3025e-003
tblVehicleEF	MCY	3.9570e-003	3.4470e-003
tblVehicleEF	MCY	5.0400e-003	5.0400e-003
tblVehicleEF	MCY	1.0000e-003	1.0000e-003
tblVehicleEF	MCY	2.2280e-003	2.1548e-003
tblVehicleEF	MCY	3.7290e-003	3.2525e-003
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tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	2.62	2.66
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.10	1.88
tblVehicleEF	MCY	2.2800e-003	2.2106e-003
tblVehicleEF	MCY	6.7100e-004	6.0100e-004
tblVehicleEF	MCY	1.16	1.20
tblVehicleEF	MCY	0.84	0.90
tblVehicleEF	MCY	0.62	0.66
tblVehicleEF	MCY	3.26	3.28
tblVehicleEF	MCY	0.71	2.49
tblVehicleEF	MCY	2.29	2.05
tblVehicleEF	MDV	0.02	9.2696e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.56	1.64
tblVehicleEF	MDV	2.79	3.50

tblVehicleEF	MDV	528.65	449.45
tblVehicleEF	MDV	106.35	89.79
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.25	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.04	0.05
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.22	0.50
tblVehicleEF	MDV	5.2990e-003	4.4442e-003
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tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.16	0.16
tblVehicleEF	MDV	0.07	0.10
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.09	0.48
tblVehicleEF	MDV	0.24	0.54
tblVehicleEF	MDV	0.02	9.7459e-003

tblVehicleEF	MDV	0.01	0.09
tblVehicleEF	MDV	1.69	1.77
tblVehicleEF	MDV	2.39	2.98
tblVehicleEF	MDV	551.85	463.58
tblVehicleEF	MDV	106.35	88.78
tblVehicleEF	MDV	0.15	0.14
tblVehicleEF	MDV	0.23	0.39
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
tblVehicleEF	MDV	2.4280e-003	2.3817e-003
tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.19	0.44
tblVehicleEF	MDV	5.5330e-003	4.5840e-003
tblVehicleEF	MDV	1.1050e-003	8.7855e-004
tblVehicleEF	MDV	0.11	0.15
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.10	0.14
tblVehicleEF	MDV	0.06	0.06

tblVehicleEF	MDV	0.08	0.44
tblVehicleEF	MDV	0.21	0.48
tblVehicleEF	MDV	0.01	9.1128e-003
tblVehicleEF	MDV	0.02	0.10
tblVehicleEF	MDV	1.52	1.59
tblVehicleEF	MDV	2.88	3.61
tblVehicleEF	MDV	520.14	444.29
tblVehicleEF	MDV	106.35	90.01
tblVehicleEF	MDV	0.17	0.16
tblVehicleEF	MDV	0.26	0.43
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	8.0000e-003	8.0000e-003
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tblVehicleEF	MDV	2.5830e-003	2.3461e-003
tblVehicleEF	MDV	0.02	0.02
tblVehicleEF	MDV	2.0000e-003	2.0000e-003
tblVehicleEF	MDV	2.2400e-003	2.1976e-003
tblVehicleEF	MDV	2.3780e-003	2.1598e-003
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.22	0.51
tblVehicleEF	MDV	5.2130e-003	4.3931e-003
tblVehicleEF	MDV	1.1140e-003	8.9074e-004
tblVehicleEF	MDV	0.07	0.09

tblVehicleEF	MDV	0.17	0.17
tblVehicleEF	MDV	0.07	0.09
tblVehicleEF	MDV	0.06	0.06
tblVehicleEF	MDV	0.11	0.55
tblVehicleEF	MDV	0.24	0.56
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	2.77	1.93
tblVehicleEF	MH	6.41	2.41
tblVehicleEF	MH	1,135.33	1,557.81
tblVehicleEF	MH	61.01	20.79
tblVehicleEF	MH	1.17	1.25
tblVehicleEF	MH	0.85	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.36	0.11

tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0577e-004
tblVehicleEF	MH	1.07	1.06
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.45	0.43
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.82
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.85	1.97
tblVehicleEF	MH	6.02	2.27
tblVehicleEF	MH	1,135.33	1,557.88
tblVehicleEF	MH	61.01	20.56
tblVehicleEF	MH	1.07	1.15
tblVehicleEF	MH	0.82	0.24
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62

tblVehicleEF	MH	0.11	0.08
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.35	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.1500e-004	2.0342e-004
tblVehicleEF	MH	1.58	1.57
tblVehicleEF	MH	0.08	0.07
tblVehicleEF	MH	0.65	0.62
tblVehicleEF	MH	0.15	0.11
tblVehicleEF	MH	0.02	1.78
tblVehicleEF	MH	0.38	0.12
tblVehicleEF	MH	0.04	0.01
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	2.74	1.92
tblVehicleEF	MH	6.46	2.43
tblVehicleEF	MH	1,135.33	1,557.79
tblVehicleEF	MH	61.01	20.83
tblVehicleEF	MH	1.15	1.22
tblVehicleEF	MH	0.86	0.25
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.2190e-003	3.5117e-004
tblVehicleEF	MH	0.06	0.06
tblVehicleEF	MH	3.1990e-003	3.2285e-003
tblVehicleEF	MH	0.02	0.02
tblVehicleEF	MH	1.1210e-003	3.2384e-004

tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.10	0.08
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.37	0.11
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.2200e-004	2.0615e-004
tblVehicleEF	MH	1.21	1.21
tblVehicleEF	MH	0.09	0.09
tblVehicleEF	MH	0.46	0.44
tblVehicleEF	MH	0.14	0.11
tblVehicleEF	MH	0.02	1.92
tblVehicleEF	MH	0.40	0.12
tblVehicleEF	MHD	0.02	4.4568e-003
tblVehicleEF	MHD	5.7010e-003	9.4687e-003
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.39	0.40
tblVehicleEF	MHD	0.42	0.87
tblVehicleEF	MHD	6.85	1.61
tblVehicleEF	MHD	131.02	70.09
tblVehicleEF	MHD	1,155.79	1,129.05
tblVehicleEF	MHD	65.08	12.73
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tblVehicleEF	MHD	1.23	2.74
tblVehicleEF	MHD	9.82	1.00
tblVehicleEF	MHD	2.8600e-004	2.2441e-003

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tblVehicleEF	MHD	5.6410e-003	0.07
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tblVehicleEF	MHD	2.7300e-004	2.1470e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.42	0.07
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tblVehicleEF	MHD	7.7100e-004	1.2593e-004
tblVehicleEF	MHD	1.2390e-003	8.0244e-004
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tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	7.9100e-004	4.9398e-004
tblVehicleEF	MHD	0.06	0.17
tblVehicleEF	MHD	0.02	0.17
tblVehicleEF	MHD	0.46	0.08
tblVehicleEF	MHD	0.02	4.2175e-003

tblVehicleEF	MHD	5.7940e-003	9.5490e-003
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tblVehicleEF	MHD	0.43	0.88
tblVehicleEF	MHD	6.50	1.53
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07
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tblVehicleEF	MHD	2.3000e-004	1.8121e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.02	0.16

tblVehicleEF	MHD	0.40	0.07
tblVehicleEF	MHD	1.3360e-003	6.8157e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.6500e-004	1.2455e-004
tblVehicleEF	MHD	1.8580e-003	1.2079e-003
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	0.04	0.03
tblVehicleEF	MHD	1.1240e-003	7.1030e-004
tblVehicleEF	MHD	0.06	0.18
tblVehicleEF	MHD	0.02	0.16
tblVehicleEF	MHD	0.44	0.08
tblVehicleEF	MHD	0.02	4.7993e-003
tblVehicleEF	MHD	5.6760e-003	9.4448e-003
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tblVehicleEF	MHD	0.53	0.51
tblVehicleEF	MHD	0.42	0.86
tblVehicleEF	MHD	6.91	1.63
tblVehicleEF	MHD	120.30	67.85
tblVehicleEF	MHD	1,155.79	1,129.04
tblVehicleEF	MHD	65.08	12.75
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tblVehicleEF	MHD	9.83	1.00
tblVehicleEF	MHD	3.4800e-004	2.7274e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	5.6410e-003	0.07

tblVehicleEF	MHD	8.9100e-004	1.5359e-004
tblVehicleEF	MHD	3.3300e-004	2.6095e-003
tblVehicleEF	MHD	0.06	0.06
tblVehicleEF	MHD	3.0000e-003	3.0000e-003
tblVehicleEF	MHD	5.3920e-003	0.07
tblVehicleEF	MHD	8.1900e-004	1.4122e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
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tblVehicleEF	MHD	0.03	0.03
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
tblVehicleEF	MHD	0.05	0.15
tblVehicleEF	MHD	0.03	0.18
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.7200e-004	1.2619e-004
tblVehicleEF	MHD	1.2900e-003	8.4856e-004
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tblVehicleEF	MHD	0.04	0.04
tblVehicleEF	MHD	7.7500e-004	4.8721e-004
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tblVehicleEF	OBUS	8.8720e-003	0.01
tblVehicleEF	OBUS	0.03	0.02
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tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
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tblVehicleEF	OBUS	1.9500e-004	3.2325e-003
tblVehicleEF	OBUS	0.06	0.06
tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
tblVehicleEF	OBUS	8.3100e-003	0.05
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tblVehicleEF	OBUS	1.4710e-003	1.8693e-003
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tblVehicleEF	OBUS	0.01	0.01

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tblVehicleEF	OBUS	7.7800e-004	9.3362e-004
tblVehicleEF	OBUS	0.08	0.18
tblVehicleEF	OBUS	0.04	0.26
tblVehicleEF	OBUS	0.39	0.13
tblVehicleEF	OBUS	0.01	9.0475e-003
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tblVehicleEF	OBUS	1.7200e-004	2.8530e-003
tblVehicleEF	OBUS	0.13	0.13
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	8.7020e-003	0.05
tblVehicleEF	OBUS	7.8900e-004	1.9874e-004
tblVehicleEF	OBUS	1.6400e-004	2.7296e-003
tblVehicleEF	OBUS	0.06	0.06

tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
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tblVehicleEF	OBUS	7.2500e-004	1.8291e-004
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tblVehicleEF	OBUS	0.05	0.09
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tblVehicleEF	OBUS	0.01	0.01
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tblVehicleEF	OBUS	3.0000e-003	3.0000e-003
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tblVehicleEF	OBUS	7.8500e-004	1.9702e-004
tblVehicleEF	OBUS	1.5180e-003	1.9793e-003
tblVehicleEF	OBUS	0.02	0.02

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tblVehicleEF	SBUS	0.03	0.03
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tblVehicleEF	SBUS	7.1700e-004	3.8010e-005
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tblVehicleEF	SBUS	0.03	7.8209e-003
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tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
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tblVehicleEF	SBUS	0.40	0.03
tblVehicleEF	SBUS	0.01	3.2238e-003
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tblVehicleEF	SBUS	6.7000e-004	4.7323e-005
tblVehicleEF	SBUS	3.5050e-003	8.8218e-004
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tblVehicleEF	SBUS	1.6510e-003	4.1639e-004
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tblVehicleEF	SBUS	0.02	0.06
tblVehicleEF	SBUS	0.44	0.04
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.79	42.44
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tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.66
tblVehicleEF	UBUS	10.68	1.20
tblVehicleEF	UBUS	15.66	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03

tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0860e-003	8.5721e-005
tblVehicleEF	UBUS	4.1600e-003	5.6311e-004
tblVehicleEF	UBUS	0.07	7.6043e-003
tblVehicleEF	UBUS	2.3580e-003	4.4793e-004
tblVehicleEF	UBUS	3.79	6.37
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	0.73	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.84	42.44
tblVehicleEF	UBUS	7.71	0.62
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.52
tblVehicleEF	UBUS	10.07	1.20
tblVehicleEF	UBUS	15.61	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03

tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	0.91	0.15
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.61	0.04
tblVehicleEF	UBUS	9.9300e-003	1.5961e-003
tblVehicleEF	UBUS	1.0650e-003	8.4268e-005
tblVehicleEF	UBUS	5.9260e-003	8.2288e-004
tblVehicleEF	UBUS	0.07	7.8577e-003
tblVehicleEF	UBUS	3.2450e-003	6.2256e-004
tblVehicleEF	UBUS	3.80	6.37
tblVehicleEF	UBUS	0.02	0.04
tblVehicleEF	UBUS	0.67	0.05
tblVehicleEF	UBUS	2.78	6.17
tblVehicleEF	UBUS	0.05	0.01
tblVehicleEF	UBUS	11.77	42.44
tblVehicleEF	UBUS	9.11	0.72
tblVehicleEF	UBUS	1,987.48	1,982.38
tblVehicleEF	UBUS	92.58	8.69
tblVehicleEF	UBUS	10.47	1.20

tblVehicleEF	UBUS	15.67	0.08
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.14	3.7132e-003
tblVehicleEF	UBUS	1.0320e-003	3.5829e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.9833e-003
tblVehicleEF	UBUS	0.13	3.5501e-003
tblVehicleEF	UBUS	9.4900e-004	3.2944e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	0.90	0.15
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.68	0.05
tblVehicleEF	UBUS	9.9290e-003	1.5960e-003
tblVehicleEF	UBUS	1.0900e-003	8.6004e-005
tblVehicleEF	UBUS	4.7460e-003	5.5071e-004
tblVehicleEF	UBUS	0.09	8.1194e-003
tblVehicleEF	UBUS	2.4840e-003	4.2610e-004
tblVehicleEF	UBUS	3.78	6.37
tblVehicleEF	UBUS	0.03	0.06
tblVehicleEF	UBUS	0.75	0.05
tblVehicleTrips	CC_TL	8.40	7.30
tblVehicleTrips	CC_TL	8.40	7.30
tblVehicleTrips	CNW_TL	6.90	7.30
tblVehicleTrips	CNW_TL	6.90	7.30

tblVehicleTrips	CW_TL	16.60	9.50
tblVehicleTrips	CW_TL	16.60	9.50
tblVehicleTrips	ST_TR	22.75	1.96
tblVehicleTrips	ST_TR	2.46	1.96
tblVehicleTrips	SU_TR	16.74	2.19
tblVehicleTrips	SU_TR	1.05	2.19
tblVehicleTrips	WD_TR	1.89	0.78
tblVehicleTrips	WD_TR	11.03	0.78
tblWater	OutdoorWaterUseRate	599,315,118.88	0.00

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					
2020	3.3726	33.2422	22.2141	0.0400	0.1232	1.6598	1.7830	0.0327	1.5428	1.5755	0.0000	3,870.6523	3,870.6523	1.0619	0.0000	3,897.1997
2022	3.2335	33.1236	20.1647	0.0394	18.2141	1.6138	19.8279	9.9699	1.4847	11.4546	0.0000	3,823.8963	3,823.8963	1.1960	0.0000	3,853.7965
2023	3.3880	34.5559	28.5278	0.0636	2,471.8498	1.4258	2,473.2755	269.5876	1.3117	270.8993	0.0000	6,159.0262	6,159.0262	1.9481	0.0000	6,207.7286
2027	33.9269	272.6953	260.8646	1.5015	99.9212	1.3435	101.2647	27.0548	1.2575	28.3124	0.0000	156,340.2157	156,340.2157	6.9537	0.0000	156,514.0577
2062	1.0112	3.6566	15.8177	0.0281	0.1071	0.1164	0.2235	0.0263	0.1164	0.1427	0.0000	2,656.5168	2,656.5168	0.0893	0.0000	2,658.7489
2065	92.8149	0.7270	1.7923	2.9700e-003	13.1436	7.4300e-003	13.1511	3.2262	7.4300e-003	3.2336	0.0000	281.4481	281.4481	9.9000e-003	0.0000	281.6957
Maximum	**92.8149**	**272.6953**	**260.8646**	**1.5015**	**2,471.8498**	**1.6598**	**2,473.2755**	**269.5876**	**1.5428**	**270.8993**	**0.0000**	**156,340.2157**	**156,340.2157**	**6.9537**	**0.0000**	**156,514.0577**

2.1 Overall Construction (Maximum Daily Emission)

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					
2020	3.3726	33.2422	22.2141	0.0400	0.1232	1.6598	1.7830	0.0327	1.5428	1.5755	0.0000	3,870.6523	3,870.6523	1.0619	0.0000	3,897.1997
2022	3.2335	33.1236	20.1647	0.0394	18.2141	1.6138	19.8279	9.9699	1.4847	11.4546	0.0000	3,823.8963	3,823.8963	1.1960	0.0000	3,853.7965
2023	3.3880	34.5559	28.5278	0.0636	2,471.8498	1.4258	2,473.2755	269.5876	1.3117	270.8993	0.0000	6,159.0262	6,159.0262	1.9481	0.0000	6,207.7286
2027	33.9269	272.6953	260.8646	1.5015	99.9212	1.3435	101.2647	27.0548	1.2575	28.3124	0.0000	156,340.2157	156,340.2157	6.9537	0.0000	156,514.0577
2062	1.0112	3.6566	15.8177	0.0281	0.1071	0.1164	0.2235	0.0263	0.1164	0.1427	0.0000	2,656.5168	2,656.5168	0.0893	0.0000	2,658.7489
2065	92.8149	0.7270	1.7923	2.9700e-003	13.1436	7.4300e-003	13.1511	3.2262	7.4300e-003	3.2336	0.0000	281.4481	281.4481	9.9000e-003	0.0000	281.6957
Maximum	**92.8149**	**272.6953**	**260.8646**	**1.5015**	**2,471.8498**	**1.6598**	**2,473.2755**	**269.5876**	**1.5428**	**270.8993**	**0.0000**	**156,340.2157**	**156,340.2157**	**6.9537**	**0.0000**	**156,514.0577**

	ROG	NOx	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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Energy	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Mobile	4.0980	3.8191	28.4744	0.0520	4.9730	0.0591	5.0321	1.3246	0.0553	1.3799		5,293.4442	5,293.4442	0.4462		5,304.6001
Total	**5.3432**	**3.8252**	**28.5309**	**0.0520**	**4.9730**	**0.0597**	**5.0327**	**1.3246**	**0.0559**	**1.3805**		**5,300.2654**	**5,300.2654**	**0.4467**	**1.2000e-004**	**5,311.4686**

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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Energy	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Mobile	4.0980	3.8191	28.4744	0.0520	4.9730	0.0591	5.0321	1.3246	0.0553	1.3799		5,293.4442	5,293.4442	0.4462		5,304.6001
Total	**5.3432**	**3.8252**	**28.5309**	**0.0520**	**4.9730**	**0.0597**	**5.0327**	**1.3246**	**0.0559**	**1.3805**		**5,300.2654**	**5,300.2654**	**0.4467**	**1.2000e-004**	**5,311.4686**

	ROG	NOx	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	Demolition	Demolition	1/1/2020	1/1/2020	5	1	
2	Site Preparation	Site Preparation	4/20/2022	4/20/2022	5	1	
3	Grading	Grading	9/6/2023	9/6/2023	5	1	
4	Building Construction	Building Construction	3/31/2027	3/31/2027	5	1	
5	Paving	Paving	11/22/2062	11/22/2062	5	1	
6	Architectural Coating	Architectural Coating	6/3/2065	6/3/2065	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 2325

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 6,000; Non-Residential Outdoor: 2,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Los Cerritos Wetlands Restoration - Operations only - Los Angeles-South Coast County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

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
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	9,203.00	3,591.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1,841.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**		**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

3.2 Demolition - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0604	0.0412	0.4609	1.2300e-003	0.1232	1.0600e-003	0.1243	0.0327	9.7000e-004	0.0337		122.9474	122.9474	3.9500e-003		123.0461
Total	**0.0604**	**0.0412**	**0.4609**	**1.2300e-003**	**0.1232**	**1.0600e-003**	**0.1243**	**0.0327**	**9.7000e-004**	**0.0337**		**122.9474**	**122.9474**	**3.9500e-003**		**123.0461**

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	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**	**0.0000**	**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

3.2 Demolition - 2020

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0604	0.0412	0.4609	1.2300e-003	0.1232	1.0600e-003	0.1243	0.0327	9.7000e-004	0.0337		122.9474	122.9474	3.9500e-003		123.0461
Total	**0.0604**	**0.0412**	**0.4609**	**1.2300e-003**	**0.1232**	**1.0600e-003**	**0.1243**	**0.0327**	**9.7000e-004**	**0.0337**		**122.9474**	**122.9474**	**3.9500e-003**		**123.0461**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836		3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**18.0663**	**1.6126**	**19.6788**	**9.9307**	**1.4836**	**11.4143**		**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0634	0.0401	0.4670	1.3800e-003	0.1479	1.1900e-003	0.1491	0.0392	1.0900e-003	0.0403		137.8344	137.8344	3.8600e-003		137.9309
Total	**0.0634**	**0.0401**	**0.4670**	**1.3800e-003**	**0.1479**	**1.1900e-003**	**0.1491**	**0.0392**	**1.0900e-003**	**0.0403**		**137.8344**	**137.8344**	**3.8600e-003**		**137.9309**

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.1701	33.0835	19.6978	0.0380		1.6126	1.6126		1.4836	1.4836	0.0000	3,686.0619	3,686.0619	1.1922		3,715.8655
Total	**3.1701**	**33.0835**	**19.6978**	**0.0380**	**18.0663**	**1.6126**	**19.6788**	**9.9307**	**1.4836**	**11.4143**	**0.0000**	**3,686.0619**	**3,686.0619**	**1.1922**		**3,715.8655**

3.3 Site Preparation - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0634	0.0401	0.4670	1.3800e-003	0.1479	1.1900e-003	0.1491	0.0392	1.0900e-003	0.0403		137.8344	137.8344	3.8600e-003		137.9309
Total	**0.0634**	**0.0401**	**0.4670**	**1.3800e-003**	**0.1479**	**1.1900e-003**	**0.1491**	**0.0392**	**1.0900e-003**	**0.0403**		**137.8344**	**137.8344**	**3.8600e-003**		**137.9309**

3.4 Grading - 2023

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					2,471.6855	0.0000	2,471.6855	269.5440	0.0000	269.5440			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105		6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**2,471.6855**	**1.4245**	**2,473.1100**	**269.5440**	**1.3105**	**270.8546**		**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.4 Grading - 2023

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0662	0.0403	0.4766	1.4800e-003	0.1643	1.2800e-003	0.1656	0.0436	1.1800e-003	0.0448		147.5485	147.5485	3.8600e-003		147.6450
Total	**0.0662**	**0.0403**	**0.4766**	**1.4800e-003**	**0.1643**	**1.2800e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**147.5485**	**147.5485**	**3.8600e-003**		**147.6450**

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					2,471.6855	0.0000	2,471.6855	269.5440	0.0000	269.5440			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105	0.0000	6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**2,471.6855**	**1.4245**	**2,473.1100**	**269.5440**	**1.3105**	**270.8546**	**0.0000**	**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.4 Grading - 2023

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0662	0.0403	0.4766	1.4800e-003	0.1643	1.2800e-003	0.1656	0.0436	1.1800e-003	0.0448		147.5485	147.5485	3.8600e-003		147.6450
Total	**0.0662**	**0.0403**	**0.4766**	**1.4800e-003**	**0.1643**	**1.2800e-003**	**0.1656**	**0.0436**	**1.1800e-003**	**0.0448**		**147.5485**	**147.5485**	**3.8600e-003**		**147.6450**

3.5 Building Construction - 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	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

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	7.5085	247.1141	79.3309	0.8820	24.3207	0.2957	24.6164	7.0021	0.2826	7.2847		94,685.2576	94,685.2576	5.1078		94,812.9522
Worker	25.0511	13.1115	165.4491	0.5925	75.6005	0.5202	76.1207	20.0528	0.4787	20.5314		59,098.4838	59,098.4838	1.2449		59,129.6073
Total	**32.5595**	**260.2256**	**244.7800**	**1.4746**	**99.9212**	**0.8159**	**100.7371**	**27.0548**	**0.7613**	**27.8161**		**153,783.7414**	**153,783.7414**	**6.3527**		**153,942.5596**

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	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

3.5 Building Construction - 2027

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	7.5085	247.1141	79.3309	0.8820	24.3207	0.2957	24.6164	7.0021	0.2826	7.2847		94,685.2576	94,685.2576	5.1078		94,812.9522
Worker	25.0511	13.1115	165.4491	0.5925	75.6005	0.5202	76.1207	20.0528	0.4787	20.5314		59,098.4838	59,098.4838	1.2449		59,129.6073
Total	**32.5595**	**260.2256**	**244.7800**	**1.4746**	**99.9212**	**0.8159**	**100.7371**	**27.0548**	**0.7613**	**27.8161**		**153,783.7414**	**153,783.7414**	**6.3527**		**153,942.5596**

3.6 Paving - 2062

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	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164		2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**		**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2062

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1071	0.0000	0.1071	0.0263	0.0000	0.0263			0.0000			0.0000
Total					**0.1071**	**0.0000**	**0.1071**	**0.0263**	**0.0000**	**0.0263**			**0.0000**			**0.0000**

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	1.0112	3.6566	15.8177	0.0281		0.1164	0.1164		0.1164	0.1164	0.0000	2,656.5168	2,656.5168	0.0893		2,658.7489
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0112**	**3.6566**	**15.8177**	**0.0281**		**0.1164**	**0.1164**		**0.1164**	**0.1164**	**0.0000**	**2,656.5168**	**2,656.5168**	**0.0893**		**2,658.7489**

3.6 Paving - 2062

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					0.1071	0.0000	0.1071	0.0263	0.0000	0.0263			0.0000			0.0000
Total					**0.1071**	**0.0000**	**0.1071**	**0.0263**	**0.0000**	**0.0263**			**0.0000**			**0.0000**

3.7 Architectural Coating - 2065

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					
Archit. Coating	92.7000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003		281.4481	281.4481	9.9000e-003		281.6957
Total	**92.8149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**		**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2065

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					13.1436	0.0000	13.1436	3.2262	0.0000	3.2262			0.0000			0.0000
Total					**13.1436**	**0.0000**	**13.1436**	**3.2262**	**0.0000**	**3.2262**			**0.0000**			**0.0000**

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					
Archit. Coating	92.7000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.0000	281.4481	281.4481	9.9000e-003		281.6957
Total	**92.8149**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.0000**	**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

3.7 Architectural Coating - 2065

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
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Worker					13.1436	0.0000	13.1436	3.2262	0.0000	3.2262			0.0000			0.0000
Total					**13.1436**	**0.0000**	**13.1436**	**3.2262**	**0.0000**	**3.2262**			**0.0000**			**0.0000**

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	4.0980	3.8191	28.4744	0.0520	4.9730	0.0591	5.0321	1.3246	0.0553	1.3799		5,293.4442	5,293.4442	0.4462		5,304.6001
Unmitigated	4.0980	3.8191	28.4744	0.0520	4.9730	0.0591	5.0321	1.3246	0.0553	1.3799		5,293.4442	5,293.4442	0.4462		5,304.6001

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	392.34	985.88	1101.57	1,234,906	1,234,906
General Office Building	1.56	3.92	4.38	5,496	5,496
Total	393.90	989.80	1,105.95	1,240,402	1,240,402

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
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455
General Office Building	0.551001	0.059862	0.185577	0.128146	0.022541	0.005543	0.010825	0.007967	0.000967	0.000632	0.022803	0.000681	0.003455

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	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
NaturalGas Unmitigated	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	57.0411	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Total		**6.2000e-004**	**5.5900e-003**	**4.7000e-003**	**3.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.3000e-004**	**4.3000e-004**		**6.7107**	**6.7107**	**1.3000e-004**	**1.2000e-004**	**6.7506**

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					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	0.0570411	6.2000e-004	5.5900e-003	4.7000e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004		6.7107	6.7107	1.3000e-004	1.2000e-004	6.7506
Total		**6.2000e-004**	**5.5900e-003**	**4.7000e-003**	**3.0000e-005**		**4.3000e-004**	**4.3000e-004**		**4.3000e-004**	**4.3000e-004**		**6.7107**	**6.7107**	**1.3000e-004**	**1.2000e-004**	**6.7506**

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	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Unmitigated	1.2446	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179

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	0.0254					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2143					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.8300e-003	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Total	**1.2446**	**4.7000e-004**	**0.0518**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1105**	**0.1105**	**2.9000e-004**		**0.1179**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0254					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.2143					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.8300e-003	4.7000e-004	0.0518	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004		0.1105	0.1105	2.9000e-004		0.1179
Total	**1.2446**	**4.7000e-004**	**0.0518**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**		**0.1105**	**0.1105**	**2.9000e-004**		**0.1179**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

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 G
Energy Calculations

ESA

LCWA Restoration Program EIR
Construction Energy Analysis

Fuel Consumption Summary

Category	Value
Diesel fuel for heavy-duty construction equipment	2,977,544
Diesel fuel for Haul Trucks	65,909
Diesel fuel for Vendor Trucks	4,762
Gasoline fuel for workers	127,191
Total Diesel Consumption from Equipment and Trucks	3,048,215
Total Gasoline Consumption	127,191
Construction Phase Duration (years)	22.0
Annual Average Gallons Diesel From Equipment and Trucks	138,555
Annual Average Gallons Diesel From Boats	100,594
Annual Average Gallons Diesel	**239,149**
Annual Average Gallons Gasoline	**5,781**

Source	Diesel	Gas
Off-Road Equipment	2,977,544	-
Haul/Vendor	70,671	-
Tug Boats	2,213,058	-
Worker	-	127,191
Total Project Fuel Consumption	**5,261,273**	**127,191**
Annual Average Gallons Diesel	**239,149**	
Annual Average Gallons Gasoline		**5,781**

	Los Angeles County Fuel Consumption		State Fuel Consumption	
	Diesel	**Gas**	**Diesel**	**Gas**
	590,196,078	3,659,000,000	3,798,039,216	15,584,000,000
Annual Project % of Consumption	0.041%	0.0002%	0.0063%	0.0000%

	Orange County Fuel Consumption	
	Diesel	**Gas**
	119,607,843	1,382,000,000
Annual Project % of Consumption	0.200%	0.0004%

1. California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2017
   https://www.energy.ca.gov/almanac/transportation_data/gasoline/2010-2017_A15_Results.xlsx
   Diesel is adjusted to account for retail (51%) and non-retail (49%) diesel sales.

2. SCE, 2017 Financial and Statistical Report

   https://www.edison.com/content/dam/eix/documents/investors/sec-filings-financials/2017-financial-statistical-report.pdf. Accessed January 2019.

LCWA Restoration Program EIR
Construction Energy Analysis

Off-Road Equipment

Equipment ≤ 100 HP

Parameter	Value
pounds diesel fuel/hp-hr (lb/hp-hr):[1]	0.41
diesel fuel density (lb/gal):[1]	7.11
diesel gallons/hp-hr (gal/hp-hr):	0.06
Total hp-hr :	9,635,047
Total diesel consumption (gal):	552,983

Equipment > 100 HP

Parameter	Value
pounds diesel fuel/hp-hr (lb/hp-hr):[1]	0.37
diesel fuel density (lb/gal):[1]	7.11
diesel gallons/hp-hr (gal/hp-hr):	0.05
Total hp-hr:	46,964,471
Total diesel gallons:	2,424,561

Total diesel gallons (off-road equipment): 2,977,544

1. 2017 Off-road Diesel Emission Factors, cells B30 and B31

Phase	Equipment	# of Equipment	Hours/ Day	HP	Load Factor	Days	Total hp-hr
Demolition and Site Preparation	Concrete saws	1	8	81	0.73	1560	737,942
Demolition and Site Preparation	Excavators	3	8	158	0.38	1560	2,247,898
Demolition and Site Preparation	Rubber Tired Dozers	2	8	247	0.40	1560	2,466,048
Demolition and Site Preparation	Tractors/Loaders/Backhoes	2	8	97	0.37	1560	892,183
Grading/Excavation - option 1	Excavators	2	8	158	0.38	5720	5,494,861
Grading/Excavation - option 1	Graders	1	8	187	0.41	5720	3,508,419
Grading/Excavation - option 1	Rubber Tired Dozers	1	8	247	0.40	5720	4,521,088
Grading/Excavation - option 1	Scrapers	2	8	367	0.48	5720	16,122,163
Grading/Excavation - option 1	Tractors/Loaders/Backhoes	2	8	97	0.37	5720	3,284,653
Grading/Excavation - option 1	Other Construction Equipment	2	8	172	0.42	5720	6,538,994
Grading/Excavation - option 1	Cranes	1	7	231	0.29	5720	2,664,706
Drainage/Utilities/Subgrade	Excavators	2	8	158	0.38	1560	1,498,598
Drainage/Utilities/Subgrade	Trenchers	2	2	78	0.50	1560	244,577
Drainage/Utilities/Subgrade	Pumps	2	8	84	0.74	1560	1,551,514
Drainage/Utilities/Subgrade	Bore/drill rig	1	6	221	0.50	1560	1,039,451
Building Construction	Cranes	1	7	231	0.29	1560	731,531
Building Construction	Forklifts	3	8	89	0.20	1560	666,432
Building Construction	Generator Sets	1	8	84	0.74	1560	775,757
Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37	1560	1,175,756
Building Construction	Welders	1	8	46	0.45	1560	258,336
Paving	Pavers	2	8	130	0.42	80	69,888
Paving	Paving Equipment	2	8	132	0.36	80	60,826
Paving	Rollers	2	8	80	0.38	80	38,912
Architectural Coating	Air Compressors	1	6	78	0.48	40	8,986

Total ≤ 100	9,635,047
Total >100	46,964,471

LCWA Restoration Program EIR
Construction Energy Analysis

On-Road Haul Trucks (HHDT)

Parameter	Value
EMFAC2017 Diesel Fuel Consumption Factor (gal/mile):[1]	0.16
Total Haul Truck VMT (miles):	419,958
Total VMT diesel gallons (on-road haul trucks):	**65,173**
HHDT Idling Fuel Consumption Factor (gal/min):[2]	0.015
Total Haul Truck Idle-Minutes per Year (minutes):	136,350
Total Idling diesel gallons (on-road haul trucks)[3]:	**736**
Total diesel gallons (on-road haul trucks):	**65,909**

Without ATCM	Gallons Saved
2045	1309

1. California Air Resources Board, EMFAC2017 (Los Angeles County; Annual; CY 2020; Aggregate MY; Aggregate Speed, HHDT, DSL)
2. 1. Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles, US Department of Energy. Accessed February 2019. https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles
3. Incorporates estimated fuel savings from Anit-Idling Regulation (64 percent based on estimated CARB emissions reductions)
   Source: California Air Resources Board (CARB), 2004. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, Appendix F, July 2004, https://www.arb.ca.gov/regact/idling/isorappf.pdf.

Phase	Total One-Way Trips	Miles/Trip	VMT	Idle Minutes
Demolition and site prep	4,680	23	108,108	35,100
Grading/Excavation -option 1	13,500	23	311,850	101,250
Drainage/Utilities/Subgrade				
Building Construction				
Paving				
Architectural Coating				

Total Haul Truck VMT: 419,958

Total Idle Minutes: 136,350

LCWA Restoration Program EIR
Construction Energy Analysis

On-Road Vendor Trucks (HHDT/MHDT)

Parameter	Value
EMFAC2017 Diesel Fuel Consumption Factor (gal/mile):[1]	0.1269
Total Haul Truck VMT (miles):	35,880
Total VMT diesel gallons (on-road vendor trucks):	**4,552**
HHDT Idling Fuel Consumption Factor (gal/min):[2]	0.0150
Total Vendor Truck Idle-minutes (min):	39,000
Total Idling diesel gallons (on-road vendor trucks):	**211**
Total diesel gallons (on-road vendor trucks):	**4,762**

1. California Air Resources Board, EMFAC2017 (Los Angeles County; Annual; CY 2020; Aggregate MY; Aggregate Speed, HHDT/MHDT, DSL)
2. 1. Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles, US Department of Energy. Accessed February 2019. https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles
3. Source: California Air Resources Board (CARB), 2004. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, Appendix F, July 2004, https://www.arb.ca.gov/regact/idling/idling.htm, accessed November 2016.

Phase	Days	Trips/Day	Miles/Trip	VMT	Idle Minutes
Demolition and site prep					
Grading/Excavation -option 1					
Drainage/Utilities/Subgrade					
Building Construction	260	20	6.9	35,880	39,000
Paving					
Architectural Coating					

Total Vendor Truck VMT: 35,880

Total Idle-Minutes 39,000

LCWA Restoration Program EIR
Construction Energy Analysis

On-Road Workers (LDA, LDT1, LDT2)

Parameter	Value
EMFAC2017 Gasoline Fuel Consumption Factor (gal/mile):[1]	0.038
Total Worker VMT (miles):	3,362,184
Total VMT gasoline gallons (workers):	**127,191**

1. California Air Resources Board, EMFAC2017 (Los Angeles County; LDA, LDT1, LDT2; CY 2020; Aggregate MY; Aggregate Speed,GAS)

Phase	Days	One-Way Trips/Day	Miles/Trip	VMT
Demolition and site prep	1560	20	14.7	458,640
Grading/Excavation -option 1	5720	28	14.7	2,354,352
Drainage/Utilities/Subgrade	1560	18	14.7	412,776
Building Construction	260	30	14.7	114,660
Paving	80	15	14.7	17,640
Architectural Coating	40	7	14.7	4,116
			Worker VMT	3,362,184

LCWA Restoration Program EIR
Boat Fuel Consumption

	Existing	ng/Excavation	ing/Excavation Year 2
Unmitigated CO_2e (MT/year)	0	1022.03	
Mitigated CO_2e (MT/year)	0		

Summary	Existing		Op year 1		Op year 2		
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	
Gasolilne	0	0	0	0	0	0	gallons
Diesel	0	0	100,594	0.00	0	0	gallons
Electric	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	GWh
Natural Gas	0.00	0.00	212.36	0.00	0.00	0.00	MBTU

Existing 2020

Unmitigated Calculations

	% Emissions	CO_2e (MT)	CO_2e (kg)	CO_2e (lbs)	kg CO2/gallon	Gallons	Mcf	MBTU	GWh
Gasoline	0.830175983	0	0	NA	8.89	0	NA	NA	NA
Diesel	0.159170192	0	0	NA	10.16	0	NA	NA	NA
Electric	0	0	NA	0	NA	NA	NA	NA	#DIV/0!
Natural Gas	0.010653825	0	0	NA	NA	NA	0.00	0.00	NA

Mitigated Calculations

	% Emissions	CO_2e (MT)	CO_2e (kg)	CO_2e (lbs)	kg CO2/gallon	Gallons	Mcf	MBTU	GWh
Gasoline	0.830175983	0	0	NA	8.89	0	NA	NA	NA
Diesel	0.159170192	0	0	NA	10.16	0	NA	NA	NA
Electric	0	0	NA	0	NA	NA	NA	NA	#DIV/0!
Natural Gas	0.010653825	0	0	NA	NA	NA	0.00	0.00	NA

Grading/Excavation Year 1 2020

Unmitigated Calculations

	% Emissions	CO_2e (MT)	CO_2e (kg)	CO_2e (lbs)	kg CO2/gallon	Gallons	Mcf	MBTU	GWh
Gasoline	0	0	0	NA	8.89	0	NA	NA	NA
Diesel	1	1022.030435	1,022,030	NA	10.16	100,594	NA	NA	NA
Electric	0	0	NA	0	NA	NA	NA	NA	#DIV/0!
Natural Gas	0.010653825	10.88853335	10,889	NA	NA	NA	204.98	212.36	NA

Mitigated Calculations

	% Emissions	CO_2e (MT)	CO_2e (kg)	CO_2e (lbs)	kg CO2/gallon	Gallons	Mcf	MBTU	GWh
Gasoline	0	0	0	NA	8.89	0	NA	NA	NA
Diesel	1	0	0	NA	10.16	0	NA	NA	NA
Electric	0	0	NA	0	NA	NA	NA	NA	#DIV/0!
Natural Gas	0.010653825	0	0	NA	NA	NA	0.00	0.00	NA

Grading/Excavation Year 2 | 2022

Unmitigated Calculations

	% Emissions	CO_2e (MT)	CO_2e (kg)	CO_2e (lbs)	kg CO2/gallon	Gallons	Mcf	MBTU	GWh
Gasoline	0.820835292	0	0	NA	8.89	0	NA	NA	NA
Diesel	0.16753441	0	0	NA	10.16	0	NA	NA	NA
Electric	0	0	NA	0	NA	NA	NA	NA	#DIV/0!
Natural Gas	0.011630299	0	0	NA	NA	NA	0.00	0.00	NA

Mitigated Calculations

	% Emissions	CO_2e (MT)	CO_2e (kg)	CO_2e (lbs)	kg CO2/gallon	Gallons	Mcf	MBTU	GWh
Gasoline	0.820835292	0	0	NA	8.89	0	NA	NA	NA
Diesel	0.16753441	0	0	NA	10.16	0	NA	NA	NA
Electric	0	0	NA	0	NA	NA	NA	NA	#DIV/0!
Natural Gas	0.011630299	0	0	NA	NA	NA	0.00	0.00	NA

Emissions Percentage

	2020	2021	2022	2023
Gasoline	0.830175983	0.825152152	0.820835292	0.81972918
Diesel	0.159170192	0.163720699	0.16753441	0.168098815
Electric	0	0	0	0
Natural Gas	0.010653825	0.011127148	0.011630299	0.012172004

Conversion Factors:

1000	kg/MT	
8.89	kg CO_2/gallon gasoline	https://www.eia.gov/environment/emissions/co2_vol_mass.php
10.16	kg CO_2/gallon diesel	https://www.eia.gov/environment/emissions/co2_vol_mass.php
53.12	kg CO_2/ thousand cubic feet	https://www.eia.gov/environment/emissions/co2_vol_mass.php
1036	btu/cubic foot	
0.907185	MT/ton	
2000	lbs/ton	

LCWA Restoration Program EIR
Electricty and Natural Gas Consumption

Electricity	kWh/yr	GWh/yr
General Office Building	25,980	0.026
City Park	0	-
Total	**25,980**	**0.026**
Total (including water, see below)	**31,952**	**0.032**
Net Project Energy Consumption	**31,952**	**0.032**

Electricity	GWh/yr
SCE 2017 Electricity Sales[1]	85,879
Project Annual	0.032
Net Project Annual	0.032
Percent Net Project of SCE	0.00004%

Water	Mgal/yr
General Office Building	0.459
City Park	-
Total	**0.459**

Electricity Intensity Factors[4]	kWh/Mgal
Electricity Factor - Supply	9,727
Electricity Factor - Treat	111
Electricity Factor - Distribute	1,272
Electricity Factor - Wastewater Treatment	1,911

Electricity from Water Demand	kWh/yr	GWh/yr
Total	**5,972**	**0.006**

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.
Base water demand is based on rates provided in City of Los Angeles Department of Public Works, Sewage Facilities Charge, Sewage Generation Factor for Residential and Commercial Categories, 2012.

Natural Gas	kBtu/yr	cubic foot (cf)[3]	Per day Usage
General Office Building	20,820	20,077	
City Park	0	-	
Project Total	**20,820**	**20,077**	55
Project Net Total	**20,820**	**20,077**	**55**

Natural Gas	million cubic foot (cf)
SoCalGas 2017 Sales[2]	913,960
Project Annual	0.020
Net Project Annual	0.020
Percent Net Project of SoCalGas	0.000002%

1. Southern California Edison, 2017 Financial and Statistical Report, p.3
   2017 Financial and Statistical Report
2. California Gas and Electric Utilities, 2018 California Gas Report, p. 101, 2018.
   https://www.socalgas.com/regulatory/documents/cgr/2018_California_Gas_Report.pdf
3. Conversion factor of 1,037 Btu per cubic foot based on United States Energy Information Administration data
   https://www.eia.gov/tools/faqs/faq.php?id=45&t=8
4. California Air Resources Board, CalEEMod, Version 2016.3.2.

LCWA Restoration Program EIR
Operational Energy Analysis

Project Fuel Usage

Annual VMT (All): 1,240,402 miles/year (from CalEEMod)

Fuel Type:[1]	**GAS**	**DSL**
Percent:	98%	7%
Miles per Gallon Fuel:	25.97	10.19
Annual VMT by Fuel Type (miles):	1,219,706	86,786
Project Annual Fuel Usage (gallons):	**46,964**	**8,514**

	Los Angeles County Fuel Consumption [2]		**State Fuel Consumption** [2]	
	Gasoline	Diesel	Gasoline	Diesel
	3,659,000,000	590,196,078	15,584,000,000	3,798,039,216
Project Annual:	46,964	8,514	46,964	8,514
Percent Project of Los Angeles County:	0.001%	0.001%	0.000%	0.000%

	Orange County Fuel Consumption [2]	
	Gasoline	Diesel
	1,382,000,000	119,607,843
Project Annual:	46,964	8,514
Percent Project of Los Angeles County:	0.003%	0.007%

Notes:

1. California Air Resources Board, EMFAC2014 (Los Angeles County; Annual; 2022, Aggregate Fleet).
2. California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2017.
   Available at: http://www.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html.
   Accessed March 2019. Diesel is adjusted to account for retail (51%) and non-retail (49%) diesel sales

Region	SOUTH COAST AQMD
Model Year	Aggregated
Speed	(All)

Row Labels	Sum of VMT	Sum of Fuel Consumption
DSL	32970821.18	3234.708375
ELEC	6527260.047	0
GAS	431741633.7	16623.79283
NG	798459.2845	242.0339944
Grand Total	**472038174.2**	**20100.5352**

Fuel Factors (All Vehicle Categories)

Fuel Type	VMT (mi/day)	Fuel Consumption (1000gal/day)	Fuel Consumption Factor (gal/mi)	Fleet Distribution	Fuel Economy (mi/gal)
DSL	32970821.18	3234.71	0.098	7%	10.19
ELEC	6527260.047	0.00	0.000	1.5%	
GAS	431741633.7	16623.79	0.039	98.3%	25.97
NG	798459.2845	242.03	0.303	0.2%	3.30

EMFAC2017 Webdatabase

Appendix H

Hydrodynamic Modeling Technical Report

ESA

LOS CERRITOS WETLAND RESTORATION PLAN PROGRAM ENVIRONMENTAL IMPACT REPORT

Hydrodynamic Modeling Technical Report

Prepared for
Los Cerritos Wetlands Authority

May 2020

LOS CERRITOS WETLAND RESTORATION PLAN PROGRAM ENVIRONMENTAL IMPACT REPORT

Hydrodynamic Modeling Technical Report

Prepared for
Los Cerritos Wetlands Authority

May 2020

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SECTION 1
Introduction

This report documents the hydrodynamic modeling of the Los Cerritos Wetlands (LCW) Restoration Project. This modeling report describes the modeling performed to analyze the potential hydrology effects of the proposed restoration program relative to existing conditions.

1.1 Project Background

Until the late 1800s, the LCW spanned approximately 2,400 acres and consisted of a network of meandering streams, vegetated wetlands, and upland areas. Historically, the program area was almost entirely (88.5%) tidal vegetated wetland, with a few natural streams and intertidal flat channels in both the north and the south (Figure 1-1) (Moffatt & Nichol 2015 and Stein et. al 2007).

Beginning in the late 1800s, the site began to undergo significant alterations due to agriculture (cattle and beet farming), the demands of a growing population, and oil production. Oil was first discovered at the LCW at the Long Beach Oil Field in 1921 and at the Seal Beach Oil Field shortly after. The development of oil production operations, paired with channelization of the San Gabriel River, resulted in substantial dredge and fill of the LCW. The program area contains oil wells, and network of oil-production tanks and pipes. Today, nearly all of the program area has been converted from its historic wetland habitat, though a few remnant and degraded historic habitats remain. Given the land use history of the LCW, sediment contamination at the site is an important consideration for restoration.

1.2 Existing Conditions

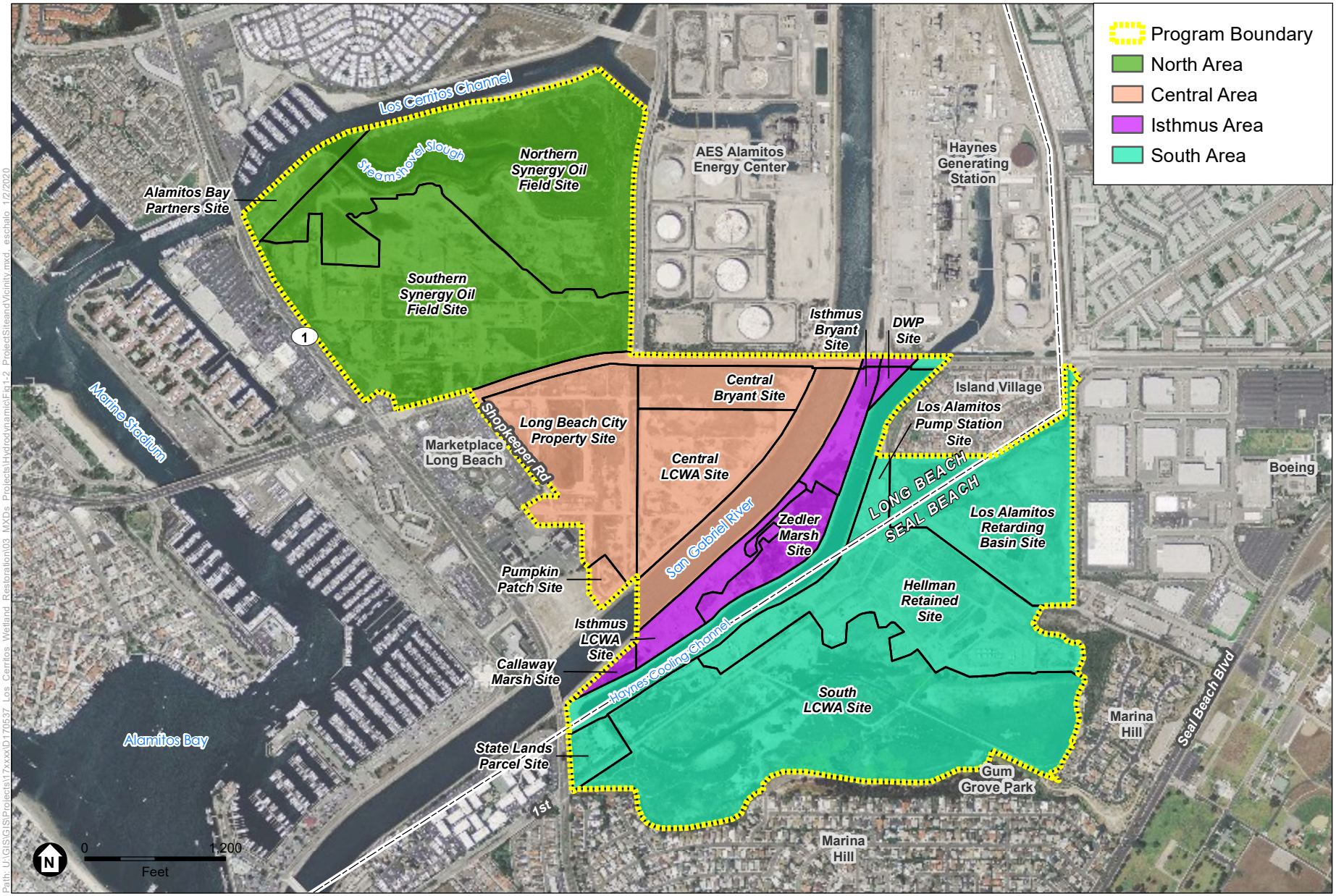
Today, three major channels are present in the program area: Los Cerritos Channel, San Gabriel River, and the Haynes Cooling Channel. A remnant historic tidal channel, called Steamshovel Slough, is also present, and drains to the Los Cerritos Channel. For purposes of organizing this report and discussion, the proposed program has been separated into 4 areas (South, Isthmus, Central, and North) and 17 individual sites (Figure 1-2).

SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 1-1
Historic Project Area Habitats

ESA



SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 1-2
Project Site and Local Vicinity

ESA

1.2.1 South Area

The South Area includes the following individual sites: Haynes Cooling Channel, State Lands Parcel, South LCWA, Hellman Retained, Los Alamitos Pump Station, and Los Alamitos Retarding Basin. For the purpose of this analysis, discussion of the South Area in this technical report focuses on the Haynes Cooling Channel, the South LCWA site, and the Hellman Retained site. Some discussion of the State Lands Parcel is included in Section 3.3, *Future Conditions with Sea-Level Rise*, but in most cases, the site is not exposed to inundation. The Los Alamitos Pump Station and Retarding Basin were not included in the modeling efforts because sufficient data was not available. The following paragraphs describe the areas that were considered for this study.

The Haynes Cooling Channel is a waterway used by the Haynes Generating Station located north of the program area to bring in water from the Pacific Ocean via 7 culverts in the Alamitos Bay Marina to cool the power plant through a method called once-through cooling. Once the water is used, it is discharged into the San Gabriel River slightly upstream of where the river crosses under 2nd Street. Once the modernization project for the Haynes Generating Station is complete (by 2029), the Haynes Cooling Channel will be decommissioned and no longer be in use for the Haynes Generating Station. Currently, there is no conduit that connects any of the program area sites to Haynes Cooling Channel.

The State Lands Parcel site contains the remnant building foundation of what was once a music venue called the Airport Club and Marina Palace. Major habitat types include ruderal uplands and southern coastal salt marsh with muted tidal connection in the channel that runs along the south of the parcel.

The South LCWA site contains multiple former sumps, landfills, and contaminated areas from prior oil operations, and is currently owned and maintained by the LCWA. Some areas of tidal southern coastal salt marsh still persist on the site but other areas were converted by previous land owners from coastal salt marsh habitat to primarily ruderal uplands with no tidal connections. Former access roads still bisect the site and cause ecological and hydrological fragmentation. Additionally, 1st Street runs parallel to Haynes Cooling Channel through the marsh.

The Hellman Channel is a small, muted tidal channel that connects to the San Gabriel River through a culvert that goes around the southern end of the Haynes Cooling Channel and above the culverts connecting the cooling channel to the Alamitos Bay Marina. The Hellman Channel runs through the South LCWA site with three culverts running under the existing access roads. One culvert runs under 1st Street, and the other two run under remnant oil infrastructure roads. Culvert dimensions are further discussed in Section 2.1.2.

The Hellman Retained site is an active oil field with substantial oil operation infrastructure (pipelines, pumps, tanks, and roadways). Historically, the site was primarily coastal salt marsh habitat; today the parcel is composed mostly of developed areas and ruderal wetlands with no tidal connection.

1.2.2 Isthmus Area

The Isthmus Area includes the following hydrologically connected sites: Callaway Marsh, DWP, Zedler Marsh, Isthmus LCWA, and Isthmus Bryant. Some discussion of the DWP is included in Section 3.3, Future Conditions with Sea-Level Rise, but in most cases, the site is not exposed to inundation.

The Callaway Marsh site is a vacant site with a heavily degraded perched salt marsh, tidally connected to the San Gabriel River by a three-foot-wide culvert with a gate, which mutes the water levels reaching the site.

The Zedler Marsh site is a 12-acre restoration site owned and managed by the LCWA and is currently being enhanced and restored as part of the LCWA Stewardship Program. The site contains tidal salt marsh and surrounding habitat. The site receives muted tidal circulation via a three-foot wide culvert connection to the San Gabriel River.

The Isthmus LCWA site is an active oil field maintained and operated by Signal Hill Petroleum, Inc. who own the mineral rights. The oil operation infrastructure includes 4 active oil wells and 1 idle oil well. The site contains a mix of disturbed ruderal habitats.

The Isthmus Bryant site is a privately owned, vacant site. The site contains salt flat and alkali meadow wetland habitat types but is fragmented both ecologically and hydrologically by the access road that bisects the site. The site is adjacent to Zedler Marsh and two culverts in the access road allow some hydrologic connection between the area adjacent to Zedler Marsh and the area northwest of the road during major high water level events.

The DWP site is a vacant site. The site contains upland wetland habitat types, with no hydrologic connection.

1.2.3 Central Area

The Central Area includes the following hydrologically connected individual sites: Pumpkin Patch, Long Beach City Property, Central LCWA, Central Bryant, and the San Gabriel River.

The Long Beach City Property site is an active oil field with oil storage tanks and associated oil production infrastructure, such as pipelines. A majority of the site is disturbed, and vegetation is generally sparse. Existing roads and oil well pads severely fragment the site ecologically and hydrologically. The site contains southern coastal brackish marsh habitat where urban stormwater runoff is directed via storm drains onto the salty soils of former tidally influenced areas. There is a perched culvert at the southern tip of the property that receives tidal waters during major high tide events, but the majority of the site is non-tidal.

The Central LCWA site is an active oil field with oil operation infrastructure (roadways, wells, power lines, pipelines, and pumps), which severely fragment the site ecologically and hydrologically. The site is composed of a mixture of native and non-native wetland habitats. The Central LCWA site is disconnected from any tidal action.

The Central Bryant site is a privately owned, vacant site. Stormwater runoff supports mulefat scrub and other wetland habitats on parts of the site. The site is comprised of southern coastal salt marsh, alkali meadow, salt flat, and ruderal wetland and upland habitats and is disconnected from tidal action.

The AES Alamitos Energy Center is adjacent to the North Area. The center uses water from the Los Cerritos Channel for once-through cooling. Once the water is used, it is discharged into the San Gabriel River slightly upstream of where the river crosses under 2nd Street.

1.2.4 North Area

A project-level EIR was prepared for the City of Long Beach to evaluate the environmental effects associated with the Los Cerritos Wetlands Oil Consolidation and Restoration Project. The PEIR for the proposed Los Cerritos Wetlands Restoration program relies on the technical analysis, impact discussion, and mitigation measures documented in the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR. Therefore, a hydrodynamic analysis of the North Area is not included in this report.

1.3 Previous Hydraulic Modeling

Previous modeling for the Los Cerritos Wetlands Restoration Plan area was conducted in 2007 by Moffatt & Nichol (M&N) for the Alamitos Bay Circulation Study. In 2011, this model was applied to the Los Cerritos Wetlands Conceptual Restoration Plan (CRP) for its Hydrologic and Hydraulic Baseline Report. Also in 2011, the United States Army Corps of Engineers (USACE) updated the Los Angeles County Department of Public Works HEC RAS model for the San Gabriel River. These reports and their results are summarized in the following sections.

1.3.1 Moffatt & Nichol (2007) Alamitos Bay Circulation Study

As part of the Alamitos Bay Circulation Study, M&N used a RMA2 hydrodynamic model to evaluate the hydraulic circulation conditions and patterns in Alamitos Bay. The hydrodynamic model included the San Gabriel River, Alamitos Bay, Marine Stadium, Colorado Lagoon, Los Cerritos Channel, the Haynes Cooling Channel outfall (not including the channel itself), the AES Corporation outfalls, and the nearshore ocean. The Circulation Study demonstrated that the dominant existing circulation pattern is water generally flowing upstream along both the Haynes Cooling Channel and Los Cerritos Channel, then returning downstream via the San Gabriel River once discharged by the generating stations. The study noted that this circulation pattern was influenced by the AES and Haynes Generating Stations operations.

1.3.2 Moffatt & Nichol (2011) Los Cerritos Wetlands Conceptual Restoration Plan

As part of the CRP, M&N applied the RMA2 hydrodynamic model from the Circulation Study to evaluate the hydrology of the LCW. The existing model was expanded to include the Haynes Cooling Channel and the Hellman Channel. As part of the modeling effort, a tide gauge was deployed in Hellman Channel to gather water level data for model calibration. Water levels were

measured from July 15 to September 9, 2011 between the 1st Street culvert and the second culvert in the South LCWA site. The model assessed both tidal hydrodynamics and flood hydrodynamics during a 100-year storm event, which was coupled with an extreme high tide series, for existing conditions and the conceptual restoration alternatives. The 100-year storm event hydrograph used for the modeling was obtained from a Los Angeles County Drainage Area (LACDA) study performed by the USACE in 1991 (USACE 1991).

The CRP modeling demonstrated that the Alamitos Bay, San Gabriel River, and Haynes Cooling Channel have full tidal ranges (e.g., no tidal muting). The study also showed the Central, Isthmus, and South Areas receive muted tidal circulation through the existing culverts and evaluated restoration alternatives.

1.3.3 USACE (2011) Los Angeles County Drainage Area

In 2011, the USACE obtained a HEC-RAS model of the San Gabriel River from the Los Angeles County Department of Public Works, converted it from NGVD to NAVD, and georeferenced it. This model of the San Gabriel River stretches from the Pacific Ocean to Siphon Road (near Whittier Narrows). USACE used a 100-yr event discharge of 44,600 cfs at the Coyote Creek Confluence, just upstream of the project site.

1.4 EIR Restoration Program

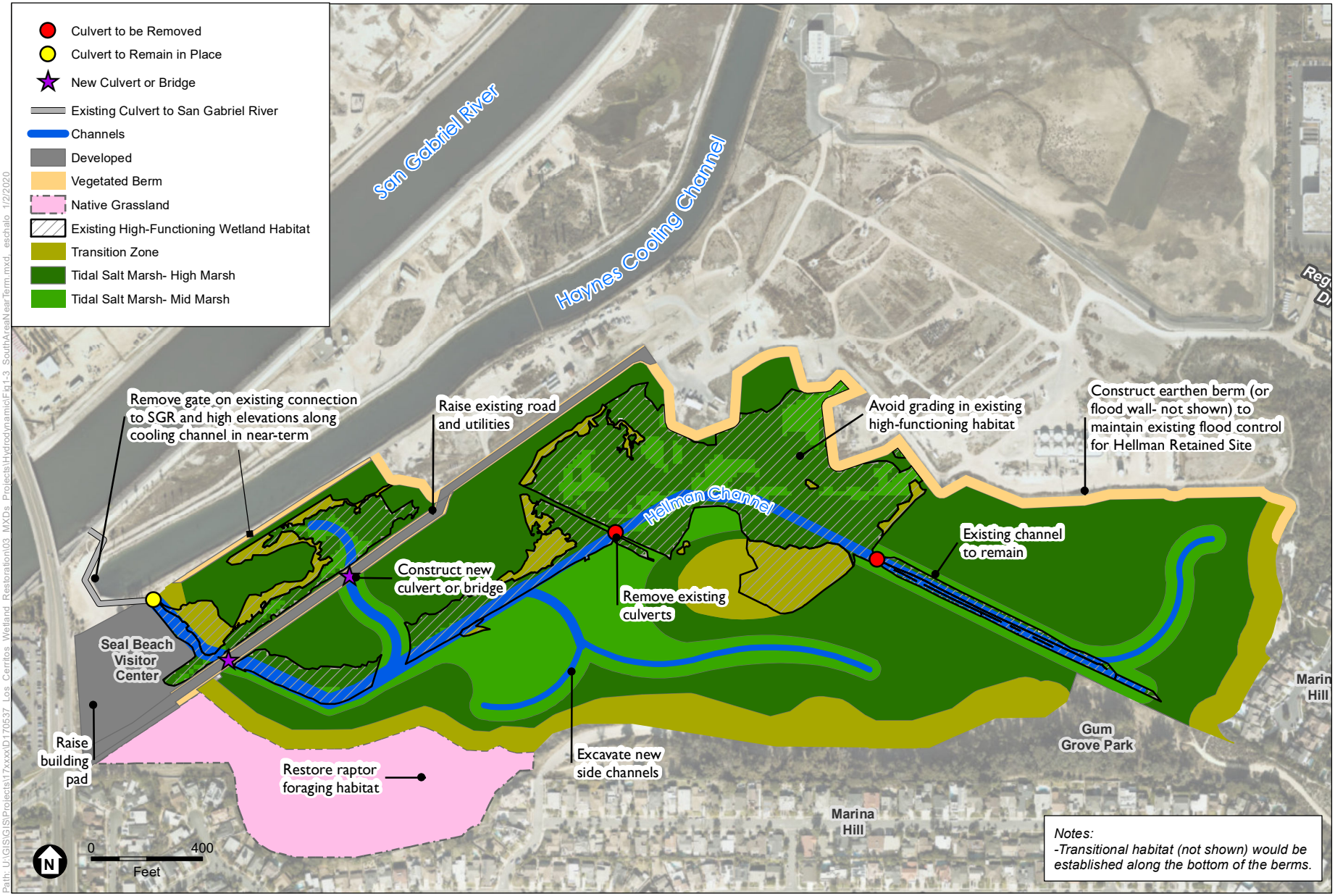
The proposed program would restore wetland, transition, and upland habitats throughout the program area. This would involve remediation of contaminated soil and groundwater, grading, revegetation, construction of new public access opportunities (including trails, visitor centers, parking lots, and viewpoints), construction of flood management facilities (including earthen levees and berms, and flood walls), and modification of existing infrastructure and utilities.

1.4.1 South Area

Ecosystem restoration in the South Area would occur in three phases based on land and oil lease ownership. The near- and mid-term phases of the program in the South Area would be mostly focused on the South LCWA and State Lands Parcel sites and would provide the conditions necessary for the expansion of coastal salt marsh habitat and associated hydrologic, biogeochemical, and habitat functions. Additional design and analysis is needed for the long-term phase of the program in the South Area, so analysis of that phase is not included in this report.

Near-term activities would include (Figure 1-3, Proposed South Area Near-Term Restoration):

- Remediating soils (e.g., on-site treatment, excavation and removal, or cap in place) that have been impacted by oil operations;
- Grading the South LCWA site, including excavation to create channels and revegetation of native plants to support a diversity of marsh, transitional, and upland habitats;
- Constructing a new earthen berm or flood wall along the Hellman Retained site boundary on the South LCWA site to protect the Hellman site from flooding;
- Raising 1st Street on the South LCWA site out of the floodplain by placing it on fill;



SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 1-3

Proposed South Area Near-Term Restoration

ESA

- Building a Seal Beach Visitor Center and associated parking on an existing raised building pad on the State Lands Parcel site;
- Removing the gate on the existing culvert connecting the South LCWA site to the San Gabriel River and removing the culverts under the former access roads. The existing culvert under 1st Street would either be improved or replaced with a bridge; and
- Restoring native grassland for raptor foraging habitat on South LCWA site.

Mid-term activities would include (Figure 1-4, Proposed South Area Mid-Term Restoration):

- Excavating a channel connecting the Hellman Channel directly to the Haynes Cooling Channel and lowering the berm along the Haynes Cooling Channel to increase the tidal range in the South LCWA site; and
- Modifying the Los Alamitos Retarding Basin operations to enhance the habitat value in the basin (e.g., change pumping operations to maintain ponding for shorter or longer time).

1.4.2 Isthmus Area

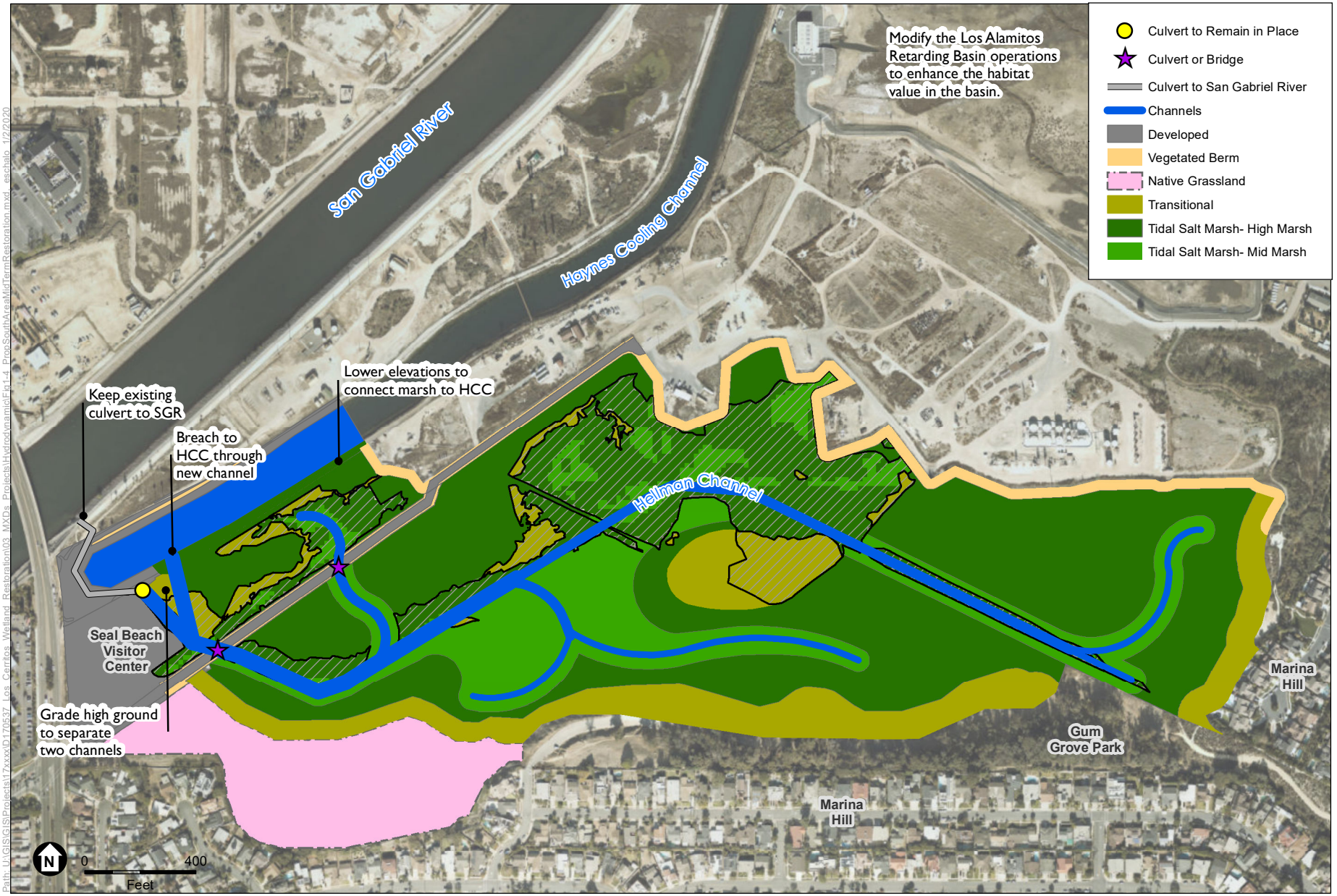
In the near-term, the proposed program would extend the restoration currently present on the Zedler Marsh site north into the Isthmus Bryant site and the portion of the DWP site west of the gas access road that connects to 2nd Street by improving the two existing culverts under the access road (Figure 1-5, Proposed Isthmus Area Restoration). The Callaway Marsh site and the rest of the DWP site would be enhanced in the mid-term, once the Haynes Cooling Channel is decommissioned by LADWP and no longer in use for the Haynes Generating Station. Additional design and analysis is needed for the long-term phase of the program in the Isthmus Area, so analysis of that phase is not included in this report.

1.4.3 Central Area

Ecosystem restoration in the Central Area would occur in two phases based on land and oil lease ownership. The Central LCWA site is available for restoration immediately, and discussions between Bryant Dakin, LLC and the LCWA on acquisition of the Central Bryant site for restoration are on-going. The program assumes that both of these properties would be available for restoration in the near-term and the existing oil operations on the Central LCWA site operated by Signal Hill Petroleum, Inc. would be protected in place by raising the wells out of the floodplain. The Long Beach City Property site and the Pumpkin Patch site would be available for restoration in the long-term, once the oil infrastructure is removed as part of the Los Cerritos Wetlands Oil Consolidation and Restoration Project.

The near-term phase of the program would be focused on the Central LCWA and Central Bryant sites and would provide the conditions necessary for the reestablishment of coastal salt marsh habitat and associated hydrologic, biogeochemical, and habitat functions (Figure 1-6, Proposed Central Area Near-Term Restoration). Near-term activities would include:

- Relocating or modifying oil infrastructure and remediation of soils on the Central LCWA site;



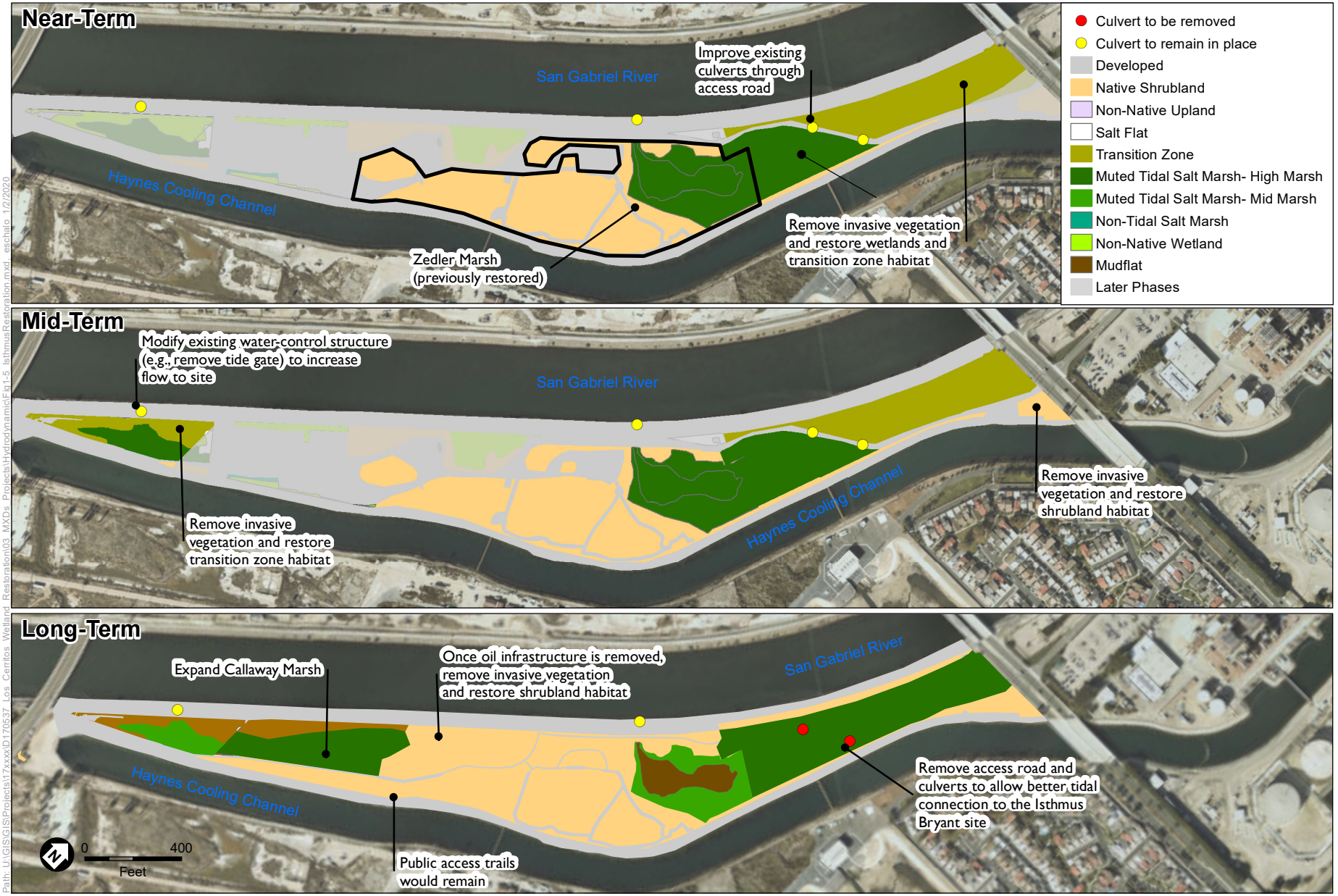
SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 1-4

Proposed South Area Mid-Term Restoration

ESA



SOURCE: Mapbox, LCWA, NOAA, ESA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 1-5
Proposed Isthmus Area Restoration

ESA

- Grading of the sites, including channels, and revegetation of native plants to support a diversity of salt marsh species;
- Removing segments of the existing levee (e.g., breaching the levee and/or lowering a segment) that currently separates the San Gabriel River from non-tidal portions of the Central LCWA and Central Bryant sites.
- Constructing a new earthen levee (Perimeter Levee) along 2nd Street from the San Gabriel River to the intersection with Studebaker Road to protect areas to the north from flooding;
- Constructing a new interim earthen levee (Interim Levee) along the western boundary of the Central LCWA site to protect the areas to the west from flooding and to provide continued access to the wells on the Central LCWA site;
- Providing flood protection for the existing wells on the Central LCWA site by raising the well pads out of the floodplain; and
- Constructing public trails on levees, including accessible ramps, and viewpoints.

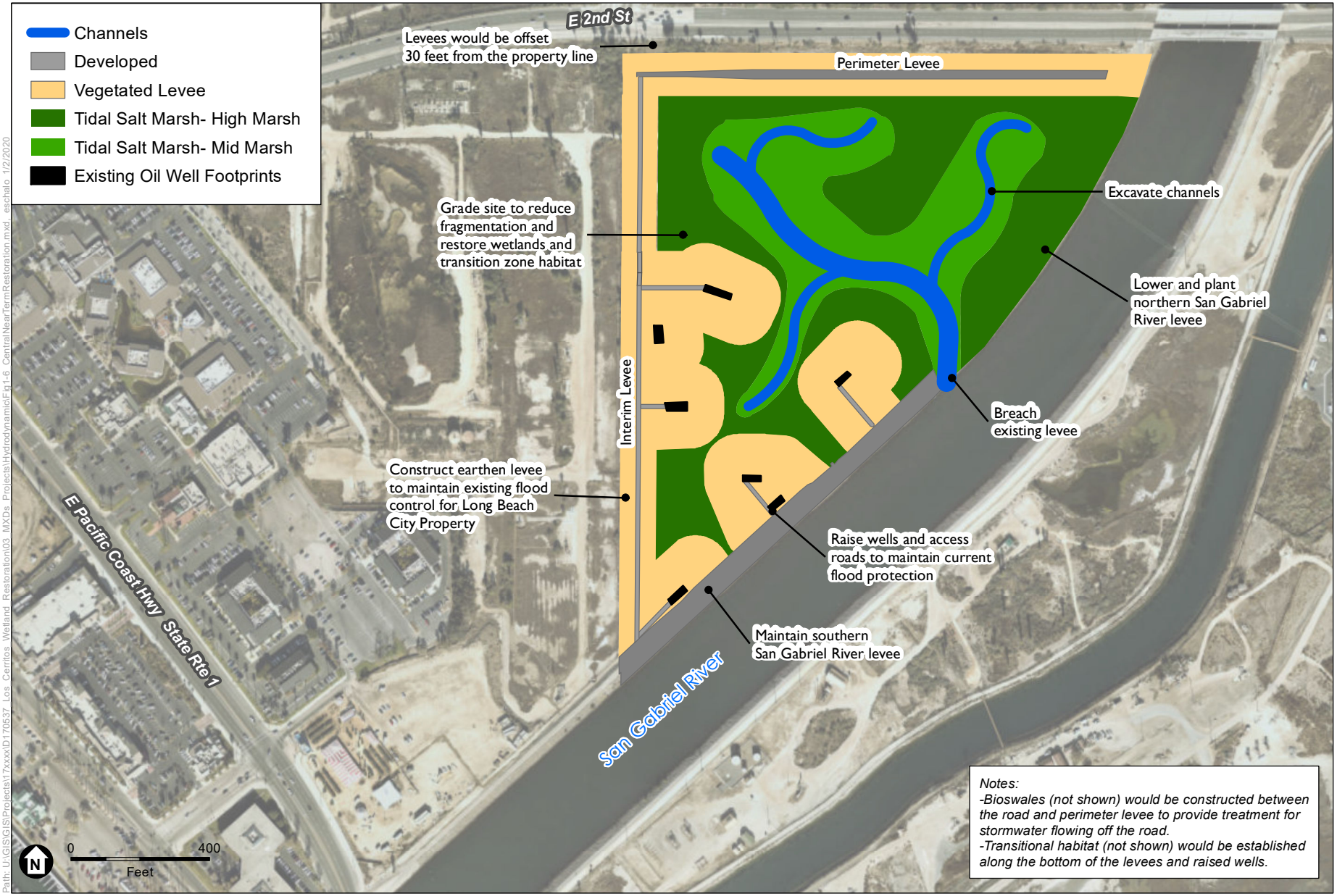
In the long-term, the Long Beach City Property site and the Pumpkin Patch site would be restored to tidal salt marsh, including (Figure 1-7, Proposed Central Area Long-Term Restoration):

- Grading the Long Beach City Property site, including channels, to support a diversity of salt marsh species;
- Removing the northern segment of the Interim Levee on the Central LCWA site to connect the restored habitats on the Central LCWA site to the non-tidal portions of the Long Beach City Property site.
- Constructing a new earthen levee (Perimeter Levee) along 2nd Street between the intersection with Studebaker Road to Shopkeeper Road on the Long Beach City Property site and then along Shopkeeper Road to the existing San Gabriel River levee on the Long Beach City Property and Pumpkin Patch sites to protect areas to the north and west from flooding; and
- Constructing public trails on levees, accessible ramps, stairs, and viewpoints.

1.5 Modeling Goals

The goals of the hydrodynamic modeling for this project are two-fold:

1. Evaluate potential flood impacts to inform the restoration design, the CEQA analysis, and permitting.
2. Evaluate restored wetland hydrology and inform the habitat elevations for the restoration design for post-restoration and future conditions with sea-level rise.



SOURCE: NOAA, ESA, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 1-6

Proposed Central Area Near-Term Restoration

ESA

SOURCE: NOAA, ESA, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 1-7

Proposed Central Area Long-Term Restoration

ESA

SECTION 2
Model Setup

ESA developed a two-dimensional (2D) hydrodynamic model of Los Cerritos Wetlands Restoration program using the USACE's HEC-RAS software package (v 5.0.7). This approach simulates 2D overbank flows across the floodplain where complex flow patterns are expected to occur. The model boundary includes the Central Area, the San Gabriel River, the Isthmus Area, the Haynes Cooling Channel, and the South Area (except for the Los Alamitos Pump Station and Los Alamitos Retarding Basin), as well as a small portion of Alamitos Bay Marina, where the Haynes Cooling Channel culverts connect to the bay. Four model geometries were analyzed:

- Existing Conditions: this scenario includes the existing topography, bathymetry, and culvert connections without the program. It is also referred to as the no program scenario.
- South Area, Near-Term Conditions: this scenario is focused on the South Area in the near-term (as described in Section 1.4.1), once the new earthen berm or flood wall is constructed, 1st Street is raised, the gate on the existing culvert connecting the South LCWA site to the San Gabriel River is removed, and the culverts under the former access roads are removed.
- Full Breach Conditions: this scenario includes the long-term Central Area restoration (Section 1.4.3) with a full breach connection to the San Gabriel River and new levees along the perimeter of the site. It also includes the mid-term Isthmus (Section 1.4.2) and South Area restorations (Section 1.4.1) once the South Area is connected to the Haynes Cooling Channel.
- Central Area, Culvert Conditions: this scenario is focused on the Central Area and considers an alternative to the full breach connection to the San Gabriel River. The San Gabriel River levee along the Central Area would be left in place, and a culvert or series of culverts would be installed through the levee to allow flows to enter the site. This scenario is otherwise identical to the Full Breach Conditions scenario.

Figure 2-1 shows the model extent used for the existing conditions, South Area, near-term conditions, full breach conditions and Central Area, culvert conditions.

Sections 2.1 through 2.4 describe the development of the four model scenarios including:

- Topography/Bathymetry – land and underwater surface elevations controlling where water flows.
- Structures – bridges and culverts that influence the hydraulics of the site.
- Hydraulic Roughness – a property of different land covers that imposes a resistance to flow (e.g., grasses or open dirt areas have lower hydraulic roughness and provide a lower resistance to flow while areas with dense salt marsh have higher hydraulic roughness and provide a higher resistance to flow).

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SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-1
Model Extent

ESA

Sections 2.4 and 2.5 describe the different hydrology and tidal boundary conditions used for the different modeling runs:

- Hydrology – inflows along the San Gabriel River from upstream in the watershed and the two power plants.
- Tidal Boundary Conditions – downstream water surface elevations driven by the tides in the ocean.

2.1 Existing Conditions

The existing conditions model represents the pre-program conditions as they exist at the time of this report, prior to the construction of the program and other planned restoration projects.

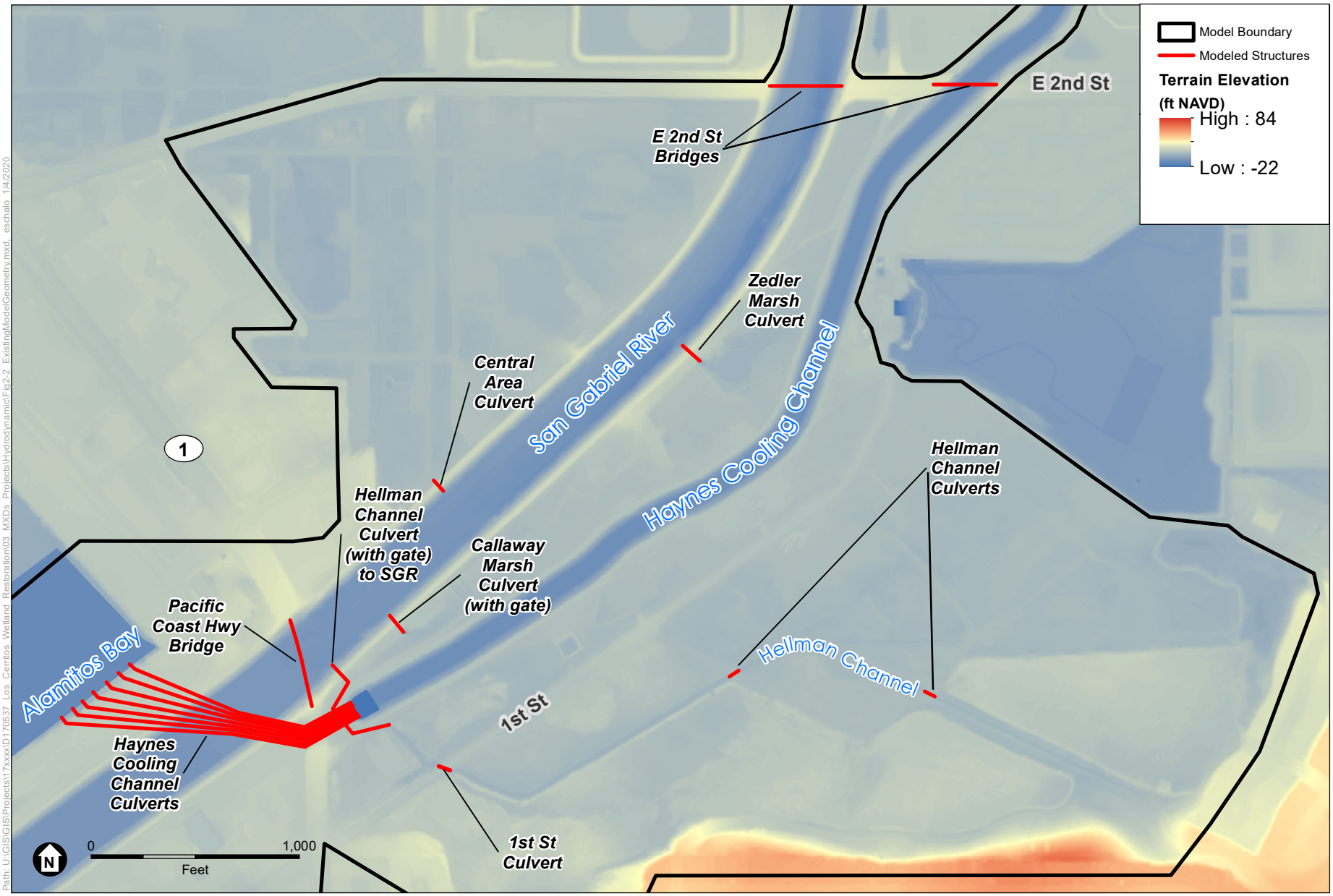
2.1.1 Topography

The Existing Conditions model topography was developed from five datasets, combined to achieve full coverage of the model extent. The San Gabriel River channel bathymetry was based on two sources: (1) a sonar-based bathymetric survey conducted by Cinquino & Passarino Inc. in 2019 as part of this project ranging between 2nd St and the Pacific Coast Highway; and (2) the USACE as-builts. The Haynes Cooling Channel bathymetry was developed from a channel cross section provided in the CRP Hydrologic and Hydraulic Baseline Report (2011). The 2009-2011 Coastal California TopoBathy Merged Project Digital Elevation Model (DEM) and 2010 LiDAR DEM by NOAA, were used to attain coverage of the remaining model extent. Figure 2-2 shows the model geometry for Existing Conditions.

2.1.2 Structures

In the South Area, a 4-foot culvert with an invert elevation of 0 feet NAVD connects the San Gabriel River to the Hellman Channel in the South LCWA site. This culvert runs around the southern edge of Haynes Cooling Channel, above and perpendicular to the 7 culverts that connect the Haynes Cooling Channel to the Alamitos Bay Marina (Figure 2-3). The culvert has a flap gate on it that is stuck open and allows some leakage into the site (Figure 2-4). The blockage depth modeled was determined by an iterative modeling calibration explained in Section 3.1 below. The South LCWA site has an additional 3 culverts along the Hellman Channel that allow the channel to pass under 1st Street and the remnant dirt roads.

There are seven 8-foot diameter culverts that connect the Alamitos Bay Marina to the Haynes Cooling Channel underneath the San Gabriel River with invert elevations of -9.2 feet NAVD. These culverts allow tidal waters into the channel and bring pumped water to the Haynes Generating Station to use for once-through cooling. These seven culverts sizes and inverts were gathered from the CRP Hydrologic and Hydraulic Baseline Report (2011). All other culvert dimensions were taken from the ESA field survey in fall 2019.



SOURCE: ESRI,LCWA

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Figure 2-2
Existing Model Geometry

ESA

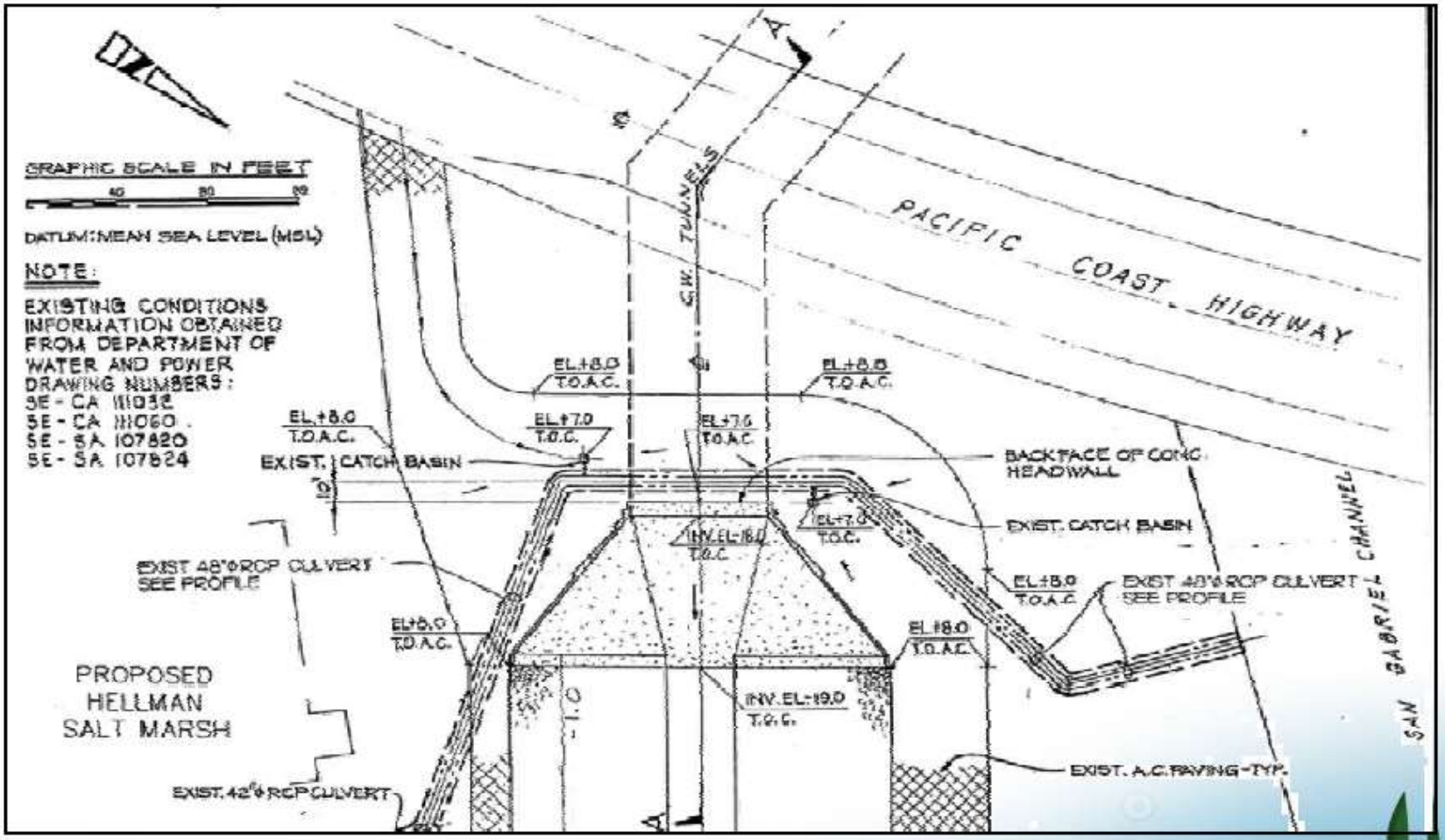


Figure 4-6. Plan View of Hellman Channel in the Vicinity of the Haynes Channel and San Gabriel River
(M&N 1996)

SOURCE: Moffatt & Nichol

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-3

Location of Culvert Connecting the San Gabriel River to the South LCWA Site

SOURCE: Tidal Influence, LLC

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-4

Culvert Connecting the San Gabriel River to the South LCWA Site Gate Photos

Along the left bank (southeast bank) of the San Gabriel River at the Isthmus Area, a 3-foot culvert with an invert elevation of 0.3 feet NAVD on the river side and 2.3 feet NAVD on the marsh side connects to the Zedler Marsh site. Further west, a 3-foot culvert with an invert elevation of 2.1 feet NAVD connects the San Gabriel River to Callaway Marsh. The culvert to Callaway Marsh has a gate on it, which allows partial tidal influence. Figure 2-5 presents photos of the culvert and gate in its current conditions. The model used a blockage depth of 95% (i.e., 2.85 feet blocked of the 3-foot culvert) to achieve the muted tidal inundation seen in Callaway Marsh.

The Long Beach City Property in the Central Area is connected to the San Gabriel River through a 2-foot culvert with an invert of 5.2 feet NAVD.

TABLE 2-1
LCW CULVERT DIMENSIONS

	Number of Culverts	Gates	Diameter (feet)	Invert Elevation (feet NAVD)
South Area				
Culverts from Alamitos Bay Marina to Haynes Cooling Channel	7	No	8	-9.2
Culvert from SGR to South LCWA site	1	Yes, leaky flap gate (modeled as 45% closed)	4	0.0
Culvert under 1st Street	2	No	3	2.7
Culvert under remnant dirt roads (west)	2	No	1	3.6
Culvert under remnant dirt roads (east)	2	No	1	4.1
Isthmus Area				
Culvert from SGR to Zedler Marsh	1	No	3	0.3 (river side) 2.3 (marsh side)
Culvert from SGR to Callaway Marsh	1	Yes, leaky flap gate (modeled as 95% closed)	3	2.1
Central Area				
Culvert from SGR to Long Beach City Property site	1	No	2	5.2

SGR = San Gabriel River

The existing conditions model also includes three bridges over the San Gabriel River and one over the Haynes Cooling Channel. The southernmost bridge along the San Gabriel River is the Marina Drive bridge, with the Pacific Coast Highway bridge upstream along the western boundary of the Central and South Areas. The northernmost bridges included in the model are the 2nd Street bridges. 2nd Street crosses both the San Gabriel River and the Haynes Cooling Channel. The three bridges along the San Gabriel River are at elevations that are 3 to 7 feet above the modeled 500-year water level, so the decks of the bridges are not expected to influence flow. With this in mind, only the piers of the bridges were included in the model. The 2nd Street bridge across the Haynes Cooling Channel is 10.2 feet above mean higher high water (MHHW), which is above the 500-year tide level (see Section 2.5.2). (Note the Haynes Cooling Channel is not expected to have extreme water levels due to rainfall runoff events because it is not connected to the San Gabriel River or a large watershed). The geometry of the bridge piers was developed based on as-builts gathered from the County, field photos, and aerial imagery.

SOURCE: Tidal Influence, LLC

Figure 2-5

Callaway Marsh Culvert Gate Photos

2.1.3 Hydraulic Roughness

The existing conditions hydraulic roughness across the model extent can be seen in Figure 2-6. The San Gabriel River, Haynes Cooling Channel, and Alamitos Bay were assigned a hydraulic roughness (manning's n) value of 0.03. Industrial, commercial, and residential areas were assigned as developed, medium density with a value of 0.080. Existing marsh areas were assigned a value of 0.05. The oil well fields and open land areas were assigned a value of 0.03.

2.2 South Area, Near-Term Conditions

The South Area, near-term conditions model is focused on the South Area in the near-term (as described in Section 1.4.1), once the new earthen berm or flood wall is constructed, 1st Street is raised, the gate on the existing culvert connecting the South LCWA site to the San Gabriel River is removed, and the culverts under the former access roads are removed.

2.2.1 Topography

The model topography was developed from one new dataset in addition to the five datasets used for existing conditions (Section 2.1.1): a conceptual-level, near-term South Area design terrain. The South Area, near-term conditions model geometry can be seen in Figure 2-7.

2.2.2 Structures

The culvert that connects the San Gabriel River to the Hellman Channel in the South LCWA site remains in place, but the gate is removed. The two culverts along the east end of the Hellman Channel are removed. The first culvert under 1st Street is removed and replaced with an open channel and a bridge. Initial model runs showed that replacing the existing two culverts (3-foot diameter) under 1st Street with either two 6-foot culverts or four 4-foot culverts still resulted in tides muted up to 0.5 feet south of the road. To provide a better tidal connection south of the road, the model was run with an open channel, assuming a bridge would be installed over the channel. This resulted in high tide muting of 0.06 feet south of the road. An additional bridge is added to 1st Street on the secondary channel.

The seven culverts that connect the Alamitos Bay Marina to the Haynes Cooling Channel underneath the San Gabriel River remain in place for the South Area, near-term conditions model.

2.2.3 Hydraulic Roughness

The South Area, near-term conditions hydraulic roughness values are the same as existing conditions in the South Area (Figure 2-8).

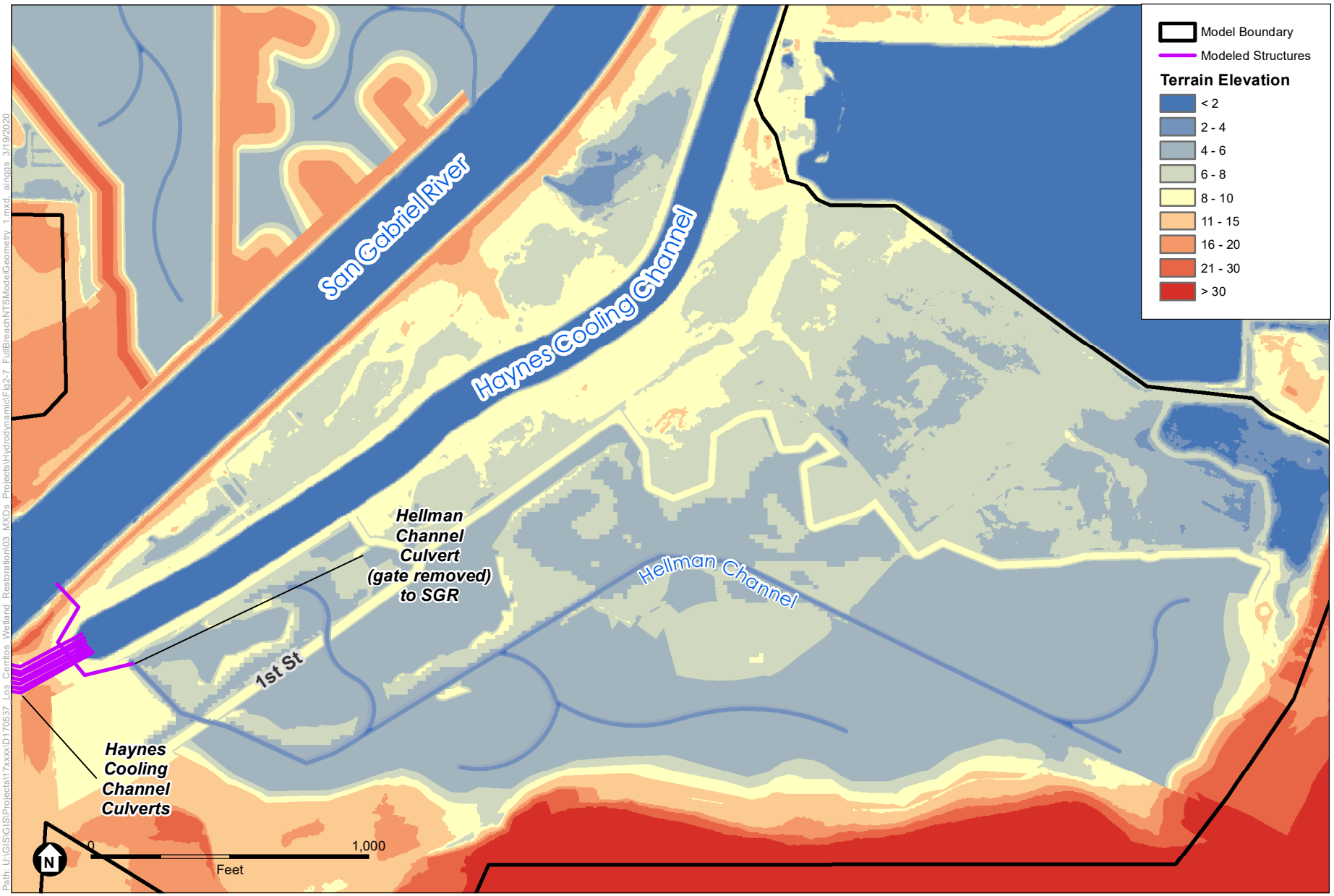
Path: U:\GIS\GIS\Projects\17xxxx\D170537_Los_Cerritos_Wetland_Restoration\03_MXDs_Projects\HydrodynamicFig2-6_Roughness_ExistingConditions.mxd eschalo 3/2/2020

SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-6
Hydraulic Roughness for Existing Conditions

ESA



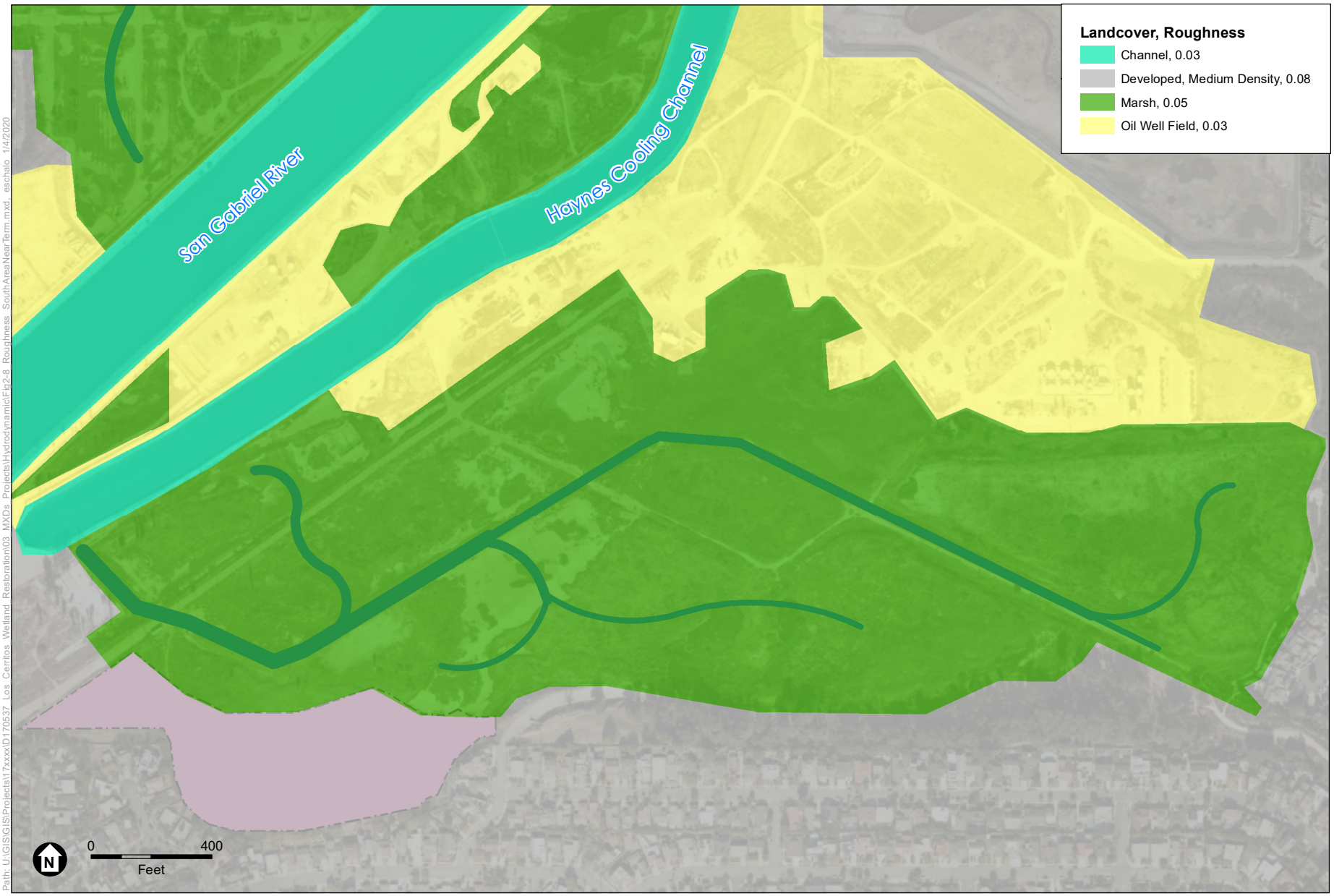
SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-7

South Area, Near-Term Model Geometry

ESA



SOURCE: ESRI,LCWA

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Figure 2-8

Hydraulic Roughness for Full Breach, Near-Term Conditions

ESA

2.3 Full Breach Conditions

The full breach conditions model includes the long-term Central Area restoration (Section 1.4.3) with a full breach connection to the San Gabriel River and new levees along the perimeter of the site. It also includes the mid-term Isthmus (Section 1.4.2) and South Area restoration (Section 1.4.1) once the South Area is connected to the Haynes Cooling Channel.

2.3.1 Topography

The model topography was developed based on the five datasets used for existing conditions as well as two new additional datasets: (1) a conceptual-level, long-term Central Area design terrain; and (2) a conceptual-level, mid-term South Area design terrain. Figure 2-9 shows the model geometry for the full breach conditions.

In the South Area, the only difference between the South Area, near-term model geometry and the full breach model geometry is the new channel connecting the Haynes Cooling Channel to Hellman Channel and removal of the access road separating the Haynes Cooling Channel from the South LCWA site.

2.3.2 Structures

The full breach conditions structures have the same geometries as the South Area, near-term restoration structures in the South Area.

The seven culverts that connect the Alamitos Bay Marina to the Haynes Cooling Channel underneath the San Gabriel River remain in place. However, in the mid-term for the South Area, the Haynes Generating Station is expected to stop using the Haynes Cooling Channel for once-through cooling, so pumping activities that pull water into the channel under existing conditions would be stopped. The tidal flows in and out of the channel would continue.

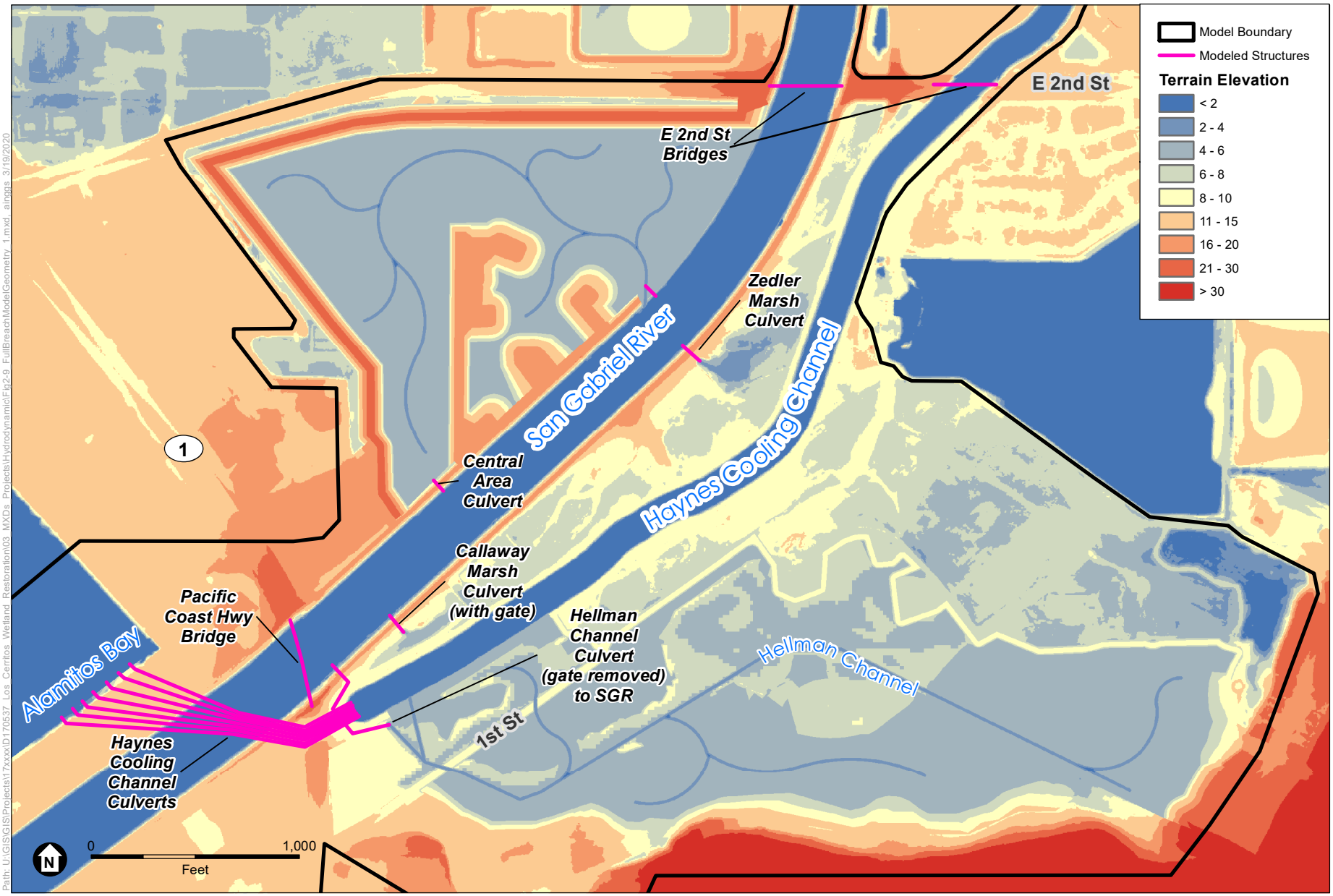
The culvert connecting the Long Beach City Property in the Central Area to the San Gabriel River remains in place under full breach conditions model, but the site is also connected to the river through a breach in the levee on the Central LCWA site.

The culvert connecting Zedler Marsh to the San Gabriel River remains in place under full breach conditions. Additionally, the culvert connecting the river to Callaway Marsh also remains in place, but the gate is removed.

The bridges in the full breach conditions are the same as under existing conditions.

2.3.3 Hydraulic Roughness

The full breach conditions hydraulic roughness values are the same as existing conditions except for the Central Area and Isthmus Bryant site, which were changed from roughness values of 0.03 to values of 0.05 to represent restoration or the marsh in these locations (Figure 2-10).



SOURCE: ESRI,LCWA

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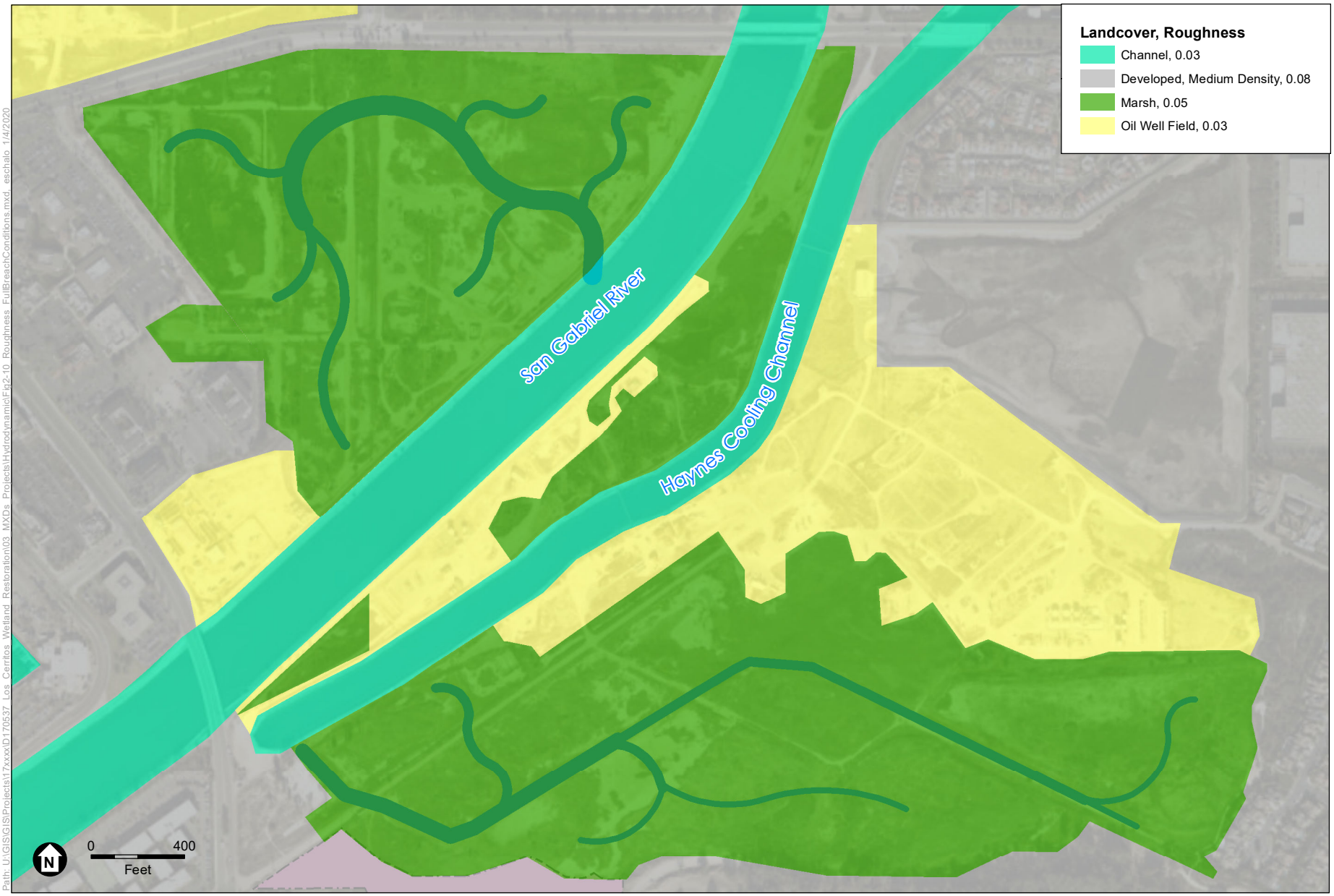
Figure 2-9
Full Breach Model Geometry

ESA



SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-10

Hydraulic Roughness for Full Breach Conditions

ESA

2.4 Central Area, Culvert Conditions

The Central Area, culvert conditions scenario is focused on the Central Area and considers an alternative to the full breach connection to the San Gabriel River. The San Gabriel River levee along the Central Area would be left in place, and a culvert or series of culverts would be installed through the levee to allow flows to enter the site. This scenario is otherwise identical to the Full Breach Conditions scenario.

2.4.1 Topography

The model topography was developed based on the five datasets used for existing conditions as well as the conceptual-level, long-term Central Area design terrain, but without the breach in the existing San Gabriel River levee. Figure 2-11 shows the model geometry for the full breach conditions.

2.4.2 Structures

Multiple culvert configurations were modeled and analyzed as an alternative to the Full Breach Conditions in the Central Area. The goal of this analysis was to examine an alternative to the Full Breach Conditions design that could result in lower levees with a smaller footprint inside the site while maintaining a strong tidal connection. Ideally, the culverts would restrict flood flows into the site, but allow a full tide range.

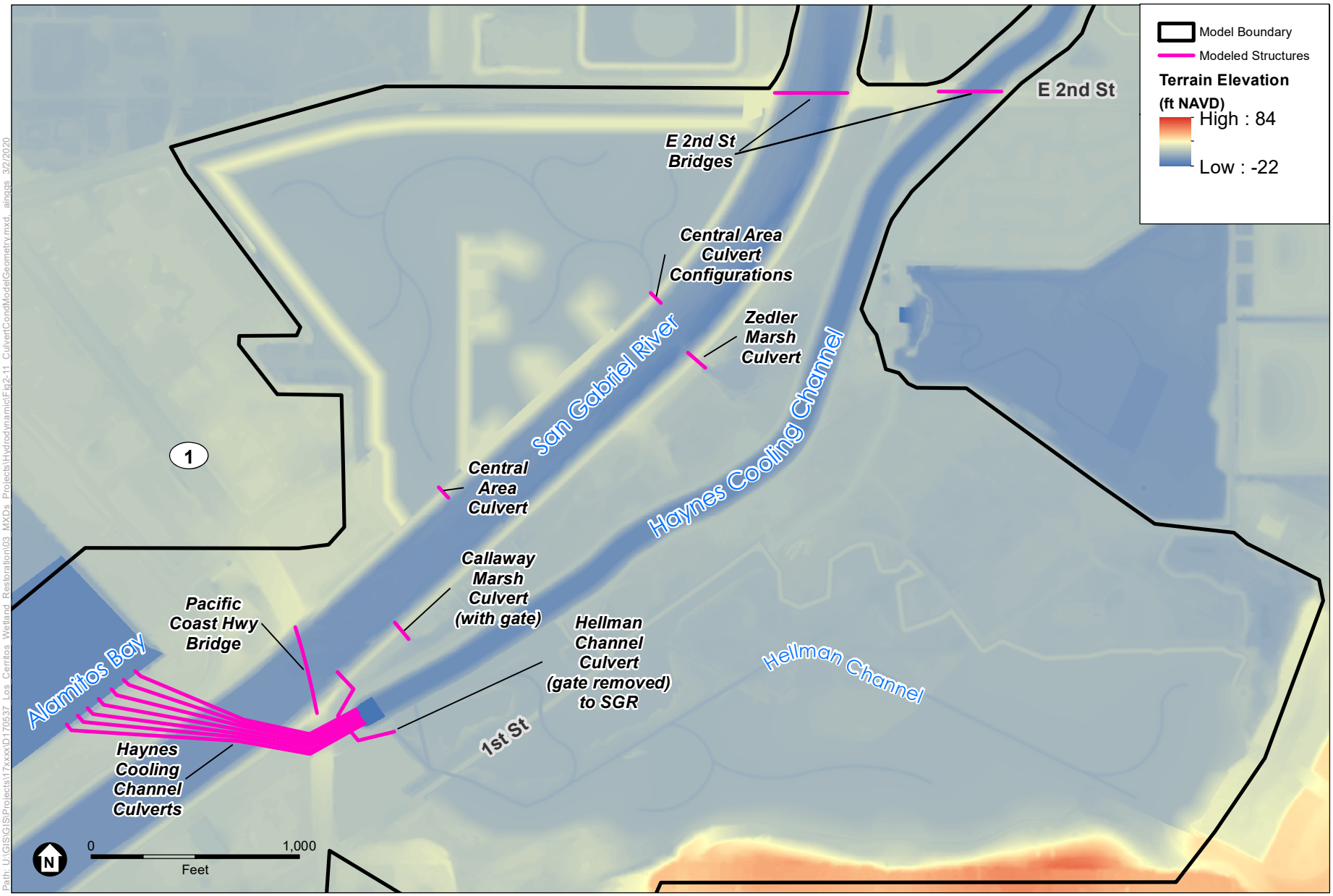
Circular culverts were modeled with diameters varying from 2 feet to 8 feet (Table 2-2). Individual culverts were modeled and banks of culverts including up to 9 culverts were assessed. Initial model runs were used to analyze culvert sizing. After reviewing these results, one 4-foot diameter culvert was chosen for further analysis (see Section 2.7 for model runs).

TABLE 2-2
CENTRAL AREA POTENTIAL CULVERT DIMENSIONS

No. of Culverts	Culvert Diameter	Invert Elevation
1	2 feet	2 feet NAVD
1	4 feet	2 feet NAVD
1	4 feet	0 feet NAVD
1	6 feet	2 feet NAVD
4	4 feet	2 feet NAVD
6	4 feet	2 feet NAVD
9	6 feet	2 feet NAVD
9	8 feet	2 feet NAVD

2.4.3 Hydraulic Roughness

The Central Area, culvert conditions hydraulic roughness values are the same as full breach conditions (Figure 2-10).



SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-11

Central Area, Culvert Conditions Model Geometry

ESA

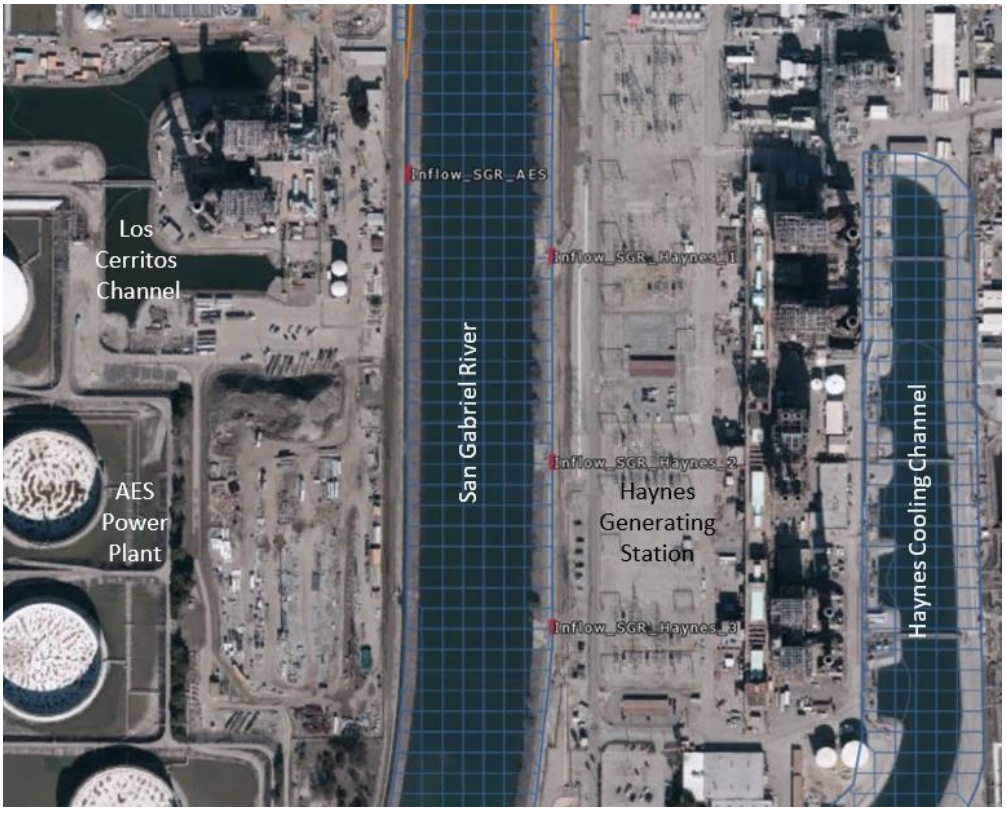
2.5 Hydrology

2.5.1 Power Plant Inflow

Under existing conditions, the two power plants along the San Gabriel River (the Haynes Generating Station on the southeast side and the AES Alamitos Energy Center on the northwest side) use once-through cooling in their processes. This involves pumping water into the facility from the Haynes Cooling Channel and Los Cerritos Channel and discharging the water into the San Gabriel River. This flow into the San Gabriel River was incorporated into the model.

In the 2007 Circulation Study Report (Section 1.3.1), discharges from the plants were measured during the period of January 1, 2006 to January 1, 2007. The Haynes Generating Station discharges varied from 600 to 1,500 cfs through the year, and the AES Alamitos Energy Center discharges varied from 0 to 2,000 cfs over the year.

The model incorporates discharge from three culverts from the Haynes Generating Station to the left bank of the river and one culvert from the AES Alamitos Energy Center to the right bank of the river (Figure 2-12). The model includes 1,500 cfs from the Haynes Generating Station (divided over the 3 culverts, so 500 cfs each) and 2,000 cfs from the AES Alamitos Energy Center for the storm event to represent a worst-case scenario. The combined discharge modeled for typical tides was 2,000 cfs.



SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-12
Power Plant Inflow Locations

In the mid-term restoration, once-through cooling would be discontinued at these plants, so the discharges into the river are not included in the model for the full breach conditions. The existing conditions and the South Area, near-term conditions models were run with both the outflows turned on (to evaluate existing and near-term water levels) and turned off (to compare against the program conditions). Since discontinuing once-through cooling is not part of the proposed program and just an expected condition when restoration occurs, the discussion comparing flood water levels under existing and program conditions relies on the model runs assuming no once-through cooling for either existing of program conditions.

2.5.2 Storm Conditions

The hydrographs for the 10-, 25-, 50-, 100-, and 500-year recurrence interval storm events (10%, 4%, 2%, 1%, and 0.2% annual chance storms, respectively) for the San Gabriel River were taken from Table 1 of the USACE Los Angeles County Drainage Area Review Final Feasibility Study Interim Report and Environmental Impact Statement from 1991. The hydrographs were developed for the San Gabriel River below Coyote Creek with a storm duration of 48 hours and discharge rates according to Table 2-3.

TABLE 2-3
DISCHARGE FREQUENCY (CFS)

	10-year	25-year	50-year	100-year	500-year
San Gabriel River below Coyote Creek	27,200	36,700	44,400	55,900	74,000

SOURCE: USACE 1991.

The hydrographs were applied as an inflow boundary condition at the most upstream portion of the San Gabriel River in the model, just downstream of 7th St (Figure 2-1).

2.6 Tidal Boundary Conditions

The San Gabriel River terminates in the Pacific Ocean, and the channel's hydraulics are influenced by the tidal input and water levels of the ocean. The nearest NOAA tide gauge is Station 9410660 located in the Port of Los Angeles at the end of Signal Street, approximately 9 miles west of the San Gabriel River mouth. ESA collected water level data in the San Gabriel River at the Zedler Marsh culvert from January 29 to April 18, 2019 to analyze how the tides propagate along the coast and into the channel and how the water levels at the site compare to the water levels at the NOAA tide gauge. Based on the results of this analysis (see Section 2.5.1), NOAA's tide gauge data was used to develop tidal boundary conditions for four downstream boundary conditions:

- 2-week typical tides time series, including a tide equal to the annual high tide – used for the tidal conditions scenarios.
- 2-week typical tides time series, including a tide equal to a typical spring high tide – used for the Central Area, culvert conditions.

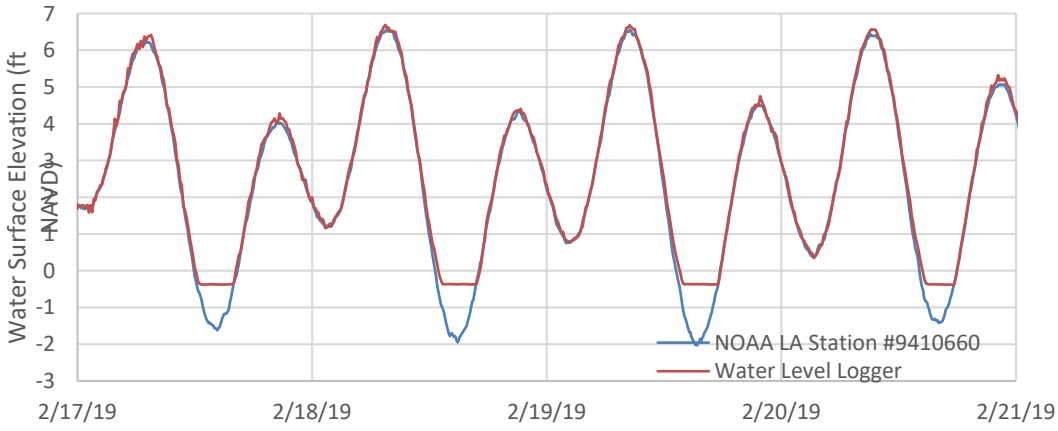
- 2-week typical tides time series, including a tide equal to MHHW – used for the Central Area, culvert conditions.
- 2-day annual high tide series – used for the storm conditions scenarios and timed so that the peak storm flow coincides with the annual high tide for worst-case water elevations.

Additionally, these tidal boundary conditions were increased to account for sea-level rise for the various sea-level rise scenarios. Downstream tidal boundary conditions are further discussed in the sections below.

2.6.1 ESA Water Level Data Collection

Since the elevations where different salt marsh species can occur are dependent on tidal water levels, and even a few inches can make a difference to the success of specific species, understanding water levels at a restoration site is essential. While the NOAA tide gauge provides a long-term dataset of water levels for Los Angeles (water levels have been collected there since 1960), there is often some amount of tidal amplification or muting that can make water levels vary throughout different parts of the coast or within a channel. ESA collected water level data in the San Gabriel River at the Zedler Marsh culvert to get a better understanding of how the water levels at the site compare to the more extensive NOAA tide data time series.

Data was gathered by installing a tide gauge and surveying it into NAVD. The tide gauge was located on the left bank of the San Gabriel River by the Zedler Marsh culvert headwall. Data was collected from January 29, 2019 until April 18, 2019. The water level data showed no amplification or muting of high tide levels compared to the NOAA gauge data (Figure 2-13), so the NOAA data was deemed sufficient to use for the tidal boundary input. Since the tide gauge was located along the side of the channel and not at the deepest part of the channel, the water levels dropped below the tide gauge around -0.5 feet NAVD.



SOURCE: ESA 2019

Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-13
ESA Gauge Data Compared to NOAA Gauge Data

2.6.2 NOAA Tidal Data Analysis

Table 2-4 presents the tidal datums and extreme coastal water levels for the San Gabriel River based on the NOAA tide gauge data and FEMA extreme water level data.

TABLE 2-4
TIDAL DATUMS AT THE SAN GABRIEL RIVER

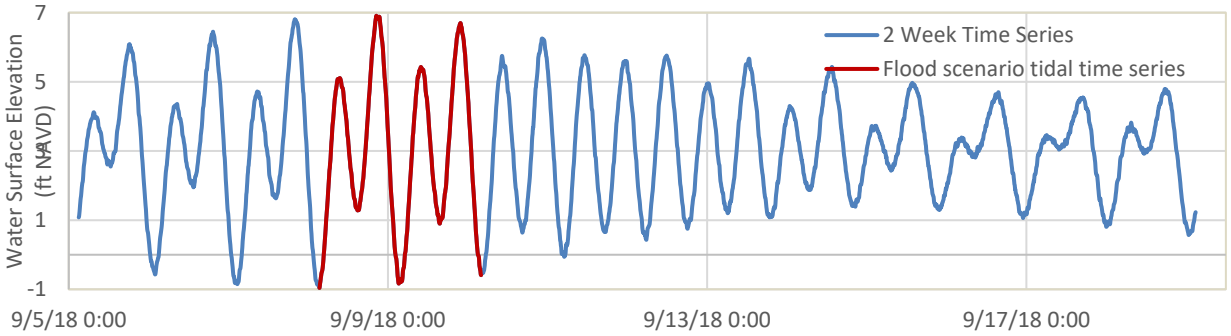
Tide	Water Level (feet NAVD)	Notes
500-year high tide in Alamitos Bay[1]	12.3	
100-year high tide in Alamitos Bay[1]	8.8	
50-year high tide in Alamitos Bay[1]	7.6	
HAT[2]	7.14	Occurred at 12/2/1990, 12:00
10-year high tide in Alamitos Bay[1]	7.0	
1-year high tide[2]	6.89	
MHHW[2]	5.29	
MHW[2]	4.55	
MTL[2]	2.64	
MSL[2]	2.62	
MLW[2]	0.74	
MLLW[2]	-0.20	
LAT[2]	-2.18	Occurred at 1/1/1987, 0:00

[1] Stillwater levels in Alamitos Bay based on FEMA 2018.
[2] Tidal datums from NOAA LA tide gauge.

2.6.2 Model Input

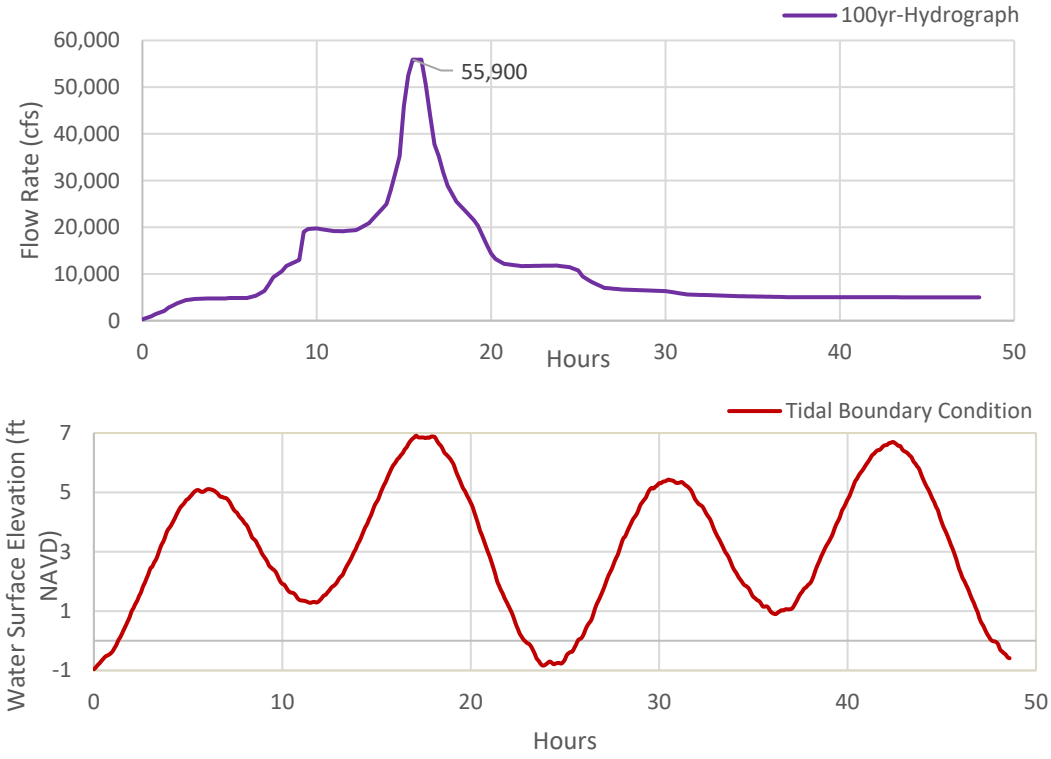
To evaluate flood risk, a conservative tidal boundary condition of the 1-year high tide was chosen. A representative 2-week tide cycle from September 5 to September 18, 2018, including an annual high tide of 6.9 feet NAVD, was used for the typical tides scenario (Figure 2-14).

For the flood scenarios, the tide cycle was shortened to a 48-hour period, including the 6.9 feet NAVD high tide, to reduce model times (Figures 2-14 and 2-15). The peak of the 100-year San Gabriel River flood discharge hydrograph was set to coincide with the 6.9 feet NAVD high tide as shown in Figure 2-15.



SOURCE: NOAA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-14
Tidal Boundary Conditions Model Input



SOURCE: NOAA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 2-15
Tidal Boundary Conditions Model Input For Storm Scenarios

To assess the capacity of the culverts in the Central Area, culvert conditions model runs, a MHHW and spring high tide cycle were analyzed. Similar to the typical tides scenario, the MHHW and spring high tides scenarios were 14-day tidal boundary conditions. The maximum water elevation for the MHHW tides was 5.3 feet NAVD88 and 6.0 feet NAVD88 for the spring high tide. A representative 2-week tide cycle from June 20 to July 4, 2019 was used for the MHHW conditions and a tide cycle from June 18 to July 2, 2019 was used for the spring high tide conditions.

2.6.3 Sea-Level Rise Model Input

State Guidance

Projections of global sea-level rise are well-documented and investigated, with recent research projecting sea-level rise on the order of 2 to 10 feet by 2100 in California (e.g., Cayan et al. 2008; Griggs et al. 2017). This research has been used to develop a series of policy guidance documents by the State of California that recommend including specific amount of sea-level rise in project planning and design, the most recent being the California Ocean Protection Council's (OPC) *State of California Sea-Level Rise Guidance* (OPC 2018). The OPC (2018) Guidance includes tables of projected relative sea-level rise at well-established tide gauges located along the coast of California through 2150 for a range of risk aversion scenarios, including low, medium-high, and extreme (e.g., H++). Table 2-5 shows the projections for Los Angeles. These projections were developed and summarized with the intention that local planning and design efforts would have a consistent and accepted basis for addressing future sea-level rise.

The California Coastal Commission (CCC) recently updated their *Sea-Level Rise Policy Guidance* in 2018 (CCC 2018). The CCC (2018) Guidance provides a basis for selecting the time horizon and the risk level of the project, which are used to define the appropriate sea-level rise amounts. The CCC (2018) Guidance recommends that project planning and design consider a range of scenarios in order to bracket the possible timing of a given amount of sea-level rise.

TABLE 2-5
PROJECTED SEA-LEVEL RISE (IN FEET) FOR LOS ANGELES

		Probabilistic Projections (in feet) (based on Kopp et al. 2014)				H++ scenario (Sweet et al. 2017) *Single scenario
		MEDIAN	LIKELY RANGE	1-IN-20 CHANCE	1-IN-200 CHANCE	
		50% probability sea-level rise meets or exceeds...	66% probability sea-level rise is between...	5% probability sea-level rise meets or exceeds...	0.5% probability sea-level rise meets or exceeds...	
			Low Risk Aversion		Medium - High Risk Aversion	Extreme Risk Aversion
High emissions	2030	0.3	0.2 - 0.5	0.6	0.7	1.0
	2040	0.5	0.4 - 0.7	0.9	1.2	1.7
	2050	0.7	0.5 - 1.0	1.2	1.8	2.6
Low emissions	2060	0.8	0.5 - 1.1	1.4	2.2	
High emissions	2060	1.0	0.7 - 1.3	1.7	2.5	3.7
Low emissions	2070	0.9	0.6 - 1.3	1.8	2.9	
High emissions	2070	1.2	0.8 - 1.7	2.2	3.3	5.0
Low emissions	2080	1.0	0.6 - 1.6	2.1	3.6	
High emissions	2080	1.5	1.0 - 2.2	2.8	4.3	6.4
Low emissions	2090	1.2	0.7 - 1.8	2.5	4.5	
High emissions	2090	1.8	1.2 - 2.7	3.4	5.3	8.0
Low emissions	2100	1.3	0.7 - 2.1	3.0	5.4	
High emissions	2100	2.2	1.3 - 3.2	4.1	6.7	9.9
Low emissions	2110*	1.4	0.9 - 2.2	3.1	6.0	
High emissions	2110*	2.3	1.6 - 3.3	4.3	7.1	11.5
Low emissions	2120	1.5	0.9 - 2.5	3.6	7.1	
High emissions	2120	2.7	1.8 - 3.8	5.0	8.3	13.8
Low emissions	2130	1.7	0.9 - 2.8	4.0	8.1	
High emissions	2130	3.0	2.0 - 4.3	5.7	9.7	16.1
Low emissions	2140	1.8	0.9 - 3.0	4.5	9.2	
High emissions	2140	3.3	2.2 - 4.9	6.5	11.1	18.7
Low emissions	2150	1.9	0.9 - 3.3	5.1	10.6	
High emissions	2150	3.7	2.4 - 5.4	7.3	12.7	21.5

SOURCE: OPC 2018

The OPC Guidance identifies three levels of risk to consider when planning for sea-level rise (blue boxes in Table 2-5):

- The low risk aversion scenario is appropriate for adaptive, lower consequence decisions (e.g., unpaved coastal trail), but is not adequate to address high impact, low probability events.
- The medium-high risk aversion scenario is appropriate as a precautionary projection that can be used for less adaptive, more vulnerable projects or populations that will experience medium to high consequences as a result of underestimating sea-level rise (e.g., coastal housing development).
- The extreme risk aversion scenario is appropriate for high consequence projects with little to no adaptive capacity and which could have considerable public health, public safety, or environmental impacts (e.g., coastal power plant, wastewater treatment plant, etc.).

For habitat restoration projects, the CCC (2018) Guidance recommends using multiple time horizons and sea-level rise projections (CCC 2018, pg. 102):

> *Determining an anticipated life for restoration activities or other related projects is somewhat more complex than for typical development projects because these activities are typically meant to exist in perpetuity. As such, assessing sea-level rise impacts may necessitate analyzing multiple different time frames, including the present, near future, and very long-term depending on the overall goals of the project. For restoration projects that are implemented as mitigation for development projects, an expected project life that is at least as long as the expected life of the corresponding development project should be considered.*

LCW Sea-Level Rise Scenarios

To inform the habitat design for the LCW, two sea-level rise amounts were selected to bracket the range of potential projections: 1.7 and 3.3 feet. According to OPC 2018, there is a 66% chance that sea-level rise will be between 1.7 and 3.3 feet of sea-level rise by 2110. There is a 0.5% chance that sea-level rise will reach or exceed 3.3 feet as soon as 2070.

To analyze potential flood impacts along the San Gabriel River, the medium-high risk aversion scenario is recommended per the OPC Guidance, since homes and other development in the area are at risk for flooding. Table 2-6 shows the model scenarios and the corresponding time frames (the first year in the range) under the medium-high risk aversion projection, for high emissions. To analyze habitat elevations, the low risk aversion project of sea-level rise, for high emissions (the third column in Table 2-5) can be used to understand the likely habitat acreages that will develop over time. Since habitat restoration requires a balance of creating wetland habitat post-restoration and providing space for future wetland habitat, the low risk aversion projection is used to assess habitat development with sea-level rise. (rather than the medium-high risk aversion). The model scenarios and the corresponding time frames under the low risk aversion projection (the second year in the range) are shown in Table 2-6.

TABLE 2-6
LOS CERRITOS WETLANDS SEA-LEVEL RISE PROJECTIONS (IN FEET)

	~2040–2070	~2070–2110
Amounts of sea-level rise	1.7	3.3

2.7 Run Catalog

Table 2-7 presents the run catalog for the different modeled scenarios with the varying model inputs.

TABLE 2-7
LOS CERRITOS WETLANDS HYDRODYNAMIC MODELING RUN CATALOG

	Run	Scenario/ Geometry	Hydrology	Downstream Boundary Conditions	Sea-Level Rise
Typical Tides	Calibration	Existing	Power plant inflow	Two weeks tides from gauge data	—
	1	Existing	Power plant inflow	Two weeks typical tides, w/ annual high tide	—
	2	Existing	No flow	Two weeks typical tides, w/ annual high tide	—
	3	South Area, Near-Term	Power plant inflow	Two weeks typical tides, w/ annual high tide	—
	4	South Area, Near-Term	No flow	Two weeks typical tides, w/ annual high tide	—
	5	Full Breach	No flow	Two weeks typical tides, w/ annual high tide	—
Flood Conditions	6	Existing	100-year event	Two days, w/ annual high tide	—
	7	South Area, Near-Term	100-year event	Two days, w/ annual high tide	—
	8	Full Breach	10-year event	Two days, w/ annual high tide	—
	9	Full Breach	25-year event	Two days, w/ annual high tide	—
	10	Full Breach	50-year event	Two days, w/ annual high tide	—
	11	Full Breach	100-year event	Two days, w/ annual high tide	—
	12	Full Breach	500-year event	Two days, w/ annual high tide	—
Sea-Level Rise	13	Existing	No flow	Two weeks typical tides, w/ annual high tide	1.7 feet
	14	Full Breach	No flow	Two weeks typical tides, w/ annual high tide	1.7 feet
	15	Existing	No flow	Two weeks typical tides, w/ annual high tide	3.3 feet
	16	Full Breach	No flow	Two weeks typical tides, w/ annual high tide	3.3 feet
Central Area Culvert Dimension Analysis	17	Culvert / 2ft diameter	No flow	Two weeks typical tides, w/ annual high tide	—
	18	Culvert / 4ft diameter	No flow	Two weeks typical tides, w/ annual high tide	—
	19	Culvert / 4ft diameter	100-year event	Two weeks typical tides, w/ annual high tide	—
	20	Culvert / 6ft diameter	No flow	Two weeks typical tides, w/ annual high tide	—
	21	Culverts / four 4ft diameter	No flow	Two weeks typical tides, w/ annual high tide	—
	22	Culverts / six 4ft diameter	No flow	Two weeks typical tides, w/ annual high tide	—
	23	Culverts / six 4ft diameter	100-year event	Two weeks typical tides, w/ annual high tide	—

TABLE 2-7
LOS CERRITOS WETLANDS HYDRODYNAMIC MODELING RUN CATALOG

	Run	Scenario/ Geometry	Hydrology	Downstream Boundary Conditions	Sea-Level Rise
	24	Culverts / nine 6ft diameter	No flow	Two weeks typical tides, w/ annual high tide	—
	25	Culverts / nine 6ft diameter	100-year event	Two weeks typical tides, w/ annual high tide	—
	26	Culverts / nine 8ft diameter	No flow	Two weeks typical tides, w/ annual high tide	—
	27	Culverts / nine 8ft diameter	100-year event	Two weeks typical tides, w/ annual high tide	—
Central Area Culvert Analysis Refinement	28	Culvert / 4ft diameter	No flow	Two weeks typical tides, w/ MHHW tide	—
	29	Culvert / 4ft diameter	No flow	Two weeks typical tides, w/ spring high tide	—
	30	Culvert / 4ft diameter / lower invert	No flow	Two weeks typical tides, w/ annual high tide	—
	31	Culvert / 4ft diameter / lower invert	100-year event	Two weeks typical tides, w/ annual high tide	—
	32	Culvert / 4ft diameter	No flow	Two weeks typical tides, w/ annual high tide	1.7 feet
	33	Culvert / 4ft diameter	No flow	Two weeks typical tides, w/ annual high tide	3.3 feet

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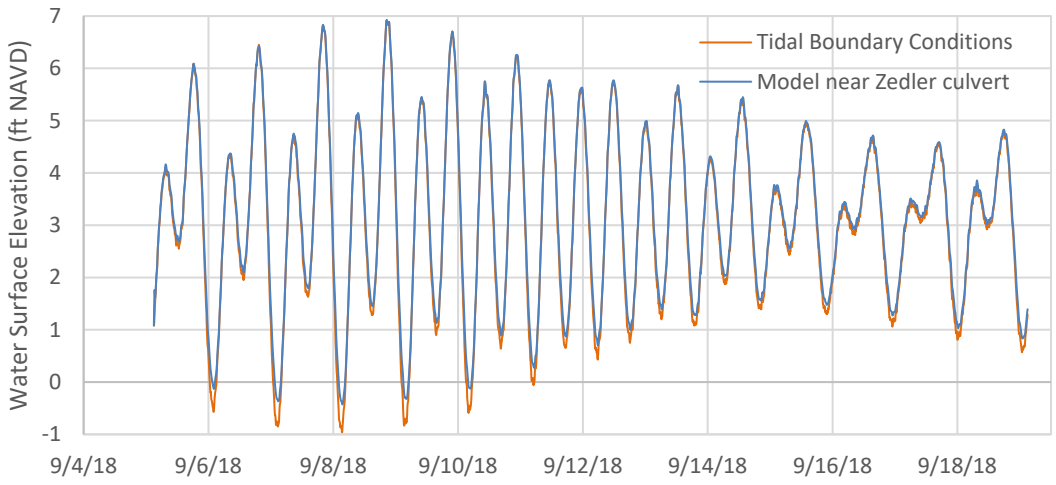
SECTION 3
Results and Discussion

3.1 Model Calibration

The model was calibrated using ESA's tide gauge data in the San Gabriel River (Section 2.5.1) and M&N's tide gauge data in the Hellman Channel (1.3.2). Additionally, Tidal Influence LLC surveyed the high tide water level extent in Zedler Marsh on November 26, 2019 during a high tide of 7.1 feet NAVD.

3.1.1 San Gabriel River Water Levels

As explained in Section 2.5.1, ESA collected tide gauge data at the Zedler Marsh culvert in the San Gabriel River. The tide data in front of Zedler Marsh matched closely to the NOAA tide data (Figure 2-13). The model also shows that the water levels in the river in front of Zedler Marsh match closely with the input NOAA tide data (Figure 3-1).

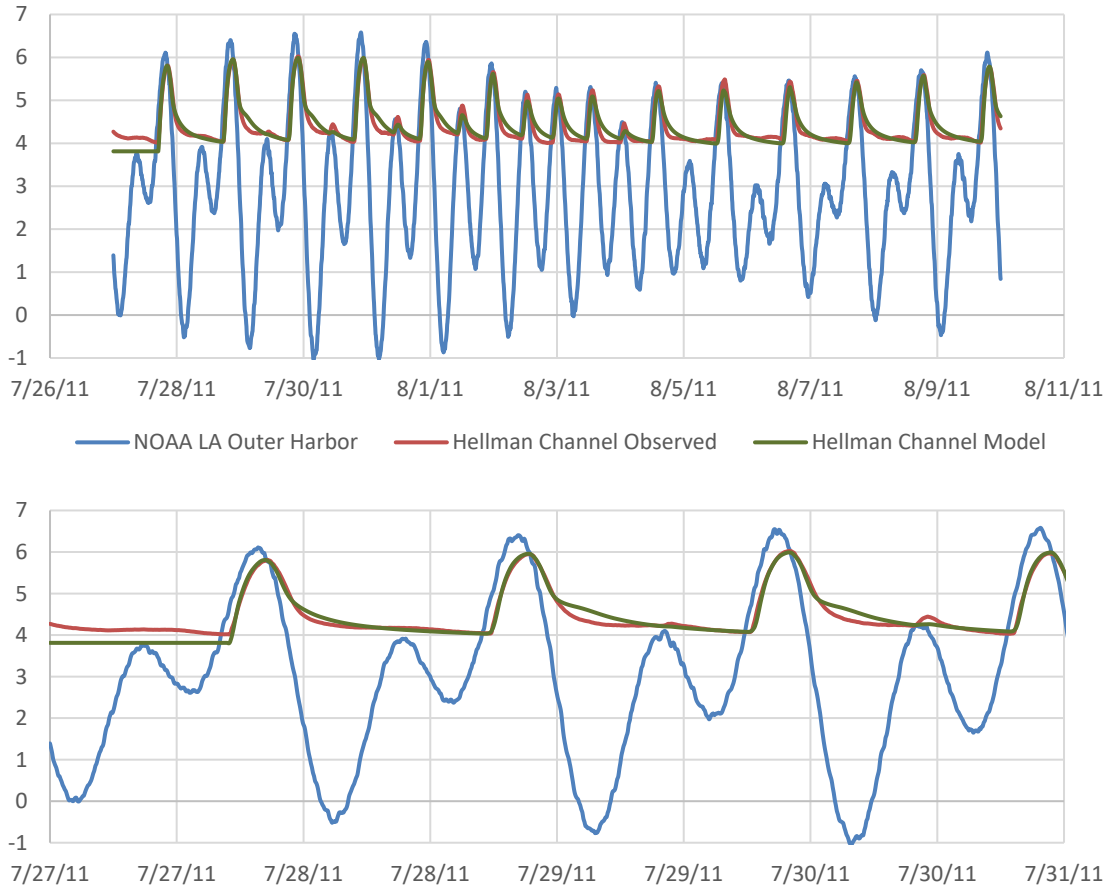


SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 3-1
Water Levels in SGR near Zedler Marsh Compared to the Model Input Data

3.1.2 Hellman Channel Water Level Calibration

The M&N tide gauge data in Hellman Channel was used to estimate the leakage on the culvert gate between the San Gabriel River and the South LCWA site. As a first pass and based on photos of the culvert and gate (Figure 2-5) the culvert was modeled at 90% blocked (i.e., only 10% of the culvert is open to allow flow into the site). A number of iterations were made in the culvert geometry and connection data to determine the optimal configuration to most closely match the M&N tide gauge data in the channel. The culvert configuration that led to the closest relationship between the modeled and measured water levels was the culvert blocked to 45% (i.e., a 1.8-foot opening to the 4-foot culvert). The results of this calibration can be seen below in Figure 3-2 below.



SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 3-2
Model Calibration for Water Levels in the Hellman Channel

Figure 3-2 shows that the measured water levels in the Hellman Channel are muted (i.e., the high tides are lower) compared to the water levels in the San Gabriel River (i.e., tidal boundary condition). The measured water levels bottom out at around 4 feet NAVD, which is the elevation of the bottom of the channel in the location of the tide gauge. In other words, when the water levels drop below 4 feet NAVD, the channel in this location is dry. Figure 3-2 also shows the high tides and bottom elevation for the measured and modeled water levels are almost identical. Water levels take a longer time to drain in the model compared to the measured data. However, the model results were deemed sufficiently representative of the measured water level data when the culvert gate is blocked to 45%.

3.1.3 Zedler Marsh Flooding Extent

The flooding extent in Zedler Marsh under existing conditions was compared to data collected by Tidal Influence during a 7.1 feet NAVD high tide. Figure 3-3 shows the extent of the flooding as measure by Tidal Influence and the results of the existing conditions model during a similar tide. The model extents showed slightly more flooding in the south of the site and up towards the Isthmus Bryant site, but were generally similar to the observed extents. This means the model is likely to provide slightly more conservatively high water levels than actual conditions.

3.2 Current Sea Level Model Results

3.2.1 Typical Tides

South Area

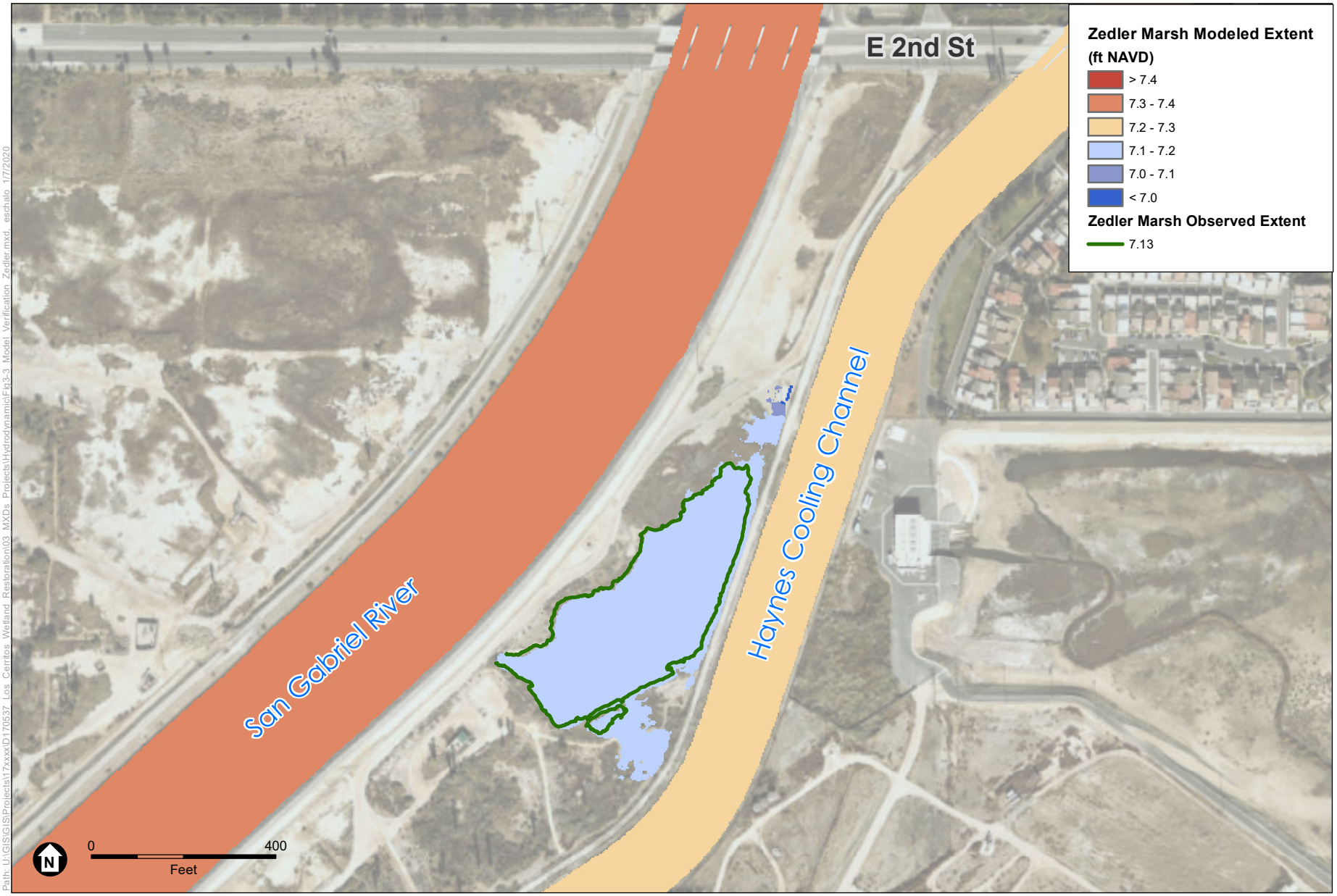
Inundation Extent and Water Levels

Under existing conditions, the model results show that tidal waters inundate the Hellman Channel and the lowest lying areas in the marsh (top panel of Figure 3-4). Most of the inundation is in the vicinity of the Hellman Channel and the tides at the back of the marsh are limited by the series of culverts along the channel, resulting in lower water levels. As shown in Table 3-1, the model shows the annual high tide water level at the mouth of the Hellman Channel as 6.2 feet NAVD, while the water level at the back of the marsh is 5.4 feet NAVD. The model shows the tide waters do not extend to the Hellman Retained site under the highest annual tide.

TABLE 3-1
MODELED WATER LEVELS IN THE SOUTH AREA UNDER TYPICAL TIDES

	Water Levels in Hellman Channel (feet NAVD)				
Scenario	**Haynes Cooling Channel**	**Mouth**	**South of 1st Street**	**Middle of Marsh (between marsh culverts)**	**Back of Marsh**
Existing Conditions	6.8	6.2	6.2	5.5	5.4
South Area, Near-Term Conditions	6.8	5.8	5.8	5.7	5.7
Full Breach Conditions	6.7	6.7	6.6	6.3	6.2

Figure 3-4 shows the locations for each column of the table.



SOURCE: ESRI,LCWA

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Figure 3-3
Model Verification at Zedler Marsh

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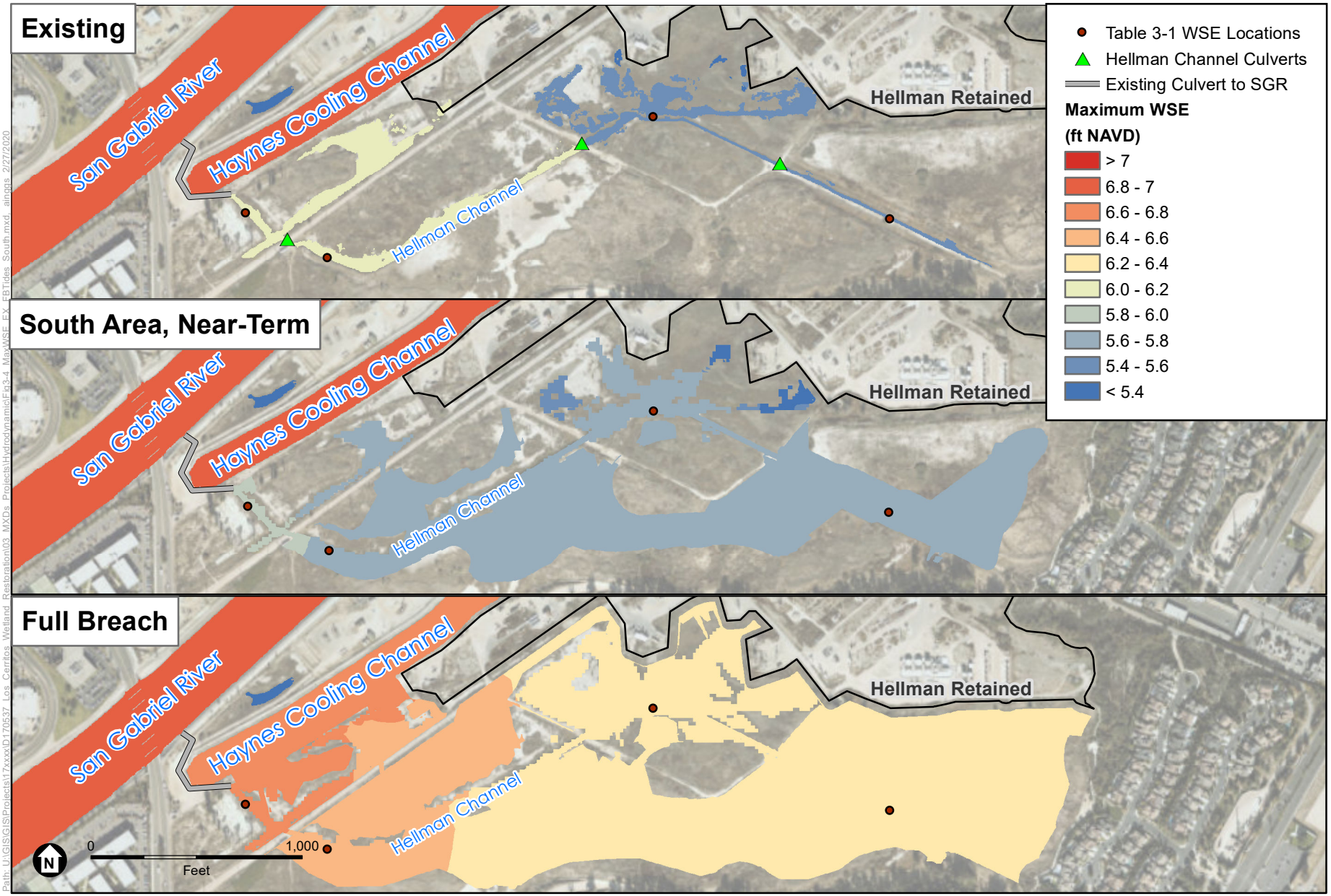

SOURCE: ESRI,LCWA

NOTE: WSE = Water Surface Elevation

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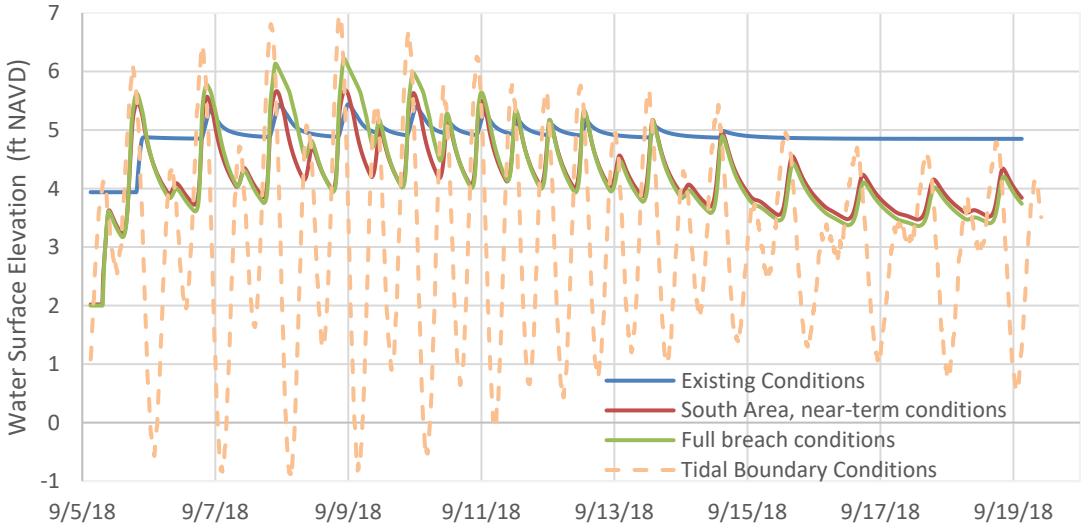
Figure 3-4
Modeled Extent of Inundation during an Annual High Tide in the South Area

ESA

Under the South Area, near-term conditions, the model shows that more of the marsh is inundated annually due to the restoration grading because the grading would lower ground elevations (middle panel of Figure 3-4). In the South Area, near-term conditions, the culverts within the marsh that constrain the water levels at the back of the marsh under existing conditions are removed. As a result, the model shows water levels are more similar across the marsh (i.e., less muting) and the annual high tide water level at the back of the marsh (Figure 3-5) is only 0.1 feet lower than the water level at the mouth of the Hellman Channel (Table 3-1).

The water levels at the mouth of the Hellman Channel are 0.4 feet lower than in existing conditions, based on the model results. This is because the grading of the site under the near-term restoration creates a much larger space for water to flow, but the culvert to the San Gabriel River still limits the amount of water that can enter the site. With the removal of the culverts within the marsh, the available water spreads more evenly across the site and water levels at the back of the site are higher than existing conditions, but the water levels near the mouth of the Hellman Channel are lower.



SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 3-5
Model Water Levels at the Back of the Marsh in the South LCWA site

The full breach conditions model results show that mid-term restoration (including connecting the site to the Haynes Cooling Channel) would further increase the extent of inundation (bottom panel of Figure 3-4). During the annual high tide, the majority of the site in inundated. The channel under 1st Street acts as a minor constriction, and the model results show water levels at the back of the marsh are up to 0.5 feet lower than water levels at the mouth of the Hellman Channel. Low tides at the back of the marsh are damped by between a few tenths of a foot up to 5 feet after higher tides compared to tides in Alamitos Bay.

The model results for the full breach conditions show that the water levels at the mouth of Hellman Channel reach an elevation of 6.7 feet NAVD, 0.5 feet higher than under existing conditions, which is due to a greater volume of water entering the marsh from the connection to

the Haynes Cooling Channel. However, this is still slightly muted from the annual high tide elevation used for the tidal boundary conditions (Figure 3-5). Water levels in the Haynes Cooling Channel show a drop from South Area, near-term conditions to full breach conditions (Table 3-1), indicating that the culverts connecting the Haynes Cooling Channel to the Alamitos Bay Marina are slightly constricting flow into the site.

Tide Range and Wetland Area

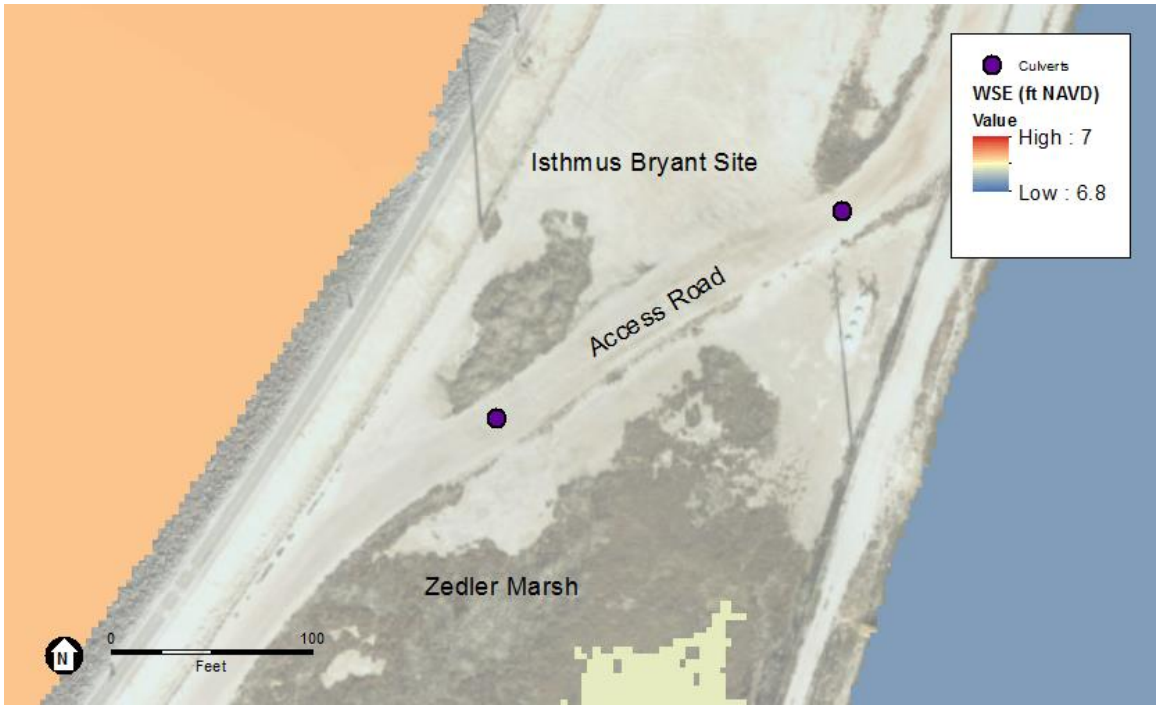
Figure 3-5 illustrates how the restoration in the South Area would increase the tidal range at the site. At the back of the site, the tide range under existing conditions is 1.4 feet (from the bottom of the channel [4.0 feet NAVD] up to the annual high tide in the site [5.4 feet NAVD]). With the restoration, the channel is excavated to 2 feet NAVD and the tide range under the South Area, near-term conditions increases to 3.7 feet, and the tide range under the full breach conditions increases to 4.2 feet, since the annual high tide also increases with restoration. The model shows the program is expected to increase the tide range by 2.3 feet in the near-term and an additional 0.5 feet in the mid-term (full breach conditions), but is damped compared to the tide range in Alamitos Bay.

The area inundated by the annual high tide would also increase, from 7.6 acres under existing conditions to 32.8 acres under the South Area, near-term conditions based on the model results. The full breach conditions model results show that mid-term restoration (including connecting the site to the Haynes Cooling Channel) would further increase the inundated marsh to 65.8 acres, 58.2 acres more than existing conditions and 33 acres more than the South Area, near-term conditions.

Isthmus Area

In Callaway Marsh, the model shows tidal waters extend only into the low-lying areas near the culvert and reach an elevation of 5.3 feet NAVD under existing conditions during the annual high tide. Under the full breach conditions (removal of the gate on the Callaway Marsh culvert), the model results for the storm event show that opening the culvert could result in increased flooding to the LCWA Isthmus Area property during the 100-year storm event (see discussion in Section 3.2.2). Since this property is currently used for oil operations, the gate on the culvert would need to stay in place until oil operations cease, and the hydrodynamics at Callaway Marsh would not be expected to change from existing conditions. Alternatively, a berm could be built around Callaway Marsh to allow for higher water levels within the site.

At Zedler Marsh, the model shows the tides reach an elevation of 6.9 feet NAVD during an annual high tide (6.9 feet NAVD) under existing conditions, indicating no tidal muting up to the annual high tide. The model shows the waters do not extend all the way north to the culverts under the access road (Figure 3-6). Therefore, under the full breach conditions, the water levels and extent would stay the same even if the culverts under the access road were improved.



SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

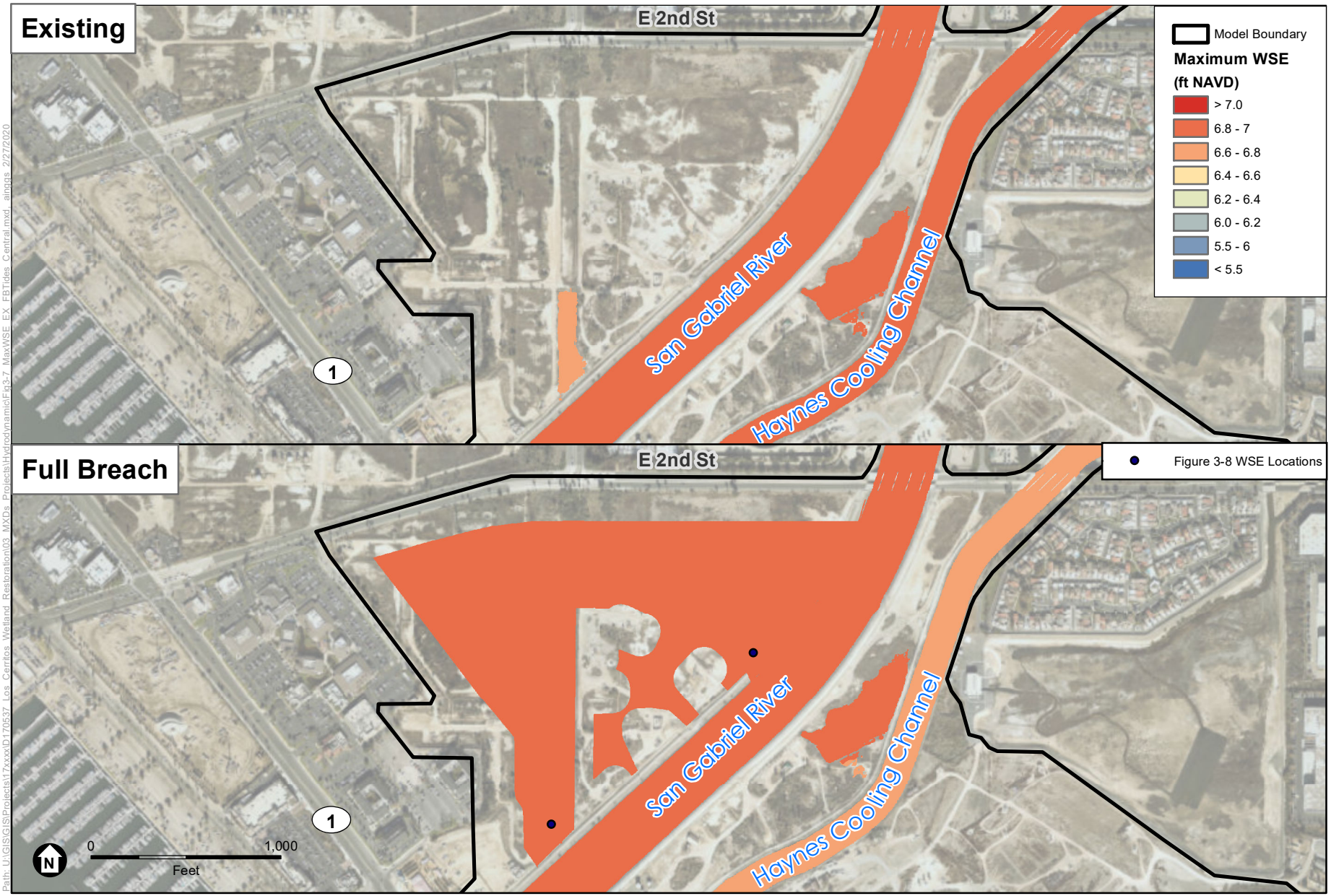
Figure 3-6
Existing Conditions Typical Tides, Maximum Water Surface Elevation in Zedler Marsh

Central Area

Existing and Full Breach Conditions

Under existing conditions, the model results show that the Central Area experiences minimal inundation, since it is limited by one perched hydraulic connection to the San Gabriel River (top panel of Figure 3-7). The maximum water surface elevation in the Central Area during the annual high tide (6.9 feet NAVD) is approximately 6.6 feet, near the culvert.

With the restoration program, the Central Area would be graded down and the existing San Gabriel River levee would be breached to provide a full tidal connection. The model results show that under the full breach conditions, the entire marsh is fully inundated (bottom panel of Figure 3-7). There is a minor time lag for high tide to reach the back of the site, but the water levels in the back of the site are within 0.1 to 0.2 feet of the water levels at the breach (Figure 3-8). The maximum water surface elevation during the annual high tide matches the tidal boundary condition. These results indicate that, with a full breach, the tides in the Central Area would function as a fully tidal marsh.



SOURCE: ESRI,LCWA

NOTE: WSE = Water Surface Elevation

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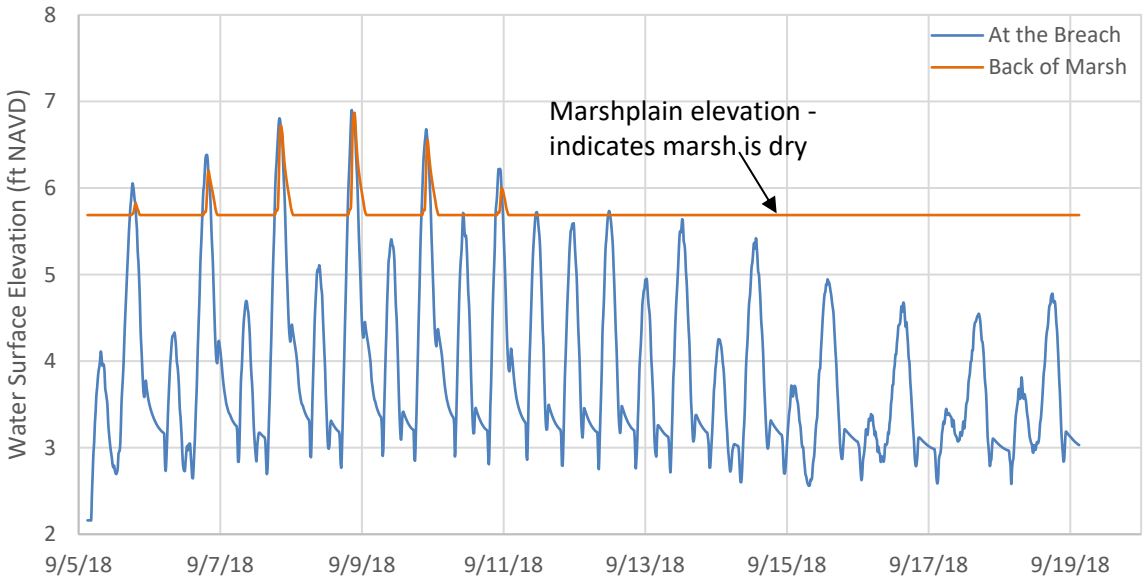
Figure 3-7

Modeled Extent of Inundation during an Annual High Tide in the Central Area

ESA



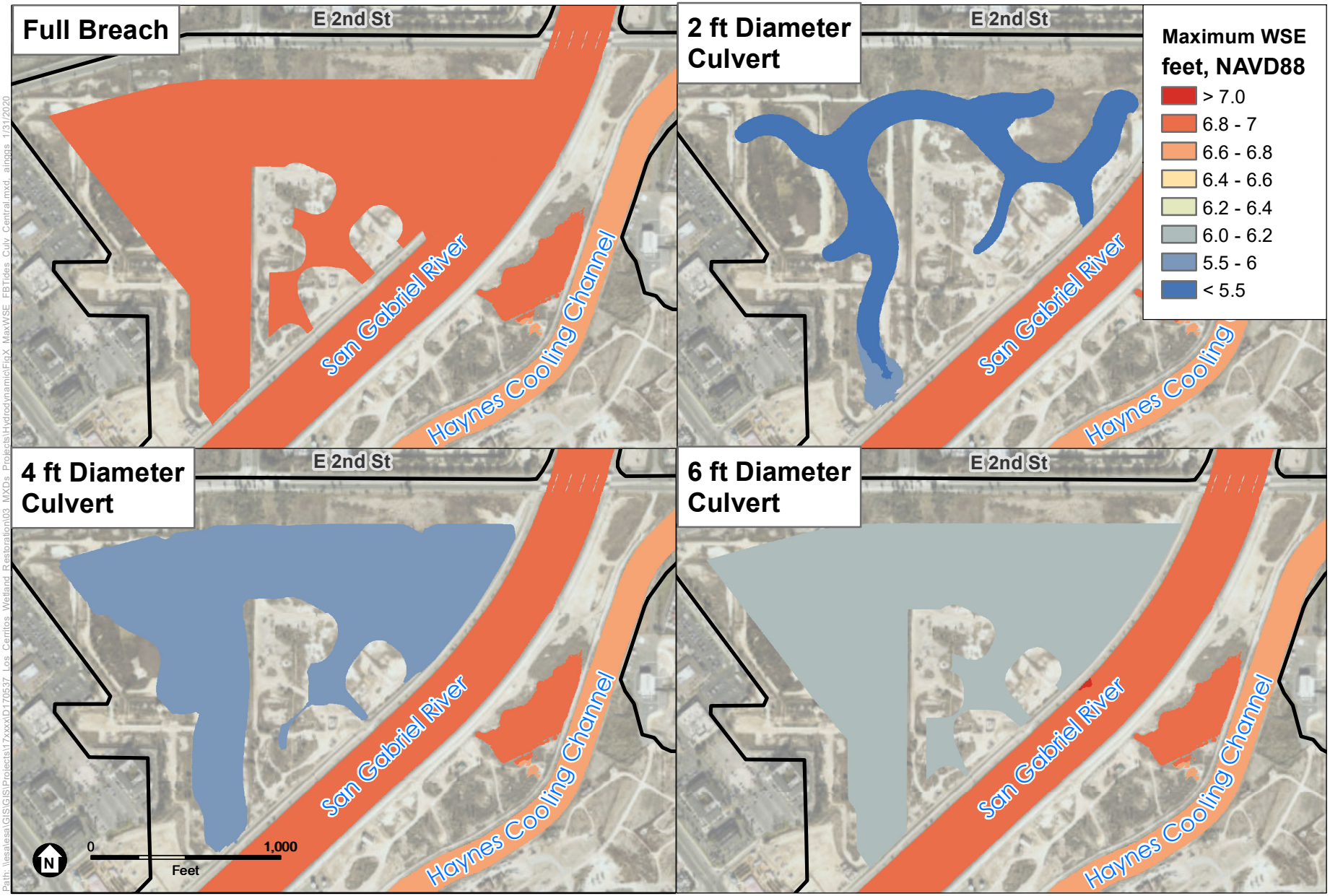
SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 3-8
Modeled Water Levels in the Central Area

Central Area, Culvert Conditions

Under the Central Area, culvert conditions the water levels in the site are constrained by the culvert or culverts in the different scenarios. Figure 3-9 shows the modeled inundation extents for the full breach compared to the 2-foot, 4-foot, and 6-foot diameter culvert scenarios. Note that the full breach and culvert scenarios assume the same restoration grading. The marsh inundation is limited to along the channels for the 2-foot diameter culvert, while the flood extents with the 6-foot culvert are similar to the full breach conditions, although the model shows that the maximum water level during the annual high tide is almost a foot lower. Adding additional culverts at larger diameters than the 6-foot diameter culvert scenario show only minor change in the inundation extents, though the tidal range and water level continue to rise.

Table 3-2 presents the modeled minimum and maximum water levels for the different culvert configurations. The maximum water level in the Central Area marsh increases with additional and larger culverts, though the differences in water levels becomes increasing smaller, as shown in Figure 3-10. However, the maximum water surface elevation during the annual high tide does not match the water level under the full breach conditions, meaning the site is not fully tidal with a culvert configuration of nine 8-foot-diameter culverts.



SOURCE: ESRI,LCWA

NOTE: WSE = Water Surface Elevation

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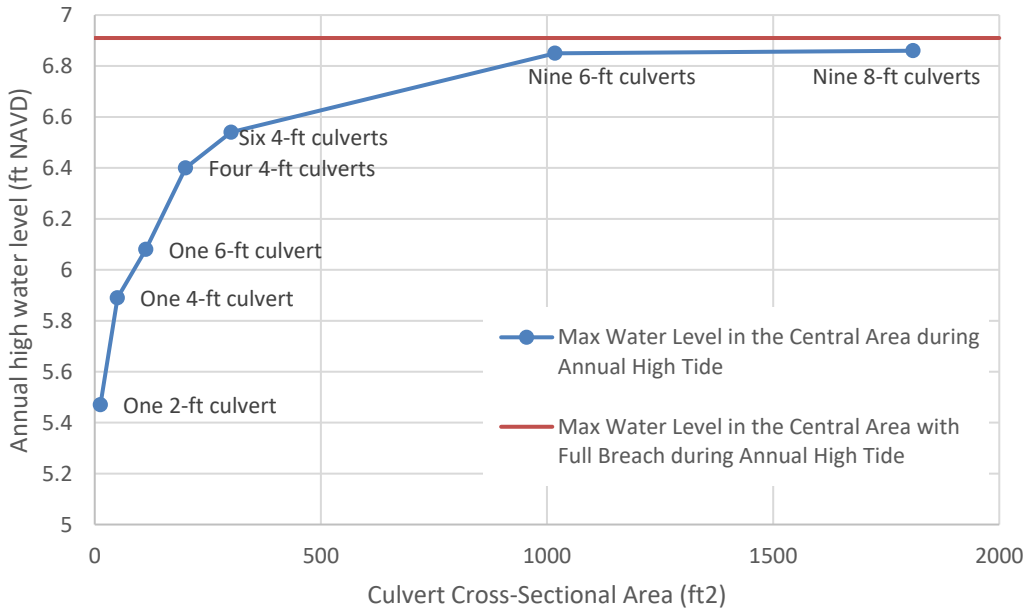
Figure 3-9

Modeled Extent of Inundation during an Extreme High Tide in the Central Area

ESA

TABLE 3-2
CENTRAL AREA, CULVERT CONDITIONS RESULTS

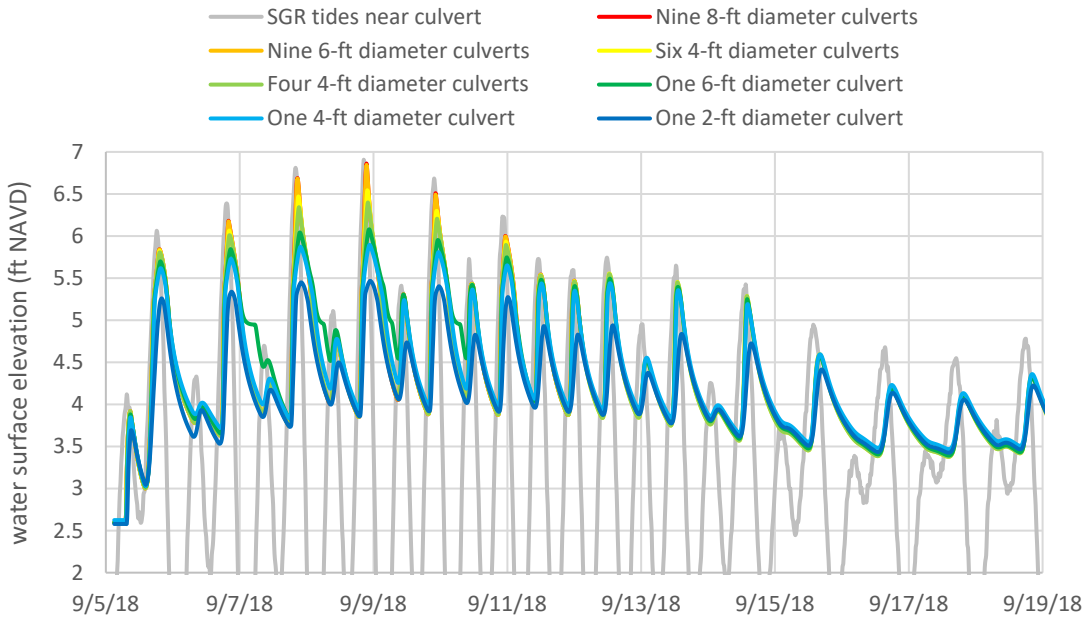
Culvert quantity and size	XSA (ft2)	Min tide level (feet NAVD)	Max tide level (feet NAVD)	Tidal muting of 1-year high tide (feet)	Annual tide range (feet)
Full breach (invert at 2 feet NAVD)(for reference)	**—**	***2.9***	***6.9***	**—**	***4.0***
One 2-foot culvert @ 2 feet NAVD	13	3.4	5.5	1.4	2.1
One 4-foot culvert @ 2 feet NAVD	50	3.5	5.9	1.0	2.4
One 6-foot culvert @ 2 feet NAVD	113	3.4	6.1	0.8	2.7
Four 4-foot culverts @ 2 feet NAVD	201	3.4	6.4	0.5	3.0
Six 4-foot culverts @ 2 feet NAVD	302	3.4	6.5	0.4	3.1
Nine 6-foot culverts @ 2 feet NAVD	1018	3.4	6.9	0.06	3.5
Nine 8-foot culverts @ 2 feet NAVD	1810	3.4	6.9	0.05	3.5
One 4-foot culvert @ 0 feet NAVD	50	0.9	5.9	1.0	5.0



SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 3-10
Modeled Water Levels in the Central Area Under Different Culvert Configurations

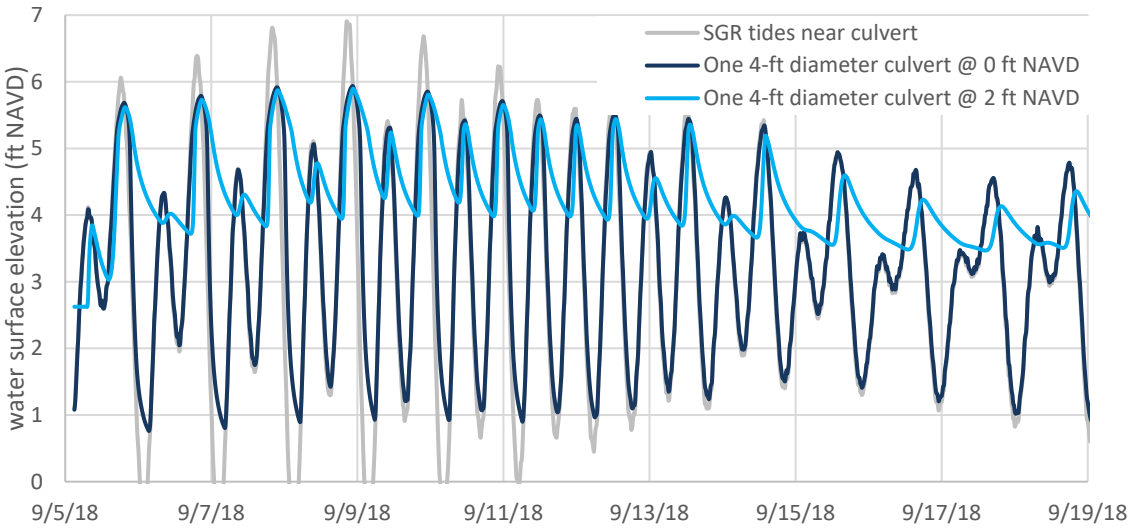
The tidal range was assessed for all culvert configurations, and is presented in Table 3-2. The invert elevation of the culverts limits how low water levels can drain within the site. The initial culvert dimensions' analysis assumed all of the culverts would have an invert elevation of 2 feet NAVD, to match the designed channel invert. An annual tidal range of 2.1 to 3.5 feet was calculated for all configurations with the 2-foot-NAVD invert. Figure 3-11 shows time series plots of the modeled water levels in the proposed channel mouth inside the Central Area for all configurations with the 2-foot-NAVD invert.



SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 3-11
Modeled Water Levels in the Central Area with Different Culvert Configurations

Since the 2-foot-NAVD invert was limiting the low tide drainage in the site, an additional scenario was run with a 4-foot-diameter culvert at an invert elevation of 0 feet NAVD. The topography of the site in the vicinity of the culvert had to be adjusted for this lower elevation, but otherwise, the scenario matched the other culvert scenarios. Lowering the 4-foot culvert invert to 0 feet NAVD yielded an annual tidal range of 5.0 feet, which was 2.6 feet greater than the tide range for the 2 foot NAVD invert scenario (Figure 3-12). The tide range increases by more than the difference in the invert elevation, which indicates that the hydraulic head drives additional drainage in the lower invert scenario. Hydraulic head is the pressure of water, so when water levels are high within the Central Area and low within the San Gabriel River (e.g., when the tide is falling), the head drives water through the culvert towards the lower water levels in the river. When the culvert invert is set lower in the tide frame, there is more time when the culvert is full of water compared to the higher invert elevation culvert, so more volume of water can flow out. However, having a culvert set in a sump (i.e., a low spot relative to the surrounding areas) has the potential to lead to increased sediment accumulation and maintenance needs.



SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

Figure 3-12
Modeled Water Levels in the Central Area with Different Culvert Invert Elevations

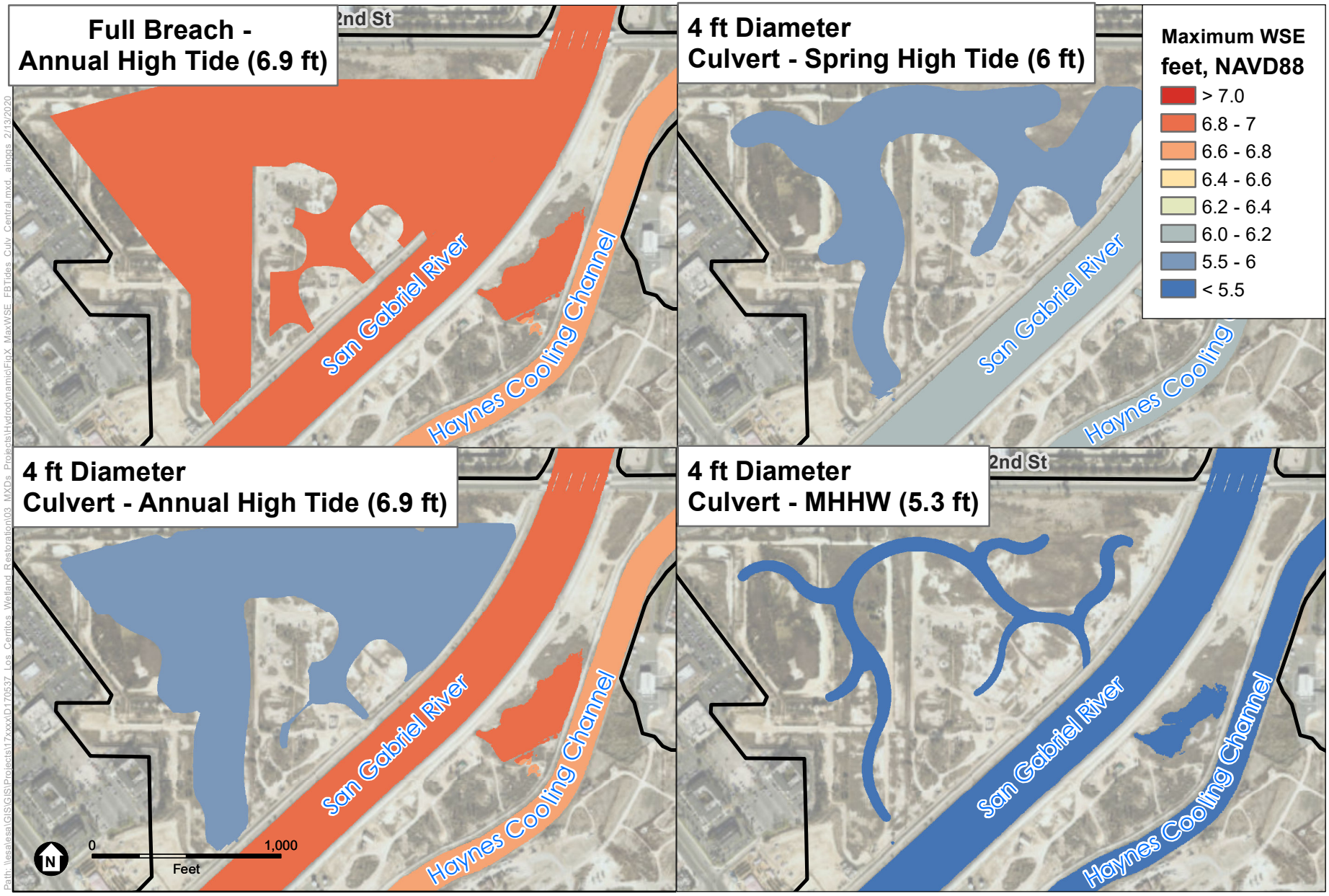
Additional analysis was conducted for the 4-foot diameter culvert scenario (with invert at 2 feet NAVD) to better understand how the scenario would function under different tidal conditions. Figure 3-13 shows the modeled inundation extent for the 4-foot diameter culvert during the annual high tide, a typical spring high tide, and at MHHW. The modeled inundation extent during the annual high tide is comparable to the full breach conditions (7.6 acres less, some of which is due to removal of the existing San Gabriel River levee), but the inundation during the spring high tide and MHHW tide show that inundation is limited to around the channel. This means that much of the site would not experience inundation except for a few times a year during more extreme tides, based on the currently proposed grading plan. However, areas that are inundated rarely, such as high marsh and transition zone habitat, are also valuable habitats.

3.2.2 100-Year Storm Event

South Area

Flooding Extent and Water Levels

During the 100-year storm event under existing conditions, water flows from the San Gabriel River through the leaky culvert, covers most of the South LCWA site, and flows into the Hellman Retained site (top panel of Figure 3-14). Due to the high elevations of the site, much of the area remains dry. The model shows water levels under the 100-year storm are approximately 1 foot above the tide levels (Table 3-1 compared to Table 3-3).



SOURCE: ESRI,LCWA

NOTE: WSE = Water Surface Elevation

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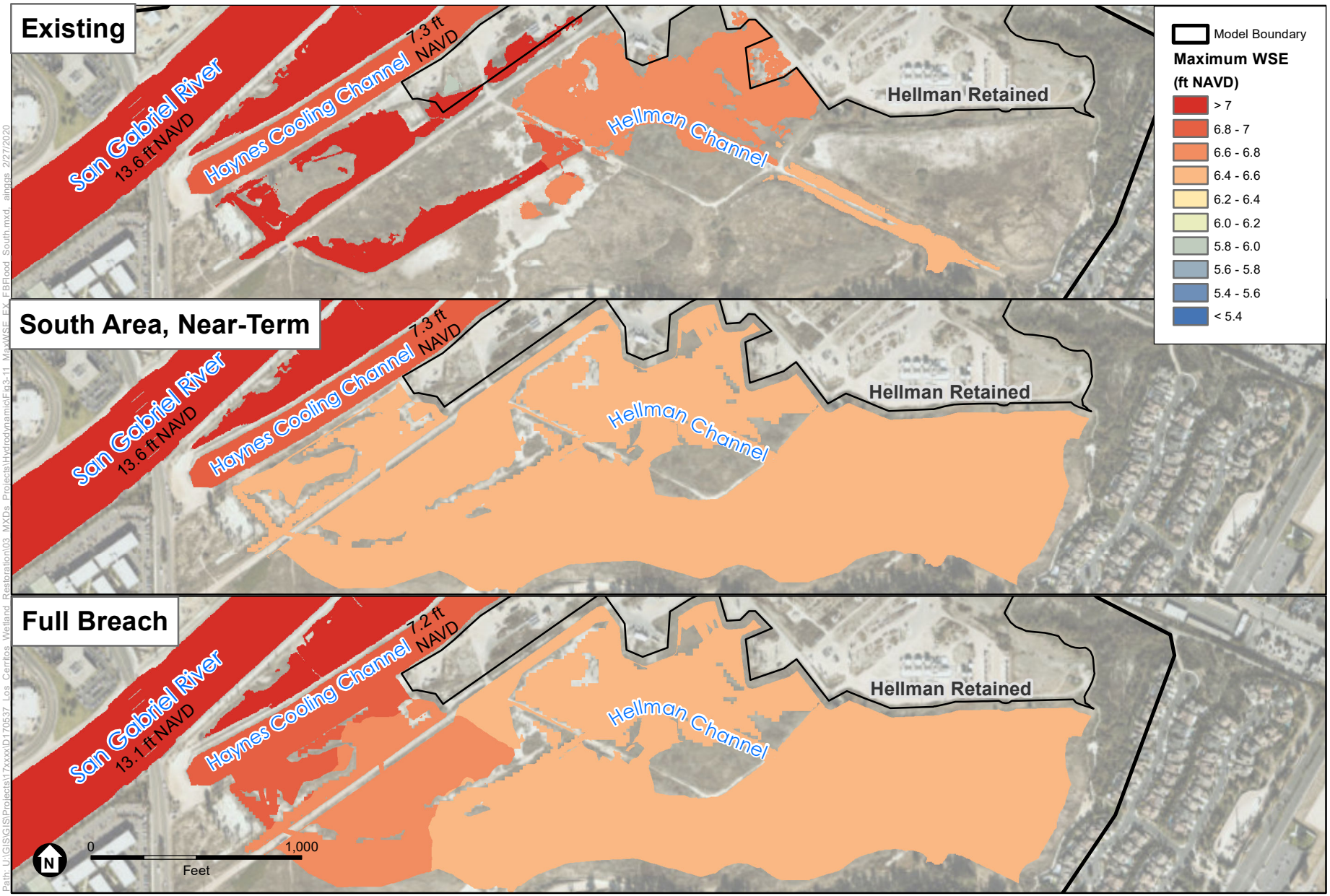
Figure 3-13

Modeled Extent of Inundation during High Tide in the Central Area

ESA



SOURCE: ESRI,LCWA

NOTE: WSE = Water Surface Elevation

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Figure 3-14

Modeled Water Levels during a 100-Year Storm Event in the South Area

ESA

Under the South Area, near-term conditions, the water levels in the site during the 100-year storm show a similar pattern to the tidal model results. Flooding is driven by the culvert connecting the South LCWA site to the San Gabriel River. With removal of the culverts in the middle of the marsh, the water levels across the site flatten out and there is less muting at the back of the marsh. However, since the culvert from the San Gabriel River still limits flow into the site, the model shows that water levels near the mouth of the Hellman Channel are lower under the South Area, near-term conditions than existing conditions, and the water level at the back of the marsh is the same as at the Hellman Channel mouth (Table 3-3). The model shows the flood extent in the South Area, near-term conditions decreases on the Hellman site due to the construction of the berm along the Hellman Retained site (Figure 3-14). However, the flood extent increases throughout the South LCWA site as intended by the design. The model shows water levels under the 100-year storm are approximately 0.7-0.8 feet above the tide levels.

TABLE 3-3
MODELED WATER LEVELS IN THE SOUTH AREA DURING THE 100-YEAR STORM EVENT

	Water Levels in Hellman Channel (feet NAVD)			
Scenario	**Mouth**	**South of 1st Street**	**Middle of Marsh**	**Back of Marsh**
Existing Conditions	7.3	7.0	6.6	6.5
South Area, Near-Term Conditions	6.5	6.5	6.5	6.5
Full Breach Conditions	6.8	6.7	6.5	6.4
Full Breach Conditions (coastal 100-year event)	8.6	8.6	8.6	8.6

Under the full breach conditions, the model results show that water levels near the mouth of the Hellman Channel are lower than under existing conditions, since the water is able to expand back into the marsh without the marsh culvert constrictions. Water levels under the full breach condition are approximately 0.2 feet higher than under the South Area, near-term conditions and are driven by the tides in the Haynes Cooling Channel (Table 3-2). This is because the tidal water levels in the Haynes Cooling Channel are still higher than the water levels in the site, so additional water flows from the channel and raises the water levels.

The model indicates that flooding in the full breach conditions is driven by coastal water levels (from Alamitos Bay and the Haynes Cooling Channel) rather than from riverine water levels from the San Gabriel River. As a result, the South Area was analyzed for a 100-year coastal water level event, because water levels would be higher under this condition (last row of Table 3-2). The model results showed that water levels would reach 8.6 feet in the site, which is 1.3 to 2.1 feet above the existing conditions water levels for the 100-year coastal water level event.

Hellman Berm Freeboard

Under existing conditions, flood waters flow onto the Hellman Retained site.

Under the South Area, near-term conditions and full breach conditions, flood levels along the Hellman Berm reach 6.5 feet NAVD (Table 3-4). This leaves 3.5 feet of freeboard to the berm crest (10 feet NAVD). During a 100-year coastal event, water levels in the South Area rise to 8.6 feet NAVD, which leaves 1.4 feet of freeboard on the berm.

TABLE 3-4
BERM FREEBOARD LEVELS IN THE SOUTH AREA DURING THE 100-YEAR EVENT

Scenario	Water level along the berm (feet NAVD)	Freeboard (feet)
Existing Conditions	—	—
South Area, Near-Term Conditions	6.5	3.5
Full Breach Conditions	6.5	3.5
Full Breach Conditions (coastal 100-year event)	8.6	1.4

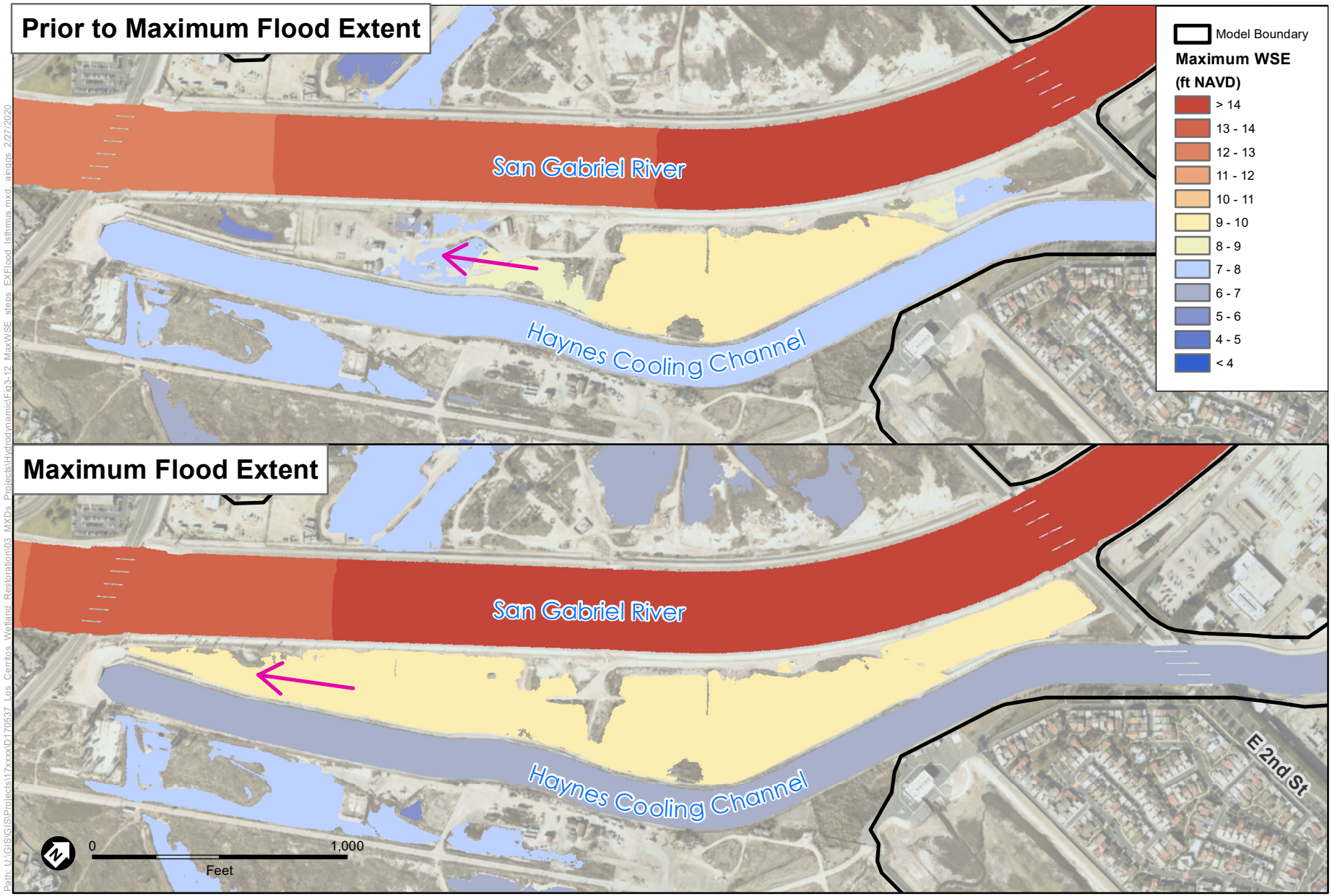
Isthmus Area

During the 100-year storm under existing conditions, the Zedler Marsh culvert allows in enough water to flood the majority of the Isthmus Area, except the DWP site (bottom panel of Figure 3-15). Flooding from the Callaway Marsh culvert does not extend beyond the Callaway Marsh site before waters from the Zedler Marsh reach the Callaway Marsh site (i.e., the Zedler Marsh culvert controls flooding of the Isthmus Area under existing conditions) (top panel of Figure 3-15). The maximum water level modeled during the 100-year storm was 9.3 feet NAVD across the site.

Under the full breach conditions, the model was initially run with the Callaway Marsh culvert gate removed. However, with no additional grading at the site, this resulted in flooding of the Isthmus LCWA property before waters from the Zedler Marsh culvert reached the Callaway Marsh site. The maximum water level modeled during the 100-year storm was 9.2 feet NAVD across the site (0.2 feet higher than existing conditions). This indicates that removing the Callaway Marsh culvert gate without additional grading could worsen flooding during smaller storm events during which the Zedler Marsh culvert does not flood the full site.

The model was rerun for the full breach scenario with the Callaway Marsh culvert gate in place. This resulted in no changes to the flooding in the Isthmus Area compared to existing conditions.

The Callaway Marsh culvert gate should not be completely removed. Further analysis and modeling would be required to develop a plan and design for modifying the culvert (e.g., the extent to which the culvert can be opened) and/or constructing a berm or other flood management measure around Callaway Marsh to avoid increasing flood levels.



SOURCE: ESRI,LCWA

NOTE: WSE = Water Surface Elevation

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Figure 3-15

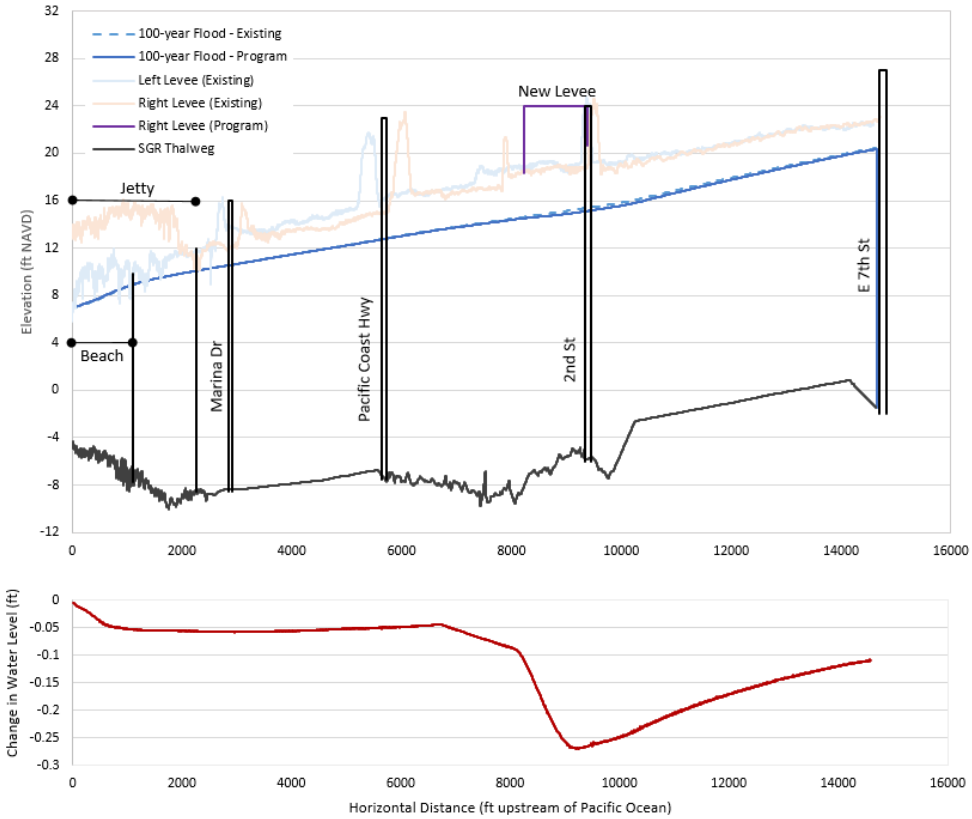
Modeled Water Levels during a 100-Year Storm Event in the Isthmus Area, Existing Conditions

ESA

San Gabriel River

During the 100-year storm event under existing conditions, flood levels are contained within the San Gabriel River channel with an average freeboard of 2-3 feet along the levees in the vicinity of the Central Area (Figure 3-16, Table 3-5). Flood levels do not reach the bridge decks during the 100-year storm. Downstream of Marina Drive but before the beach, the existing conditions model results show flood overtopping of the levee on the left bank levee (southeast side). Additionally, the model shows flood levels overtop the jetty that separates the San Gabriel River from Alamitos Bay under existing conditions. The model was also run without the inflow from the power plants upstream of 2nd Street. This reduced water levels slightly.

Under the full breach conditions, the model shows that water levels in the San Gabriel River upstream of the Central Area are reduced by up to 0.3 feet compared to existing conditions without inflow from the power plants during a 100-year flow event (Figure 3-16). In the vicinity of the Central Area, the model shows that water levels are reduced by 0.3 feet compared to existing conditions. Downstream of the Central and South Areas, the water levels in the channel are reduced by up to 0.2 feet compared to existing conditions. The reduction in water levels is likely due to the additional storage provided by the Central and South Areas.



SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report

NOTE: SGR = San Gabriel River

Figure 3-16

Modeled Water Levels during a 100-Year Storm Event along the San Gabriel River

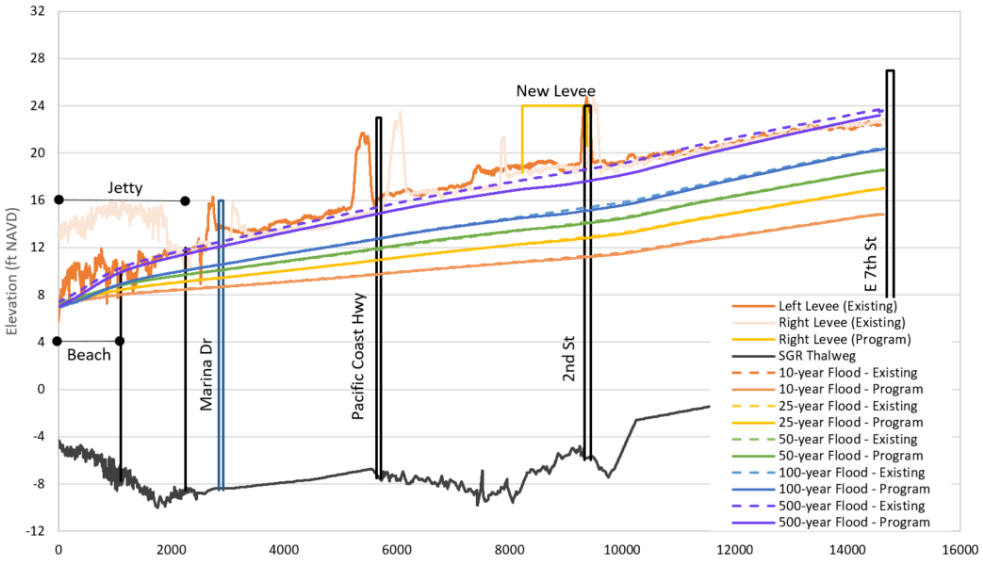
In addition to lowering water levels in the river, the restoration would also increase the levee height in the Central Area. The existing levee elevation is around 19 feet NAVD, and the conceptual design proposes constructing the new levees to 24 feet NAVD. The model results show this results in a levee freeboard of 9.4 feet in the Central Area. The height of the levee and the resulting freeboard is expected to be refined as part of future design phases.

TABLE 3-5
LEVEE FREEBOARD DURING THE 100-YEAR STORM EVENT

	Levee Freeboard in the Vicinity of the Central Area (feet)
Existing Conditions[1]	2 – 3
Program[2]	9.4

1 Freeboard to existing levee
2 Freeboard to proposed Perimeter Levee

Figure 3-17 shows the water surface profile model results for a range of peak flows representing the 10-, 25-, 50-, 100-, and 500-year events. These results show the sensitivity of the water surface profile to discharge rates as well as the consistent trend of slightly lower water levels under the program conditions. The results show that the program's effect on the water surface profile increase relative to existing conditions as discharge increases. For example, the model results show that the program reduces the 10-, 25-, and 50-year flood levels by up to 0.1 feet, but the 100-year flood level is reduced by up to 0.3 feet and the 500-year flood level is reduced by up to 1 foot. The 1-foot modeled reduction during the 500-year event is likely a significant benefit of the program. Further analysis could be performed to assess the potential reduction in flooding upstream and downstream of the program.



SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report
NOTE: SGR = San Gabriel River

Figure 3-17
Modeled Water Levels during Varying Storm Event along the San Gabriel River

Central Area

Existing and Full Breach Conditions

The top panel of Figure 3-18 shows the modeled maximum water levels during the 100-year storm event in the Central Area for existing conditions. The water levels are muted by the perched culvert connection to the San Gabriel River, so flooding is minimal, although more extensive than under tidal conditions (top panel of Figure 3-7). Waters extend up towards 2nd Street near the intersection with Studebaker Road, but water levels are about 2 feet below the road elevation. The maximum water level during the 100-year storm in the Central Area is approximately 7.5 feet NAVD.

Under full breach conditions, the model shows the Central Area marsh floods to the edge of the proposed levee to a maximum flood elevation of 14.6 feet (bottom panel of Figure 3-18). This is roughly 7 feet higher than under existing conditions. However, construction of the Perimeter Levee as part of the restoration would provide increased flood protection for 2nd Street and Shopkeeper Road. As opposed to the 2 feet of freeboard from the flood waters to 2nd Street under existing conditions, the model shows the full breach conditions would provide approximately 9.4 feet of freeboard, a 7-foot increase above existing conditions (Table 3-6).

TABLE 3-6
FREEBOARD TO 2ND STREET DURING THE 100-YEAR STORM EVENT

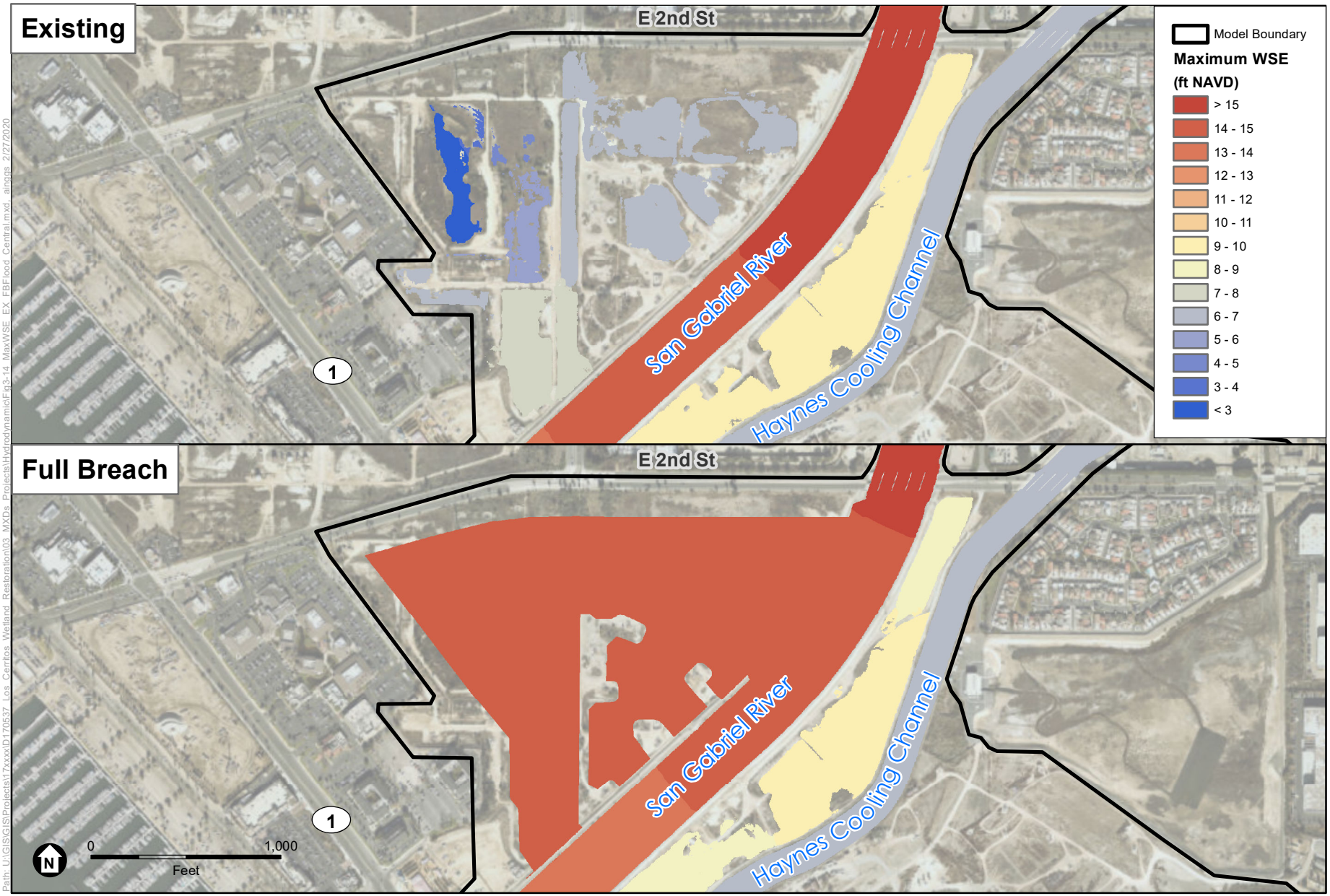
	Freeboard to 2nd Street (feet)
Existing Conditions[1]	2
Program[2]	9

[1] Freeboard to 2nd Street
[2] Freeboard to proposed Perimeter Levee

Under existing conditions, the Central Area provides flood storage for surrounding areas. With restoration, the new levee would limit drainage to the Central Area. The proposed design includes bioswales and a new freshwater marsh area to accommodate the offsite drainage. These features would be sized in the next phase of design and are not analyzed in this report.

Central Area, Culvert Conditions

Under Central Area, culvert conditions, the maximum water levels in the Central Area are muted by the culvert connections to the San Gabriel River. The maximum water level varies according to the culvert size and number of culverts, as shown in Table 3-7. With a 4-foot diameter culvert, the modeled maximum water level is 7.7 feet NAVD, providing approximately 16.3 feet of freeboard to the proposed Perimeter Levee. The model results show that increasing the size and number of culverts decreases the amount of freeboard to the proposed Perimeter Levee as seen below (Table 3-7).



SOURCE: ESRI,LCWA

NOTE: WSE = Water Surface Elevation

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Figure 3-18

Modeled Water Levels during a 100-Year Storm Event in the Central Area

ESA

TABLE 3-7
FREEBOARD TO 2ND STREET DURING THE 100-YEAR STORM EVENT

	Maximum 100-year stormwater level (feet NAVD)	Freeboard to 2nd Street (feet)
Full Breach (for reference)	***14.4***	***9***
One 4-foot culvert[1]	7.7	16
Six 4-foot culverts	11.0	12
Nine 6-foot culverts	13.6	10
Nine 8-foot culverts	14.3	9

[1] For both culvert with invert of 2 feet and 0 feet NAVD

The culvert option to the full breach was analyzed to evaluate whether a culvert connection could provide a full tidal connection while limiting flood flows in the site. If the culvert option could provide lower flood levels, then the levee design could be refined to reduce the levee height and footprint. To maintain the same level of freeboard as the full breach scenario, the one 4-foot culvert scenario could reduce the proposed levees along 2nd Street and Shopkeeper Road by 7 feet. This would result in a reduction in the levee footprint based on the proposed design of up to 2.6 acres.

3.3 Future Conditions with Sea-Level Rise

3.3.1 South Area

The South Area, mid-term scenario is expected to be constructed in 10 – 20 years, or by 2040. The LCW sea-level rise scenarios assume 1.7 feet of sea-level rise occurs between 2040 and 2070. Therefore, the South Area, near-term scenario was not modeled for sea-level rise conditions, since it would occur before 2040, when sea-level rise is still less than 1.7 feet (based on the LCW sea-level rise scenarios).

Inundation Extent and Water Levels

Under existing conditions (i.e., no program scenario) with 1.7 feet of sea-level rise, the model shows water levels in the South LCWA site increase by roughly 0.5 feet compared to tidal conditions with no sea-level rise (Table 3-8). The annual water level in the South Area with 1.7 feet of sea-level rise is 6.6 feet NAVD around the mouth of Hellman Channel. The culvert from the San Gabriel River limits how much water can enter the site, so the water levels in the South LCWA site do not increase linearly with sea-level rise (i.e., water levels in the site are not 1.7 feet higher than under no sea-level rise) and do not inundate much of the marsh (middle panel of Figure 3-19).

With 3.3 feet of sea-level rise, the Hellman Retained site begins to inundate directly from the Haynes Cooling Channel and inundation from the South LCWA site increases and extends to the State Lands Parcel site (bottom panel of Figure 3-19). The annual water level in the South Area with 3.3 feet of sea-level rise is 8.8 feet NAVD (Table 3-8). Under an extreme tide level with 3.3 feet of sea-level rise, 1st Street would overtop and the entire South Area would be inundated.

Under the full breach conditions with 1.7 feet of sea-level rise, the model shows water levels in the South LCWA show about a foot of tidal muting from the front and back of the marsh (Table 3-8). The maximum water level in the South Area with 1.7 feet of sea-level rise is 8.2 feet NAVD around the mouth of Hellman Channel.

With 3.3 feet of sea-level rise, the model shows the Hellman Retained site begins to inundate directly from the Haynes Cooling Channel. However, the Hellman Berm continues to prevent water from the South LCWA site from flowing into the Hellman site. The annual water level in the South Area with 3.3 feet of sea-level rise is 9.6 feet NAVD (Table 3-8). The restoration includes raising the building pad on the State Lands Parcel site, so tidal inundation does not occur on this site under restored conditions.

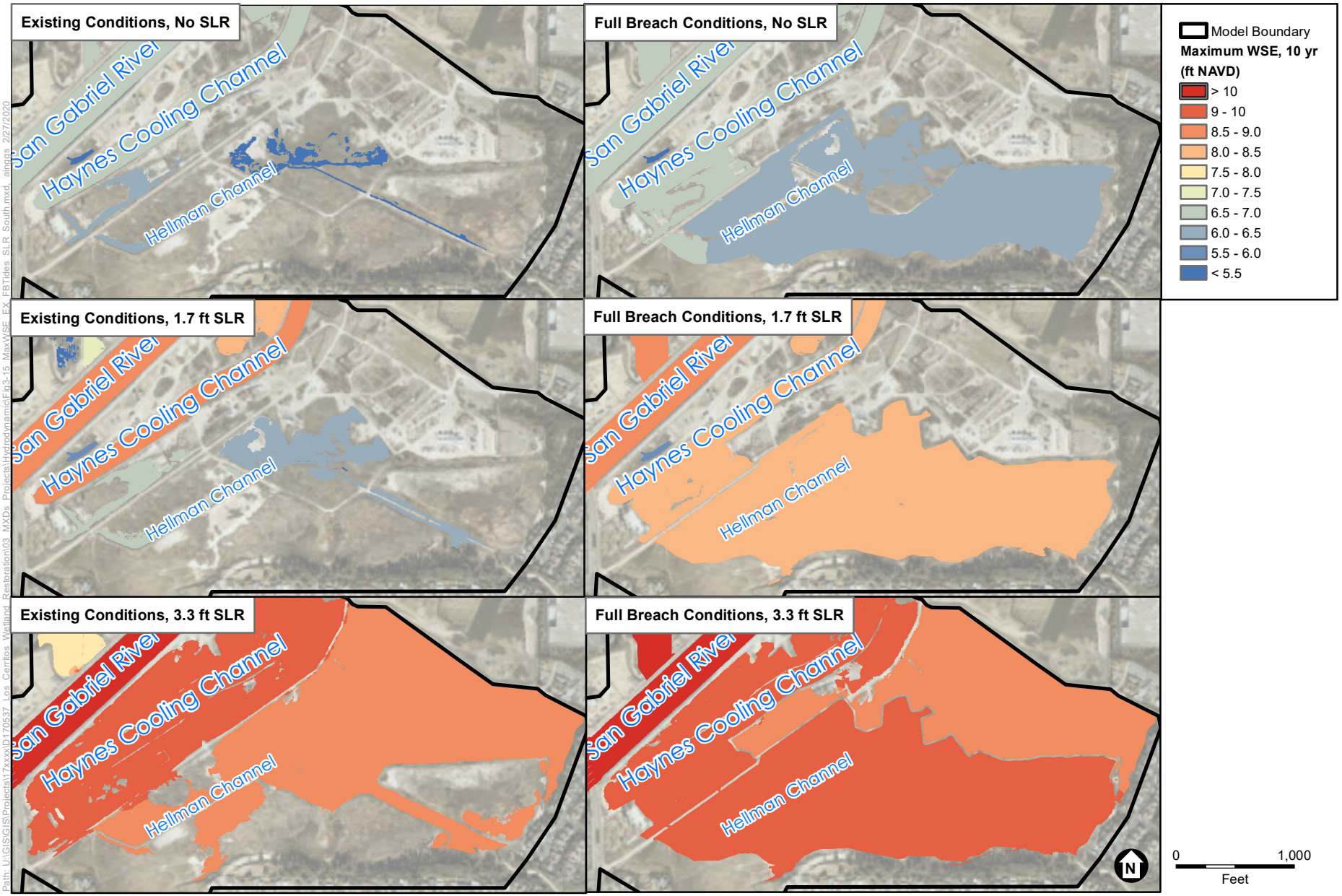
The model shows water levels in the Haynes Cooling Channel do not increase linearly with sea-level rise (Table 3-8). This indicates that the culverts from the Alamitos Bay Marina continue constraining the flow into the channel. With 3.3 feet of sea-level rise under program conditions, the water levels are about 0.5 feet below those in the San Gabriel River and open ocean.

TABLE 3-8
MODELED WATER LEVELS IN THE SOUTH AREA UNDER TYPICAL TIDES

	Water Levels in Hellman Channel (feet NAVD)				
Scenario	**Haynes Cooling Channel**	**Mouth**	**South of 1st Street**	**Middle of Marsh (between marsh culverts)**	**Back of Marsh**
Existing Conditions, no sea-level rise	6.8	6.2	6.2	5.5	5.4
Existing Conditions, 1.7 feet of sea-level rise	8.6	6.6	6.6	6.0	6.0
Existing Conditions, 3.3 feet of sea-level rise	9.8	9.6	8.8	8.8	8.8
Full Breach Conditions, no sea-level rise	6.7	6.7	6.6	6.3	6.2
Full Breach Conditions, 1.7 feet of sea-level rise	8.3	8.2	8.2	8.2	8.2
Full Breach Conditions, 3.3 feet of sea-level rise	9.7	9.7	9.6	9.6	9.6

Tide Range

At the back of the site, the model results show that the tide range with 1.7 feet of sea-level rise under existing conditions is 2.0 feet (from the bottom of the channel [4.0 feet NAVD] up to the annual high tide in the site [6.0 feet NAVD]). This is a 0.9-foot increase in tide range from the no sea-level rise scenario. The tide range under the full breach conditions is 6.2 feet, since the annual high tide increases with restoration and the bottom of the channel in program conditions is 2 feet NAVD. The model shows the program is expected to increase the tide range by 4.2 feet compared to existing conditions with 1.7 feet of sea-level rise.



SOURCE: ESRI,LCWA

NOTE: WSE = Water Surface Elevation

SLR = Sea-Level Rise

ESA

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Figure 3-19

Modeled Extent of Inundation during an Annual High Tide in the South Area, with SLR

In the same analysis location, the model results show that the tide range with 3.3 feet of sea-level rise under existing conditions is 2.6 feet and the tide range under the full breach conditions is 7.7 feet.

3.3.2 Isthmus Area

Under existing conditions and project conditions, the model shows that the maximum tidal water level in Zedler Marsh with 1.7 feet of sea-level rise is 8.2 feet NAVD and the extents are confined to Zedler Marsh and Calloway Marsh within the Isthmus Area. With 1.7 feet of sea-level rise, water will reach the culverts under the access road and likely flow into the Isthmus Bryant site. However, data on these culverts was not included in the model.

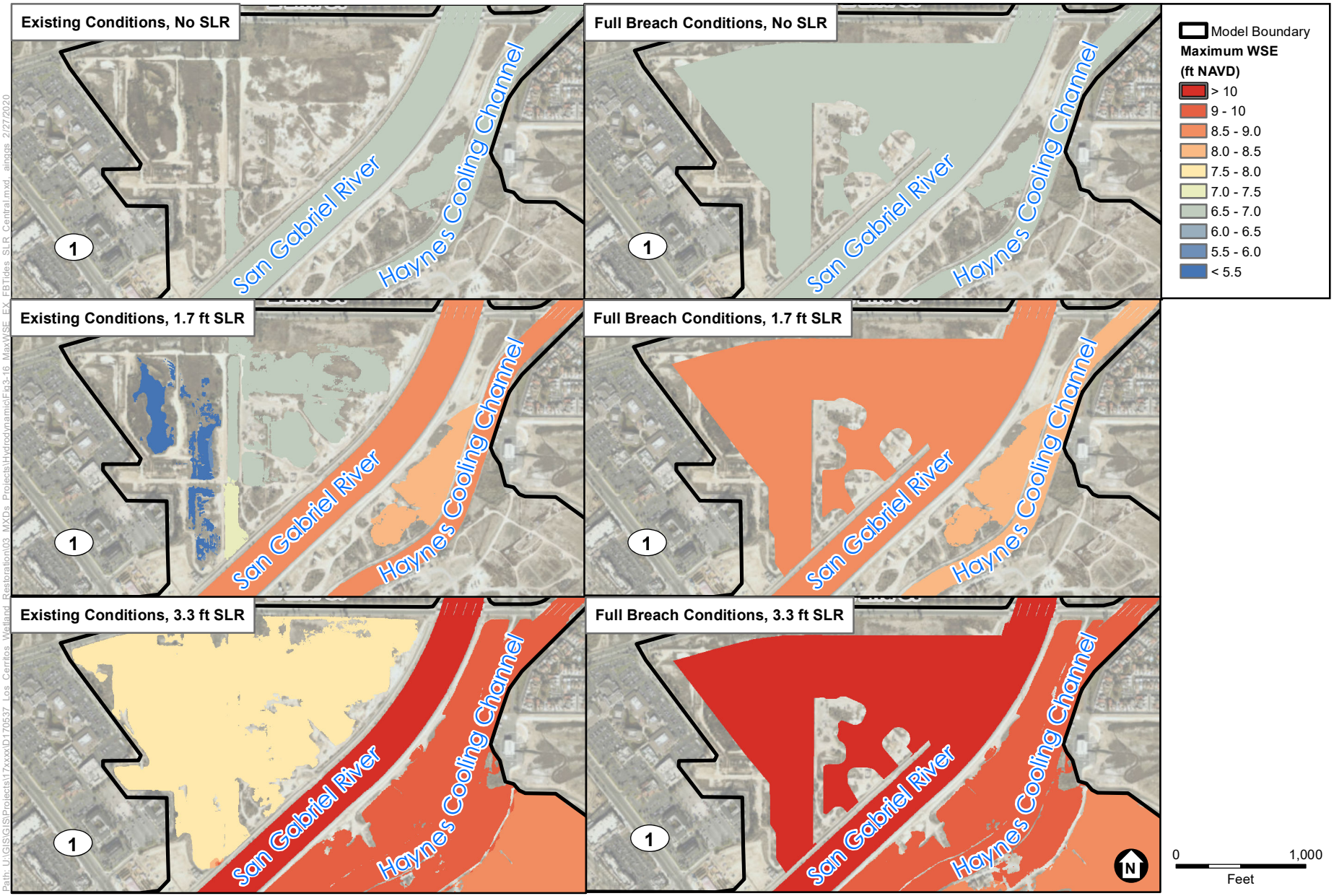
Under 3.3 feet of sea-level rise, Haynes Cooling Channel overtops its banks (9.5 feet NAVD on the Isthmus Area side) during the annual high tide and higher water levels (Figure 3-19). The model shows the maximum tide level is 9.8 feet NAVD under the no program conditions, which inundates the entire Isthmus Area (including the DWP site). The model shows the maximum tidal water level is 9.6 feet under the full breach conditions, since the restoration in the South Area lowers the water level in the Haynes Cooling Channel.

3.3.3 Central Area

Existing and Full Breach Conditions

The model results for existing conditions (i.e., no program conditions) show that the maximum water surface elevation in the Central Area with 1.7 feet of sea-level rise is approximately 7.4 feet and it increases to 7.8 feet with 3.3 feet of sea-level rise. As the water levels rise, the perched culvert becomes less perched, and water can flow into the site more frequently and for longer portions of the tidal cycle (Figure 3-20). Water levels in the site do not increase linearly with sea-level rise, due to the constraint of the culvert on flow to the site.

The model results for full breach conditions show that the maximum water surface elevation in the Central Area with 1.7 feet of sea-level rise is approximately 8.6 feet, and it increases to 10.2 feet with 3.3 feet of sea-level rise. This indicates that water levels in the Central Area are expected to increase linearly with sea-level rise (i.e., the increase in tidal water levels at the site is expected to be the same as the increase in sea-level rise).



SOURCE: ESRI,LCWA

NOTE: WSE = Water Surface Elevation

SLR = Sea-Level Rise

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Figure 3-20

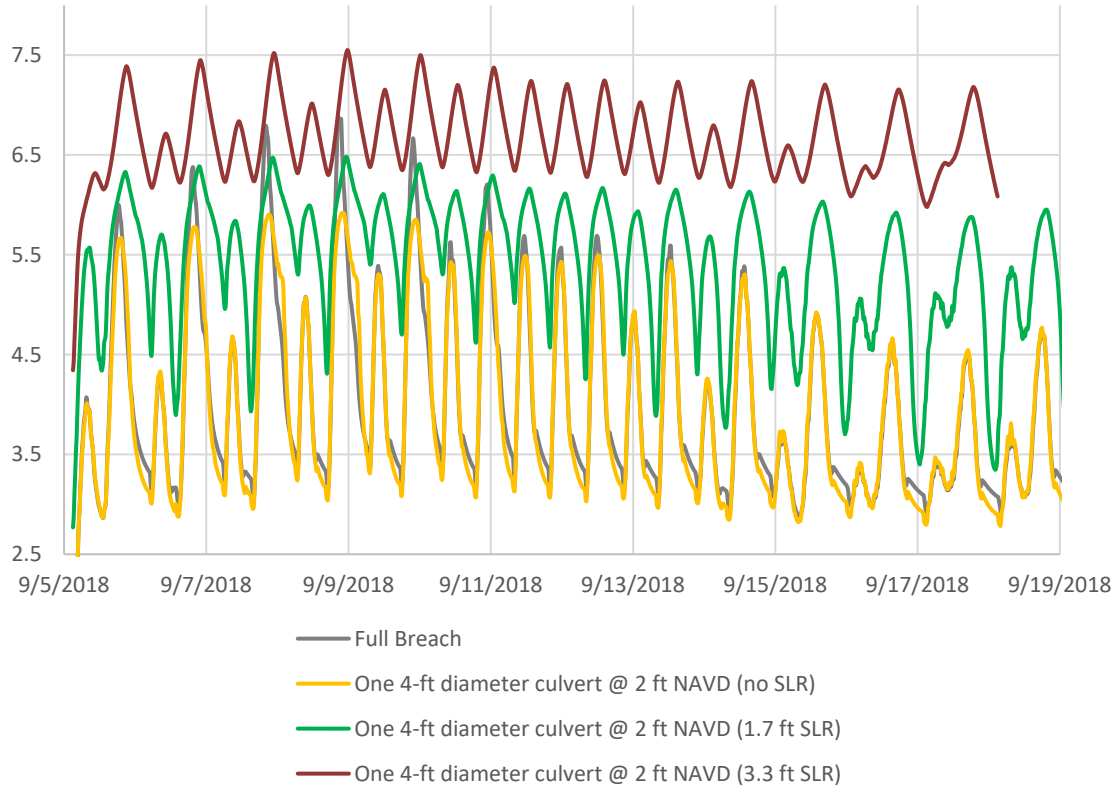
Modeled Extent of Inundation during an Annual High Tide in the Central Area, with SLR

ESA

Central Area, Culvert Conditions

The two sea-level rise scenarios were run for the 4-foot-diameter culvert configuration. The tidal range in the site narrows with sea-level rise, as the culvert limits drainage and the site stays ponded (Figure 3-21). With 1.7 feet of sea-level rise, the tide range drop to approximately 2 feet and with 3.3 feet of sea-level rise, it drops to 1 foot. With 3.3 feet of sea-level rise, the model results show that the marshplain is permanently inundated and does not drain at low tide.

It is expected that with the culvert set to a 0-feet-NAVD invert, rather than the 2-feet-NAVD invert modeled and presented in Figure 3-21, the low tides may drain lower with 1.7 feet of sea-level rise. However, as the tides continue to rise in the river to 3.3 feet of sea-level rise, it is expected that the tide range would be similar for the two culvert invert elevations, because the full culvert would be inundated for the majority of the time.



SOURCE: ESA 2019 Los Cerritos Wetlands Restoration Plan Program EIR Hydrodynamic Technical Report
NOTE: SLR = Sea-level rise

Figure 3-21
Modeled Water Levels during a 100-Year Storm Event along the San Gabriel River

3.3.4 100-Year Storm Event with Sea-Level Rise

In the South Area, the 100-year coastal storm event with 3.3 feet of sea-level rise would reach 12.1 feet NAVD. This would overtop the berm along the Hellman Retained site, but the Hellman Retained site would flood from the Haynes Cooling Channel well before this point. Additional flood protection for the Hellman Retained site would be needed before 3.3 feet of sea-level rise occurs; if the oil operations are still present at this time and berm along the Haynes Cooling Channel is raised to increase flood protection, the berm along the property line between the South LCWA and Hellman Retained site could be raised as well.

In the Isthmus Area, flooding would be driven by the tides from the Haynes Cooling Channel with 3.3 feet of sea-level rise, which would inundate the full Isthmus Area. Water levels across the site would reach 10.0 feet NAVD.

In the Central Area, water levels under 3.3 feet of sea-level rise and with a 100-year storm would be greater for the program conditions compared to existing conditions due to the breach. The model shows water levels reach 15.7 feet NAVD during the storm. This still leaves 8.3 feet of freeboard along the Perimeter Levee. Note that the height of the levee and the resulting freeboard is expected to be refined as part of future phases of the design.

SECTION 4
Habitat Elevations

The salt marsh habitat zones can be defined for different areas based on the elevation of the area relative to tidal datums (i.e., as a surrogate for the frequency of tidal inundation). ESA calculated estimated habitat elevation ranges at LCW based on vegetation-inundation relationships measured at other reference sites and field measurements at Steam Shovel Slough, Zedler Marsh, and Hellman Retained site.

4.1 Existing Conditions and Verification

Inundation frequencies were determined for each habitat zone based on the CRP and literature values (ESA PWA 2015, James and Zedler 2000, Josselyn and Welchel 1999, Myers et. al 2017, Ward, Callaway, and Zedler 2003, Zedler 1982, and Zedler 2000). Table 4-1 presents the percent inundations and the corresponding elevations based on the NOAA Los Angeles gauge for fully tidal conditions, for reference. The M&N tide data in the Hellman Channel only measured water levels down to around 4 feet NAVD, which means lower water levels were missed. Instead of using this data to estimate the inundation frequency for the South Area, the existing conditions modeling results at the front of the marsh were used, since the results captured lower water levels. Since the model was calibrated to the M&N data, the results are representative of conditions on site.

The habitat elevations in Table 4-1 were compared to elevations of pickleweed and cordgrass at LCW taken during two survey dates in March and April 2018 for verification. At Steamshovel Slough, the average cordgrass elevation was 4.1 feet NAVD (with measurements ranging from 3.1 to 6.0 feet NAVD), which falls at the upper end of the low marsh category for fully tidal marsh. Drainage at Steamshovel Slough is muted, so the low marsh at Steamshovel Slough would be expected to be perched above the fully tidal low marsh habitat band. Average pickleweed elevation was measured to be 5.2 feet NAVD (with measurements ranging from 3.7 to 7.0 feet NAVD), which falls into the mid-marsh category.

At the Zedler and LCWA South properties, the average pickleweed elevations were 6.9 feet NAVD (6.0 to 8.6 feet NAVD range) and 7.5 feet NAVD (6.0 to 8.4 feet NAVD range), respectively, which are higher than the 10-year tidal water level. As a result, the upland and transition zone categories in Table 4-1 were shifted higher than would be indicated based on tidal inundation frequency alone to capture actual site conditions.

TABLE 4-1
ELEVATION BANDS AND INUNDATION FREQUENCIES OF DIFFERENT HABITAT TYPES UNDER EXISTING CONDITIONS FOR THE SOUTH AREA

	Fully Tidal (reference)		Muted Tidal (South Area)		
Habitat Type	**Elevation Bands (feet NAVD)**	**Inundation Frequency (% time)**	**Front of the Marsh Elevation Bands (feet NAVD)**	**Back of the Marsh Elevation Bands (feet NAVD)**	**Notes**
Upland	> 9.0	Based on field observations	> 8.5	> 8.5	Based on existing vegetation; 100-yr tidal inundation is approx. 7.0 feet NAVD at the front of the marsh and 6.5 feet NAVD at the back of the marsh
Transition Zone	7.1 to 9.0	0.05% to 10-yr inundation	6.9 to 8.5	6.1 to 8.5	Based on existing vegetation to 0.05% inundation frequency
High Marsh	5.7 to 7.1	0.05% to 4%	5.9 to 6.9	5.4 to 6.1	0.05% to 4% inundation frequency
Mid Marsh	4.3 to 5.7	4% to 20%	4.5 to 5.9	4.9 to 5.4	4% to 20% inundation frequency
Low Marsh	2.9 to 4.3	20% to 50%	3.1 to 4.5	4.85 to 4.93	20% to 50% inundation frequency
Mudflat	-1.8 to 2.9	50% to 99.99%	0 to 3.1	4.1 to 4.9	50% inundation frequency to culvert elevation
Subtidal	< -1.8	> 99.99%	< 0	< 4.1	culvert elevation

Additional field data collection at the site and at reference sites will be needed to further refine these habitat elevation estimates. Some additional factors to consider for the next phase of the design, include:

- Transition zone lower and upper elevation limits vary between systems and are dependent on topography (e.g., slope), tidal muting, and fluvial flooding frequency and depth.
- High marsh upper elevation limit can be highly variable and depends on topography (e.g., slope) and tidal muting.
- Mid marsh elevation limits are likely more consistent between natural marshes with different tidal connections/muting.
- Low marsh elevation limits are especially sensitive to distortions of low tides (e.g., invert elevations of culvert connections, distance from tidal connections, etc.). The low marsh elevation range is wider and extends lower where low tides are fully expressed (e.g., San Diego Bay, Anaheim Bay, Upper Newport Bay) and narrower where low tides are distorted (e.g., Carpinteria marsh, Tijuana estuary).
- Mudflat elevation limits are also sensitive to distortion of low tides (e.g., invert elevations of culvert connections, distance from tidal connections, etc.).
- Subtidal upper elevation limit is controlled by the invert elevation of the tidal connection (e.g., culvert invert or sill height). In a perfectly drained site, the invert elevation equals the subtidal upper elevation limit, but more likely, the elevation limit is up to a foot or higher than the invert elevation.

4.2 Program Conditions

To determine the habitat elevations for the post-restoration tidal conditions, water levels from the modeling analysis were used (Section 3). Table 4-2 shows the habitat elevation bands for the different restoration scenarios.

TABLE 4-2
ELEVATION BANDS AND INUNDATION FREQUENCIES OF DIFFERENT HABITAT TYPES UNDER PROGRAM CONDITIONS

Habitat Type	Central Area Full Breach Elevation Bands (feet NAVD)	South Area, Near-Term Elevation Bands (feet NAVD)	South Area, Full Breach Elevation Bands (feet NAVD)
Upland	> 9.0	> 8.5	> 8.5
Transition Zone	7.1 to 9.0	6.5 to 8.5	7.6 to 8.5
High Marsh	5.7 to 7.1	5.7 to 6.5	6.1 to 7.6
Mid Marsh	4.3 to 5.7	4.5 to 5.7	4.6 to 6.1
Low Marsh	2.9 to 4.3	3.8 to 4.5	3.7 to 4.6
Mudflat	-1.8 to 2.9	0 to 3.8	-0.2 to 3.7
Subtidal	< -1.8	< 0	< -0.2

As discussed in Section 3.2.1, the tide range in the South Area increases with restoration. This means that the habitat bands expand to a wider range of values. After restoration, the South Area continues to be perched above a fully tidal system due to muting of low tide drainage due to the channel system and the Haynes Cooling Channel culverts. The restored Central Area is expected to be a fully tidal system.

4.3 Sea-Level Rise Conditions

Future habitat elevations were estimated for 1.7 and 3.3 feet of sea-level rise. To determine the future habitat elevations for the Central Area, sea-level rise was applied to the habitat elevations shown in Table 4-2 (Tables 4-3 and 4-4), since the modeling results showed that water levels in the Central Area increased linearly with sea-level rise. For the future habitat elevations for the South Area, the sea-level rise modeling results were used to determine habitat elevations under muted conditions based on inundation frequency. The full breach scenario was used rather than the South Area, near-term scenario, based on the assumption that the mid-term restoration would be completed before 1.7 feet of sea-level rise has occurred.

TABLE 4-3
ELEVATION BANDS AND INUNDATION FREQUENCIES OF DIFFERENT HABITAT TYPES UNDER 1.7 FEET OF SEA-LEVEL RISE

Habitat Type	Central Area Full Breach Elevation Bands (feet NAVD)	South Area, Full Breach Elevation Bands (feet NAVD)
Upland	> 10.7	>10.2
Transition Zone	8.8 to 10.7	9.2 to 10.2
High Marsh	7.4 to 8.8	7.6 to 9.2
Mid Marsh	6.0 to 7.4	6.1 to 7.6
Low Marsh	4.6 to 6.0	5.6 to 6.1
Mudflat	-0.1 to 4.6	-1.5 to 5.6
Subtidal	< -0.1	< 1.5

TABLE 4-4
ELEVATION BANDS AND INUNDATION FREQUENCIES OF DIFFERENT HABITAT TYPES UNDER 3.3 FEET OF SEA- LEVEL RISE

Habitat Type	Central Area Full Breach Elevation Bands (feet NAVD)	South Area, Full Breach Elevation Bands (feet NAVD)
Upland	> 12.3	>11.8
Transition Zone	10.4 to 12.3	10.4 to 11.8
High Marsh	9.0 to 10.4	9.1 to 10.4
Mid Marsh	7.6 to 9.0	7.5 to 9.1
Low Marsh	6.2 to 7.6	6.5 to 7.5
Mudflat	1.5 to 6.2	3.1 to 6.5
Subtidal	< 1.5	< 3.1

With 1.7 feet of sea-level rise, the habitats in the South Area are still perched, but the existing habitats would be inundated more frequently than under no sea-level rise conditions. With 3.3 feet of sea-level rise, only the lower habitats are perched (low marsh and mid marsh) and high marsh and transition zone habitat are at elevations similar to fully tidal areas.

These habitat elevation bands will inform the next phase of design work, which is expected to include a more detailed grading plan.

SECTION 5
Conclusions

The goals of the hydrodynamic modeling for this project are two-fold:

1. Evaluate potential flood impacts to inform the restoration design, the CEQA analysis, and permitting.
2. Evaluate restored wetland hydrology and inform the habitat elevations for the restoration design for post-restoration and future conditions with sea-level rise.

The following discussion summarizes the modeling results as they apply to the study goals.

5.1 Potential Flood Impacts

Table 5-1 graphically summarizes the differences between existing conditions and program conditions by area and scenario. The modeling results show the program could potentially result in two environmental impacts without mitigation.

The first potential impact is that the model results show that the water levels in the South LCWA site during the near-term restoration would be 0.1 feet lower than under existing conditions in the west side of the marsh during an annual tide and up to 0.5 feet lower during more extreme tides. This could impact existing habitats by reducing the tidal inundation to areas of established vegetation. However, during the more frequent tides, this difference in water levels would be negligible and it is likely that existing vegetation would be able to accommodate the difference.

The second potential impact is that the model results show that removing the gate on the Callaway Marsh culvert would result in increased flooding of the Isthmus LCWA site during storm and sea-level rise conditions (see Section 3.3.2 for further discussion). Since the Isthmus LCWA site is an active oil field, increased flooding would impact operations at the site. This potential impact could be addressed by building a berm along the edge of Callaway Marsh, leaving the gate in place, or replacing the gate with new gate that would enhance tidal inundation, but avoid increased flooding.

Further design of the program areas can address both of these potential flood impacts.

TABLE 5-1
LCW RESTORATION IMPACTS ON WATER LEVELS COMPARED TO EXISTING CONDITIONS

		South Area			Isthmus Area					San Gabriel River	Central Area
		State Lands Parcel	South LCWA	Hellman Retained	Callaway Marsh	Isthmus LCWA	Zedler Marsh	Isthmus Bryant	DWP	All	All
Extreme High Tide	South Area, Near-Term	○	↑ ↓	○	***N/A***	*N/A*	***N/A***	***N/A***	***N/A***	***N/A***	***N/A***
	Full Breach	○	↑	○	↑	○	◒	○	○	◒	↑
100-Year Storm Event	South Area, Near-Term	○	↓	↓	***N/A***	***N/A***	***N/A***	***N/A***	***N/A***	***N/A***	***N/A***
	Full Breach	○	↑	↓	↑	↑	◒	◒	○	↓	↑
Extreme High Tide with 1.7 ft of Sea-Level Rise	Full Breach	○	↑	↓	↑	↑	◒	○	○	◒	↑
Extreme High Tide with 3.3 ft of Sea-Level Rise	Full Breach	↓	↓	↓	↑	↑	↓	↓	↓	◒	↑
100-Year Storm Event with 3.3 ft of Sea-Level Rise	Full Breach	↓	↓	↓	↑	↑	↓	↓	↓	↓	↑

○ No flooding under existing or program conditions

◒ No changes between existing and program conditions

↑ Water levels increase with the program, no impacts

↓ Water levels decrease with the program, no impacts

↑ Water levels increase with the program, and could result in impacts

↓ Water levels decrease with the program, and could result in impacts

5.2 Restoration Design

The modeling results provide insight for future iterations of the design. Future phases of the design should consider the following, in addition to the items identified in Section 5.1:

- **A refined design for the Hellman Channel under 1st Street in the South Area.** The model results showed that increasing the existing two 3-foot culverts to two 6-foot culverts or four 4-foot culverts still resulted in tides muted up to 0.5 feet south of the road. With an open channel, (assuming a bridge would be installed over the channel), the model showed that high tide would be muted by around 0.1 feet south of the road. The design of the open channel should be refined using hydraulic geometry relationships and/or modeling to size the channel to appropriately convey the tidal prism through the site.
- **The limitations of the Haynes Cooling Channel culverts.** The model results showed that the restoration in the South Area creates a large enough tidal prism to result in muted tides through Haynes Cooling Channel culverts. Water levels in the Haynes Cooling Channel were muted by 0.1 feet under current conditions (i.e., no sea-level rise) and up to 0.3 feet with 3.3 feet of sea-level rise.
- **The limitations of the culvert option for the Central Area.** The model results show that a culvert option in the Central Area could not achieve both a fully tidal system and a reduced flood level during the 100-year event. The culvert configurations that were closest to achieving a full tide range during an annual high tide were also big enough that water levels in the site during a 100-year storm were nearly identical to the water levels under the full breach scenario. Smaller culvert configurations, such as one 4-foot-diameter culvert, could allow for a smaller levee system (7 feet lower than the levee needed for the full breach condition), but would result in less regular inundation across the marshplain and substantially less resilience with sea-level rise. An intermediate culvert configuration with six 4-foot-diameter culverts reduces 100-year storm water levels by about 3 feet and result in a 3-foot tide range, compared to a 4-foot tide range modeled for a full breach.

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Appendix I

Sediment Dynamics and Sediment Budget Analysis

ESA

LOS CERRITOS WETLANDS RESTORATION PROGRAMMATIC EIR

Sediment Dynamics Analysis Technical Report

Prepared for
Los Cerritos Wetlands Authority

April 2020

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SECTION 1
Introduction

This Sediment Dynamics Analysis Technical Report assesses potential effects of the Los Cerritos Wetlands (LCW) Restoration Program on long-term deposition, erosion, and sediment transport patterns in the San Gabriel River, Haynes Cooling Channel, and the restored wetlands for the purpose of assessing potential environmental impacts for the proposed program. The analysis builds on the results of other analyses, including the Hydrodynamic Modeling Technical Report (ESA 2020) and Water and Sediment Quality Technical Report (ESA 2019) developed for the LCW Restoration Plan Program Environmental Impact Report (PEIR), and the Conceptual Restoration Plan's (CRP) Watershed Impacts Report (Everest 2012).

This analysis includes hydrodynamic modeling, geomorphic analyses, and estimates of potential changes in onsite and off-site erosion and deposition. The analyses assess both existing and proposed program conditions to evaluate potential changes due to the program.

Section 1 presents the historic context, existing conditions, and proposed program. Section 2 presents geomorphic analyses for the riverine, tidal, and coastal sediment transport processes. Section 3 compares LCW to local reference sites and lastly, Section 4 summarizes the results and overall morphological development that is expected for the LCW under restored conditions.

1.1 Project Background

Until the late 1800s, the LCW spanned approximately 2,400 acres and consisted of a network of meandering streams, vegetated wetlands, and upland areas. Historically, the program area was almost entirely (88.5%) tidal vegetated wetland, with a few natural streams and intertidal flat channels in both the north and the south **(Figure 1-1**) (Stein et. al 2007; Tidal Influence 2012).

Beginning in the late 1800s, the site began to undergo significant alterations due to agriculture (cattle and beet farming), the demands of a growing population, and oil production. Oil was first discovered at the LCW at the Seal Beach Oil Field in 1923. The development of oil production operations, paired with channelization of the San Gabriel River, resulted in substantial dredge and fill of the LCW. The program area contains oil wells, and network of oil-production tanks and pipes. Today, nearly all of the program area has been converted from its historic wetland habitat, though a few remnant and degraded historic habitats remain. Given the land use history of the LCW, sediment contamination at the site is an important consideration for restoration. The history of the LCW can be used to guide the design of the restoration; however, existing constraints must be considered as well. For example, although the LCW was historically a tidal vegetated wetland, much of the site only receives tidal action through culverts, affecting the LCW tidal processes.

SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 1-1
Historic Project Area Habitats

ESA

1.2 Existing Conditions

Today, three major channels are present in the program area: Los Cerritos Channel, San Gabriel River, and the Haynes Cooling Channel. A remnant historic tidal wetland, called Steamshovel Slough, is also present, and drains to the Los Cerritos Channel. For purposes of organizing this report and discussion, the proposed program has been separated into 4 areas (South, Isthmus, Central, and North) and 17 individual sites (**Figure 1-2**).

1.2.1 South Area

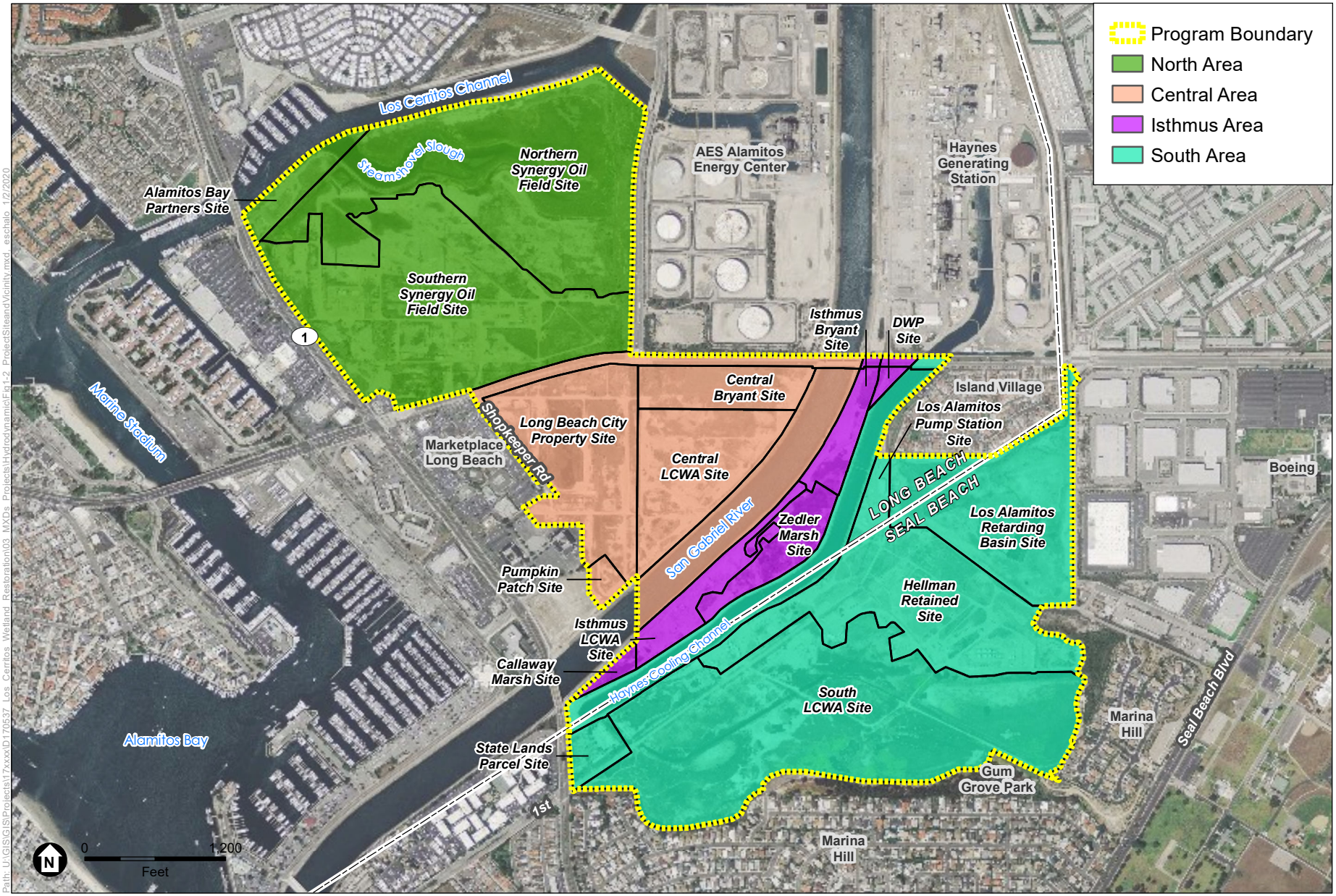
The South Area includes the following individual sites: Haynes Cooling Channel, State Lands Parcel, South LCWA, Hellman Retained, Los Alamitos Pump Station, and Los Alamitos Retarding Basin. For the purpose of this analysis, discussion of the South Area in this technical report focuses on the Haynes Cooling Channel, the South LCWA site, and the Hellman Retained site. The State Lands Parcel is not exposed to inundation, so it is not discussed in this report. The Los Alamitos Pump Station and Retarding Basin were not included in the modeling efforts because sufficient data was not available. The following paragraphs describe the areas that were considered for this study.

The Haynes Cooling Channel is a waterway used by the Haynes Generating Station located north of the program area to bring in water from the Pacific Ocean via 7 culverts in the Alamitos Bay Marina to cool the power plant through a method called once-through cooling. Once the water is used, it is discharged into the San Gabriel River slightly upstream of where the river crosses under 2nd Street. Once the modernization project for the Haynes Generating Station is completed (by 2029), the Haynes Cooling Channel will be decommissioned and no longer be in use for the Haynes Generating Station. Currently, there is no conduit that connects any of the program area sites to Haynes Cooling Channel.

The South LCWA site contains multiple former sumps, landfills, and contaminated areas from prior oil operations, and is currently owned and maintained by the LCWA. Some areas of tidal southern coastal salt marsh still persist on the site but other areas were converted by previous land owners from coastal salt marsh habitat to primarily ruderal uplands with no tidal connections. Former access roads still bisect the site and cause ecological and hydrological fragmentation. 1st Street runs parallel to Haynes Cooling Channel.

The Hellman Channel is a small, muted tidal channel that connects to the San Gabriel River through a culvert that goes around the southern end of the Haynes Cooling Channel and above the culverts connecting the cooling channel to the Alamitos Bay Marina. The Hellman Channel runs through the South LCWA site with three culverts running under the existing access roads. One culvert runs under 1st Street, and the other two run under remnant oil infrastructure roads. Culvert dimensions are further discussed in Section 2.1.2.

The Hellman Retained site is an active oil field with substantial oil operation infrastructure (pipelines, pumps, tanks, and roadways). Historically, the site was primarily coastal salt marsh habitat; today the parcel is composed mostly of ruderal wetlands with no tidal connection.



SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Sediment Dynamics Technical Report

Figure 1-2
Project Site and Local Vicinity

ESA

1.2.2 Isthmus Area

The Isthmus Area includes the following hydrologically connected sites: Callaway Marsh, DWP, Zedler Marsh, Isthmus LCWA, and Isthmus Bryant. The DWP is not exposed to inundation, so it is not discussed in this report.

The Callaway Marsh site is a vacant site with a heavily degraded perched salt marsh, tidally connected to the San Gabriel River by a three-foot-wide culvert with a gate, which mutes the water levels reaching the site.

The Zedler Marsh site is a 12-acre restoration site owned and managed by the LCWA and is currently being enhanced and restored as part of the LCWA Stewardship Program. The site contains tidal salt marsh and surrounding habitat. The site receives muted tidal circulation via a three-foot wide culvert connection to the San Gabriel River.

The Isthmus LCWA site is an active oil field maintained and operated by Signal Hill Petroleum, Inc. who own the mineral rights. The oil operation infrastructure includes 4 active oil wells and 1 idle oil well. The site contains a mix of disturbed ruderal habitats.

The Isthmus Bryant site is a privately owned vacant site. The site contains salt flat and alkali meadow wetland habitat types but is fragmented both ecologically and hydrologically by the access road that bisects the site. The site is adjacent to Zedler Marsh and two culverts in the access road allow some hydrologic connection between the area adjacent to Zedler Marsh and the area northwest of the road during major high water level events.

1.2.3 Central Area

The Central Area includes the following hydrologically connected individual sites: Pumpkin Patch, Long Beach City Property, Central LCWA, Central Bryant, and the San Gabriel River.

The Long Beach City Property site is an active oil field with oil storage tanks and associated oil production infrastructure, such as pipelines. A majority of the site is disturbed, and vegetation is generally sparse. Existing roads and oil well pads severely fragment the site ecologically and hydrologically. The site contains southern coastal brackish marsh habitat where urban stormwater runoff is directed via storm drains onto the salty soils of former tidally influenced areas. There is a perched culvert at the southern tip of the property that receives tidal waters during major high tide events, but the majority of the site is non-tidal.

The Central LCWA site is an active oil field with oil operation infrastructure (roadways, wells, power lines, pipelines, and pumps), which severely fragment the site ecologically and hydrologically. The site is composed of a mixture of native and non-native wetland habitats. The Central LCWA site is disconnected from any tidal action.

The Central Bryant site is a privately owned, vacant site. Stormwater runoff supports mulefat scrub and other wetland habitats on parts of the site. The site is comprised of southern coastal salt marsh, alkali meadow, salt flat, and ruderal wetland and upland habitats and is disconnected from tidal action.

1.2.4 North Area

A project-level EIR was prepared for the City of Long Beach to evaluate the environmental effects associated with the Los Cerritos Wetlands Oil Consolidation and Restoration Project. The PEIR for the proposed Los Cerritos Wetlands Restoration program relies on the technical analysis, impact discussion, and mitigation measures documented in the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR. Therefore, a sediment dynamics analysis of the North Area is not included in this report.

1.3 Related Studies

1.3.1 Watershed Impacts Report

As part of the CRP, Everest International Consultants developed a Watershed Impacts Report in 2012. The report summarizes the watershed activities that have the potential to affect or impede the restoration of the LCW. The watershed impacts were assessed as follows:

Local drainage areas and storm water sources were defined for each parcel in the Los Cerritos Wetlands Complex;

Existing hydrologic and hydraulic connections were defined between the wetlands and rivers;

Pollutant sources were identified;

Long-term water quality improvements anticipated from planned watershed efforts were evaluated;

The Watershed Impacts Report provides context to the sediment dynamics assessment by defining the existing hydrologic and hydraulic connectivity of the site and identifying watershed inputs to the wetland system.

1.3.2 Water and Sediment Quality Technical Report

In parallel to this report, ESA developed a Water and Sediment Quality Technical Report. The purpose of the investigation was to:

Summarize and assess available data on the water and sediment quality within the LCW near-term program areas;

Assess potential restoration program impacts;

Analyze the potential impact of flows from the watershed on the restoration program; and

Develop a framework for adaptive management and monitoring to address potential impacts.

The water and sediment quality of the LCW is connected with the sediment dynamics at the site. Areas that accrete sediment may be susceptible to accumulation of contaminants. Conversely, areas that erode sediment may contribute to degraded water quality.

1.3.3 Hydrodynamic Modeling Technical Report

In parallel to this report, ESA developed a Hydrodynamic Modeling Technical Report. ESA constructed a 2-D HEC-RAS model for the LCW to support the restoration planning process. The model was developed to characterize the hydrodynamic response of the restoration, as well as to inform the preliminary restoration design, and to more closely examine some of the 2-D processes (plan-view, depth averaged), such as flow area, velocity, and bed shear stress (hydraulic) for project conditions. The hydrodynamics of the site drive much of the sediment dynamics and influence where areas are expected to erode or accrete.

1.4 EIR Restoration Program

The proposed program would restore wetland, transition, and upland habitats throughout the program area. This would involve remediation of contaminated soil and groundwater, grading, revegetation, construction of new public access opportunities (including trails, visitor centers, parking lots, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities.

1.4.1 South Area

Ecosystem restoration in the South Area would occur in three phases based on land and oil lease ownership. The near- and mid-term phases of the program in the South Area would be mostly focused on the South LCWA and State Lands Parcel sites and would provide the conditions necessary for the expansion of coastal salt marsh habitat and associated hydrologic, biogeochemical, and habitat functions. Additional design and analysis is needed for the long-term phase of the program in the South Area, so analysis of that phase is not included in this report.

Near-term activities would include (**Figure 1-3**):

Remediating soils (e.g., on-site treatment, excavation and removal, or cap in place) that have been impacted by oil operations;

Grading the South LCWA site, including excavation to create channels and revegetation of native plants to support a diversity of marsh, transitional, and upland habitats;

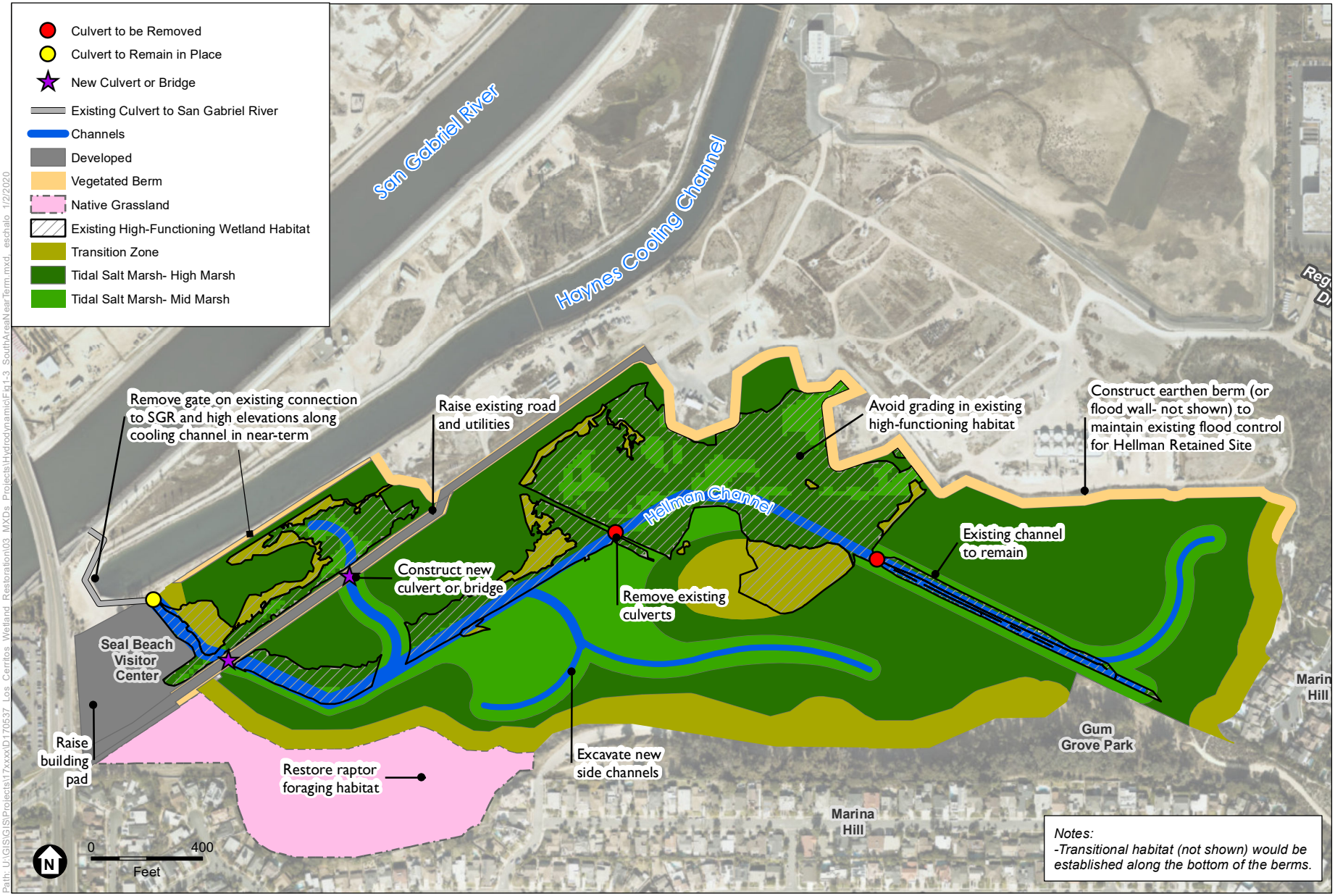
Constructing a new earthen berm or flood wall along the Hellman property boundary on the South LCWA site to protect the Hellman site from flooding;

Raising 1st Street on the South LCWA site out of the floodplain by placing it on fill;

Building a Seal Beach Visitor Center and associated parking on an existing raised building pad on the State Lands Parcel site;

Removing the gate on the existing culvert connecting the South LCWA site to the San Gabriel River and removing the culverts under the former access roads. The existing culvert under 1st Street would either be improved or replaced with a bridge; and

Restoring native grassland for raptor foraging habitat on South LCWA site.



SOURCE: ESRI,LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Sediment Dynamics Technical Report

Figure 1-3

Proposed South Area Near-Term Restoration

ESA

Mid-term activities would include (**Figure 1-4**):

Excavating a channel connecting the Hellman Channel directly to the Haynes Cooling Channel and lowering the berm along the Haynes Cooling Channel to increase the tidal range in the South LCWA site; and

Modifying the Los Alamitos Retarding Basin management operations to enhance the habitat value in the basin (e.g., change pumping operations to maintain ponding for shorter or longer time).

1.4.2 Isthmus Area

In the near-term, the proposed program would extend the restoration currently present on the Zedler Marsh site north into the Isthmus Bryant site and the portion of the DWP site west of the oil access road (**Figure 1-5**). The Callaway Marsh site and the rest of the DWP site would be enhanced in the mid-term, once the Haynes Cooling Channel is decommissioned by LADWP and no longer in use for the Haynes Generating Station. Additional design and analysis is needed for the long-term phase of the program in the Isthmus Area, so analysis of that phase is not included in this report.

1.4.3 Central Area

Ecosystem restoration in the Central Area would occur in two phases based on land and oil lease ownership. The Central LCWA site is available for restoration immediately, and discussions between Bryant Dakin, LLC and the LCWA on acquisition of the Central Bryant site for restoration are on-going. The program assumes that both of these properties would be available for restoration in the near-term. Oil operations operated by Signal Hill Petroleum, Inc. are expected to remain until agreements for decommissioning are made. The Long Beach City Property site and the Pumpkin Patch site would be available for restoration in the long-term, once the oil infrastructure is removed as part of the Los Cerritos Wetlands Oil Consolidation and Restoration Project.

The near-term phase of the program would be focused on the Central LCWA and Central Bryant sites and would provide the conditions necessary for the reestablishment of coastal salt marsh habitat and associated hydrologic, biogeochemical, and habitat functions (**Figure 1-6**). Near-term activities would include:

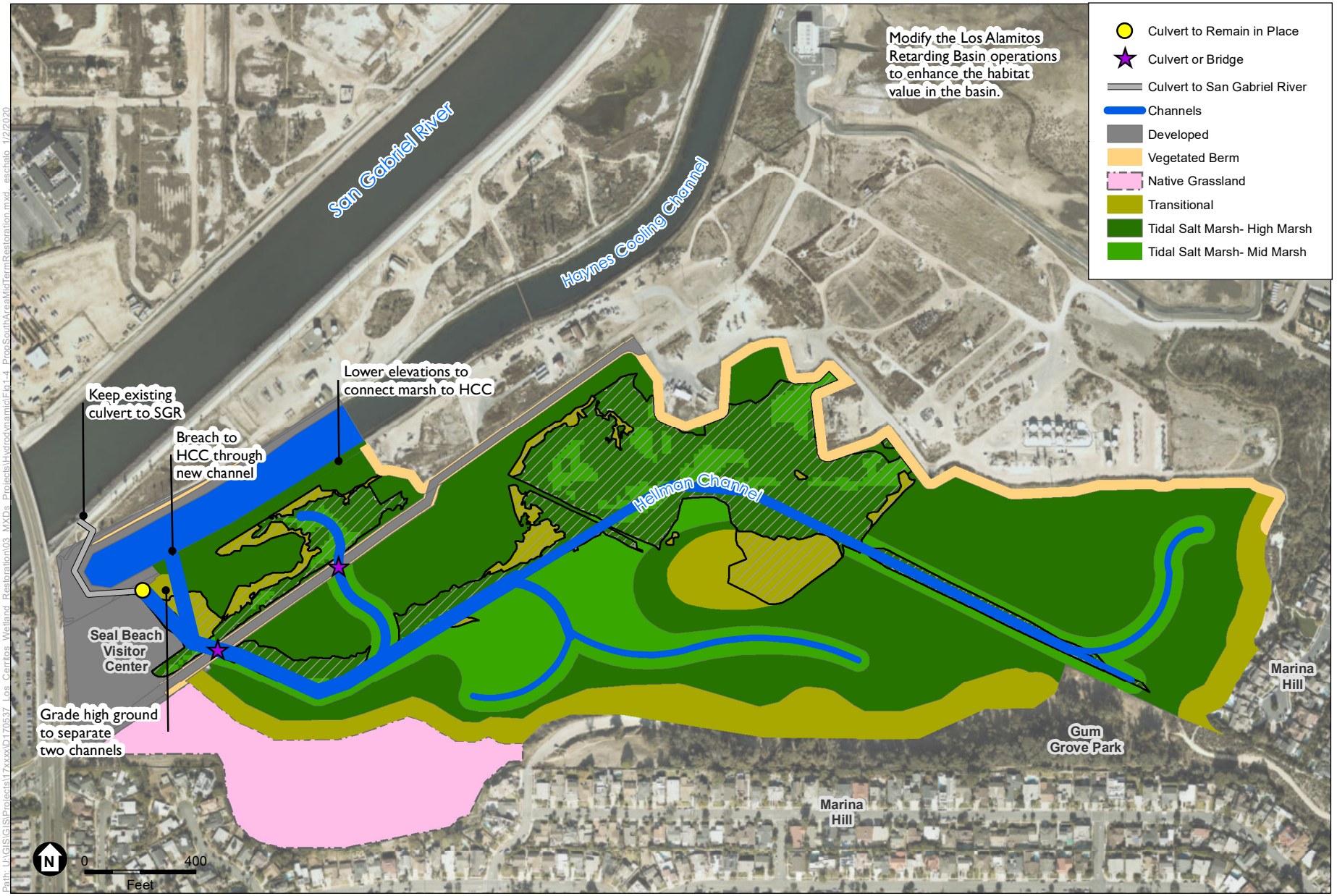
Relocating or modifying oil infrastructure and remediation of soils on the Central LCWA site;

Grading of the sites, including channels, and revegetation of native plants to support a diversity of salt marsh species;

Removing segments of the existing levee (e.g., breaching the levee and/or lowering a segment) that currently separates the San Gabriel River from non-tidal portions of the Central LCWA and Central Bryant sites.

Constructing a new earthen levee (Perimeter Levee) along 2nd Street from the San Gabriel River to the intersection with Studebaker Road to protect areas to the north from flooding;

Constructing a new interim earthen levee (Interim Levee) along the western boundary of the Central LCWA site to protect the areas to the west from flooding and to provide continued access to the wells on the Central LCWA site;



SOURCE: ESRI,LCWA

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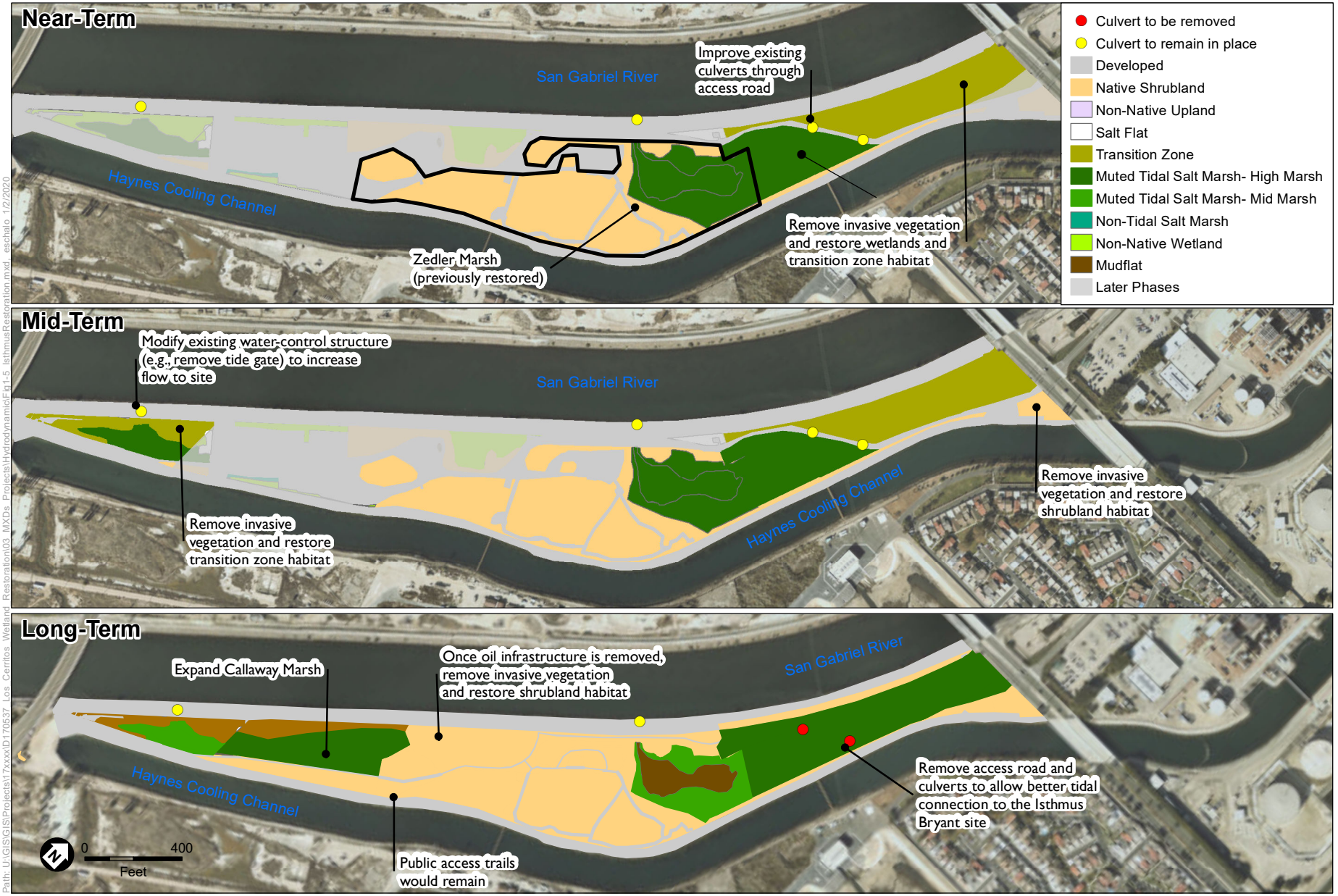
Figure 1-4

Proposed South Area Mid-Term Restoration

ESA



SOURCE: Mapbox, LCWA, NOAA, ESA

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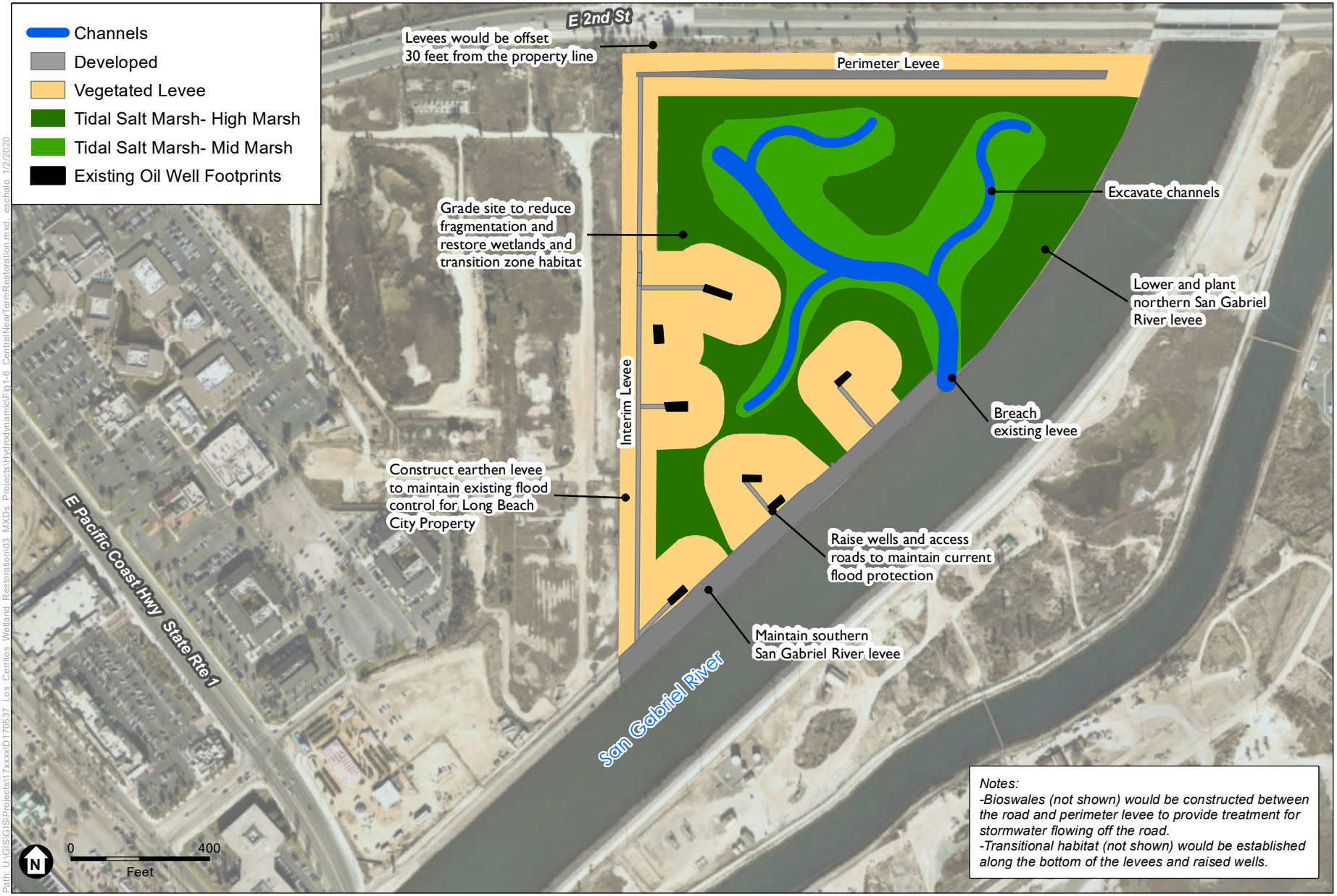
Figure 1-5
Proposed Isthmus Area Restoration

ESA



SOURCE: NOAA, ESA, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Sediment Dynamics Technical Report

Figure 1-6

Proposed Central Area Near-Term Restoration

ESA

Providing flood protection for the existing wells on the Central LCWA site by raising the well pads out of the floodplain; and

Constructing public trails on levees, including accessible ramps, and viewpoints.

In the long-term, the Long Beach City Property site and the Pumpkin Patch site would be restored to tidal salt marsh, including (**Figure 1-7**):

Grading the Long Beach City Property site, including channels, to support a diversity of salt marsh species;

Removing the northern segment of the Interim Levee on the Central LCWA site to connect the restored habitats on the Central LCWA site to the non-tidal portions of the Long Beach City Property site.

Constructing a new earthen levee (Perimeter Levee) along 2nd Street between the intersection with Studebaker Road to Shopkeeper Road on the Long Beach City Property site and then along Shopkeeper Road to the existing San Gabriel River levee on the Long Beach City Property and Pumpkin Patch sites to protect areas to the north and west from flooding; and

Constructing public trails on levees, accessible ramps, stairs, and viewpoints.

1.4.4 North Area

A project-level EIR was prepared for the City of Long Beach to evaluate the environmental effects associated with the Los Cerritos Wetlands Oil Consolidation and Restoration Project. The project applicant, Beach Oil Minerals Partners (BOMP), proposes to consolidate existing oil operations and implement a wetlands habitat restoration project in portions of the North and Central Areas within the program area and on one property outside the program area. The PEIR for the proposed Los Cerritos Wetlands Restoration program relies on the technical analysis, impact discussion, and mitigation measures documented in the Los Cerritos Wetlands Oil Consolidation and Restoration Project EIR. Therefore, a sediment dynamics analysis of the North Area, including the Los Cerritos Channel is not included in this report.

SOURCE: NOAA, ESA, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR Sediment Dynamics Technical Report

Figure 1-7

Proposed Central Area Long-Term Restoration

ESA

SECTION 2
Sediment Processes and Geomorphic Analysis

ESA performed a geomorphic analysis to assess how the site will develop and evolve over time in response to the restoration and physical processes. Sediment transport from the watershed, tidal action, and coastal sediment transport processes are examined below.

2.1 Sediment Transport from the Watershed

During a storm event, the San Gabriel River conveys flood water and sediment from the watershed to the ocean. A review of the amount and size of the sediment, as well as the historic scour and deposition, can help determine where channel sediment is typically transported.

2.1.1 Sediment Yield (Sediment Supply)

Sediment yield estimates for the San Gabriel River vary in the literature (Table 2-1). Brownlie and Taylor (1981) and Willis and Griggs (2003) looked at the natural/historic and current (post-watershed-modification) yield of sand-sized material[1] (sand yield) of multiple Southern California rivers with dams. Brownlie and Taylor found a 67% reduction in sand yield from the natural sand yield to the current sand yield for the Los Angeles and San Gabriel Rivers combined. Willis and Griggs found a current sand yield of 59,250 cy based on sediment yield of adjacent basins, and determined a natural sand yield of 181,800 cy using the estimated 67% reduction in sand flux caused by dams, as estimated by Brownlie and Taylor. Brownlie and Taylor also summarized a quantitative survey of the San Gabriel River following a flood event in 1938, which indicated a storm deposit of 273,400 cy of generally sand-sized material for an approximately 30-year storm (storm with a 3% chance of occurrence every year).

Inman and Jenkins (1999) estimated an average annual sediment yield of 47,100 cy (36,000 m^3) using a sedimentation curve from a reference watershed and flow rates from the San Gabriel River.[2]

[1] Sand-sized material is a grain size diameter generally between 0.062 mm – 2.0 mm. Some coastal studies focus on sand-sized material because it would typically be large enough to remain on beaches.

[2] Inman and Jenkins provided sediment yield in tons/yr. Sherman, et. Al (2002) provided the results in volume, which is cited here.

TABLE 2-1
SAN GABRIEL RIVER SEDIMENT YIELD ESTIMATES

Source	Natural Average Sand Yield (no dams) (cy/yr)	Current Average Sand Yield (cy/yr)	Post-flood Sand yield (cy)	Method/Source	Note
Brownlie, W.R. and Taylor, B.D., 1981			273,400 (30-yr event)	Post-flood sand yield estimated by a survey of San Gabriel River Delta near the mouth by LA County Flood Control District.	Survey conducted by Los Angeles County Flood Control District following 1938 flood event. Brownlie and Taylor assume the return event of the 1938 storm is 30 years.
Inman, D.L. and Jenkins, S.A. 1999.		47,100		Based on suspended sediment rating curve of a similar watershed and gauge data at USGS 11088000 (data from 1944-1995).	Total load
Willis and Griggs, 2003	181,800	59,250		Current average sand yield determined from sediment yield of adjacent basin. Natural average sand yield determined from current average sand yield and applying the Brownlie and Taylor 67% reduction factor.	

Sediment yield estimates for the Haynes Cooling Channel were not readily available and are not expected to be substantial since the channel is not expected to have extreme water levels due to rainfall runoff events because it is not connected to the San Gabriel River or a large watershed.

2.1.2 Sediment Size

As part of the Integrated Receiving Water Impacts Report 1994-2005 for Los Angeles County, Weston Solutions, Inc. (Weston) sampled sediment sizes in the San Gabriel Estuary over seven stations. The stations were located along the San Gabriel River, with the most downstream station located at the mouth of the San Gabriel River and the most upstream station located at the 2nd Street bridge. Weston found that sand was the dominant sediment constituent at all sample stations. The median grain size sampled ranged from 0.243 mm to 0.624 mm.

Sediment sizes for the Haynes Cooling Channel were not readily available.

2.2 Channel Scour and Deposition

The locations of fluvial scour and deposition in a channel are dependent on sediment yield or availability (Section 2.1.1), sediment size (Section 2.1.2), channel dimensions and materials, storm events, and tidal action. The effect of waves on channel morphology for the San Gabriel River is considered negligible due to the jetties at the mouth that limit wave-driven coastal sediment transport and deposition upstream of the mouth.

This section examines historic data (Section 2.2.1) and channel hydraulic geometry relationships (Section 2.2.2) to predict how the San Gabriel River could change in response to project conditions.

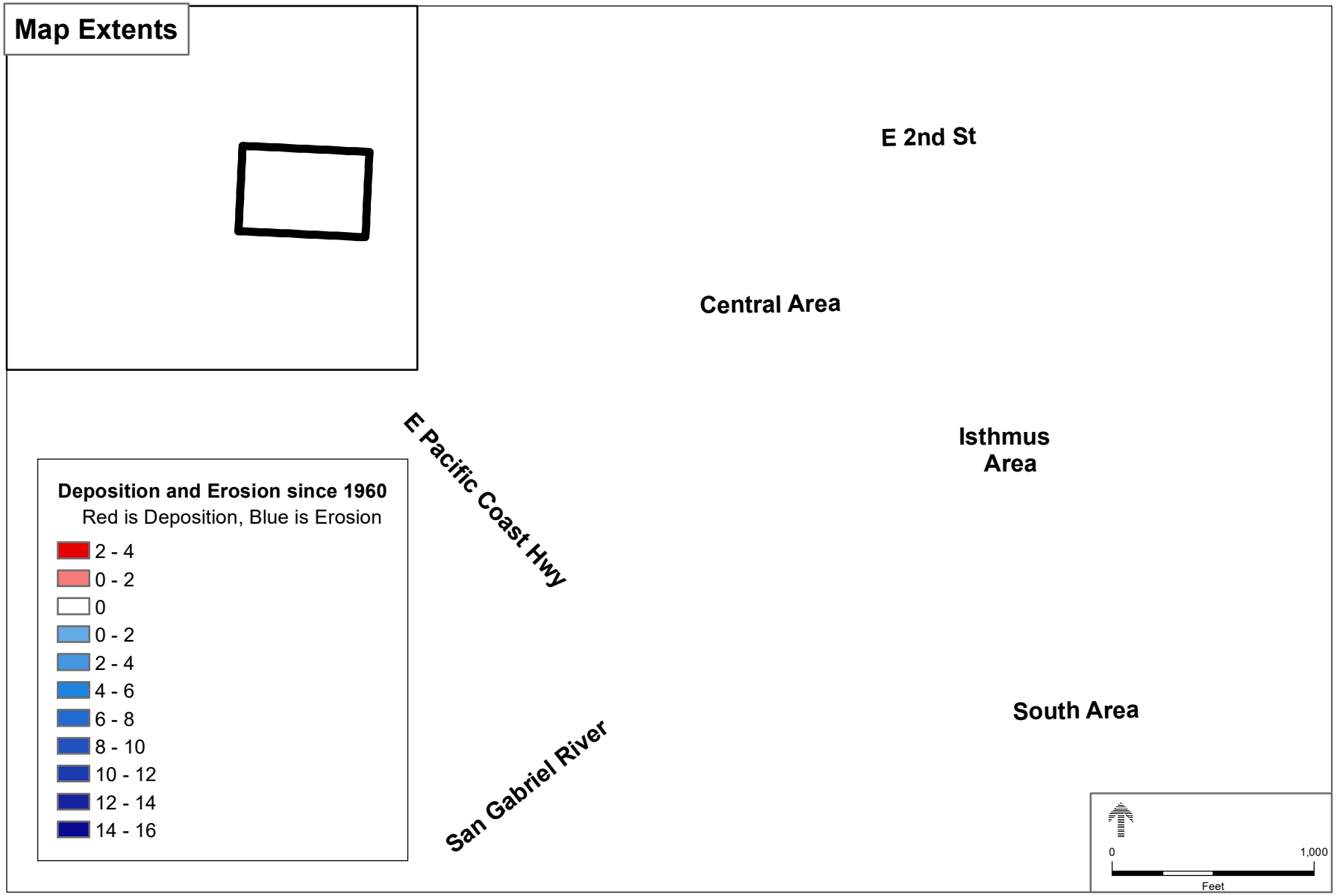
2.2.1 Historic Data

Change in bathymetric surveys over time can help identify locations of scour and deposition. The San Gabriel River as-built survey from 1960 and a 2019 survey by Cinquini & Passarino, Inc. were compared to look at deposition and scour within the channel. **Figure 2-1** shows the deposition (positive values) and scour (negative values) since the 1960 as-built survey. Compared to the 1960 survey, the San Gabriel River has generally scoured in the vicinity of the program site, with erosion depths up to 14 feet in some areas. The most significant channel bed scour is on the northeastern side of the channel along the Isthmus Area near Zedler Marsh. This indicates velocities in the San Gabriel River are higher on the outside of the channel bend, which is typical of natural systems. Additionally, the overall scour indicates that the channel is sediment supply limited rather than transport limited (i.e., there is more erosive power than sediment available to be moved).

2.2.2 Hydraulic Geometry

Within and around the LCW, the channels were designed to contain flood flows or to transport cooling water to power plants. Channels that are tidally influenced (like all of the channels in the LCW) adjust from their constructed designs to accommodate the tidal flow moving through the channel, if they are not constrained by armoring. For example, an undersized channel tends to scour because the restricted flow area creates higher velocities, which can erode the channel bottom or edges. The channel will continue scouring until it begins to approach dimensions that are in equilibrium with the tidal flow. Conversely, an oversized channel may fill in with sediment (assuming sufficient sediment supply) because tidal flows are slower, allowing sediment to drop out of suspension.

The proposed restoration in the LCW will increase tidal current velocities downstream of the project area, as more flow moves in and out of the sites. Based on other restoration experience (Williams et. al 2002), it is anticipated that increased tidal velocities will result in channel deepening until a new channel geometry occurs, which is in equilibrium with the system's tidal prism (the volume of water between MLLW and MHHW). Empirical tidal channel hydraulic geometry relationships (PWA 1995) were applied to estimate an anticipated amount of channel down-cutting and scour along the main channel and in the Haynes Cooling Channel following tidal restoration. The relationships relate tidal prism to channel cross-sectional area, width, and depth. The results for each channel are presented below.



SOURCE: ESRI (background imagery)

ESA

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 2-1

San Gabriel River Bathymetric Changes 1960-2019

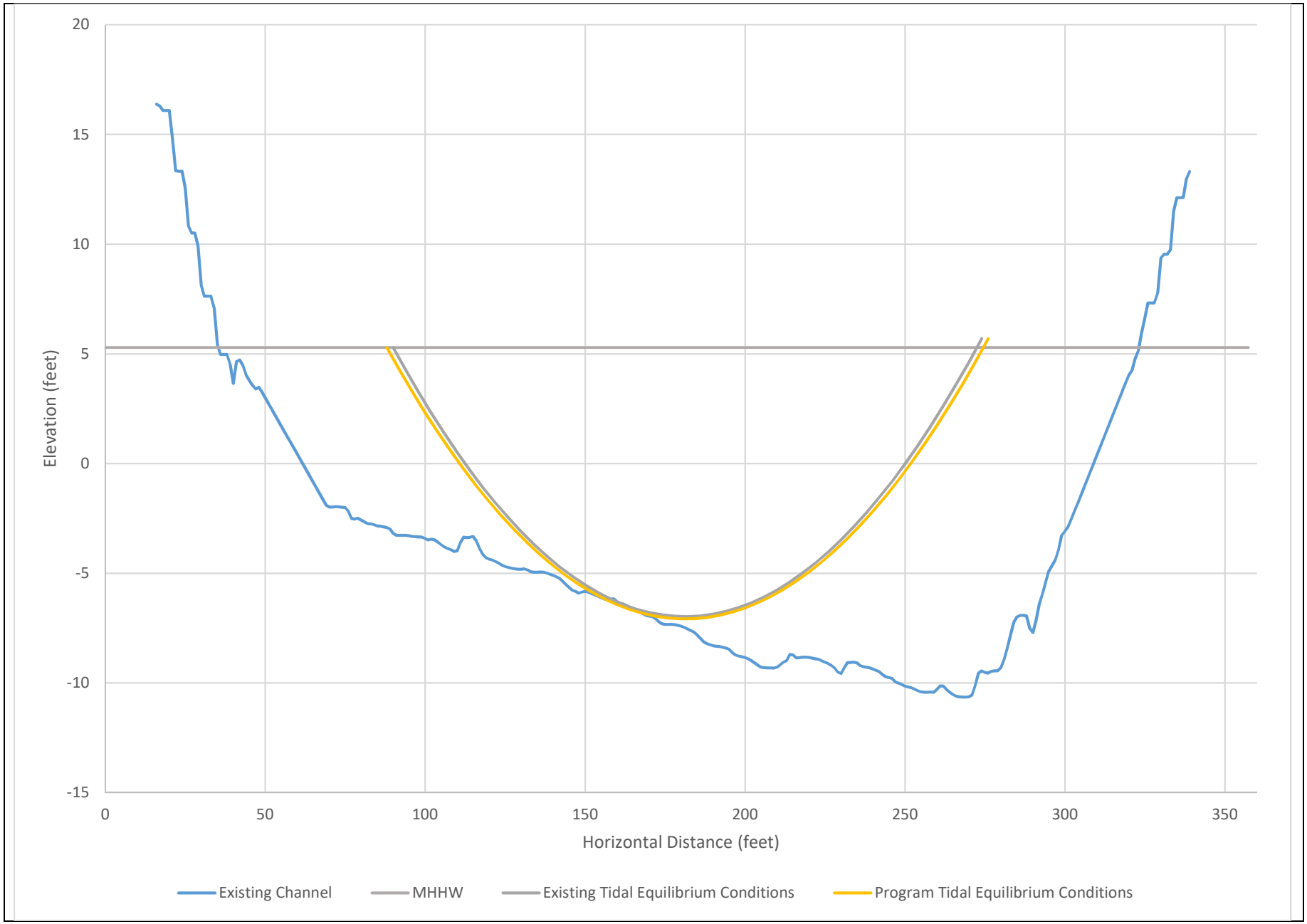
San Gabriel River

The existing San Gabriel River channel is sized to carry both fluvial and tidal flows and is consequently much larger than would be predicted for an exclusively tidal channel (**Figure 2-2**). Under existing conditions, the San Gabriel River has a tidal prism (from MLLW to MHHW) of approximately 550 acre-feet from the mouth to the College Park Drive Bridge and a tidal prism of 317 acre-feet from the Pacific Coast Highway Bridge (at the downstream end of the program area) to the College Park Drive Bridge. Based on just the tides moving in and out of the channel, hydraulic geometry relationships predict the channel should be approximately 120 feet narrower and approximately the same depth as compared to existing conditions just downstream of the Central Area (Table 2-2, **Figure 2-3**). The cross section shown in Figure 2-2 for the existing channel is based on the 2019 field survey.

TABLE 2-2
SAN GABRIEL RIVER (SGR) CHANNEL DIMENSIONS

	Tidal Prism (ac-ft)	Channel Width at MHHW (ft)	Channel Depth below MHHW (ft)	Channel Cross-Sectional Area below MHHW (ft^2)
Existing Conditions				
Measured channel existing conditions	n/a	305	12.0	3,363
Estimated based on tidal influence in the channel alone	317	183	12.3	1,302
Estimated based on tidal influence of channel and culvert connections*	322	184	12.3	1,314
Program Conditions				
SGR with Central Area long-term restoration	325	185	12.3	1,322
SGR with South Area mid-term restoration	327	185	12.3	1,328
SGR with both Central Area long-term and South Area mid-term restoration	332	187	12.4	1,342
Future Conditions				
Restored site with 1.7 feet of sea-level rise	494	224	13.3	1,737
Restored site with 3.3 feet of sea-level rise	726	267	14.2	2,229

* San Gabriel River Channel plus Zedler, Callaway, and South LCWA Marshes.

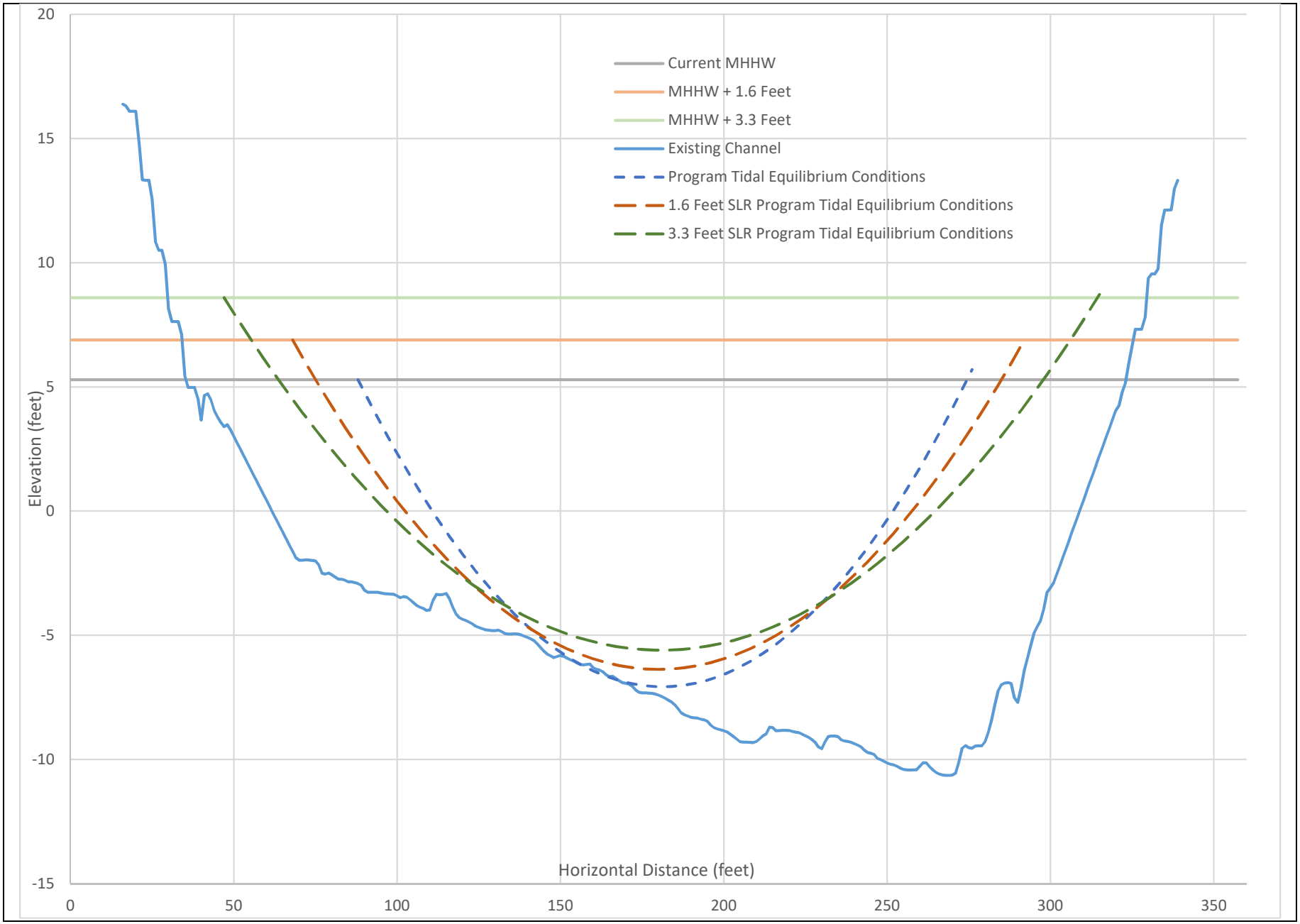


SOURCE: ESA 2020

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 2-2

Equilibrium Channel Conditions



SOURCE: ESA 2020

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 2-3

Equilibrium Channel Conditions with Sea-Level Rise

The San Gabriel River is tidally connected by culverts to two marshes in the Isthmus Area, Callaway Marsh and Zedler Marsh. These marshes receive muted tidal flows from the San Gabriel River, however they have comparatively small tidal prisms (1.8 ac-ft and 0.1 ac-ft, respectively). Another culvert connects the river to the Long Beach City Property site (Central Area) at the highest tides and during flood flows. However, the tidal prism under existing conditions is negligible since the culvert is set around MHHW and only the highest water levels enter the site.

Another culvert connects the river to the South LCWA site (South Area), although the culvert has a flap gate on it, which limits how much water flows into the site. The existing tidal prism in the South LCWA site is 2.8 ac-ft, since the existing grades are quite high (mostly above MHHW except in and along the Hellman Channel). The total existing tidal prism in the San Gabriel River (river channel + Zedler Marsh + Callaway Marsh + South LCWA marsh) is 322 ac-ft, which corresponds to a 1,314 ft^2 channel, 12.3 ft wide at MHHW, and with a channel thalweg elevation of -7.0 feet NAVD.

For program conditions, both the Central Area and South LCWA site would be graded to create mid- and high marsh, which are generally around MHHW. This means the restored tidal prism of the Central Area (6 acre-feet) and the South Area (8 acre-feet) would be comparatively small and is not expected to have a noticeable impact on the channel, since the tidal prism of the San Gabriel River is so much larger. The hydraulic geometry analysis suggests that the equilibrium tidal channel for the program conditions could be up to 3 feet wider and 0.1 feet deeper than the channel projected for existing conditions by the hydraulic geometry relationships. This is still dramatically smaller than the actual channel.

In the future, sea-level rise will also increase the tidal prism at the site in addition to restoration (Figure 2-3). Future sea-level rise scenarios of 1.7 feet and 3.3 feet were analyzed, based on State guidance (OPC 2018- see the hydrodynamic report for more details, ESA 2020). Under project conditions, 1.7 feet of sea-level rise is anticipated to increase the tidal prism to 494 acre-feet and make the equilibrium tidal channel 37 feet wider and 1 foot deeper the no sea-level rise scenario. With 3.3 feet of sea-level rise, the tidal prism increases to 726 acre-feet and the equilibrium channel is 80 feet wider and 2 feet deeper than the no sea-level rise scenario. However, the hydraulic geometry analysis shows that even with 3.3 feet of sea-level rise, the existing San Gabriel River is large enough to convey the full tidal prism.

Haynes Cooling Channel

The Haynes Cooling Channel is a trapezoidal channel approximately 145 feet wide (at MHHW) by 16 feet deep (below MHHW) that carries cooling water to the Haynes Generating Station. It is connected to the Alamitos Bay Marina by seven, 8-foot-diameter culverts with a total conveyance area of 352 ft^2. Under existing conditions, the channel has a tidal prism of 112 acre-feet, which would correspond to an equilibrium tidal channel 113 feet wide and 10.2 feet deep and with a cross-sectional area of 662 ft^2 (**Table 2-3, Figure 2-4**). The conveyance area of the existing culverts is approximately 53% of the area of the equilibrium channel, indicating that tidal flows experience some restriction through the connection. Under existing conditions, the Haynes Generating Station pumps water up the channel, forcing water through the constriction.

TABLE 2-3
HAYNES COOLING CHANNEL DIMENSIONS

	Tidal Prism (ac-ft)	Channel Width at MHHW (ft)	Channel Depth below MHHW (ft)	Channel Cross-Sectional Area below MHHW (ft^2)
Existing Conditions				
Culvert to Alamitos Bay Marina	-	-	-	352
Measured channel existing conditions	n/a	145	16.0	1,733
Estimated based on tidal influence in the channel	112	113	10.2	662
Program Conditions				
Haynes with South Area mid-term restoration	120	116	10.3	691
Future Conditions				
Restored site with 1.7 feet of sea-level rise	207	150	11.4	987
Restored site with 3.3 feet of sea-level rise	344	190	12.5	1,374

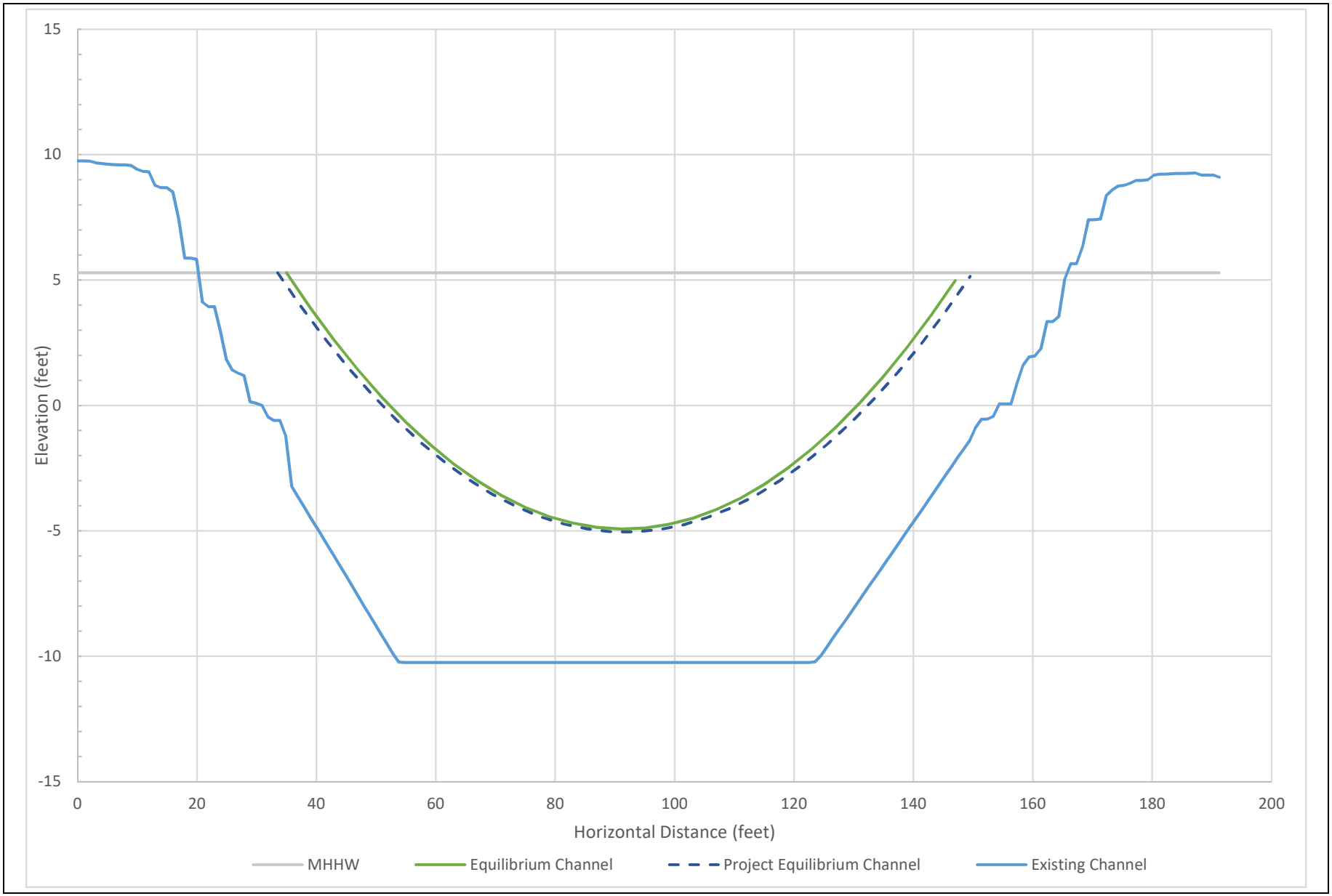
For program conditions, the South LCWA site would be connected to the Haynes Cooling Channel in the mid-term, once the channel is decommissioned and pumping stops. This would increase the tidal prism to 120 ac-ft, which would require a 116 ft wide and 10 ft deep channel. This is still within the range of the existing channel, so no scour would be expected.

With 1.7 feet of sea-level rise, the tidal prism increases to 207 acre-feet and the equilibrium channel becomes 34 feet wider and 1 foot deeper than the predicted existing conditions equilibrium channel, but the actual existing channel could still convey the flow (**Figure 2-5**). With 3.3 feet of sea-level rise, the tidal prism increases to 344 acre-feet and the equilibrium channel becomes 74 feet wider and 2 feet deeper than existing conditions equilibrium channel. The actual existing channel would still be able to convey the flow based on the cross-sectional area, but would be narrower and deeper than predicted by the hydraulic geometry relationships.

The predicted cross-sectional area in the channel is much greater than the cross-sectional area of the culverts that connect the channel to the marina, even without restoration. This means the velocities in the culverts will be higher than in the channel, in order to convey the tidal flow. As a result, sediments are less likely to settle out and block the culvert. The increase in tidal prism as a result of the restoration (and sea-level rise) would further increase velocities through the culverts. This would further lower the likelihood of sedimentation in the culverts.

2.2.3 Channel Scour

Some erosion in the San Gabriel River is expected during major storm events. The hydrodynamic modeling (Section 1.3.3) calculated where the highest areas of shear stress are expected to occur during the 100-year event (**Figure 2-6**). The model results show that the proposed program is expected to decrease shear stress in the San Gabriel River, so less channel erosion would be expected during a 100-year event.

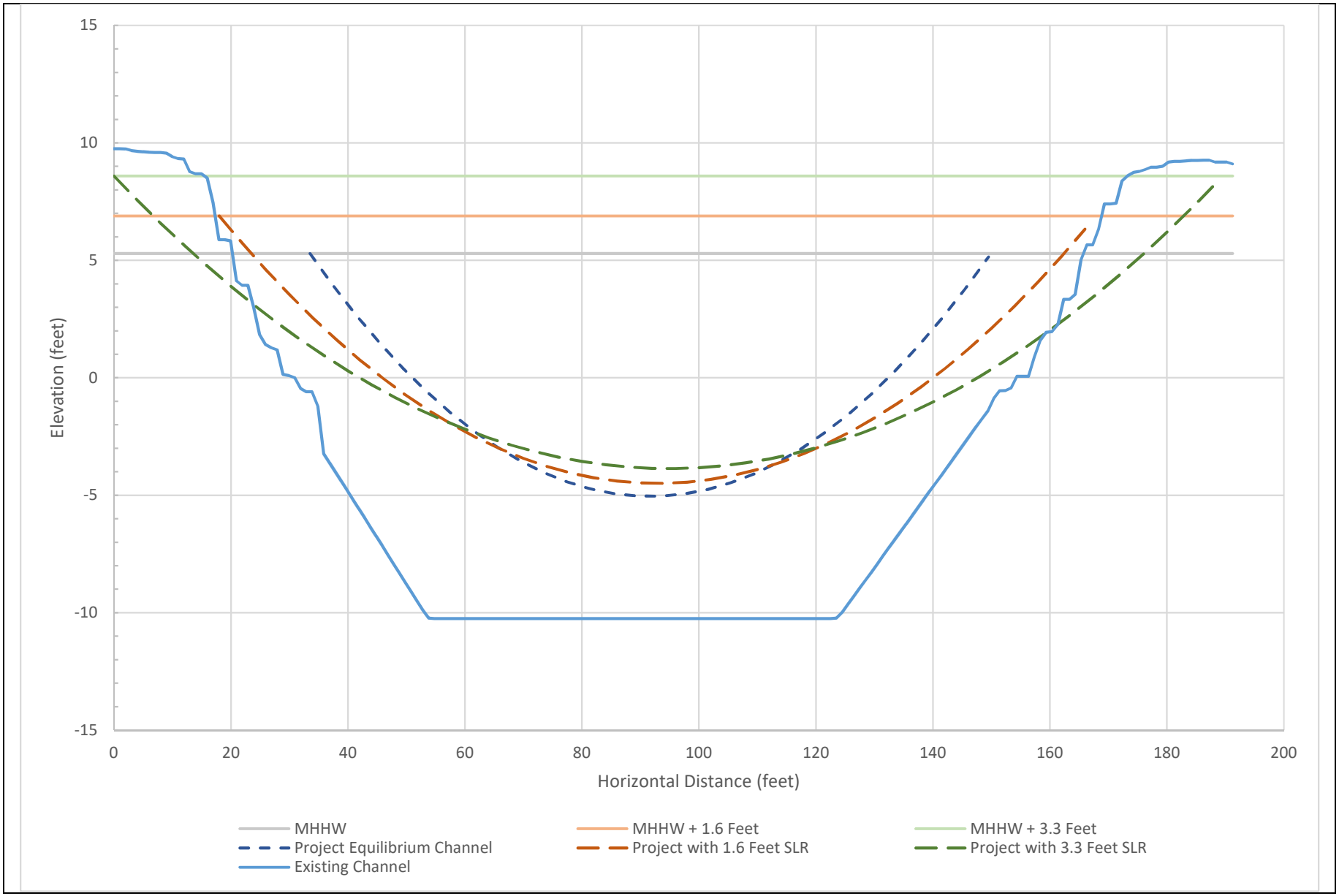


SOURCE: ESA 2020

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 2-4

Haynes Cooling Channel Equilibrium Conditions

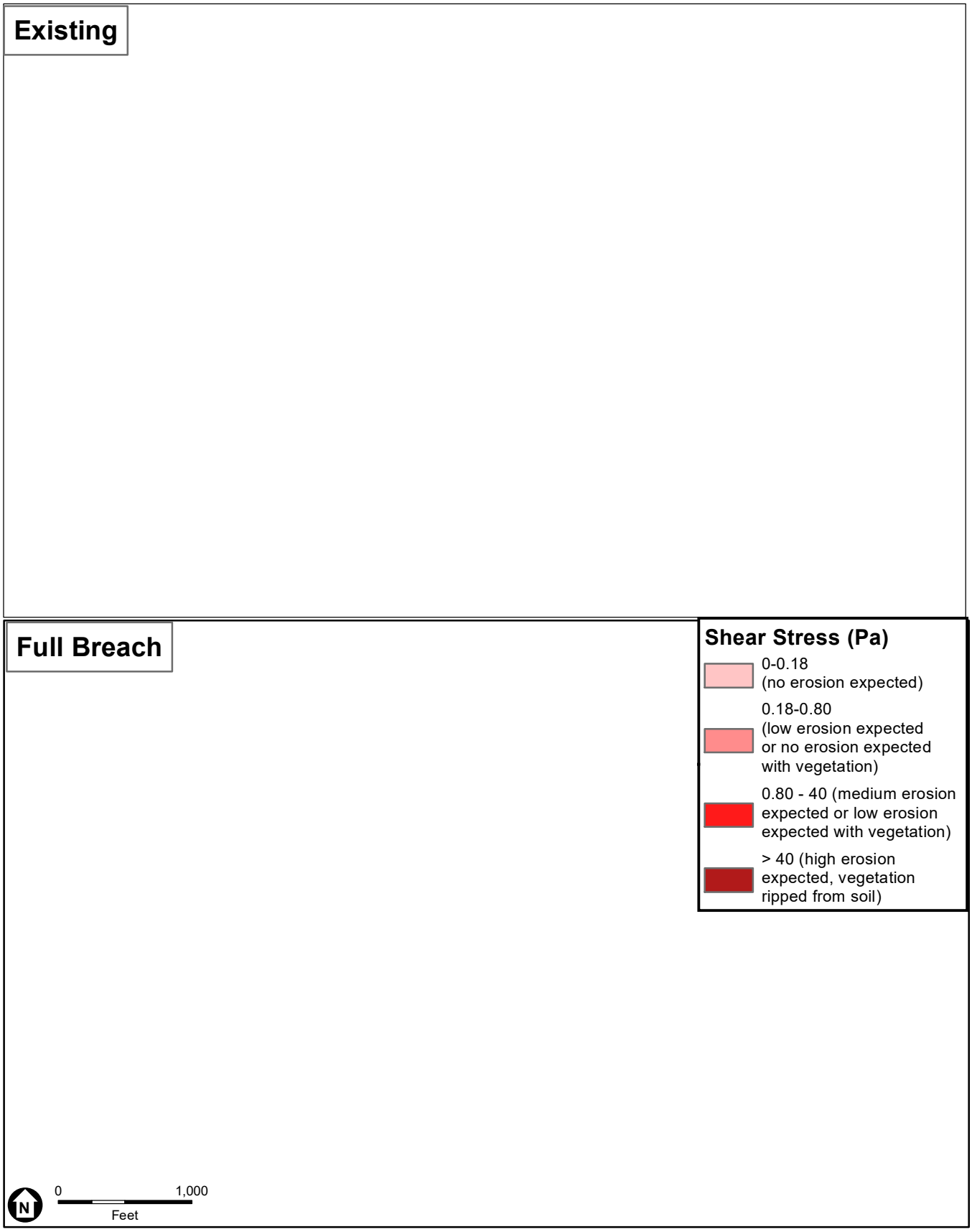


SOURCE: ESA 2020

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 2-5

Haynes Cooling Channel Equilibrium Conditions with Sea-Level Rise



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SOURCE: ESRI

Los Cerritos Wetlands Restoration Plan Program EIR Sediment Dynamics Technical Report

Figure 2-6

Modeled Shear Stress during a 100-Year Storm Event

ESA

In the Haynes Cooling Channel, the shear stress would increase from less than 2 Pa to up to 10 Pa near the Los Alamitos Pump Station. This is equivalent to a difference of roughly 2 inches of scour over the course of the storm.

2.3 Marshplain Scour and Deposition

Under existing conditions, the culvert connections to the Central Area, Callaway Marsh, Zedler Marsh, and the South Area protect the existing habitats from major tidal scour by muting the tides, which limits tidal velocities. Similarly, the culverts limit how much sediment can enter the wetlands, so deposition is limited.

2.3.1 Tidal Processes

For project conditions, the tidal channels would be sized to convey the tidal prism of the marsh using hydraulic geometry relationships (Section 2.2.2), so the marshplain is not expected to erode under tidal conditions, once vegetated. Additionally, little sediment is expected to come into the marshes during typical tidal conditions, since sediment sources, such as mudflats, are limited in the area and the watershed sediment supply is minimal during typical tidal conditions, so marshplain deposition is expected to be minimal.

Post-construction and before vegetation establishment, some channel sloughing and sediment transport is expected. The project design is expected to use marshplain slopes to guide the flow of tidal water to the channel tributaries before discharging to the river/channel. This will focus shear stress in the channel rather than on the marshplain under tidal flows, however, some marshplain scour is expected until vegetation is established. Further discussion of each site is presented below.

South Area

In the near-term, restoration of the South Area would involve removing the gate on the culvert connecting the site to the San Gabriel River. This would increase the amount of flow entering the site, but since flow would still be limited by the culvert, increased erosion of the marshplain is not expected. Additionally, new tidal channels would be excavated across the site. The tidal channels would be designed using hydraulic geometry relationships to be appropriately sized to accommodate the restored tidal flow.

In the mid-term, restoration of the South Area would involve connecting the site to the Haynes Cooling Channel by removing the berm along the channel to allow for sheet flow across the marsh. The marshplain is expected to be vegetated by this time, which would help hold sediments in place. Erosion is not expected to increase at the site as a result of this additional tidal connection.

Isthmus Area

In the mid-term, restoration of the Isthmus Area could involve removing the gate on the culvert connecting Callaway Marsh to the San Gabriel River. This would increase the amount of flow

entering the site, but since flow would still be limited by the culvert, increased erosion of the marshplain is not expected.

Central Area

In the near-term, restoration of the Central Area would involve connecting the Central LCWA and Central Bryant sites to the San Gabriel River by breaching the existing San Gabriel River levee to allow for full tidal influence into the site. Additionally, new tidal channels would be excavated across the site. The tidal channels would be designed using hydraulic geometry relationships to be appropriately sized to accommodate the restored tidal flow. Once vegetated, the site is not expected to erode under tidal conditions.

In the long-term, tidal channels would be extended onto the Long Beach City Property site and designed to accommodate tidal flows. Once vegetated, the site is not expected to erode substantially under tidal conditions.

2.3.2 Extreme Event Processes

Under mid-term restored conditions, the South LCWA site would be connected to the Haynes Cooling Channel. Due to the small watershed that drains into the channel, the Haynes Cooling Channel does not experience dramatic increases in water levels or suspended sediment due to riverine events. Therefore, the South Area is not susceptible to substantial scour or deposition due to storm events on the Haynes Cooling Channel. Additionally, high fluvial flows and sediment loads in the San Gabriel River are limited from entering the South Area by the culvert connection between the two, although some erosion is expected.

Under restored conditions, the culvert connections to Callaway Marsh and Zedler Marsh protect the existing habitats from fluvial scour by limited the flows into the sites, which limits velocities. Similarly, the culverts limit how much sediment can enter the wetlands, so deposition is limited.

In the restored Central Area, the direct connection to the San Gabriel River makes the site susceptible to both scour and deposition. The following sections describe these processes in greater detail.

Marshplain Scour

On the marshplain and along the channel banks of healthy marshes, some erosion is expected during major storm events. The hydrodynamic modeling (Section 1.3.3) calculated where the highest areas of shear stress are expected to occur during the 100-year event (Figure 2-6). Ganthy (2011) and Simon and Hanson (2001) derived equations relating shear stress to erosion based on lab tests of field cores and in situ jet-testing measurements respectively. Ganthy proposes:

$$\boldsymbol{E = E_0\left(\frac{\tau_0}{\tau_{cr}} - 1\right)^{\alpha}}$$

where E is erosion in g/m^2-s, E_0 is erosion at the critical shear stress in g/m^2-s, τ_0 is shear stress in pascals (Pa), τ_{cr} is the critical shear stress in Pa, and α is an empirical constant. Simon and Hanson propose:

$$E = k_d(\tau_0 - \tau_{cr})$$

where E is erosion in m/s, k_d is an erodibility coefficient in m^3/N-s, and τ_0 and τ_{cr} are in Pa. The erodibility coefficient can be calculated based on the critical shear stress as:

$$k_d = 0.2{\tau_{cr}}^{-0.5}$$

where k_d is in cm^3/N-s and τ_{cr} is in Pa.

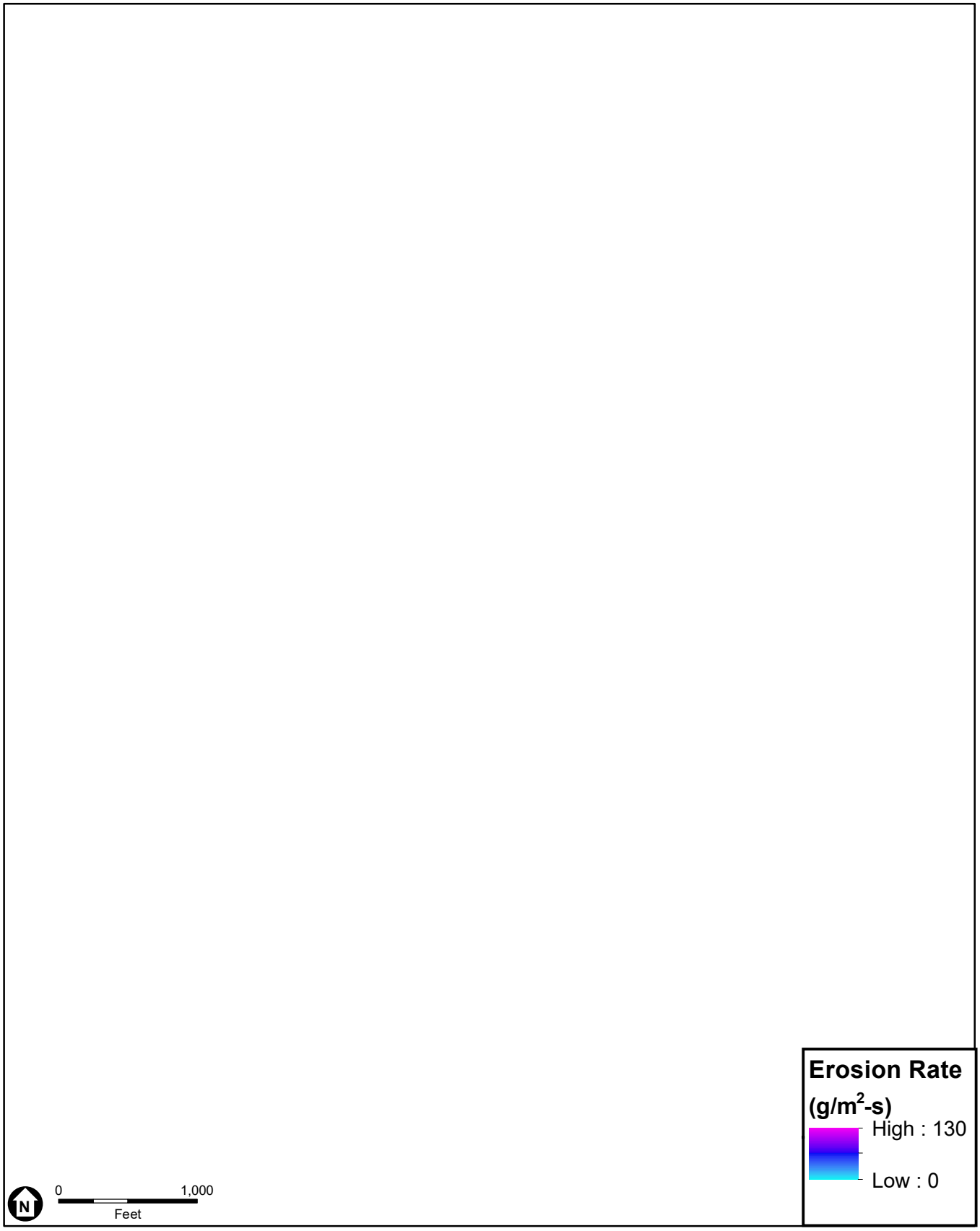
Table 2-4 shows the critical shear stresses values found in the literature. Ganthy (2011) and Simon and Hanson (2001) offer estimates of critical shear stress for other sites.

TABLE 2-4
CRITICAL SHEAR STRESS RANGES

Method	Critical Shear Stress (Pa)	Source
Lab tests of field cores along French Atlantic coast	0.18 – 3.04	Ganthy (2011)
In situ jet-testing in the Midwestern USA	0.38 – 400	Simon and Hanson (2001)

As shown in Figure 2-6, shear stress less than 0.18 Pa would be less than the most conservatively low critical shear stress applied by Ganthy, so no erosion would be expected in these areas. Once areas are vegetated, erosion on the marsh will be limited by vegetation, as the roots will help hold the sediment in place. The critical shear stress would jump to at least 0.80 Pa, assuming full vegetation cover, so areas between 0.18 and 0.80 Pa would be expected to have some erosion if unvegetated, but would not be expected to erode if vegetated. Fischenich (2001) estimated the critical shear stress before erosion of short vegetation would occur to be 40 Pa and tall vegetation to be 65 Pa. So areas between 0.8 and 40 Pa would be expected to erode at slower rate if vegetation is established and a faster rate for just bare earth. Above 40 Pa, vegetation would be ripped out and erosion would increase.

Combining the equations above with the estimates of critical shear stress provides a method to calculate an erosion rate from the modeled shear stresses. **Figure 2-7** presents the maximum erosion rates (Ganthy equation with a critical shear stress of 0.18 Pa) spatially at the peak of the 100-year storm. The highest shear stresses appear at the downstream end of the Haynes Cooling Channel through the culverts and at the mouth of the restored South and Central Area marsh channels.



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SOURCE: ESRI

Los Cerritos Wetlands Restoration Plan Program EIR Sediment Dynamics Technical Report

Figure 2-7

Modeled Erosion Rate during a 100-Year Storm Event

ESA

Shear stress time series with a triangular distribution were then estimated to approximate the total erosion over the course of the storm. A maximum erosion duration of 3.25 hours was extracted from model outputs based on the amount of time the shear stress at the site was above the 0.18 critical shear stress value. Assuming no vegetation on the marsh, the analysis shows erosion of up to 24 inches (2 feet) at the channel mouths over the duration of the 100-year storm (**Table 2-5**). While this is a substantial amount of erosion, it would be limited to the darkest pink areas in Figure 2-7.

TABLE 2-5
MAXIMUM EROSION USING GANTHY (2011)

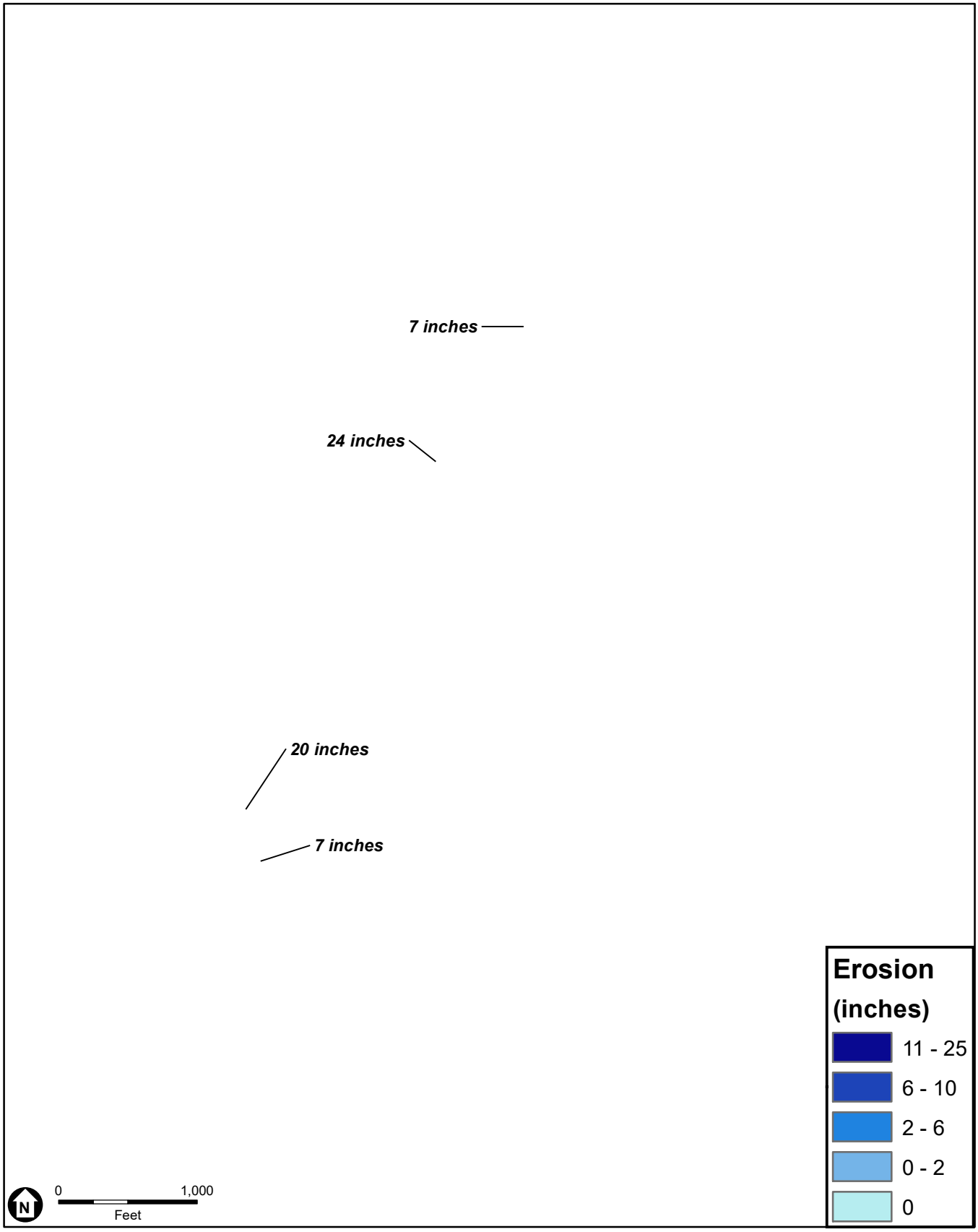
	No vegetation	With Vegetation
Location (Figure X)	**100-year erosion (in)**	**100-year erosion (in)**
South and Central Area channel mouths	24	23
Central Area interior	10	2
South Area interior	<1	0

NOTES: These rates use the Ganthy (2011) equation and a critical shear stress of 0.18 Pa for No Vegetation. With Vegetation, a critical shear stress of 0.8 Pa is used to represent vegetation until 40 Pa is reached and the vegetation is expected to erode away (Fischenich 2001). Then the critical shear stress drops to 0.18 Pa to represent unvegetated sediment.

In the marsh interiors, shear stress and predicted erosion are considerably lower. The Ganthy equation predicts a maximum of 10 inches of erosion in the interior of the Central Area and along the banks of the primary channel of the South Area, assuming vegetation has not yet established at the site.

During a 100-year event, the erosion analysis shows that even under such extreme conditions and using conservatively high assumptions, the highest shear stresses are limited to areas at the mouths and banks of the restored marsh channels and are estimated to cause 2 ft or less of erosion (**Figure 2-8**). Additionally, once vegetated, erosion on the marsh will be less. This would reduce the highest estimated amount of erosion on the marshplain to 2 inches under the 100-year storm, assuming short vegetation (Table 2-5). Additionally, the project design may include armoring at key points, and these estimates do not consider any armoring, which would decrease channel bank erosion.

The map of erosion (Figure 2-8) was used to analyze the total volume of sediment that would be eroded from each area. During the 100-year event, approximately 5,000 cy and 1,800 cy would erode from the Central Area and South LCWA site marshplains, respectively. Most of the erosion in the Central Area would occur at the mouth and banks of the restored marsh channel, near the culvert, and at the northeast corner of the site where the San Gabriel River first expands into the Central Area. Most of the erosion in the South Area would occur at the mouth and banks of the Hellman Channel. The resulting erosion map was used to analyze the habitats that would remain in the Central Area after a 100-yr event (**Figure 2-9**). During the 100-year event, erosion would possibly lower elevations along the breach from high marsh elevations to mid marsh elevations and transition zone to high marsh elevations. At the mouth of the channel a small area would possibly convert from mid marsh to low marsh and from low marsh to mudflat.



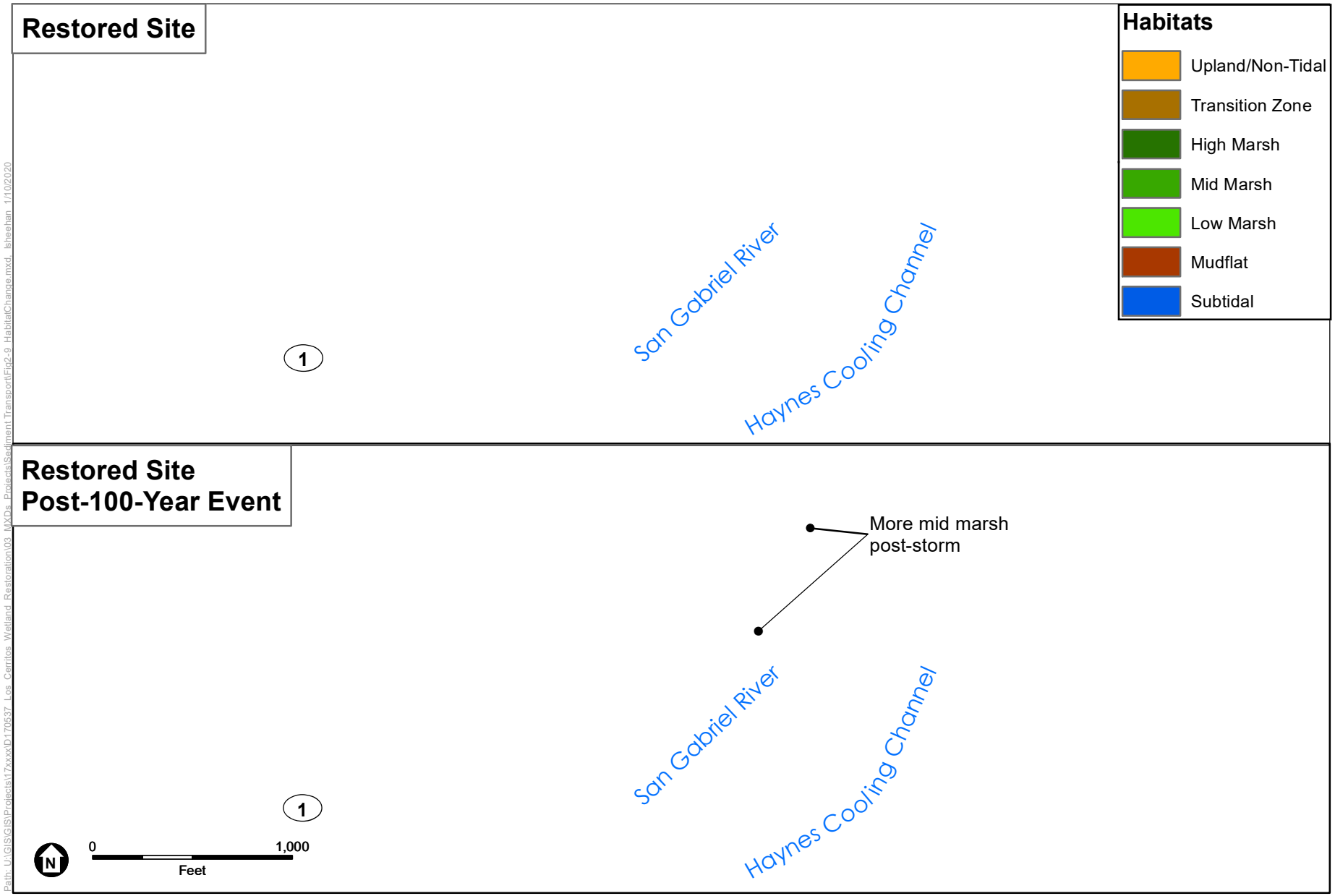
SOURCE: ESRI

Los Cerritos Wetlands Restoration Plan Program EIR Sediment Dynamics Technical Report

Figure 2-8

Modeled Erosion during a 100-Year Storm Event

ESA



SOURCE: ESRI,LCWA

NOTE: WSE = Water Surface Elevation

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 2-9

Habitats Pre- and Post-100-Year Event

ESA

Marshplain Deposition

The South Area is not expected to experience deposition despite its slower velocities because it is hydraulically connected to the Alamitos Bay Marina, rather than the San Gabriel River, and consequently has less sediment supply. As in the Isthmus Area, the South Area is also connected to the San Gabriel River through a culvert, which limits the amount of sediment that can enter the site.

In certain areas of the Central Area marsh where the velocities are slow, some deposition is expected during storm events. The culvert connections are expected to limit deposition in the Isthmus and South Areas. Most of the sediment that enters the wetland system will be brought in during storm events, and in areas experiencing velocities slower than the settling velocity of the sediment, the sediment is expected to drop out onto the marsh. Cahoon et al (1996) estimated that 0.64% of sediment yield was deposited on the marsh during storm events for creek mouth tidal wetlands. To roughly approximate the amount of sediment being deposited at different locations in the Central Area, the estimate of 0.64% was applied to the total sediment yield to estimate the volume of deposition. The total sediment yield of the 30-year storm event has been estimated to be 273,400 cy (Brownlie and Taylor 1981). If 0.64% of this sediment were to deposit across the Central Area, it would have an average thickness of approximately 0.2 inches. If the sediment were to deposit in just the areas where erosion is not expected (roughly one third of the site), the average thickness would be approximately 0.6 inches.

Marsh vegetation has been shown to be able to grow through several inches of sedimentation, so this amount of deposition on the marsh is not likely to impact the existing habitats. Additionally, deposition is a natural marsh process and will provide the marsh the ability to move up in the tide frame to accommodate to sea-level rise in the future.

For long-term sedimentation, the 50,000 cy/year sediment yield estimate of the San Gabriel River would result in marsh deposition of 320 cy/year, or 0.1 inches/year across the portion of the site that is not expected to erode. This amount of sedimentation could help the marsh keep up with sea-level rise.

The larger the storm, the larger the sediment load that it typically carries. However, in terms of marshplain deposition, larger storms may result in more erosion and less deposition. Storms around and larger than the 30-year event would likely result in erosion of the marsh during the storm, with only the most protected areas receiving sediment deposition. In more frequent storm events, the velocities would be lower, so deposition is more likely to occur, although the sediment load could be lower.

2.4 Coastal Sediment Transport

The historic longshore transport in the San Pedro Littoral Cell, which extends from Point Fermin in the northwest to Dana Point at the southeast, is generally toward the southeast. The Newport Submarine Canyon is at the southeastern end of the cell and acts as a sediment sink.

Historic processes in the littoral cell have been disrupted by the San Pedro-Long Beach port complex, dam construction, channelization of the Los Angeles and San Gabriel Rivers and the construction of a series of coastal structures. Prior to the dam construction, the Santa Ana, San Gabriel, and Los Angeles Rivers often changed course and their watersheds provided abundant

sediment to local beaches. Following the extensive construction of dams, pavement, and channelization, the sediment deliveries from the San Gabriel and Los Angeles river basins are now substantially reduced (see discussion in Section 2.1).

The San Gabriel River flowed into Alamitos Bay from 1868 until 1933-1935, when its new flood channel outlet was constructed. The new construction included levees and stone jetties at its mouth. The east and west jetties for the new San Gabriel River mouth were completed in 1932 and 1933, respectively. The west jetty was extended in 1940-1941 to slow the shoaling of the outlet. A new bay entrance was dredged in 1945-1946. This separated the Alamitos Bay from the San Gabriel River ocean outlet, resulting in three stone jetties at the bay entrance and its adjacent river mouth outlet.

The Long Beach Detached Breakwater protects most of the coast from ocean waves, resulting in relatively little longshore transport in the vicinity of the site (USACE 1986). However, northwest longshore transport at Seal Beach has led to accumulation of sand at the San Gabriel River mouth east jetty and erosion at the Anaheim Bay west jetty according to Wiegel (2009). Many of the beaches in the San Pedro Littoral Cell are nourished with sands annually to combat erosion (Orme et al 2011). In the vicinity of the program at Belmont Shore Beach and Seal Beach, nourishment began in 1940s, with much of the material coming from Alamitos Bay. A history of dredge events for Alamitos Bay from 1933-2002 is provided in **Table 2-6**.

TABLE 2-6
DREDGE EVENTS AT ALAMITOS BAY AND SAN GABRIEL RIVER

Date[1]	Location	Destination	Quantity (cy)	Source[2]
1944-1946	Alamitos Bay	Seal Beach	800,000	1
1945	Alamitos Bay	East Belmont Shore	800,000	1
1946	Alamitos Bay	Alamitos Bay peninsula	628,000	1
1950	Alamitos Bay	Alamitos Bay Peninsula shore	540,000	1
1954	Long Beach Marina	Seal Beach	800,000	1
1959	San Gabriel River	Seal Beach	225,000	1
1967	San Gabriel River	Seal Beach	70,000	1
1950s-1970s	Alamitos Bay, San Gabriel River mouth	East Belmont Shore	Not included	1
1994-2002	Alamitos Bay	Local Beaches	18,300[3]	2

1 Indicates year project was started

2 Quantities in Source 2 were provided in cubic meters. They were converted to cubic yard for this table.

3 This volume represents annual volumes.

SOURCES:

1. Wiegel 2009, San Pedro Bay Delta, in Southern California Shore and Shore Use Changes During Past 1-1/2 Centuries from a Coastal Engineering Perspective

2. USACE Los Angeles District 2004. Los Angeles Regional Dredged Material Management Plan Feasibility Study, Baseline Conditions (F3) Report

Due to jetties at the mouth of the San Gabriel River, coastal sediment transport is not expected to have a substantial impact on the sediment dynamics at the LCW.

SECTION 3
Reference Sites

Coastal wetland habitats in southern California exhibit a broad range of morphologies, as well as degrees to which physical and ecological conditions and processes have been impacted by human activities (Grossinger et al. 2011). The morphology of a given coastal wetland is largely governed by the interactions between antecedent geology, fluvial processes (e.g. watershed size and characteristics, storm hydrology, and sediment transport), and coastal processes (e.g. tides, wave/swell exposure, littoral sediment transport, and dune movement), as well as vegetation communities that can have feedback effects on physical processes. The study of reference systems with similar physical and ecological conditions to those proposed for the LCW restoration provides insight into how future LCW habitats are anticipated to persist in the near-term. This section describes conditions at the Anaheim Bay Wetlands, just south of the Los Angeles County border in Orange County, and the San Elijo Lagoon wetlands, in northern San Diego County.

3.1 Anaheim Bay

The Anaheim Bay wetlands are located within Seal Beach National Wildlife Refuge, entirely within the boundaries of the Naval Weapons Station Seal Beach (**Figure 3-1**). Prior to western settlement, the Anaheim Bay wetlands were part of an extensive backbarrier wetland system of over 2,000 ac that included large areas of tidal salt marsh as well as freshwater marsh further inland. Mapping of the area from 1873 indicates a subtidal inlet (Grossinger et al. 2011), which when coupled with the significant size of the system, implies that the tidal prism was large enough to maintain an open inlet under most conditions. The open nature of the inlet stands in contrast to many other coastal wetland systems in southern California which had seasonally closed inlets prior to western settlement (ibid). The wetlands have a watershed of approximately 38,000 acres (USFWS and US Navy 1990), compared to 440,960 acres at LCW, and receive limited inflows from the Bolsa Chica and Wintersburg flood control channels as well as local runoff (**Table 3-1**; CDFG and USFWS 1976).

TABLE 3-1
REFERENCE SITE CHARACTERISTICS

Site	Watershed Area (acres)	100-Yr Streamflow (cfs)	Sediment Supply (cy/yr)	Inlet Condition	Depositional or Erosional?
LCW	440,960	55,900	50,000	Open	Expected to be stable
Anaheim Bay	38,000[1]	Negligible input[2]	Negligible input[2]	Open Dredged	Erosional- due to tidal currents in undersized channels, wind waves over areas of long fetch, and negligible sediment input.[2]
San Elijo Lagoon	54,112[3]	22,255[4]	21,700 – 26,100[4]	Open Dredged	Depositional- due to urbanization: increased freshwater flows and sediment transport[4]

1 USFWS and US Navy 1990

2 USFWS 2011

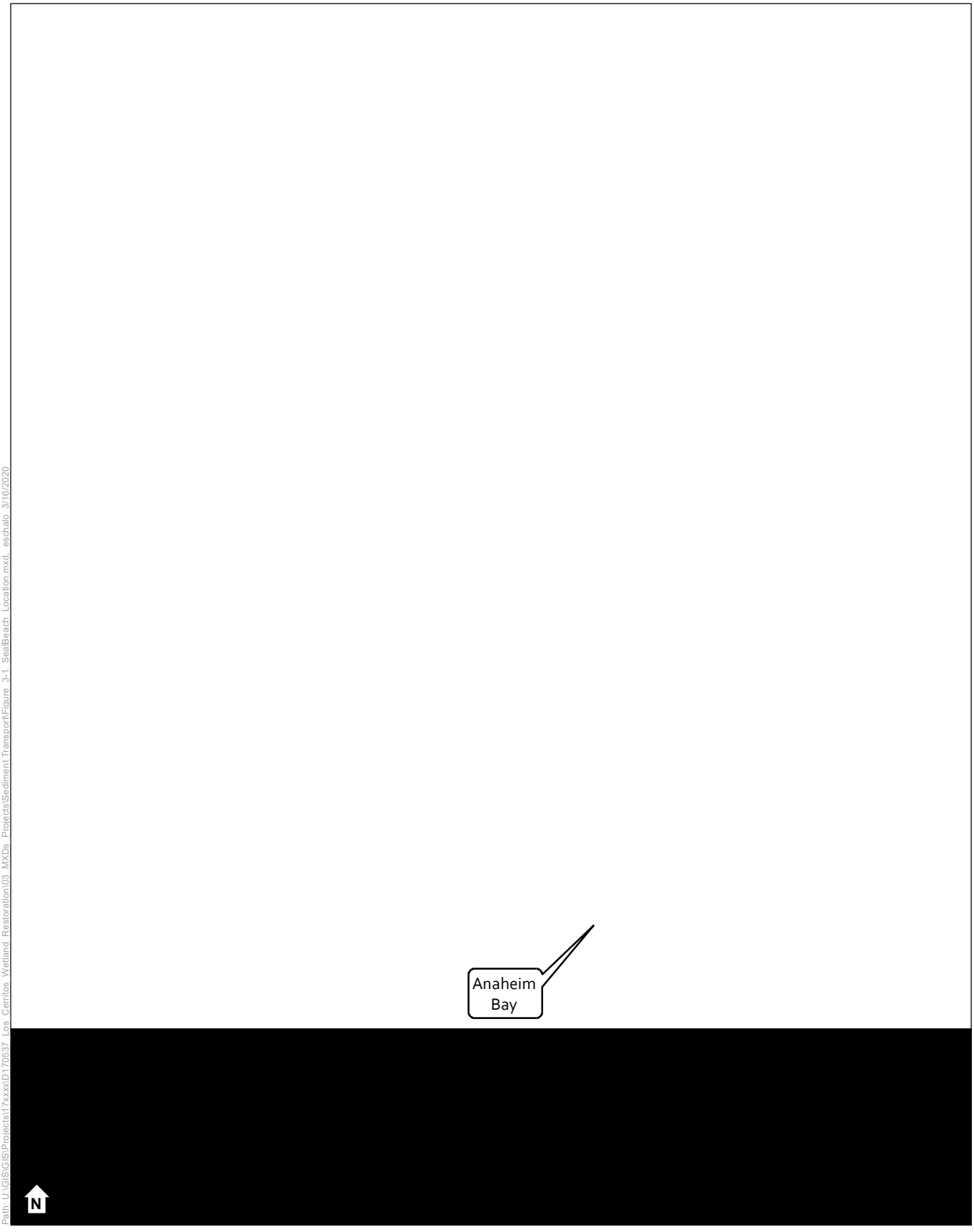
3 Moffatt & Nichol 2012

3 Laton et al 2002

The development of the Naval Weapons Station and Huntington Harbor have significantly altered the local landscape, resulting in the loss of half of the system's wetlands as well as permanently anchoring an open inlet through the construction and armoring of Anaheim Bay (**Figure 3-2**). In addition, watershed urbanization and the construction of hydrologic impediments such as roads have altered circulation at the site; portions of the wetlands that were once fully tidal now have a muted tidal regime (USFWS 2013). Additionally, the channelization of the Santa Ana River redirects freshwater flow and sediment away from the marsh. Nonetheless, a comparison of existing habitats to historic habitats indicates that the planform of the remaining Anaheim Bay tidal salt marshes has remained remarkably consistent since the late 1800s.

Erosion has occurred in the constructed tidal channels, in areas where the marsh tidal prism is larger than the channel can convey. Some of these channels have reached equilibrium and erosion has diminished (USFWS 2011). At LCW, the tidal channels will be sized to correspond to equilibrium conditions to avoid erosion (Section 2.2.2). At Anaheim Bay, additional erosion has occurred in Forrestal Pond, where the deeper water and longer fetch length has allowed waves to erode the northeast corner. At LCW, the fetch within the site is not large, so erosion due to wind waves in not expected.

Due to the loss of fluvial sediment input, the periodic dredging of Anaheim Bay to remove sand deposited by littoral (longshore) transport, and the periodic dredging of Sunset/Huntington Harbor to remove sediment from the Bolsa Chica Channel, there has been a net loss of sediment from the wetland in the last 100 years (USFWS 2011). San Gabriel River, although sediment poor, is still expected to contribute some sediment to the marsh (Section 2.3.2).



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SOURCE: ESRI

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 3-1
Location of Anaheim Bay

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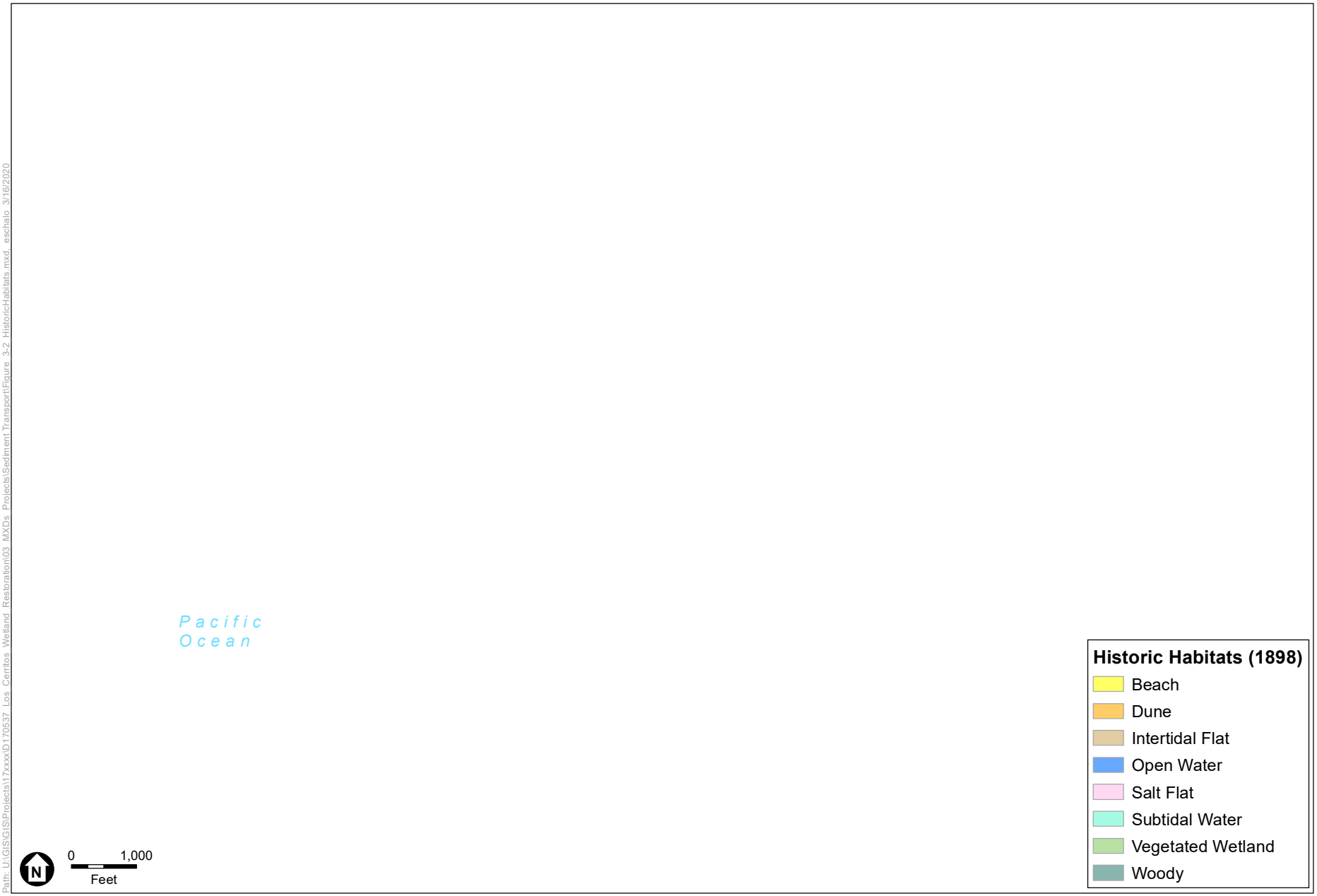

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SOURCE: ESRI, 2019; SFEI 2011

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 3-2

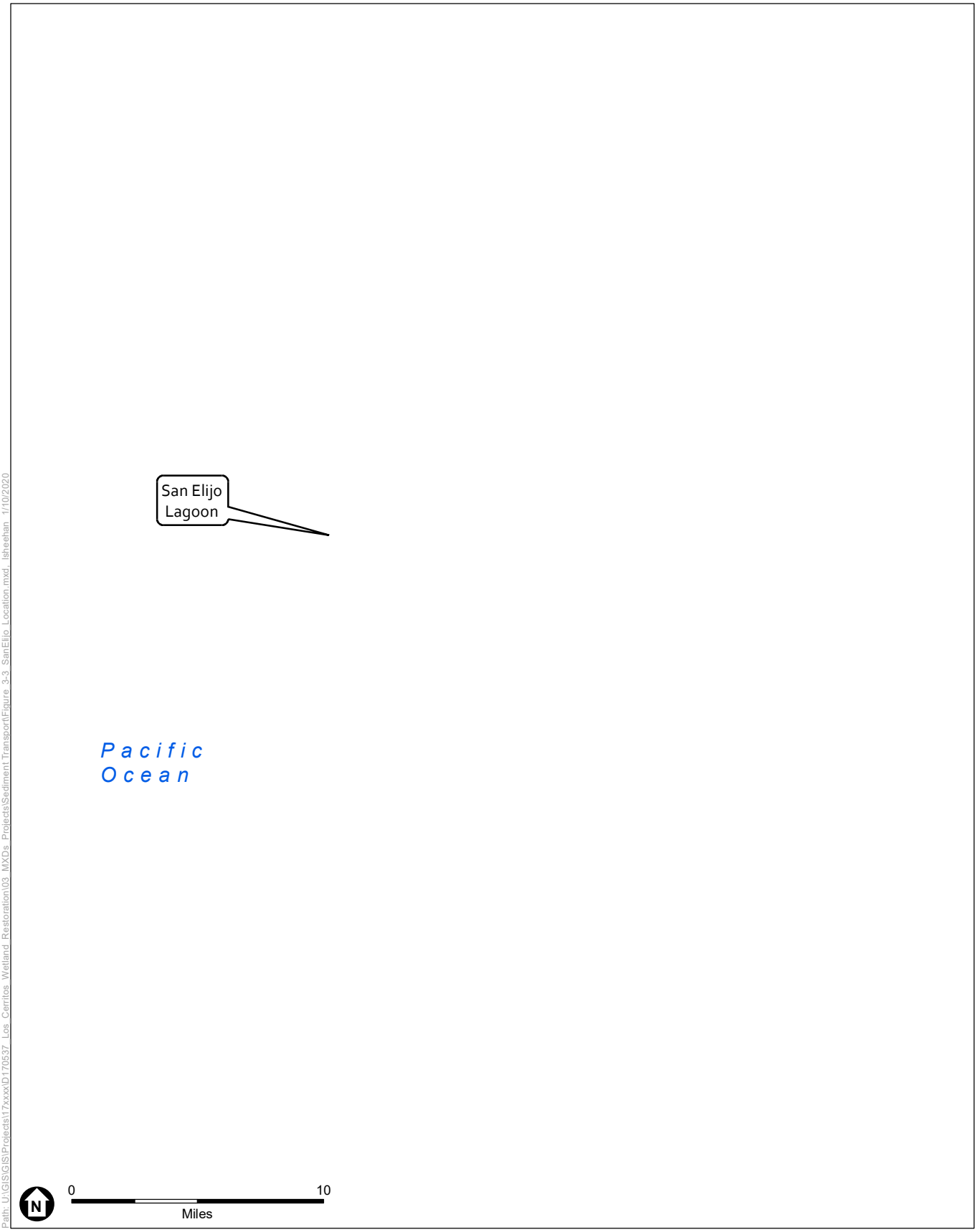
Anaheim Bay Historic Habitats

ESA

3.2 San Elijo Lagoon

The coastal wetlands of San Elijo Lagoon are located within the San Elijo Lagoon Ecological Reserve, a regional park comprised of lands owned by San Diego County, the state of California, and the Nature Collective (**Figure 3-3**). The reserve is 915 acres in size; approximately 600 of these acres are wetlands that include tidal salt marsh, brackish and freshwater wetlands, mudflats, and shallow open water habitats (Laton et al. 2002). The full extent of historic tidal habitats is not clear, as the earliest mapping in 1888 occurred after railroad development and diking activities throughout the basin (Grossinger et al. 2011). The lagoon shares a similar morphology with other lagoons within the Oceanside littoral cell, including Buena Vista, Agua Hedionda, and Batiquitos Lagoons to the north; its historic habitats likely were similar to these systems as well as the San Dieguito and Los Peñasquitos lagoons to the south (Grossinger et al. 2011). The primary freshwater inflow to the lagoon is Escondido Creek, which has a watershed of approximately 54,000 ac (SELC 2013).

Like the LCW and Anaheim Bay, the wetlands of San Elijo Lagoon have been significantly altered by human activity, including watershed urbanization, diking and draining of wetlands, road/berm construction across the lagoon, and the anchoring of the tidal inlet at the lagoon's northern end (**Figure 3-4**, Grossinger et al. 2011). As a result of this urbanization, increased sedimentation within the wetland basin has reduced the tidal prism relative to historic conditions (Laton et al. 2002), necessitating the annual dredging of the inlet to maintain open tidal conditions (SELC 2013). Proposed enhancement activities within the lagoon are largely aimed at decreasing sedimentation and increasing tidal exchange throughout the lagoon's wetlands and subtidal habitats. Despite the extensive alterations to the system, tidal wetlands in the lagoon have continued to persist, and in some locations have expanded due to sedimentation. The highly sinuous planform of the wetlands' main tidal channel has remained relatively unchanged, though this may primarily be due to the anchoring of the inlet location as evidence indicates the inlet was formerly farther south (Laton et al. 2002). Since the San Gabriel River also has an anchored inlet, this may indicate that channel migration at LCW will be minimal.



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SOURCE: ESRI

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 3-3

San Elijo Lagoon Location

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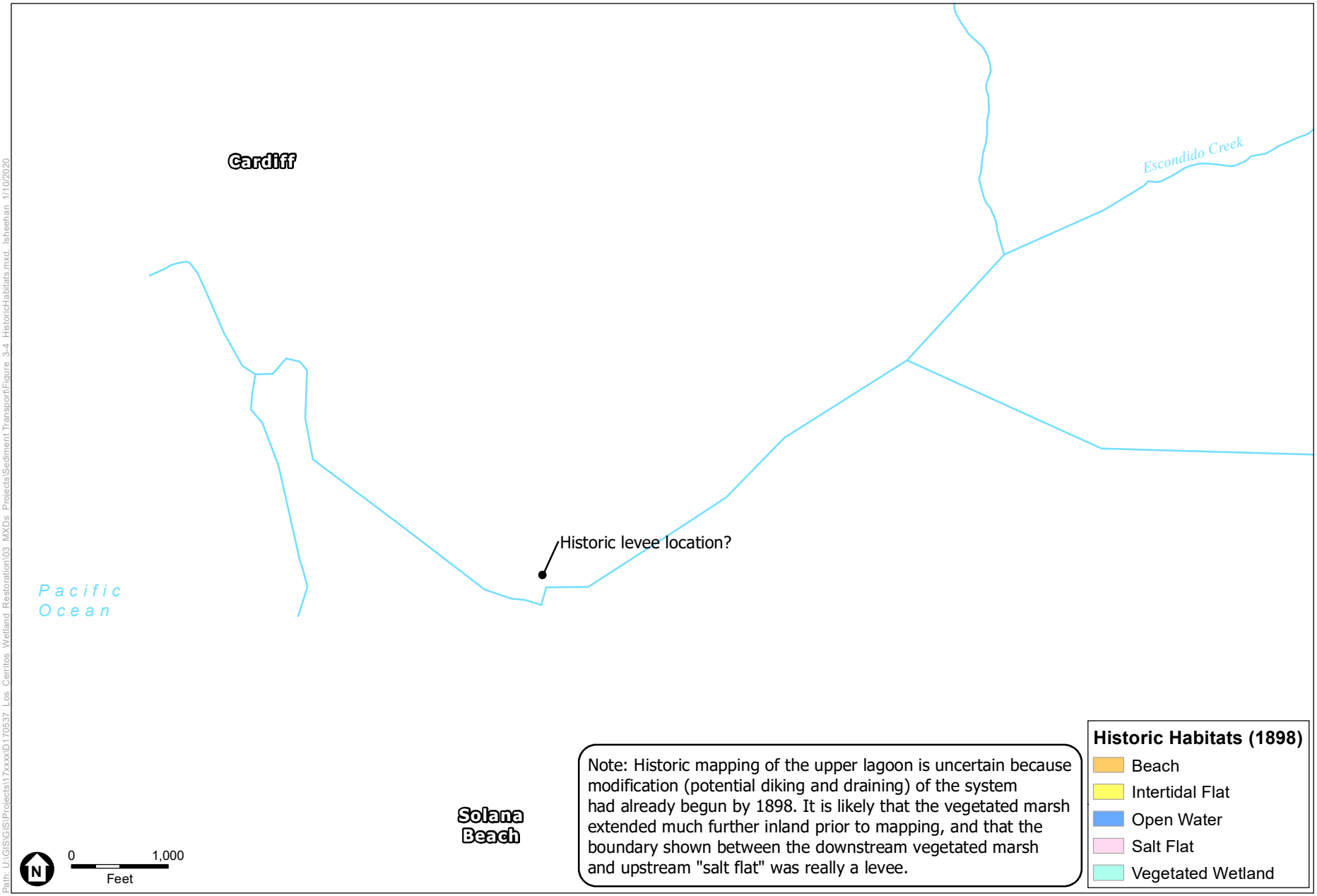

SOURCE: ESRI, 2019; SFEI 2011

Los Cerritos Wetlands Restoration Plan Program Sediment Dynamics Report

Figure 3-4

San Elijo Lagoon Historic Habitats

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SECTION 4
Conclusions

The sediment dynamic analyses assess both existing and proposed program conditions to evaluate potential changes due to the program. Under existing conditions, storm events in the existing San Gabriel River transports approximately 50,000 cy of sediment per year on average from the San Gabriel River watershed.

4.1 Channels

4.1.1 San Gabriel River

Under existing conditions, the San Gabriel River is oversized for the tidal prism it conveys, since it also must transport large riverine flood events. In the absence of large riverine flood events, the channel would be expected to fill in with sediment during typical tides (i.e., under non-storm conditions) until the channel reached equilibrium with the tidal scour and deposition processes. However, sediment in the system is limited during non-storm conditions, since the jetties at the mouth of the river keep the majority of coastal sediment from reaching the site. Any deposition that does occur under non-storm events is likely flushed from the system during a storm. Comparing surveys from 1960 and 2019 shows that the reach of the San Gabriel River in the vicinity of the site is erosional, with up to 14 feet of channel scour in some locations.

Under program conditions, the channel is expected to respond to similar dynamics. The increase in tidal prism due to the program is small compared to tidal prism of the river itself and since the channel is oversized for tidal conditions, no scour is expected in the channel due to the increased tidal prism of the restoration. Additionally, the hydrodynamic modeling shows that shear stresses are expected to decrease under program conditions, which will lessen the erosion in the channel during a 100-year event.

4.1.2 Haynes Cooling Channel

The geomorphology of the constructed Haynes Cooling Channel is driven by the tidal flows from the Alamitos Bay Marina. Under existing conditions, the constructed channel is much larger than would be predicted to convey the tidal prism of the channel, which would indicate that the channel could fill with sediment until it reaches an equilibrium with tidal scouring if adequate sediment supply were available. However, the sediment supply from the Alamitos Bay Marina is low.

Under mid-term program conditions, the Haynes Generating Station would stop pumping water up the channel and the Haynes Cooling Channel would be connected to the South LCWA site.

Even with the additional tidal prism from the restored South LCWA site, the Haynes Cooling Channel would be oversized. This means the channel could fill in with sediment until it reaches equilibrium with the tidal scour and deposition processes. However, sediment in the system is limited from the Alamitos Bay Marina. Additionally, the hydrodynamic modeling shows that the shear stresses are expected to increase slightly under program conditions during a 100-year riverine event, which could scour out deposited sediment in the channel.

The sediment dynamics analysis shows that the culverts connecting the channel to the Alamitos Bay Marina are undersized to convey the tidal prism of the restored site. This means that the velocities in the culverts will be higher than in the rest of the Haynes Cooling Channel, indicating that the potential for sedimentation in the culverts (and the need for increased maintenance) is low.

4.2 Restored Wetlands

The sediment dynamic analysis shows that some wetland deposition could occur during more frequent storm events. During larger storm events, based on conservatively high estimates of potential wetland erosion, a small amount of sediment could be eroded from restored wetlands along the San Gabriel River and along the restored channels during more extreme storm events (up to 6,800 cy of erosion during the 100-year event). During a 100-year event, results show 0 to 7 inches of erosion in the Central Area wetlands, with erosion at the breach up to 24 inches. During a 100-year event, the model results show 0 to 2 inches of erosion could occur in the South Area, with up to 20 inches of erosion near the mouth of the Hellman Channel.

This pattern of erosion could lower high marsh areas to elevations where mid marsh would re-establish following the event, causing a conversion from high marsh to mid marsh habitat. The potential for habitat conversion due to erosion is relatively small in the South Area. In the Central Area, the results show the potential to convert some of the high marsh to mid marsh habitat along the San Gabriel River and near the breach. In summary, these conservatively high erosion results indicate that erosion and temporary loss of wetland may occur in response to large infrequent storm events, but that wetland vegetation could recover following the storm event. Conservatively high estimates of erosion are used to provide an upper end of the potential wetland erosion. Further refinement of the analysis would likely show less erosion due to better spatial representation of shear stress and consideration of a mid-range estimate of the critical shear stress for erosion, a range of erosion equations, and deposition of eroded material within the wetlands during the erosion event. Additionally, the program design may include armoring, and these estimates do not consider any armoring, which would decrease channel bank erosion. Furthermore, the degree of erosion estimated for the program during extreme events has not been observed or documented at other similar California river estuaries, such as San Elijo Lagoon. This degree of erosion is therefore not likely to occur, but provides an upper end estimate for the purpose of evaluating and planning for potential environmental effects.

Note that immediately after restoration, before vegetation has fully established, the potential for erosion is greater and pre-establishment of vegetation prior to breaching the levees is therefore recommended.

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Appendix J

Sediment and Water Quality Investigation Technical Report

ESA

LOS CERRITOS WETLAND RESTORATION PLAN PROGRAM ENVIRONMENTAL IMPACT REPORT

Sediment and Water Quality Investigation Technical Report

Prepared for
Los Cerritos Wetlands Authority

September 2019

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LOS CERRITOS WETLAND RESTORATION PLAN PROGRAM ENVIRONMENTAL IMPACT REPORT

Sediment and Water Quality Investigation Technical Report

Prepared for
Los Cerritos Wetlands Authority

September 2019

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SECTION 1
Purpose and Scope of the Investigation

The purpose of this sediment and water quality investigation is to:

- Summarize and assess available data on the water and sediment quality within the Los Cerritos Wetland Complex (LCW) near-term program areas (Sections 2-4);
- Assess potential restoration program impacts (Section 5);
- Analyze the potential impact of flows from the watershed on the restoration program (Section 6); and
- Develop a framework for adaptive management and monitoring to address potential impacts (Section 7).

The proposed restoration will include excavation, regrading, and disposal of existing sediment. This report provides an overview of potential beneficial uses and restrictions at the program area based on the sediment characterization in order to inform subsequent phases of the design. This investigation provides a summary of prior sampling investigations; no additional water or sediment quality sampling has been performed as part of the current project. Next steps are identified in Section 8, including additional investigations to confirm suitability of sediment for reuse, upland disposal, or in-ocean disposal. Design specifications for sediment management will be developed during subsequent phases of the design based on the Program EIR and regulatory requirements.

Additionally, this report assembles pertinent information on groundwater and surface water quality as a basis for the analysis of potential water and sediment quality impacts. The report analyzes impacts of the program on the surrounding environment, as well as impacts of the watershed on the program area.

Because there is uncertainty in how the program and the surrounding environment will interact, this report provides a framework for developing an adaptive management and monitoring plan. This plan will allow for the program proponents to monitor, assess, and manage potential water and sediment quality impacts to biological resources and human health from and to the project after construction. The plan will include adaptive management measures that would be taken if impacts are identified based on multiple lines of evidence.

1.1 Site Background

Until the late 1800s, the LCW spanned approximately 2,400 acres and consisted of a network of meandering streams, vegetated wetlands, and upland areas. Historically, the project area was almost entirely (88.5%) tidal vegetated wetland, with a few natural streams and intertidal flat channels in both the north and the south (Figure 1-1).

Beginning in the late 1800s, the site began to undergo significant alterations due to agriculture (cattle and beet farming), the demands of a growing population, and oil production. Oil was first discovered at the LCW at the Long Beach Oil Field in 1921 and at the Seal Beach Oil Field shortly after. The development of oil production operations, paired with channelization of the San Gabriel River, resulted in substantial dredge and fill of the LCW. The program area contains oil wells, and network of oil-production tanks and pipes. Today, nearly all of the program area has been converted from its historic wetland habitat, though a few remnant and degraded historic habitats remain. Given the history of the LCW land use, sediment contamination at the site is an important consideration for restoration.

SOURCE: ESRI,LCWA, SFEI

Los Cerritos Wetland Restoration Sediment and Water Quality Technical Report D.170537

Figure 1-1
Historic Ecology

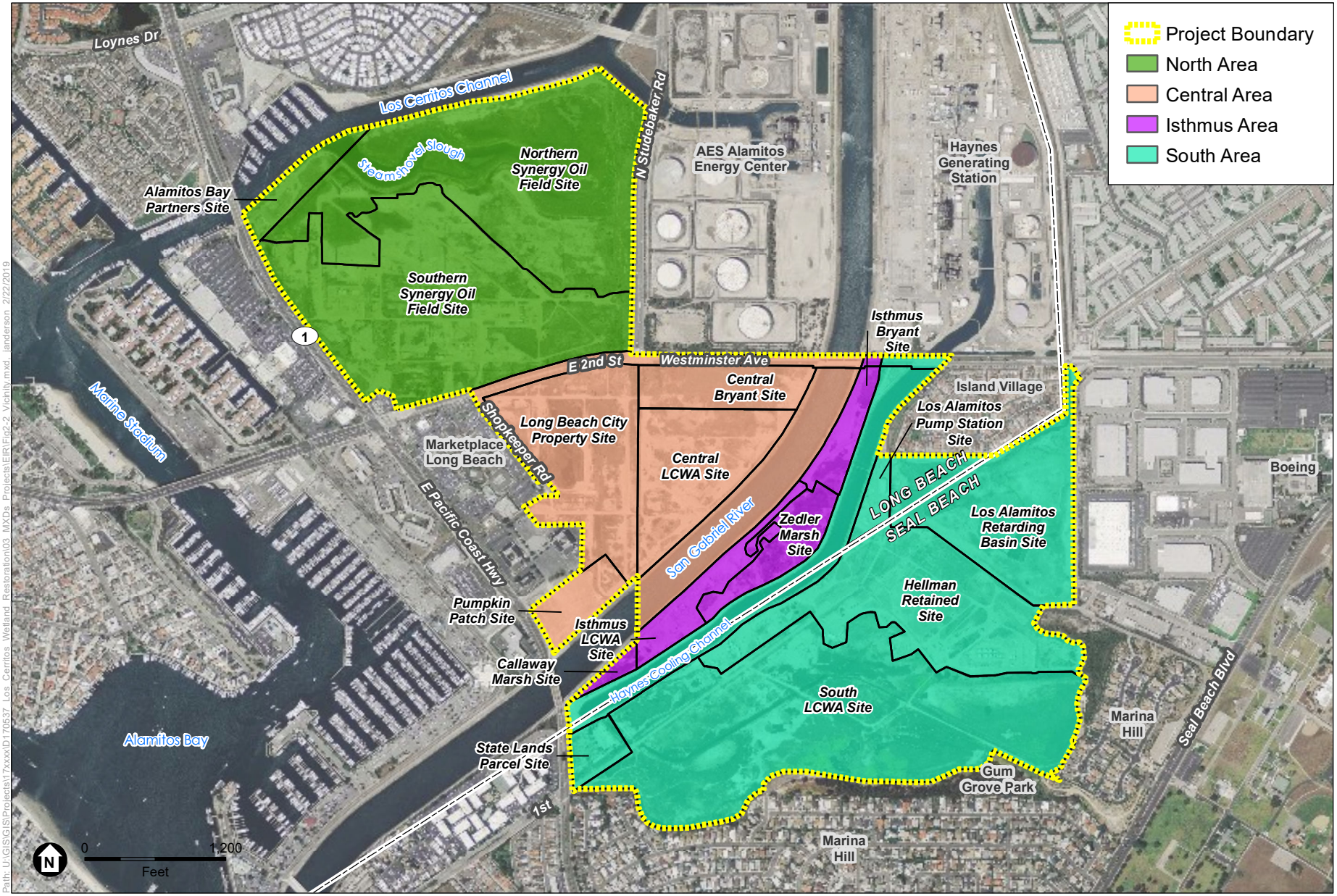
ESA

SECTION 2
Sediment Quality Within the Program Area

Sediment sampling and water quality monitoring at the LCW has occurred since the late 1980s. This section summarizes soil sampling that has been performed in three areas within the program boundaries: the Central Area, South Area, and Isthmus Area. These areas are identified in Figure 2-1. Table 2-1 below identifies the report title, date, and corresponding program area reviewed in Sections 2 and 3 of this investigation.

TABLE 2-1
PRIOR SEDIMENT AND GROUNDWATER SAMPLING REPORTS

Report	Date	Location
International Technology Corporation Phase 1 Environmental Assessment of Bryant (Texaco) Property	1988	Central Area/Isthmus Area
Earth Technology Corporation Site Investigation at Texaco Bryant Lease	1988	Isthmus Area
Engineering Enterprises, Inc. (EEI) Report of Preliminary Subsurface Environmental Assessment	1989	Central Area/Isthmus Area
Camp Dresser & McKee Inc. Environmental Audi, Texaco-Bryant Lease	1991	Central Area/Isthmus Area
Camp Dresser & McKee Inc. Phase II Environmental Assessment	1991	Central Area/Isthmus Area
Anchor Environmental, LLC Hellman Ranch Supplemental Environmental Site Investigation	2004	South Area
Anchor Environmental, LLC Hellman Ranch Groundwater Assessment	2006	South Area
Pacific Coast Environmental Conservancy (PCEC) Assessment of PAHs, PCBs, and Pesticides in Sediment from Zedler Marsh and the State Lands Parcel at Los Cerritos Wetlands	2014	Isthmus Area (Zedler Marsh)



SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan Program EIR

Figure 2-1

Project Site and Local Vicinity

ESA

2.1 Overview of Prior Studies

The following section provides a general summary of the soil sampling activities and recommendations at each of the LCW Complex Locations (Central Area, Isthmus Area, and South Area). A more detailed analysis of six sediment investigations between 1988 and 2014 are provided in Section 2.3. More detail on groundwater results is included in Section 3.

2.1.1 Central Area and Isthmus (Former Texaco-Bryant Lease)

Though full restoration of the Isthmus LCWA site (central property on the Isthmus) is not anticipated until the long-term phase of the LCW program, historically the Central LCWA site and Isthmus LCWA site were owned jointly under the Texaco-Bryant Lease, and past environmental assessments have occurred across the entire program area. Two Phase 1 Environmental Site Assessments (ESAs) have been performed at the Central LCWA, Isthmus LCWA, Zedler Marsh, and Isthmus Bryant sites.

The first Phase I ESA, performed by International Technology Corporation in 1988, evaluated 180 soil borings extracted at 2-foot and 10-foot depths for benzene, toluene, ethyl benzene, xylene (BTEX), and metals. The primary result of this sediment investigation were metal "hot spots", or zones of elevated barium, lead, and chromium concentrations, determined by mapping the metal concentrations as contours. In addition to these zones, the investigation also found toulene and xylene at three of the sediment sample locations. Based on these results, International Technology Corporation recommended a more specific evaluation of these hot spots and BTEX findings in a Phase II investigation.

The second Phase I ESA was performed at a former sump location on the Isthmus LCWA site. The Phase I report (The Earth Technology Corporation, 1988) evaluated the extent of hydrocarbons in groundwater and soil directly adjacent to the former 404-gallon concrete sump location. The Phase I report evaluated soil and groundwater samples from three monitoring wells for total petroleum hydrocarbons[1] (TPHC) and BTEX and found TPH levels as high as 320 milligram/kilogram (mg/kg) in the soil sampling. The presence of both BTEX and TPHC was also noted in the groundwater samples.

Following these initial Phase I ESAs, additional subsurface environmental assessments were performed to further evaluate the soil and groundwater quality within the Texaco-Bryant lease (Central LCWA, Isthmus LCWA, Isthmus Bryant, and Zedler Marsh areas).

In 1989, Engineering Enterprises, Inc. (EEI) performed a subsurface environmental assessment on behalf of Kaufman and Broad of Southern California, who were interested in redeveloping the Texaco-Bryant parcel. Their investigation reviewed prior investigations, aerial photography, and

[1] Total petroleum hydrocarbons (TPHC) is an umbrella term used to describe several hundred chemical compounds derived from crude oil and petroleum products. These include hexane, benzene, toluene, xylene, naphthalene fluorine. TPHC are grouped into sub-groups or fractions based on similar characteristics in water and soil. These fractions include aromatic compounds (primarily gasolines and middle distillates), field additives (gasolines), polycyclic aromatic compounds (middle distillates and residual fuels).

regulatory agency records. Additionally, EEI drilled 32 soil borings, 10 of which were used for groundwater monitoring wells, and collected 55 soil samples, five surficial soil grabs, and sixteen groundwater samples. The sampling found elevated levels of total petroleum hydrocarbons and moderate to low levels of total fuel hydrocarbons. The report notes that these elevated concentrations were found primarily on the eastern portion of the Isthmus site (Isthmus Bryant) and concentrations decreased with depth. The EEI report recommended some remedial activity, though "the actual activities have not been determined." Furthermore, the environmental assessment recommended the development of a work plan prior to site development.

In April 1991, Camp Dresser and McKee (CDM) provided an Environmental Audit to further determine potential areas and sources of contamination. The 1991 CDM report found 23 former sumps and three former tank farm locations within the Texaco Bryant Lease (Central LCWA Isthmus LCWA, Isthmus Bryant, and Zedler Marsh areas), and recommended further soil and groundwater monitoring to obtain more information on potential contamination in the vicinity of these former oil operations.

Following their April Environmental Audit, CDM completed a Phase II Environmental Assessment in November 1991. The Phase II Environmental Assessment performed by CDM evaluated 25 former sumps and 4 former tank farms on the Central LCWA/Isthmus LCWA, Isthmus Bryant, and Zedler Marsh sites. CDM evaluated Total Recoverable Petroleum Hydrocarbons (TRPH) in excess of 1000 mg/kg at 16 of the 25 former sumps and three of the four former tank sites. The analysis estimated approximately 15,000 cubic yards of soil with TRPH concentrations greater than 1000 mg/kg. Multiple metal samples showed levels greater than 10 times the STLC, but subsequent wet-extraction testing produced only one sample of lead that was found to have a soluble lead concentration of 5 mg/L, which is the STLC limit. The Phase II investigation also included a biotreatability study that evaluated the potential of biodegradation at the site. Final recommendations from the Phase II report included a pilot study on biodegradation to assess the feasibility, remedial action, and a groundwater sampling plan.

In December 2014, the Pacific Coast Environmental Conservancy (PCEC) completed an assessment of PAHs, PCBs, and pesticides in soil samples taken from Zedler Marsh and the State Lands Parcel site. The study took samples at 10 different locations (8 in Zedler Marsh and 2 in the State Lands Parcel site) and found that "all contaminant levels analyzed exhibited very low concentrations" and recommended that Zedler Marsh and the State Lands site be protected and restored.

2.1.2 South Area

In 2004 Anchor Environmental, CA, L.P. prepared a supplemental Environmental Site Investigation in the South LCWA site (formerly Hellman Ranch) on behalf of the California State Coastal Conservancy. The investigation evaluated metals, pesticides, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAH) of both low and high molecular weight from 19 different borings taken at 12 former sumps and an additional 14 samples taken in "open" (non-sump) areas. The supplemental site investigation "raised issues in regards to potential contaminants that may interfere with the biological success of wetland creation and upland restoration at Hellman Ranch due to elevated metal and pesticide concentrations above ecological

risk levels and free-product petroleum contamination found floating on top of the groundwater table." Anchor Environmental recommended that an Ecological Risk Assessment should be conducted at the site to understand risks associated with future project habitats.

Following their 2004 assessment, Anchor Environmental (2006) performed a follow-up groundwater assessment on the South LCWA site to further characterize and understand an area on the southwestern edge of the property that was identified in the initial assessment as containing crude, shallow subsurface oil. This investigation characterized the former dump site materials, defined the lateral extent of the crude oil found in the 2004 investigation, identified potential sources of the oil, evaluated the groundwater flow directional, and analyzed the crude oil to assess the potential effects of migration to receiving waters. The study determined that the extent of the crude oil is approximately 100 feet wide by 500 feet long, with crude oil found in 3-6-inch-thick bands at depth varying from approximately 12-14 feet below ground surface.

2.2 Comparison Criteria

This section provides an overview of the three criteria used to assess sediment quality at the LCW: hazardous waste, ecological criteria, and human health. First, the sediment constituent concentrations were compared to the hazardous waste criteria, which severely restricts reuse, placement, and disposal of excavated materials. Next, ecological criteria were evaluated to determine any potential effects on the restored habitat if these materials were to be exposed and/or used for re-grading. Finally, as the most conservative estimate of the sediment quality, the constituent concentrations were compared to residential health criteria. Soil constituents found below the human health residential standards have the greatest flexibility for reuse, placement, and disposal.

It is important to note that although the individual chemical constituents of TPHC often have thresholds associated with hazardous waste disposal, ecological criteria, and human health, TPHC itself does not. There are no regulations or guidelines promulgated by the federal government for TPHC. Many of the studies summarized in Section 2.3 report TPHC values but do not provide additional information on the sub-fraction or constituent chemicals. This presents a challenge in discussing the potential risks associated with TPHC levels at the LCWA site. It is recommended that the program consider any new regulations or guidelines on TPHC levels as they are developed.

2.2.1 Hazardous Waste

The California state hazardous waste material disposal thresholds, Total Threshold Limit Concentrations (TTLC) and Soluble Threshold Limit Concentrations (STLC), were used to evaluate the hazardous waste criteria for sediment at the LCW. The TTLC value for each constituent is the upper limit allowed in a solid or powdered waste to possibly be considered non-hazardous; any constituent that exceeds the promulgated TTLC values are considered toxic hazardous waste. Similarly, the STLC value is the maximum concentration of a waste constituent in liquid form to not be considered hazardous. If a solid waste sample falls between the STLC and TTLC value, it is considered non-hazardous if the concentration is less than ten times the STLC value. If the measured concentration exceeds ten times the STLC, it is likely hazardous but the

optional "Waste Extraction Test (WET)" can be performed to determine whether the sample is considered hazardous. Hazardous waste material criteria dictate which facility or treatment is required for disposal of hazardous material.

2.2.2 Ecological Criteria

Effects Range-Low and Effects Range-Median Values

Effect range (ER) values are used in dredged material evaluations for ocean disposal. These values were developed by Long et al. (1995), and are helpful in assessing the potential significance of elevated sediment-associated constituents of concern, in conjunction with biological analyses. These values were developed from a large data set where results of both benthic organism effects (e.g., toxicity tests, benthic community effects) and chemical analysis were available for individual samples. To derive the effect range low (ER-L) and effect range median (ER-M) guidelines, the chemical values for paired data demonstrating benthic impairment were sorted according to ascending chemical concentration. The ER-L was then calculated as the lower tenth percentile of the observed effects concentrations and the ER-M as the 50th percentile of the observed effects concentrations. For dredged material evaluations, the ER-L and ER-M are used in conjunction with bioassay testing. No prior sampling at the LCW included bioassay testing (i.e., measurement of the concentration or potency of a substance by its effect on living cells or tissues). In this report, ER-L and ER-M values are used as the representative ecological criteria, but future bioassay testing should be considered to better understand the effects of soil quality on ecology at the LCW Complex.

Beneficial Reuse Criteria for Wetland Restoration

These criteria were first developed by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and presented in the Draft Staff Report entitled, *Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines* dated May 2000. The document was prepared to assist in planning beneficial reuse projects in the Bay Area by establishing general screening guidelines and general sediment testing requirements. The guidelines include specific criteria for reuse of sediments in wetland and upland beneficial uses. The guidelines for the wetland foundation use are based on the ER-M concentrations (Long et. al., 1995). Ambient concentrations in the San Francisco Bay were used to develop the guidelines for re-use of sediments for wetland surface. These guidelines are to be used in combination with bioassay testing to determine suitability of the materials for use in wetland restoration projects (SFBRWQCB, 2000).

Additional ambient sediment chemical and toxicity testing were performed following the Draft Staff Report in 2000. A statistical analysis was performed on the historical and more recent analytical data to develop a statically derived set of recommended sediment chemistry screening guidelines for beneficial reuse. The results of this analysis and recommended guidelines were presented in *An Evaluation of Existing Sediment Screening Guidelines for Wetland Creation/Beneficial Reuse of Dredged Material in the San Francisco Bay Area along with a Proposed Approach for Alternative Guideline Development* (Germano & Associates, 2004), which was funded by the California State Coastal Conservancy. The recommended guidelines

presented in the 2004 report are based on the Floating Percentile Method for predicting acute amphipod toxicity. These guidelines presented in the 2004 Germano & Associates report, therefore, can be applied to sites outside of the Bay Area as they are based on toxicity testing results rather than ambient concentrations in San Francisco Bay. These guidelines are presented in the results summary tables (Appendix A) to compare with constituent concentrations in sediment to assess the suitability of these materials for wetland surface and foundation beneficial uses.

2.2.3 Human Health Criteria

Environmental Screening Levels (ESLs), developed and maintained by the SFBRWQCB, are used by regulatory agencies throughout the state of California. The SFBRWQCB develops separate screening levels for residential and commercial/industrial land uses and construction worker exposure. As the board notes, the residential ESLs are the most stringent thresholds, and soil "with chemical concentrations below these levels generally would not require remediation and would be suitable for unrestricted uses if disposed offsite" (SFBRWQCB 2019). In addition to ESLs, constituent concentrations were compared to Regional Screening Levels (RSLs), which were previously referred to as Preliminary Remediation Goals (PRG), as promulgated by the U.S. Environmental Protection Agency (EPA).

2.3 Analysis of Prior Studies

This section provides a more detailed review of the prior sediment investigations. When possible, the results of each study is compared to current hazardous waste, ecologic, and human health criteria (Section 2.2). This comparison can help inform decisions about the excavation, placement, and treatment of sediment at the site. Tables that compare the sediment samples to hazardous waste, ecological, and human health criteria are found in Appendix A.

2.3.1 Results of the Phase 1 1988 International Technology Corporation Environmental Assessment

As part of the Phase I Environmental Assessment of the Texaco-Bryant lease property (Central Area and Isthmus Area), International Technology Corporation performed 180 soil borings (157 at 2 feet below ground surface [bgs] and 23 at 10 feet bgs). The samples were taken at the Central LCWA, Isthmus LCWA, Zedler Marsh, and Isthmus Bryant locations. The shallow samples were tested for arsenic, barium, chromium, lead, and vanadium. In addition to metals, the deeper borings were also sampled for BTEX at 5- and 10-foot depths. Tables showing the results of the sediment sampling compared to each threshold criteria can be found in Appendix A.

Comparison to Hazardous Waste Material

Metal concentration did not exceed promulgated TTLC standards, though multiple samples exceeded 10 times the STLC standard for every constituent. Most samples exceeded 10 times the STLC standard for chromium, though a "Waste Extraction Test (WET)", was not performed during the investigation. Though samples in exceedance of ten times the STLC value are likely hazardous, because no WET test was performed, the samples cannot be conclusively declared hazardous. Based on the elevated metal concentrations, the report created contour maps showing delineated zones where metal concentrations exceeded "background concentrations." The barium, chromium, and lead concentration isoline figures are shown as Figures 2-2 through 2-4 below. There are no TTLC or STLC standards for BTEX (Appendix A, Table A-1).

Comparison to Ecological Criteria

Multiple samples for lead, chromium, and arsenic exceeded both the ER-M and ER-L ecological criteria thresholds at all sampling depths (Appendix A, Table A-2). It is important to note, however, that marine sediments often exceed the arsenic criteria thresholds due to elevated ambient arsenic levels.

Comparison to Human Health Criteria

Multiple lead, arsenic, and vanadium samples exceeded the ESLs (Appendix A, Table A-3) for all sampling depths. BTEX constituents (specifically toluene and xylene) were detected in two locations (one on the Central LCWA, and one in Zedler Marsh). No concentrations of BTEX exceeded ESL thresholds.

Conclusion

The Phase I investigation showed exceedances across all criteria categories for the metal constituents at each of the sampling depths. While metal concentrations could not conclusively be declared hazardous, multiple samples were above ecological criteria and human heath criteria. If further testing confirms these results, sediments may need to be remediated or removed from the site before restoration can occur. Signal Hill Petroleum is responsible for soil remediation in this area.

Following the Phase I investigation, International Technology Corporation recommended a revised Phase II exploration program, with the primary objectives of corroborating low metal concentrations in samples from greater depths determining vadose zone soils and possible hazardous organics, and determining hazardous material concentrations in groundwater. The Phase II Investigation was performed in 1991 and is detailed in Section 2.3.4.

SOURCE: International Technology Corporation

Figure 2-2
Barium Concentration Isolines

SOURCE: International Technology Corporation

Figure 2-3
Chromium Concentration Isolines

SOURCE: International Technology Corporation

Figure 2-4
Lead Concentration Isolines

2.3.2 Results of the Phase 1 1988 Earth Technology Corporation Site Investigation at Texaco Bryant Lease

Earth Technology Corporation performed a soil and groundwater sampling investigation on the eastern bank of the San Gabriel River within the Texaco-Bryant lease property (the Central LCWA, Isthmus LCWA, Zedler Marsh, and Isthmus Bryant sites). The Earth Technology Investigation occurred following the removal of a 404-gallon concrete sump that had stored crude oil, lubricating oil, and rainwater. The Los Angeles County Department of Public Works (LACDPW) issued a permit to close the sump in 1987 and required soil and groundwater sampling around the former sump. In 1988, boreholes were drilled around the former sump location and sediment samples were taken every 5 feet (Figure 2-5). Two boreholes were converted to groundwater monitoring wells; the results of the groundwater sampling are discussed in Section 3.1.

The sampling tested soil samples for total petroleum hydrocarbons (TPHC) at varying depths below ground surface. Tables showing the results of the sediment sampling during the Phase 1 1988 investigation can be found in Appendix A (Tables A-4 and A-5).

Comparison to Hazardous Waste

There are no TTLC or STLC standards for BTEX or TPHC.

Comparison to Ecological Criteria

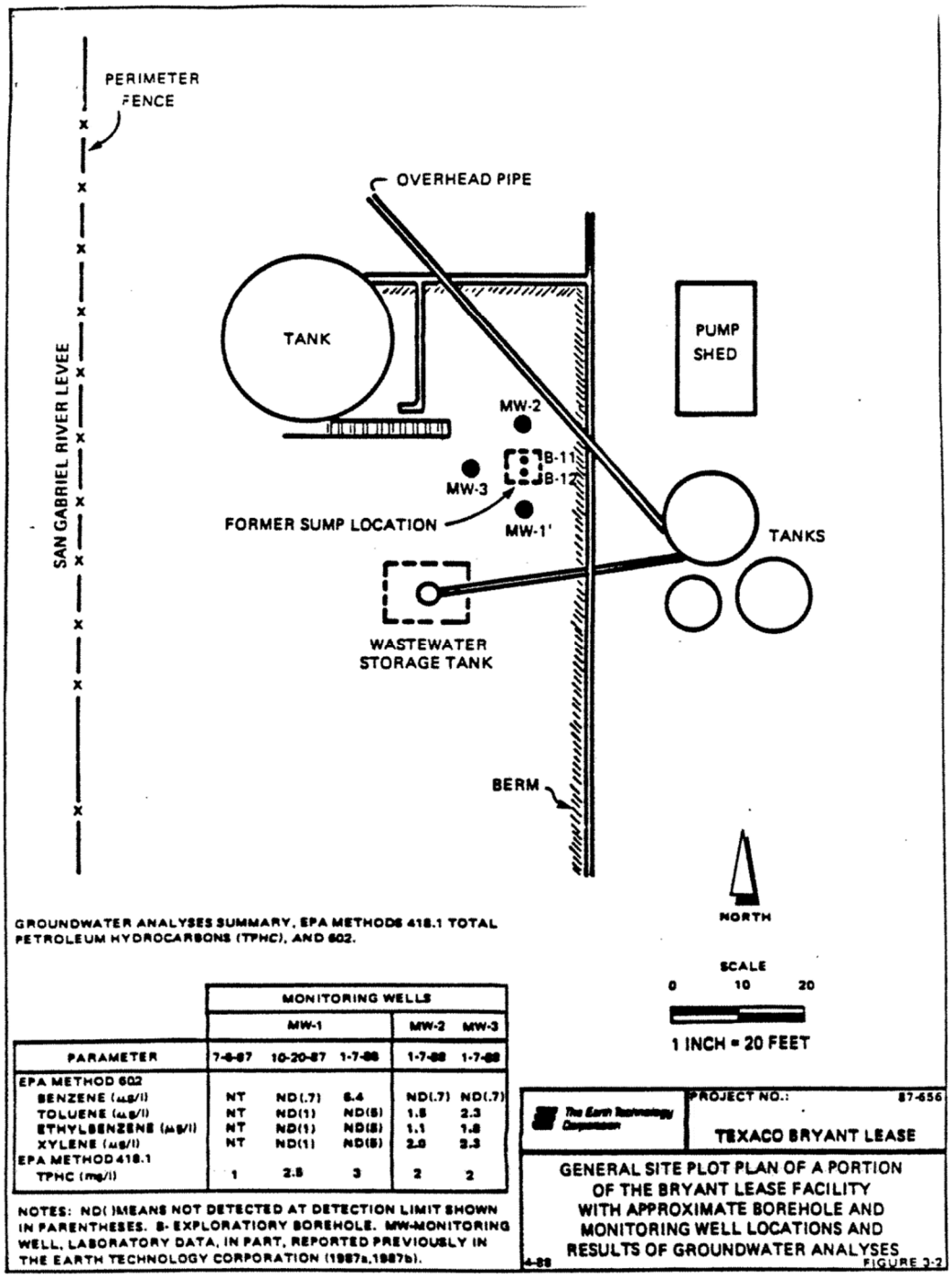
There are no defined ER-L or ER-M values for BTEX or TPHC.

Comparison to Human Health Criteria

Two soil samples exceeded the ESL TPHC standard of 100 mg/kg for gasoline and diesel constituents (3,300 mg/kg and 320 mg/kg).

Conclusions

There are no hazardous waste or ecological criteria for BTEX and TPHC, but both gasoline and diesel constituents exceeded the human health criteria in two samples. Based on the elevated concentrations of hydrocarbon in both soil and groundwater found during the 1988 sampling, Earth Technology proposed further soil and groundwater sampling to delineate the extent of contamination at the site. This additional sampling was completed in 1989 by Engineering Enterprises, Inc. (EEI) (Section 2.3.3) and in 1991 by CDM (Section 2.3.4). Signal Hill Petroleum is responsible for any site cleanup.



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SOURCE: The Earth Technology Corporation 1988

Figure 2-5
1998 Earth Technology Corporation Site Investigation Soil Sample Location Map

2.3.3 Results of the 1989 Engineering Enterprises, Inc. (EEI) Environmental Assessment

EEI performed soil sampling and analysis on 55 samples collected between March and April 1989 in Central LCWA, Isthmus LCWA, Isthmus Bryant, and Zedler Marsh sites. The investigation evaluated semi-volatile compounds (SVOCs), TPHC, and total fuel hydrocarbons, and used the GC-FID response following EPA Method 8015 protocol to estimate BTEX.

Comparison to Hazardous Waste Criteria

There are no TCLP or STLC for BTEX, SVOCs, or TPHC.

Comparison to Ecological Criteria

There are no ER-L or ER-M criteria for BTEX, SVOCs, or TPHC.

Comparison to Human Health Criteria

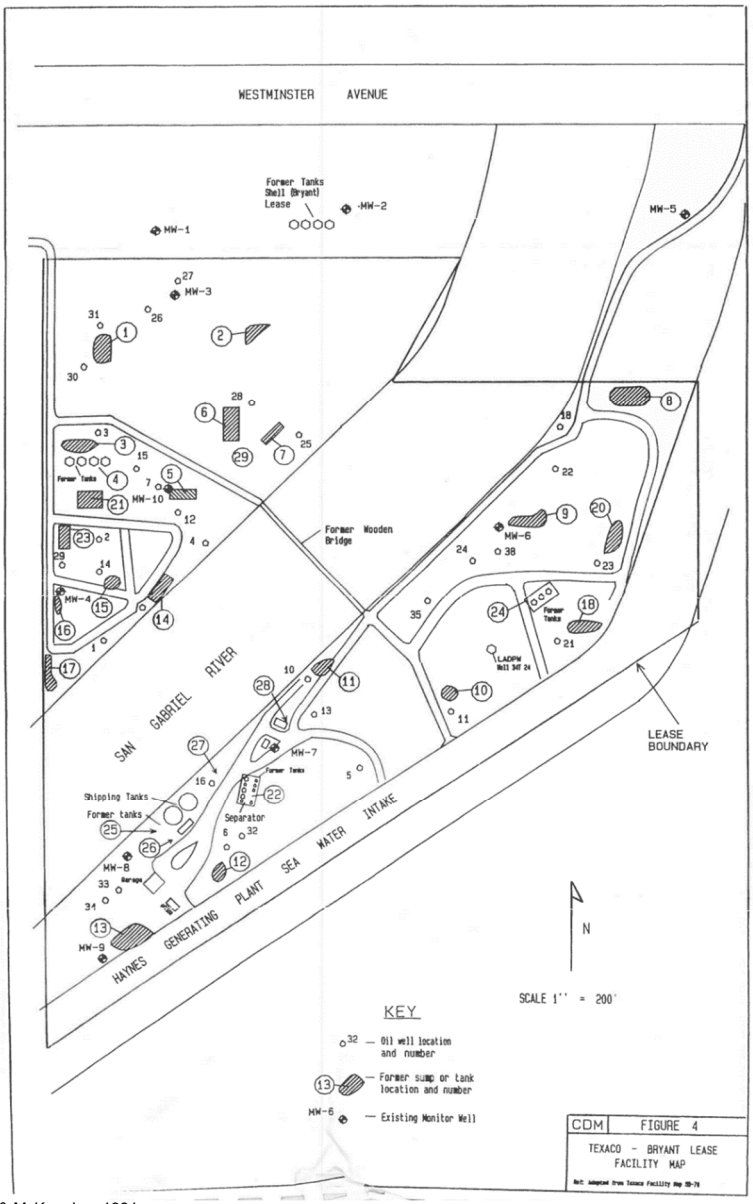
While most of the chemical screening values were below the level of concern for human health, there was at least one sample that exceeded ESL residential thresholds for benzene, toluene, ethyl benzene, and xylenes (Appendix A, Table A-6). EEI noted that elevated hydrocarbon levels were primarily limited to shallow samples in the eastern portion of the property (Isthmus Bryant). The highest concentration of TPHC was 189,568 mg/kg, which greatly exceeds the ESL standards of 100 mg/kg for gasoline, solvents, and diesel.

Conclusion

The results of the 1989 EEI analysis showed elevated levels of hydrocarbons in the shallow soils, most notably on the Isthmus Bryant area. All but one of the samples were below the human health criteria for BTEX, SVOCs, and TPHC, which is the most conservative criteria (no hazardous waste or ecological criteria exist for BTEX, SVOCs and TPHC). Hydrocarbon concentrations were found to decrease rapidly with depth. EEI concluded that the eastern portion of the site had elevated total petroleum hydrocarbon concentrations, “of limited lateral and vertical extent.” The report further determined that some remediation activity would be necessary, though EEI did not determine the remediation activities or associated costs. Further analysis could inform necessary remediation prior to restoration.

2.3.4 Results of the 1991 Camp Dresser & McKee Inc. Phase II Environmental Assessment

In 1991, CDM took soil samples at 25 former sumps and 4 former tank farms within the Texaco Bryant Lease Oilfield (Central LCWA, Isthmus LCWA, Isthmus Bryant, and Zedler Marsh Area, Figure 2-6) as part of the Phase II Environmental Assessment. TRPH concentrations greater than 1000 mg/kg were found at 16 of the 25 former sump areas, and 1 of the 4 former tanks farms. Camp Dresser & McKee estimated approximately 15,000 cubic yards (cy) were contaminated with TRPH at concentrations greater than 1,000 mg/kg.



SOURCE: Camp Dresser & McKee, Inc. 1991

Figure 2-6
1991 Camp Dresser & McKee Inc. Soil Sample Location Map

Comparison to Hazardous Waste Criteria

There are no federal or state guidelines or regulations for TRPH. However, the report mentions that "the Los Angeles Regional Water Quality Control Board (LARWQCB) notes that petroleum hydrocarbon contaminated soils should be bio-remediated to acceptable levels as determined by the Executive Officer, but not exceeding 1,000 ppm (mg/kg)." Of the 71 total TRPH samples, 60 exceeded 1000 mg/kg (Appendix A, Table A-7).

In addition to TPRH, the assessment also evaluated metal concentrations. There were six locations with elevated metal concentrations (greater than 10 times STLC limits), but the subsequent WET extraction test showed that all of the samples were below the STLC limits with the exception of one soluble lead concentration, which was equal to the STLC thresholds of 5 mg/kl.

Comparison to Ecological Criteria

Multiple samples of arsenic, copper, lead, mercury, nickel, and zinc exceeded the ER-L thresholds. One sample of nickel exceeded the ER-M criteria (Appendix A, Table A-8).

Comparison to Human Health Criteria

ESL human health criteria were exceeded for arsenic and lead (Appendix A, Table A-9).

Treatability Studies

Camp Dresser & McKee performed a bio treatability study to determine the potential of soils to be treated through biodegradation. The study found that biodegradation of petroleum hydrocarbon-containing soils was feasible at the site and recommended a further pilot study to determine the time requirements.

Conclusion

The 1991 study showed multiple samples throughout the site that exceeded hazardous waste, ecological, and human health criteria. Note that the CDM investigation only took samples at former sump and tank farm locations, where constituent concentrations may be higher than other locations. These elevated concentrations may limit the suitability of placement or disposal if no additional remediation occurs. Based on the investigation, CDM estimated approximately 15,000 cubic yards of soil with TRPH concentrations greater than 1000 mg/kg. This concentration exceeds the TRPH criteria guidance outlines by the LARWQCB and if further testing confirms these elevated levels, sediments may need further remediation or removal prior to restoration. The positive results of the bio treatability study indicate that biodegradation may be a suitable remediation option to reduce the concentration of petroleum hydro-carbons on on-site soils.

2.3.5 Results of the 2004 Anchor Hellman Ranch (South LCWA) Soil and Groundwater Sampling

In 2003 and 2004 Anchor Environmental L.L.C. did a soil and groundwater investigation on the Hellman Ranch Property (South LCWA Site) to sample for metals, semi-volatile organics (PAHs, PCBs), volatile organics, TPH(diesel), and TPH(gas), including benzene, toluene, ethyl benzene, and xylenes/methyl-t-butyl ether (BTEX/MTBE). The soil sampling focused on 12 former sumpareas (nineteen borings) and “open”/non –sump areas (fourteen borings).

Anchor designed the soil and groundwater investigation field plan to both fill data gaps not addressed by earlier soil sampling and to evaluate the vertical and lateral extent of potential contamination to inform the placement and or remediation of existing soil for future restoration alternatives. To assess the vertical extent, composite soil samples were taken from the surface to

2 feet below ground surface and +1 to -1 mean lower low water (MLLW). Anchor notes that these intervals were chosen to assess contaminants that could be exposed in placement as wetland/upland material, and noted that if the ground surface elevation of a sampling location was at approximately +1 MLLW, only one composite sample to 2 feet below ground surface was taken.

Comparison to Hazardous Waste Material

Soil sampling in 2004 found the mean and maximum concentration of lead, 4,4”-DDE, 4-4”-DDT, and chlordane to exceed either the TTLC or ten times the STLC (Appendix A, Table A-10). No WET extraction test was performed.

Comparison to Ecological Criteria

Soil sampling found multiple analytes in exceedance of ER-L and ER-M criteria (Table B-11). Metals that exceeded ER-L thresholds included arsenic, copper, lead, mercury, nickel, zinc. Metals in exceedance of ER-L thresholds (arsenic, mercury, selenium) were found in both subsurface and surface samples both within sumps and in open areas. Organochloride pesticides found in exceedance of ER-L criteria were 4,4’-DDD, 4,4’-DDE, 4,4’-DDT, chlordane, and dieldrin. Though no high molecular weight PAHs were found at concentrations above ER-L limits, four lower weight PAHs (acenaphthene, flourene, naphthalene, and phenanthrene) were found above ER-L values. The maximum concentrations of lead, mercury, 4,4’-DDT, and chlordane across all samples also exceeded ER-M criteria. Figure2 2-7 through 2-9 show the locations where samples exceeded ER-L concentrations; though high levels of metals and pesticides were found throughout the site, PAH concentrations in exceedance of ER-L were limited to sumps.

Comparison to Human Health Criteria

The mean concentration across all samples of arsenic, chromium, 4,4’-DDE, chlordane, and dieldrin in exceedance of the ESLs. At least one sample also exceeded ESL criteria for benzo(a)pyrene, heptachlor epoxide, and 4,4’-DDD (Appendix A, Table A-12).

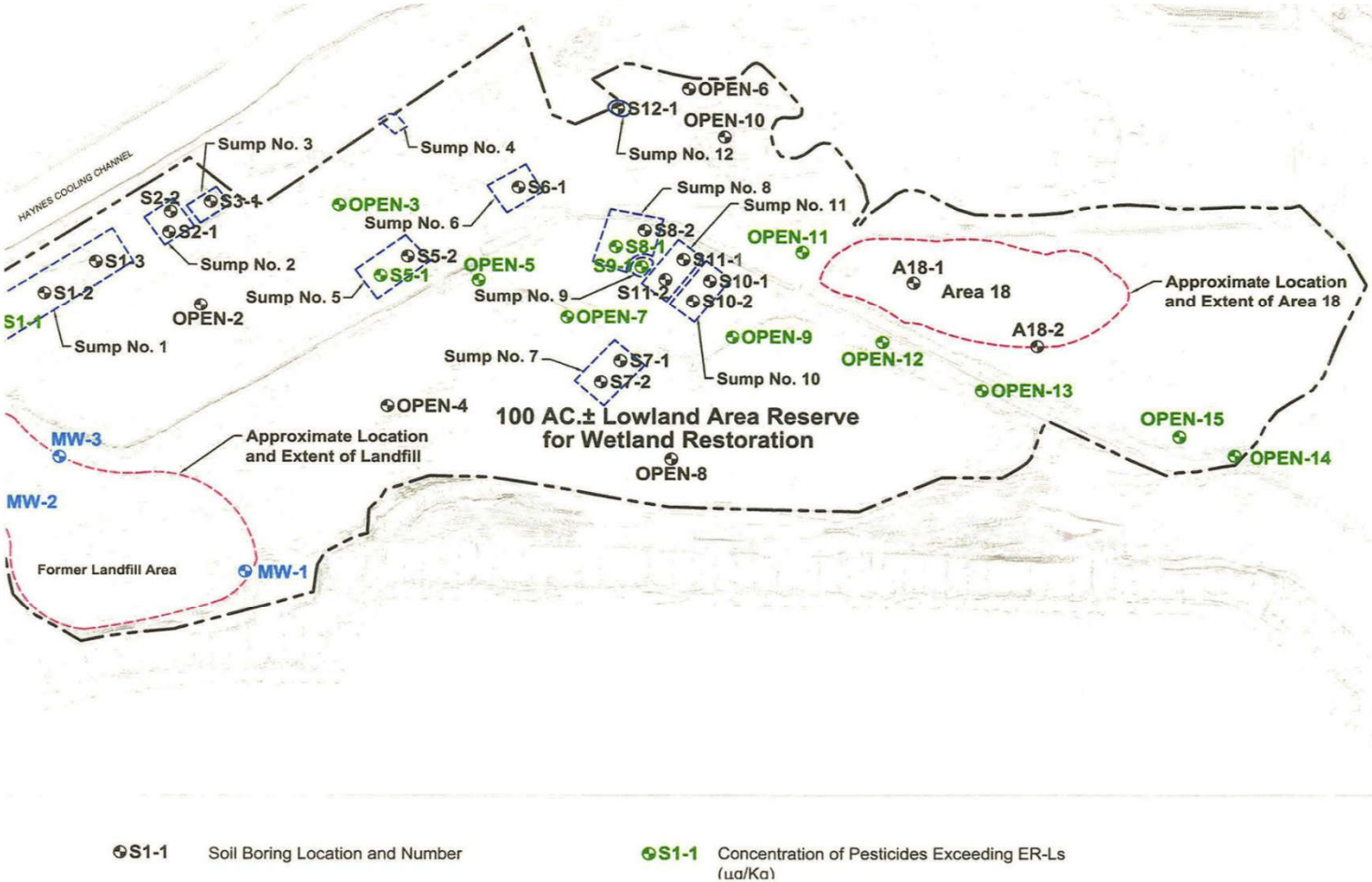
Comparison of Sampling Location and Depth

Statistical analyses related sampling location (sump or open) and depth (surface of subsurface) to analyte concentrations. An Analysis of Variance (ANOVA) was used to test whether any constituent was more likely to occur in a sump versus an open area. Results from the analysis indicated that elevated concentrations of PAHs, which are associated with crude oil, were significantly more likely to occur in sump zones than open areas. The location of elevated concentrations of TRPH, metals, pesticides, and PCBs were not statistically significant between sumps and open areas.

Comparison to Background Metal Concentrations

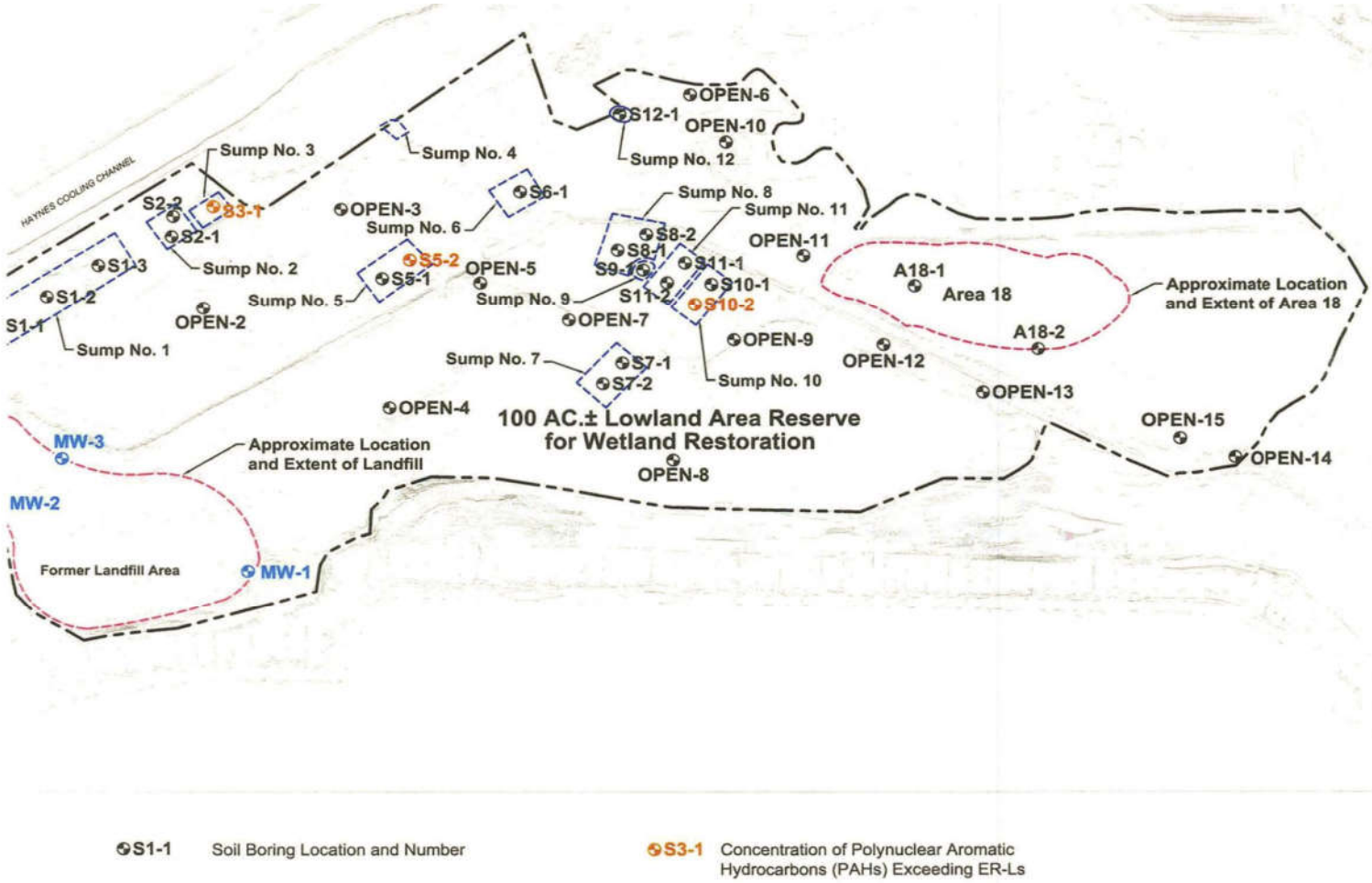
Metals naturally occur in marine sediment and soils; it is important to understand whether high observed metal concentrations are due to natural processes or the result of prior land use. To identify levels caused by anthropogenic activities, Anchor compared metal concentrations at the South LCWA property to background metal concentrations in typical California soils (Table 2-2).

The findings indicate that samples on the site with elevated concentrations of lead, arsenic, and selenium were generally above benchmark concentrations, but that chromium, copper, mercury, nickel, silver, thallium, and zinc were all within normal background concentration ranges.



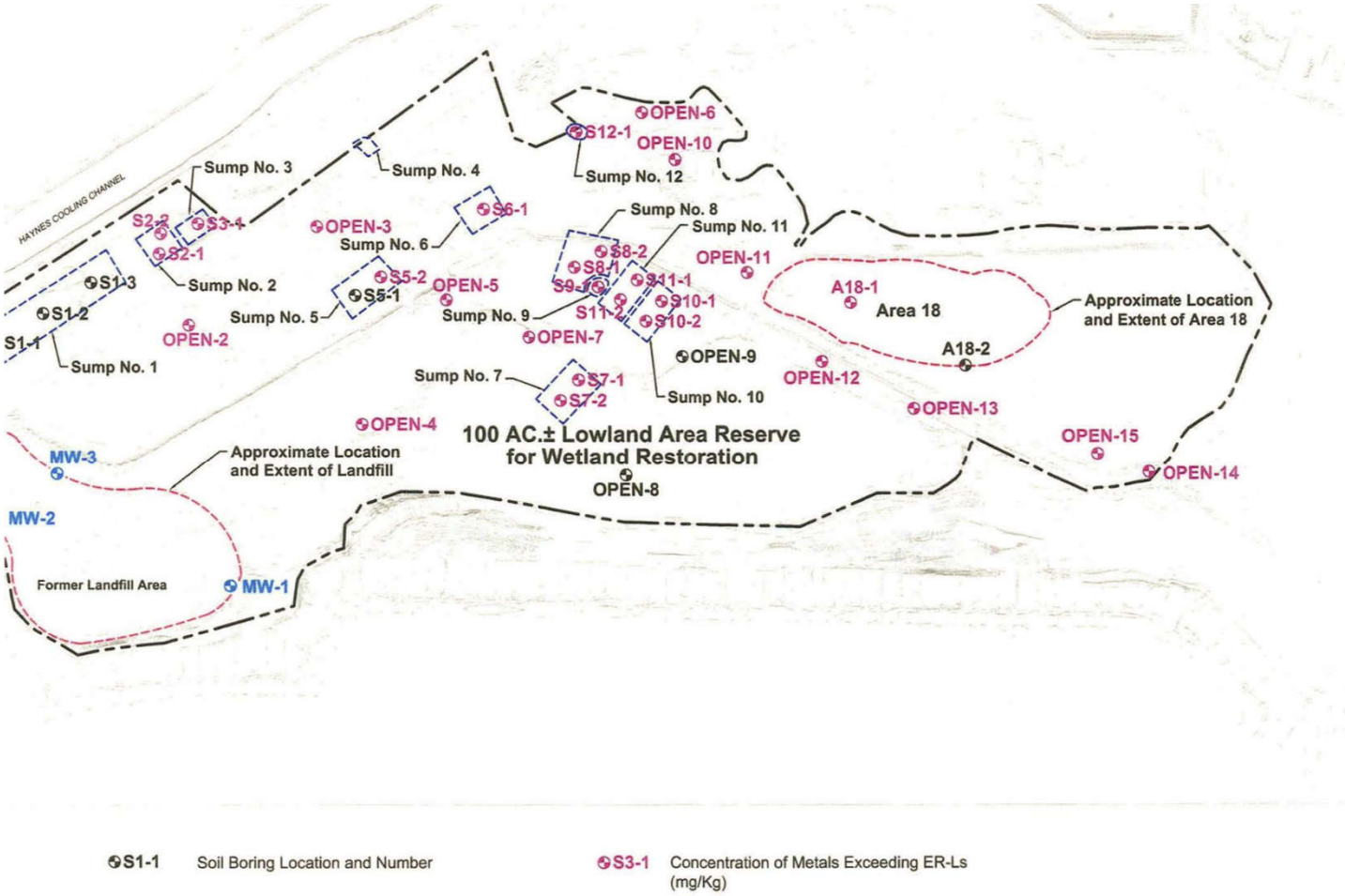
SOURCE: Anchor 2004

Figure 2-7
Concentrations of Pesticides Exceeding ER-Ls



SOURCE: Anchor 2004

Figure 2-8
Concentrations of PAHs Exceeding ER-Ls



SOURCE: Anchor 2004

Figure 2-9
Concentrations of Metals Exceeding ER-ls

TABLE 2-2
COMPARISON OF SOUTH LCWA SAMPLING (2004) TO BACKGROUND CONCENTRATIONS

	South LCWA Samples		Benchmark California Soils	
Analyte	**Mean Concentration (mg/kg)**	**Max Concentration (mg/kg)**	**Mean Concentration (mg/kg)**	**Max Concentration (mg/kg)**
Arsenic	**7.9**	**40**	3.5	11.0
Chromium (Total)	32.1	57.6	122.0	1579.0
Copper	**31.3**	65.5	28.7	96.4
Lead	**30.1**	**240.0**	23.9	97.1
Mercury	0.2	0.9	0.3	0.9
Nickel	24.9	49.1	57.0	509.0
Selenium	**0.4**	**1.3**	0.1	0.4
Silver	0.1	0.2	0.8	8.3
Thallium	0.2	0.5	15.7	36.2
Zinc	94.4	207.0	149.0	236.0

Note: Bold values in the table indicate concentrations above background metal concentrations in typical California soils

Correlation Analysis

Anchor evaluated the correlation of TRPH contaminated soils with different constituents. The strongest correlation found was between TRPH and PAHs and TRPH and lead (r = 0.41 and r=0.36). The study did not find a correlation between arsenic, mercury, and selenium and petroleum hydrocarbons.

Conclusion

Soil sampling at the South LCWA property showed exceedances of hazardous waste, ecological, and human health criteria for multiple constituents. Anchor found that the results of the 2004 sampling "raise issues in regards to potential contaminants that may interfere with the biological success of wetland creation and upland restoration at Hellman Ranch [South LCWA]." In particular, Anchor expressed concern that the metal concentrations above ER-L for both surface and subsurface soils, pesticide concentrations above ER-L values, and free-product petroleum contamination. Anchor recommended that a site-specific Ecological Risk Assessment be conducted to determine the potential ecological risks associated with restoration of the LCW site. This has not been done, to date. Further investigation of soils at the South LCWA property can better inform the steps necessary to ensure suitability prior to restoration.

2.3.6 Results of the 2014 Pacific Coast Environmental Conservancy (PCEC) Geotechnical Assessment

The Pacific Coast Environmental Conservancy (PCEC) performed an analysis of PAHs, PCBs, and pesticides in the Zedler Marsh and State Lands Parcel in 2014. PCEC evaluated contamination levels at 8 sampling locations within the Zedler Marsh and 2 within the State Lands Parcel. Sampling and contaminant evaluation was done at approximately 6 inches below

the ground surface. The investigation analyzed the sediment samples for 25 different PAHs, 54 PCBs, and 30 chlorinated pesticides.

Comparison to Hazardous Waste Criteria

No samples exceeded TTLC or STLC standards.

Comparison to Ecological Criteria

Two samples found sediment concentrations above ER-M thresholds for acenaphthene and flourene. No samples exceeded ER-M thresholds.

Comparison to Human Health Criteria

Analysis of PCB concentrations for all ten samples indicate levels "well below normal ranges," based on the LARWQCB standards, for the 54 congeners of PCBs tested. The majority of samples had concentrations below the detection threshold. The PCH analysis returned samples that exceeded ESL thresholds for the following constituents: benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, and pyrene.

The investigation also compared current (2014) PAH concentrations to samples taken in approximately the same location from a Texaco 1995 study. Table 2-3 below compares the concentrations of TRPH from 1995 to the highest concentration PAH found during the 2014 sampling at the closest sampling locations. Sampling for chlorinated pesticides similarly resulted in many non-detections, with only two samples exceeding the ESL thresholds for dieldrin. All other samples were either not detected or below human health criteria levels.

TABLE 2-3
COMPARISON OF PAH CONCENTRATIONS IN 1995 AND 2014

2014 Sample	2014 Concentration (ppb)	1995 Sample	1995 TRPH Concentration (ppb)
ZM1	111.8	#4	25,600,000
ZM2	139.1	Sump #5	39,400,000
ZM3	11.7	Sump #10	50,000
ZM4	19.1	Sump #11	14,600,000
ZM5	1.7	Sump #18	5,100,000
ZM6	3.8	Sump #21	50,000
ZM7	4.9	#24	10,600,000
ZM8	130.5	Sump #23	6,200,000
SLP9	7.6	Sump #14	24,300,000
SLP10	19.7	#25	16,200,000

Conclusion

Though sampling did find a few samples that exceeded both ER-M and human health criteria, the study found that the concentrations of PAHs, PCBs, and pesticides found at Zedler Marsh and the State Lands Parcel "do not require remediation" prior to the restoration of the site. The data showed that PAHs in the area had been reduced significantly from the study performed by Texaco in 1995. This could be attributable to vegetation at the marsh, which may encourage degradation of PAHs. The study indicated that "Zedler Marsh and the State Lands Parcel are prime candidates for plant community restoration activities." The report recommended maximum vegetation cover for the restoration. Significant decreases in PAH levels at Zedler Marsh are encouraging, as they may indicate reduced constituent concentrations across the program area since the results of the previous sampling efforts.

SECTION 3
Groundwater Quality Within the Program Area

The following Section provides an overview of three groundwater sampling investigations that have occurred within the program boundaries.

3.1 Results of the Phase 1 1988 Earth Technology Corporation Site Investigation at Texaco Bryant Lease

Earth Technology Corporation performed a soil and groundwater sampling investigation on the eastern bank of the San Gabriel River within the Texaco-Bryant lease property (the Central LCWA, Isthmus LCWA, Zedler Marsh, and Isthmus Bryant locations). Groundwater sampling evaluated TPHC and BTEX concentrations at three monitoring wells. Floating hydrocarbons (a floating layer of viscous crude oil) of approximately 1/8" thickness were found during sampling of monitoring well 1, and a sheen on the groundwater surface was noted during sampling at monitoring well 3.

Two groundwater samples exceeded the human health based groundwater ESL for benzene and ethyl benzene (Appendix A, Table A-4 and Table A-5). Based on the elevated concentrations of hydrocarbon in both soil and groundwater found during the 1988 sampling, Earth Technology proposed further groundwater sampling to delineate the extent of contamination at the site.

3.2 Results of the 1989 Engineering Enterprises, Inc. (EEI) Environmental Assessment

Engineering Enterprises, Inc. (EEI) performed groundwater sampling at ten different wells between March and April 1989 in the Central LCWA, Isthmus LCWA, Isthmus Bryant, and Zedler Marsh areas. The groundwater investigation yielded sixteen groundwater samples, which were evaluated for SVOCs, total fuel hydrocarbons, and BTEX using EPA Methods 8015 (modified) and 418.1. Six groundwater samples showed elevated concentrations of TPHC (ranging from 3,700 – 32,000 microgram/liter [ug/L]). Three samples had total fuel hydrocarbons greater than 250 ug/L, with the highest sample showing a concentration of 22,021 ug/L. At least one sample also exceeded ESL standards for BTEX.

The groundwater analysis found slightly elevated levels of TPHC in some of the sample wells. There were no samples with detectable levels of SVOCs. EEI concluded that the eastern portion of the site had elevated total petroleum hydrocarbon concentrations, "of limited lateral and vertical extent." The report further determined that some remediation activity would be necessary, though EEI did not determine the remediation activities or associated costs.

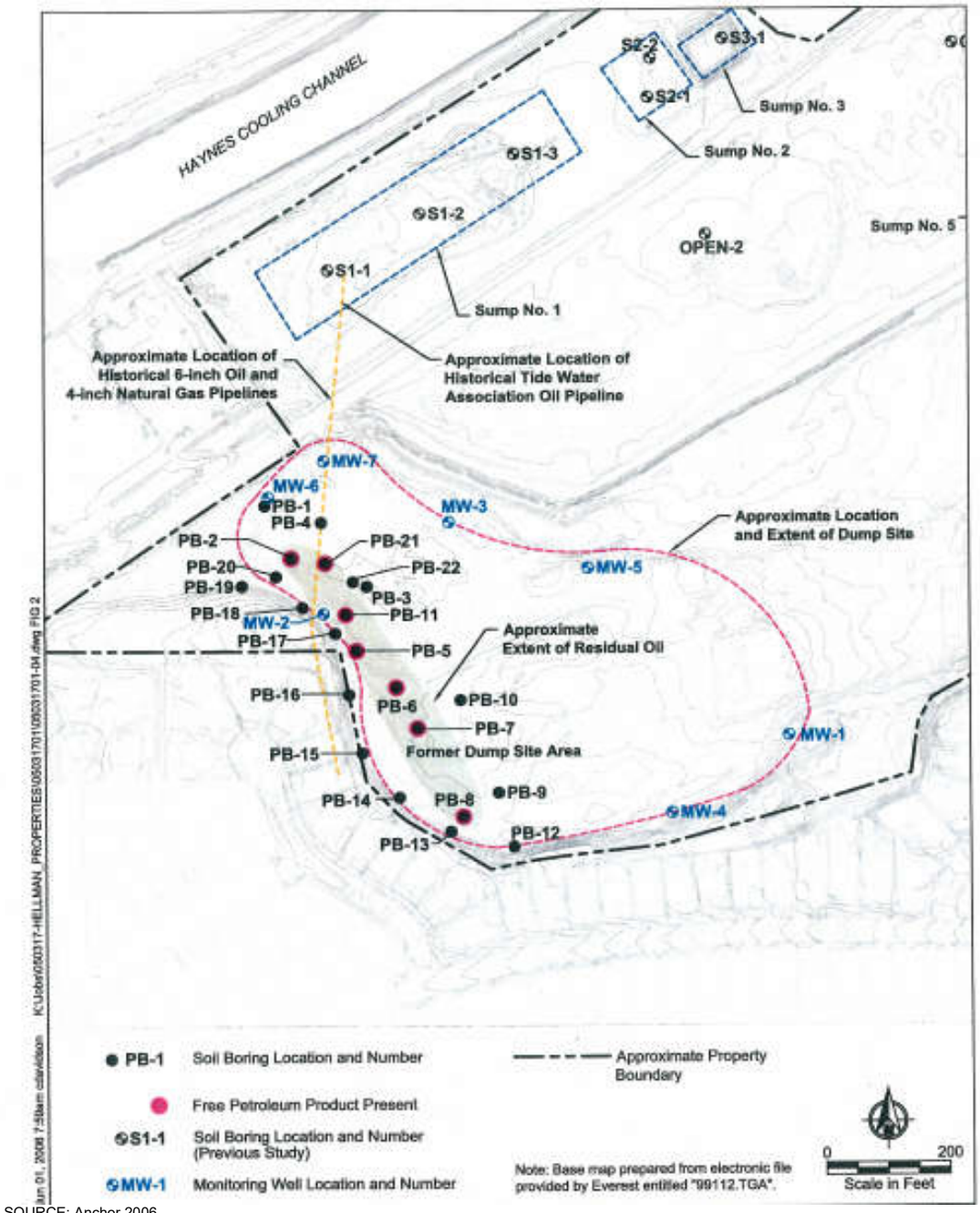
3.3 Results of the 2006 Hellman Ranch (South LCWA) Groundwater Sampling

In 2006, as a follow-up to their 2004 LCWA Phase II Soil and Groundwater Sampling, Anchor collected groundwater samples at seven different monitoring wells located on the Hellman ranch (South LCWA) property (Figure 3-1). The sampling aimed to characterize the former dump site materials, define the lateral extent of the crude oil plume found in the 2004 monitoring, identify the potential and likely sources of crude oil, characterize the groundwater flow, and analyze the contaminants of concern and their ability of migrating to potential receiving waters.

Anchor determined the approximate extent of the crude oil: a 100 foot by 500-foot area on the Southwestern portion of the property (Figure 3-1) and determined that the likely source was a former 6-inch oil and gas line that ran along the border of the contaminated area.

To assess groundwater quality, samples were tested for volatile organic compounds, polycyclic aromatic hydrocarbons, semi volatile organic compounds, dissolved metals, and common cations and anions and compared to the most stringent California Toxics Rule Standards. In general, the samples were below the Toxic Rule Standards, though there were exceedances for benzene, bromodichloromethane, 1,2,-dichlorethane, chrysene, benzo(a)pyrene, copper, and silver. Additionally, the sampling found crude-oil at one of the monitoring wells.

Given the zone of the approximated crude oil contamination and constituent results, Anchor recommended that “future restoration plans should minimize disturbance of groundwater flow gradients in this area.”



SOURCE: Anchor 2006

Figure 3-1
Groundwater Sampling Locations

SECTION 4
Water and Sediment Quality in the Channels

The water and sediment quality data summary presented in this section will be used to assess the potential impact from the following inflows to the restored areas:

- **Los Cerritos Channel** –The Los Cerritos Channel drains approximately 27 square miles of densely urbanized land east of Long Beach. The open-channel is concrete lined and acts as a conduit for freshwater. Tides influence the channel up until Anaheim Road, which is upstream of the LCW.
- **San Gabriel River** –The San Gabriel River (SGR) Watershed covers approximately 690 square miles and is located in Los Angeles and Orange Counties. The watershed drains predominantly urbanized areas. The Lower SGR is broken into two reaches: Reach 1, a concrete-lined channel that stretches from the SGR Estuary to Firestone Boulevard, and Reach 2, which extends from Firestone Boulevard upstream.
- **Haynes Cooling Channel** –The Haynes Cooling Channel is operated by the City of Los Angeles Department of Water and Power. It is an intake that draws water from the Alamitos Bay Haynes Generating Station and discharges to the San Gabriel River. The Haynes Generating Station's various units came in-service between 1962-2005 (TetraTech 2008). Once-through cooling will cease by 2029 (Propes 2019).
- **Alamitos Bay-** The Alamitos Bay drains approximately 5.7 square miles. Alamitos Bay is a recreation facility built in the 1930s and currently used for boating, water skiing, and jet skiing.
- **Urban Runoff and Stormwater** – Urban runoff and stormwater discharge into the program area from various locations. Stormwater from the developed area north of 2nd Street discharges into the North and Central Areas. Stormwater from the Marketplace as well as from areas west of the Pacific Coast Highway also discharges into the North and Central Areas. The developed area south and east of the South Area discharge stormwater into the South Area.

4.1 Los Cerritos Channel

4.1.1 Water Quality

Historically, dry weather flows from the Los Cerritos Channel exceed copper water quality objectives from the State Water Quality Control Board and Regional Basin Plan. Data from wet-weather flows indicated exceedances for copper, lead, and zinc. In response to these exceedances, a Total Maximum Daily Load (TMDL) was developed to address impairments in the water column in Los Cerritos Channel for copper, lead, selenium, and zinc. The TMDL set numeric targets based on the water quality criteria contained in the California Toxics Rule (CTR). In addition to metals, the Los Cerritos Channel is listed under the Clean Water Act Section 303(d)

for ammonia, phthalate, chlordane, metals, coliform bacteria, and trash. Table 4-1 lists the impairments and anticipated TMDL completion dates for the Los Cerritos Channel pollutants.

TABLE 4-1
LOS CERRITOS CHANNEL TMDL

Pollutant	Anticipated TMDL Adoption Date
Ammonia	1/1/2019[1]
Bis(2ethylhexyl)phthalate (DEHP)	1/1/2019[1]
Chlordane (sediment)	1/1/2019[1]
Coliform bacteria	1/1/2019[1]
Metals (copper, lead, zinc)	USEPA TMDL Adopted on 3/17/2010
Trash	1/1/2019[1]

Source: Everest 2012
[1] No updated TMDLs have been adopted according to the California Waterboard's Website as of May 2019

Monitoring conducted as part of the Los Cerritos Channel Watershed Management Program found that between 2011 and 2013 copper and zinc concentrations upstream of the program boundaries exceeded the metals TMDL limit, while lead was under the limit (RWA 2017). The program conducted monitoring at the Los Cerritos Channel Stearns Street mass emission site over 13 years and found a relatively small list of constituents of concern. Long-term trends suggest that lead and zinc concentrations have been decreasing, but copper concentrations have remained steady. The monitoring found that fecal indicator bacteria was generally elevated, with concentrations increasing during storm events. Additionally, pyrethroid pesticides were found to be at concentrations that produce a toxic response in some bioassay species during storm events, but in general, there has been a trend of reduced toxicity in bioassay testing.

4.1.2 Sediment Quality

The Metals TMDL for the Los Cerritos Channel was approved by the EPA on March 17, 2010. Constituents in the water column are carried with suspended sediment in storm flows from the watershed to the estuary, where sediments often settle out at the fresh water and salt water interface. Constituents that include PAHs and pesticides (such as chlordane) are hydrophobic and will adsorb to sediment particles carried by storm flows. Metals can also be present in the dissolved phase within the water column or adsorbed to sediment particles that may be carried during storm event down to the estuary. The water quality of storm flows from the watershed has direct effects on the quality of sediments within the estuary. Adoption of the TMDL will set a strategy for reducing potential impacts to the program as the TMDLs are anticipated to be adopted in 2019.

4.2 San Gabriel River

4.2.1 Water Quality

The San Gabriel River and its associated tributaries exceed water quality objectives (which are based on beneficial uses and CTR values) for a number of constituents. Coyote Creek, which converges with the San Gabriel River just upstream of the program area, is listed under Section 303(d) for diazinon, coliform bacteria, pH, toxicity, copper, lead, and zinc. The San Gabriel River Estuary is listed for copper. The Lower San Gabriel River Watershed Management Program (WMP), a multi-jurisdictional planning document, has found that the municipal separate storm sewer systems (MS4s) contributes significantly to the metal loading rates found in the San Gabriel River during dry-weather flow events. This is attributed to high metal concentrations in urban runoff. Table 4-2 shows the 303(d) impaired waters and pollutant for the Lower San Gabriel River watershed and the anticipated TMDL dates.

TABLE 4-2
303(D) IMPAIRED WATERS AND POLLUTANTS FOR THE LOWER SAN GABRIEL RIVER WATERSHED

Water Body	Pollutant and TMDL Adoption Date (or Anticipated Date)
Coyote Creek	Ammonia (Timeline N/A) Cynide (Timeline N/A) Copper (TMDL completed 3/27/2007) Diazinon (1/1/2019)[1] Coliform Bacteria (1/1/2009)[1] Lead (TMDL completed 3/27/2007) pH (1/1/2019)[1] Toxicity (1/1/2009)[1] Zinc (TMDL completed 3/27/2007)
Coyote Creek, North Fork	Indicator Bacteria (1/1/2012)[1] Selenium (1/1/2021)
San Gabriel River Reach 2	Coliform bacteria (1/1/2011)[1] Cynide (1/1/2021) Lead (TMDL completed 3/27/2007)
San Gabriel River Reach 1	Ammonia (timeline N/A) Coliform bacteria (1/1/2019)[1] pH (1/1/2019)[1] Copper
San Gabriel River Estuary	Copper (TMDL completed 3/27/2007)

Source: Everest 2012, SGR 2015
1. No updated TMDLs on California Waterboard's Website as of May 2019

The WMP identifies and classifies pollutants into three categories which helps identify water quality priorities.

- Category 1: Waterbody pollutant combinations for which water quality-based effluent limitations and/or receiving water limitations are established in TMDL Provisions and the MS4 Permit

- Category 2: Pollutants for which data indicate water quality impairment in the receiving waters according to the State Board's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d)
- Category 3: Pollutants for which there are insufficient data to indicate water quality impairment in the receiving water according the State's Listing policy but which exceed applicable receiving water limitations.

Copper, lead, zinc, selenium, bacteria, ammonia, cyanide, diazinon, PAHs, mercury, nickel, chloride, pH, toxicity, total dissolved solids, and lindane are all listed as Category 1 or Category 2 constituents in the WMP. The WMP also provides numerical water quality objectives for each of the Category 2 pollutants. These objectives are based on a variety of sources, including the Basin Plan, CTR values, the California Department of Fish and Game, and National Toxics Rule (NTR). To address these constituents of concern, the WMP has identified multiple watershed control measures designed to improve water conditions in the SGR.

Trash is another pollutant on the San Gabriel River. The City of Seal Beach estimated 3,000 – 10,000 cubic yards of trash per year reaches the mouth of the river (City of Seal Beach 2002 as cited in Everest 2012). Trash has been a concern at Zedler Marsh and will likely be an important consideration for the restoration.

Sampling of the San Gabriel River has been conducted in 2005 as part of the Surface Water Ambient Monitoring Program and in 2009-2014 through the Stormwater Monitoring Coalition. Monitoring conducted in 2005-2010 as part of the San Gabriel River Regional Monitoring Program, showed that nutrient and metal levels rarely exceeded basin plan water quality objectives and bacteria concentrations were generally below federal and state water quality objectives. The Southern California Coastal Water Research Project (SCCWRP) conducted a study in 2004 of dry weather water quality in the watershed. SCCWRP also conducted a toxicity study in 2006 and found that toxicity was not widespread in the estuary.

4.2.2 Sediment Quality

Data on the sediment quality of the San Gabriel River was not readily available. However, as discussed in Section 4.1.2, the water quality in the river likely has a significant effect on sediment quality in a channel.

4.3 Haynes Cooling Channel

4.3.1 Water Quality

The Haynes Cooling Channel provides water for the Haynes Generating Station for cooling. The generating station pulls water from the Alamitos Bay, runs it through the generating station, and discharges to the San Gabriel River adjacent to the generating station. The water quality in the Haynes Cooling Channel is expected to be similar to the water quality in Alamitos Bay (see Section 4.4.1). The Haynes Generating Station is undergoing a modernization project that would eliminate the use of ocean water to cool the plant by 2029; once complete, the Haynes Cooling Channel will be decommissioned.

A monitoring report found that concentrations of all priority pollutants in the Haynes Generating Station intake (e.g., water coming from the Haynes Cooling Channel) were low enough to be due to background levels or laboratory testing (City of Los Angeles 2011).

4.3.2 Sediment Quality

No information on the Haynes Cooling Channel sediment quality is available at this time.

4.4 Alamitos Bay

4.4.1 Water Quality

Alamitos Bay is 303(d) listed for indicator bacteria, which is an issue that affects the local beaches as well. No TMDLs have been established for the bay.

The Long Beach Estuary Monitoring Plan (2016) is an Integrated Monitoring Program aimed to assess the effects of MS4s on receiving waters. As part of this plan, the City of Long Beach has set up a monitoring site in the Alamitos Bay (LBR2). Beginning in 2015, three wet-weather and two dry-weather events have been monitored at the Alamitos Bay Site. At this time, data is not publically available.

The County Health and Human Services performs weekly water samples at the Long Beach Beaches, including those in Alamitos Bay. Los Angeles County provides watch conditions based on the monitoring results. Historical monthly monitoring is available through the County's website. According to the Long Beach Estuary Monitoring Plan, beaches in Long Beach (including the beaches at Alamitos Bay) have shown an improvement in bacterial compliance.

Additionally, Heal the Bay, an environmental non-profit, grades the water quality of beaches within the Greater Los Angeles area based on the bacteria sampling performed by the Long Beach Health and Human Services. Heal the Bay has given grades to Alamitos Bay as shown in Table 4-3. Though dry weather grades are generally high, wet-weather grades are consistently poor.

TABLE 4-3
HEAL THE BAY WATER QUALITY GRADES AT ALAMITOS BAY

Year	Summer Dry	Winter Dry	Annual Wet
2017	A	B	F
2016	B	B	F
2015	A+	A	F
2014	A	A	F
2013	B	A+	F
2012	B	A	F
2011	C	F	F
2010	C	F	F

Source: Heal the Bay (2019)

4.4.2 Sediment Quality

As part of the City of Long Beach's NPDES Stormwater Monitoring Program and Beach Bacteria Monitoring, the Belmont Pump Station which feeds stormwater to Alamitos Bay has been monitored from 2000-2015. Sediments within the Los Cerritos Estuary, adjacent to Alamitos, have indicated chlordane, metals, and DDTs in exceedance of ERL and ERM criteria.

4.5 Urban Runoff and Stormwater

4.5.1 Water Quality

The areas of the program that are most affected by urban runoff are the Los Alamitos Retarding Basin Site, Gum Grove Park (on the southeastern side of the South LCWA site), and the Long Beach City Property Site (Everest 2012). Constituents common to urban runoff include metals, bacteriological indicators, and nutrients (Center for Natural Lands Management and Geosyntec 2003, 2005). While data on the local stormwater is not available, similar characteristics can be expected from runoff entering the three locations.

4.5.2 Sediment Quality

Suspended sediment and organic matter in urban runoff attract and provide the mechanism to transport constituents such as heavy metals (copper, lead, zinc), bacteria, pesticides, PAHs, and other organic compounds to receiving waters. These sediments then settle out as velocity decreases when storm flows meet tidal waters or enter into the wetlands.

SECTION 5
Potential Impacts from the Program

The water and sediment quality data summary presented in Sections 2-4 provides the basis to assess the potential impacts from the program on the environment during and following construction of the restoration program. The discussion includes both identification of potential impacts and proposed program mitigation measures that would reduce such impacts. Where additional mitigation measures are needed to address the potential impacts for post-construction operation and maintenance, the discussion references Section 7 (Adaptive Management and Monitoring).

5.1 Impacts During Construction

The following questions should be considered in addressing impacts from the program during construction:

Would construction of the program violate any water quality standards or waste discharge requirements?

What are the potential impacts of sediment migration from the program area during grading activities to adjacent water bodies including the Los Cerritos Channel, the San Gabriel River, and the Haynes Cooling Channel?

What are the potential impacts of contaminated sediment migration from the program area during construction to adjacent water bodies?

The restoration program would require ground disturbance, vegetation removal, and/or grading to restore and enhance the wetlands, and flood management systems. Exposure and removal of topsoil and the underlying sub-soils during construction could generate sediment that, if mobilized by stormwater runoff or runoff from applied water during construction, could deliver sediment-laden runoff and possibly other constituents to the Los Cerritos Channel, San Gabriel River, or Haynes Cooling Channel. Additionally, work within the San Gabriel River to breach the levee would temporarily increase turbidity.

The construction activities for the proposed restoration would be required to comply with the Construction General Permit for the State and the County MS4 Permit required as part of the permitting process. The program would be required to comply with the General Construction and MS4 Permits because more than 1 acre of ground would be disturbed. For work in the San Gabriel River, the program would be required to comply with a Section 401Water Quality Certification. Breaching and lowering of the levee may extend below the water table and could require temporary dewatering. All excavation dewatering would be conducted in accordance with

the General Construction Permit, which ensures discharge water would not be discharged in such a way as to result in direct or indirect degradation of surface water in the San Gabriel River or Alamitos Bay. Compliance with the General Construction Permit, MS4 Permit, and 401 Certification would ensure that the proposed activities would include adequate stormwater protection through Best Management Practices (BMPs) and monitoring, to limit increased turbidity and decreased water quality from sediment and other pollutants leaving the construction site.

What are the potential impacts from on-site sediments placed in a permitted marine placement site?

The program would excavate sediments in certain areas to reach marshplain elevations. Excavated sediment would be used on-site to the extent feasible, but any remaining sediment may be designated for placement in an off-site landfill or in ocean disposal sites at either the Los Angeles (LA-2) or Newport Bay (LA-3) sites. The suitability of on-site excavated sediment for placement at a designated ocean dredged material disposal site would require a Tier III evaluation in accordance with Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual (OTM; U.S. EPA/U.S. Army Corps of Engineers 1991). The Tier III evaluation contains sediment quality standards which are set based on water quality criteria and protection of water quality. Sediment would be placed in an ocean disposal site only if it met the standards of the OTM, therefore, there would be no adverse impact as a result of ocean disposal.

5.2 Impacts Post-Construction

The following questions should be considered in addressing impacts from the program post-construction:

What is the potential impact of site sediments on water quality and biological resources within the created tidal wetlands and uplands?

Based on sampling data summarized in Section 2, it is highly likely that the program area has been impacted from past oil operations. Restoring a site with poor sediment quality could impact the water quality in surrounding water ways and impact the biological resources created as part of the restoration.

Any impacted soils identified during further sampling would be managed and remediated depending on constituent concentrations and regulatory action levels as required by permit. Potential remediation activities could include in-situ treatment/remediation, removal and disposal at a permitted facility, and/or stabilization and containment. Section 8.1 discusses further testing required to determine the suitability of sediment for different restoration purposes (e.g., wetland surface material, wetland foundation material).

What is the potential impact of site sediments on groundwater below the site?

The groundwater sampling summarized in Section 3 indicates that groundwater at the site has already been impacted by the historic site land uses. It is likely that sediment in certain areas of

the site will require remediation before restoration, which would improve conditions and be a benefit to groundwater quality.

Furthermore, the groundwater elevations below the site correspond to the tidally influenced river and channel elevations and therefore are also likely tidally influenced. It is not likely the sites groundwater will be used for direct potable use due to the tidal connection and salt water intrusion.

What is the potential impact of site sediments on the public that may visit the site?

The results of the analytical analyses from 1988-2014, compared to residential ESL indicated multiple constituents in exceedance of residential thresholds, including arsenic, lead, 4,4-DDE, chlordane, dieldrin, vanadium, and PAHs (including benzo(a)pyrene. The 2004 Anchor report (Section 2.3.5) compared metal concentrations at the South LCWA property to background metal concentrations in typical California soils (Table 2-2) and found that lead and arsenic were generally above benchmark concentrations. As residential criteria, these thresholds are more conservative to actual site usage. Potential impact to visitors at the site is only possible in areas of high public use and access where direct exposure to onsite sediments at the surface is possible. As most of the site will be restricted to public access as a wetland preserve, areas of potential impact are very limited. Measures to fully address potential impact due to direct exposure of site sediments in these limited areas of high public access may include covering on-site sediments in these higher public access areas with a 6- to 8-inch layer (loose thickness) of clean soil, top soil or mulch, and restrict activities that would disturbed this cover and expose these sediments. Measures may also include sediment remediation as required by permit.

SECTION 6
Potential Impacts on the Program

The following discussion focuses on the potential impacts to the program from water and sediment quality from upstream on the San Gabriel River and Los Cerritos Channel and urban runoff into the site. Based on the existing and applicable water and sediment quality data summarized in Section 4, a set of potential impact questions were developed for each of the following inputs to the program that may impact the program:

- What are the potential impacts of water quality from dry and wet weather flows (including dissolved and solid fraction constituents and sediment) in the Los Cerritos Channel and the San Gabriel River on the restoration program?

- What are the potential impacts of water quality from urban runoff and stormwater flows from adjacent urbanized areas and roadways on the restoration program?

The water and sediment quality data summary presented in Section 4 provides the basis to assess the potential impacts from watershed and adjacent properties on the program. The assessment of these potential impacts is presented as responses to the specific assessment questions presented below. The discussion following these related assessment questions include both identification of potential impacts to the program and proposed program design and implementation measures to minimize these impacts. Where additional measures are needed to address the potential impacts to the program for post construction operation and maintenance, the discussion references Section 7.

6.1 Impacts from the Rivers and Channels

Based on the existing and applicable water and sediment quality data summarized in Section 4, the following questions should be considered in addressing impacts to the project post-construction:

What are the potential impacts of water quality from dry and wet weather flows (including dissolved and solid fraction constituents and sediment) in the Los Cerritos Channel and the San Gabriel River on the restoration program?

As summarized in Section 4, historical and current water quality data indicates that flows from the Los Cerritos Channel and the San Gabriel River exceed water quality objectives. TMDLs have been developed or are anticipated for the different constituents. The LARWQCB has incorporated the TMDL waste load allocations and timelines into the reissued municipal separate storm sewer system (MS4) permit.

Both Alamitos Bay and Los Cerritos Channel and the Lower San Gabriel River have Watershed Management Programs (WMP) which have identified watershed control measures (WCMs). The WCMs will help jurisdictions meet the MS4 permit requirements and improve water and sediment quality in the rivers and channels.

Since the flows in the Los Cerritos Channel and the San Gabriel River exceed certain water quality objectives, there is a potential for impact to the program. However, the concentration and loading of these constituents from the watershed will be reduced to comply with the reissued MS4 Permit, TMDLs, and the WMPs. The potential for impacts to the program will, therefore, be significantly reduced.

In addition, the development of the program has and will consider these potential impacts in the design of the restoration. The program design allows for full tidal flows into the Central Area wetlands and during the long-term phase, in the South Area wetlands. Full tidal exchange creates favorable water quality conditions by limiting retention times of potentially impacted stormwater and non-storm flows and enhancing flushing of the wetlands with much higher quality ocean water. Sediment carried from the watershed during storm flows that may contain high levels of constituents may accumulate in some areas of the wetland floodplain in the Central Area. These areas of sediment accumulation will be open to full tidal flow and periodic flushing during high tide events. Additionally, monitoring will track any changes to sediment quality in the site, and adaptive management measures could be taken if needed (see Section 7).

To address the impact of trash on the program, a trash boom may be installed on the San Gabriel River upstream of the program area. This would limit the amount of trash that could end up in the Central Area marsh or Zedler and Callaway Marshes. A trash boom would require additional operations and maintenance. Further discussions with the County of Los Angeles, who would likely be responsible for such maintenance, is required.

6.2 Impacts from Urban Runoff

Based on the existing and applicable water and sediment quality data summarized in Section 4, the following potential impact questions will be assessed:

What are the potential impacts of water quality from urban runoff and stormwater flows from adjacent urbanized areas and roadways on the restoration program?

There is a potential for stormwater from adjacent roadways and urbanized areas to impact the water and sediment quality of the program, unless measures are implemented to reduce pollutant loading and concentrations of metals, pesticides and PAH form stormwater discharges to the program.

In the next phase of the program design, a Stormwater Management Plan will be developed to address these impacts. The planned measures will include the construction of bioswales along the existing roadways and stormwater retention facilities at any stormwater outfalls that discharge directly into the restored areas. BMPs will provide for the capture and reduction of sediment carried in stormwater flows that can also contain metals, PAH and pesticides. BMPs will therefore be designed to remove pollutants in stormwater from adjacent properties to concentrations that will reduce the impact to the water and sediment quality of the program.

SECTION 7
Monitoring and Adaptive Management

As discussed in the assessment of potential impacts to the program (Section 6), there may be the potential for impact from the watershed during storm events depending on the effectiveness of the implementation of BMPs under the WMPs. A sediment and water quality monitoring and adaptive management plan is recommended to address the potential impact if the reductions under the WMPs are not made or potential new emerging water quality issues occur that are not fully addressed by the WCMs implemented under the WMP. The monitoring will focus on sediment quality in areas subject to the greatest deposition from storm events and that are also not subject to regular tidal flushing, (e.g., the southwestern corner of the Long Beach Property Site). The sediment quality monitoring would be performed at a frequency that would capture the potential build-up of contaminants in the deposited sediment before concentration are reached that would impact benthic macro-invertebrates and other sensitive species.

The plan would include sediment management measures that would be triggered if impacted sediment is identified. Protocols would be established for the detection of impacted accumulated sediments that may pose an impact to the biological resources of the program. These measures may include additional sampling and analysis, additional testing to determine the risk of impact based on toxicity and where applicable bioaccumulation. Depending on the concentrations and results of follow-up testing, additional measures may be taken to partially remove impacted sediments. These measures will balance the potential impact from the constituents in the sediment with the impact of temporary disturbance of sediments and habitat. More detailed monitoring and adaptive management procedures will be developed in subsequent phases of the project.

SECTION 8
Conclusions and Recommendations

8.1 Sediment Quality on Site

Based on the sediment and water quality characterization results to date for the LCW, the program sites have been impacted from past oil and gas operations. The impacts include the presence of petroleum hydrocarbons, PCBs, pesticides, VOCs, SVOCS, and bi-products in onsite soils and groundwater. Though the most recent study (Reyes 2014) shows that PAHs have decreased significantly in the Zedler Marsh and State Lands Area since the mid-1990s, further sampling efforts should be made to determine existing sediment and groundwater concentrations in the program area.

Though a few sediment samples taken to date have exceeded Hazardous Waste Criteria (TTLC and STLC), the primary concern at the complex is constituents that exceed ecological criteria (ER-L and ER-M) and human health criteria (ESL). The sediment studies performed at the site indicate that impacted soils may require management and/or remediation depending on the final placement and associated constituent concentrations and regulatory action levels.

The concentration and extent of impacted soils will be better defined as part of next phase of the restoration design and subsequent investigations. Potential remediation activities may include in-situ treatment/remediation, removal and disposal at a permitted facility, and/or stabilization and containment. Specific remediation approaches will be developed following the investigation to further define the levels and extent of contamination that will inform the program design and remediation approach. The proposed restoration will incorporate land grading, dredging, and fill processes, requiring the movement and potential exposure of contaminated soils. It is important that the constituent concentrations located at depths that are anticipated to serve as wetland surface material are below wetland criteria thresholds (ER-L and ER-M). Similarly, any soil that will be exposed in public access areas must fall below required ESL standards to minimize potential exposure risk.

Based on these conclusions, the following next steps are recommended.

8.1.1 Testing for Suitability for Wetland Surface Materials

Materials that are planned for use as wetland surface materials should be the highest quality materials and not possess constituent concentrations above the Beneficial Reuse guidelines for wetland surfaces (SFBRWQCB 2000, Germano & Associates 2004). Sampling results showed that multiple samples exceeded the ER-Ls and ER-Ms for metals. Materials that are not shown to

be suitable for wetland surface materials can be used for wetland foundation or upland material or may require remediation.

8.1.2 Testing for Suitability for Wetland Foundation Materials

Materials that are planned for use as wetland foundation materials should not possess constituent concentrations above the Beneficial Reuse guidelines for wetland foundations (SFBRWQCB 2000, Germano & Associates 2004). Sampling results showed that multiple samples exceeded the ER-Ls and ER-Ms for metals. Materials that are not shown to be suitable for wetland foundation materials can be used for upland material or may require remediation.

8.1.3 Testing for Suitability of Upland Material

Materials that are planned for use as upland material should not possess constituent concentrations above the ER-M. Materials that are to be used as surface upland materials (top six inches) should meet the applicable ESL, or demonstrate that the constituent concentrations are within the typical range of marine sediments and do not exhibit a potential human health risk. For the sediments sampled to date, constituents that have been found above the human health criteria are lead, arsenic, chromium, vanadium, benzene, toluene, ethyl benzene, xylene, benzo(a)pyrene, heptachlor epoxide, and 4,4'-DDD, 4,4'-DDE, chlordane, and dieldrin.

If these materials are not able to be shown suitable for use as surface materials for upland areas based on the ESLs, then they can be covered with a minimum one-foot clean layer of soil that would meet all the above criteria listed for suitability as surface upland materials for both ecological and human health criteria. The top foot of material should also meet the agronomical requirements for establishing the designated upland habitat.

8.1.4 Testing for Suitability for Potential Marine Discharge

Any materials that are planned for off-site ocean disposal or open water placement should be further tested and assessed in accordance with ITM (USEPA/USACE 1998) and OTM (USEPA/USACE 1991) guidelines. The testing results to date do not preclude this alternative, but require further biological testing to meet the applicable guidelines. This additional testing will include running the solid phase toxicity testing using a fine-grained control, and suspended solid phase toxicity and bioaccumulation potential testing. If the material is determined to be suitable for this placement alternative, specific permitting for ocean disposal or open-water placement will be required for the designated site. Appendix B contains more information on marine disposal.

8.1.5 Developing a Sampling and Analysis Plan

In the next phase of the design, a Sampling and Analysis Plan (SAP) should be developed. The SAP will define methods and frequency for testing excavated sediment for use as the various proposed beneficial uses. The SAP will be developed in coordination with the permitting agencies during the next phase of the project.

8.2 Channel Sediment and Water Quality

The Los Cerritos Channel and San Gabriel River are both listed as impaired waterbodies for a number of constituents through the 303(d) and TMDL programs. The main constituents of concern for the two primary channels are metals (copper, lead, zinc, mercury, nickel), diazinon, coliform bacteria, pH, toxicity, bis(2ethylhexyl)phthalate, and trash. The Los Cerritos Channel has an approved TMDL (2007) for metal, and TMDLs are anticipated for the remaining constituents of concern. Water quality concerns within the San Gabriel River and Alamitos Bay/Los Cerritos Channel are being addressed through the WMPs and TMDLs. The WMPs contain specific numeric goals and watershed control measures (WCMs) that will improve water quality within the drainage areas. Los Cerritos Channel and Alamitos Bay is also part of the Long Beach Estuary Monitoring Plan which will provide more specific monitoring data and allow for appropriate WCMs.

Though the water bodies are listed as impaired, it is anticipated that water quality conditions will improve at the project site based on the WMP, TMDL, and monitoring programs. As such, it is anticipated that water quality within the program area will improve (compared to existing conditions) as the San Gabriel River, Los Cerritos Channel, and Alamitos Bay comply with the promulgated targets and goals.

In addition to water quality improvements due to the WCMs, the restoration program will allow for fully tidal flows into the program area, creating favorable water quality conditions by limiting retention time and enhancing tidal exchange. This flushing will also minimize the impacts of sediment accumulation with high levels of constituents deposited on the restored program area during high storm flow events.

SECTION 9
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Appendix A

Tables from Prior Sediment Reports

TABLES FROM PRIOR SEDIMENT REPORTS

This appendix provides the results of the soil and groundwater sampling investigations discussed in Section 4 and Section 5. The comparison criteria (hazardous waste, ecological criteria, and human health) have been added by ESA for easier comparison.

Results of the Phase 1 1988 International Technology Sediment Sampling

The following tables show the results of the sediment sampling of the 1988 International Technology 1988 International Technology Corporation Environmental Assessment.

TABLE A-1: SUMMARY OF 1988 INTERNATIONAL TECHNOLOGY SOIL SAMPLING COMPARED TO HAZARDOUS WASTE CRITERIA

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
STLC	**5**	**5**	**24**	**100**	**5**
TTLC	**1000**	**500**	**2400**	**10000**	**2500**
S2 A-1	14	11	122	960	52
S2 A-1-4	26	6	95	1100	124
S2 A-1-5	6	1	77	840	185
S2 A-1-6	11	7	123	920	60
S2 A-1-7 2'	21	5	89	980	210
S2 A-1-7 5'	13	8	115	930	122
S2 A-1-7 10'	15	13	151	1000	97
S2 A-1-8	10	6	97	1000	147
S2 A-2	14	10	138	1000	83
S2 A-2-6 2'	12	11	131	990	58
S2 A-2-6 5'	14	9	123	830	57
S2 A-2-6 10'	10	10	104	840	77
S2 A-3	15	10	107	990	59
S2 A-3-6 2'	14	11	135	830	59
S2 A-3-6 5'	10	5	111	890	60
S2 A-3-6 10'	7	6	89	830	125
S2 A-4	10	11	107	900	32
S2 A-5	15	12	127	990	60
S2 A-6	15	13	146	1100	61
S2 A-7	16	6	111	960	186
S2 A-8	9	4	102	1100	148
S2 A-9	6	3	75	910	95

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
STLC	**5**	**5**	**24**	**100**	**5**
TTLC	**1000**	**500**	**2400**	**10000**	**2500**
S2 A-10	11	7	100	930	134
S2 B-1	11	8	112	980	82
S2 B-1-2	27	8	1211	1100	128
S2 B-1-3	12	12	119	920	58
S2 B-1-4	10	7	103	950	151
S2 B-1-5	12	10	135	920	60
S2 B-1-7	37	10	117	960	166
S2 B-1-8	54	3	101	780	207
S2 B-2	21	7	119	1000	219
S2 B-2-8	8	5	96	960	147
S2 B-3 2'	19	6	107	1400	184
S2 B-3 5'	12	10	119	970	97
S2 B-3 10'	8	5	96	900	94
S2 B-4	10	7	104	920	105
S2 B-5	12	10	131	1100	59
S2 B-6	11	2	85	1100	213
S2 B-7	16	9	111	9711	54
S2 B-8	9	3	120	1000	114
S2 C-1	110	7	113	970	57
S2 C-1-3	17	12	131	910	48
S2 C-1-4	18	9	143	1000	52
S2 C-1-5	16	11	167	800	51
S2 C-1-6	7	3	811	860	160
S2 C-1-8	159	10	93	1100	241
S2 C-2	281	8	138	940	54
S2 C-2-5	31	12	129	1300	66
s2 C-J	14	8	143	950	64
S2 C-4	7	3	90	9100	88
S2 c-5	13	9	125	1000	54
S2 C-6	16	10	136	1100	85
S2 C-7	31	9	93	1100	195
S2 D-1	17	4	160	1000	114
S2 D-1-1	15	3	159	990	60
S2 D-1-2	12	6	117	940	51
S2 D-1-4	15	12	150	910	55
S2 D-1-5 2'	19	12	167	910	54
S2 D-1-5 5'	15	12	141	970	75
S2 D-1-5 10'	9	4	100	910	109
S2 D-2	261	6	140	980	60
S2 D-3	18	15	144	1100	60
S2 D-4 2'	18	5	111	900	90

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
STLC	**5**	**5**	**24**	**100**	**5**
TTLC	**1000**	**500**	**2400**	**10000**	**2500**
S2 D-4 5'	8	7	144	1100	102
S2 D-4 10'	12	8	146	810	70
S2 D-5	20	5	78	1100	202
S2 D-6	16	14	177	890	57
S2 D-7	20	7	125	930	119
SZ E-1	12	3	86	1200	141
S2 E-1-2	13	8	127	930	84
S2 E-1-4	10	7	122	900	132
S2 E-1-5 2'	283	8	110	4800	84
S2 E-1-5 5'	367	7	88	5100	127
S2 E-1-5 10'	381	6	92	5100	91
S2 E-2	13	8	125	920	73
S2 E-3	11	8	116	790	48
S2 E-4	9	6	109	1000	237
S2 E-5	15	10	147	970	57
S2 E-6	15	8	133	1000	140
S2 F-1	14	8	138	980	46
S2 F-1-2	18	6	79	890	190
S2 F-1-3	13	10	151	990	50
S2 F-2-2	15	9	155	970	58
S2 F-2-3	15	6	146	850	68
S2 F-3	21	11	149	1100	55
S2 F-3	15	9	133	900	55
S2 F-3	19	20	172	1100	75
S2 F-3 2'	16	11	168	930	54
S2 F-3-2 5'	306	8	157	990	108
S2 F-4 10'	11	8	124	970	60
S2 F-5	9	4	107	8711	91
S2 G-1	19	18	158	910	59
S2 G-1-2	19	8	114	1000	190
S2 G-1-2	16	13	119	840	54
S2 G-1-2 2'	7	6	95	830	121
S2 G-2 5'	30	10	121	980	208
S2 G-3 10'	12	9	136	860	54
S2 G-4	10	4	77	930	171
S2 H-1	12	8	136	890	58
S2 H-2	11	9	130	880	56
S2 K-1	9	5	104	900	169
S2 K-2	10	5	119	890	195
S2 K-3	19	4	93	1100	134
S2 K-4	13	6	130	1000	157

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
STLC	**5**	**5**	**24**	**100**	**5**
TTLC	**1000**	**500**	**2400**	**10000**	**2500**
S2 K-5	82	6	129	1200	144
S2 K-6	21	6	135	1100	172
S2 K-7	13	6	117	930	173
S2 K-8	11	6	118	980	82
S2 K-9	24	9	133	1100	194
S2 K-10	21	4	87	970	230
S2 K-11	8	2	68	1000	383
S2 K-12	77	10	73	1200	323
S2 K-13	11	4	92	1000	108
S2 K-14	25	8	119	900	88
S2 K-15	21	7	134	940	130
S2 K-16	23	6	80	970	184
S2 K-17	12	12	116	1200	58
S2 K-18 2'	13	8	101	960	123
S2 K-18 5'	12	8	131	1000	9
S2 K-18 10'	7	2	91	830	50
S2 L-1	126	9	89	1100	214
S2 L-1-3 2'	21	3	82	880	681
S2 L-1-3 5'	35	4	68	1000	534
S2 L-1-3 8'	12	9	136	810	112
S2 L-2	10	6	105	1000	139
S2 L-3	29	4	79	900	225
S2 L-4	23	4	74	980	207
S2 L-5	9	6	102	860	81
S2 L-6	33	4	75	1100	308
S2 L-7	13	4	80	1100	196
S2 L-8	24	8	86	1000	198
S2 L-9	26	5	74	1100	265
S2 L-9-1 2'	6	4	80	1100	280
S2 I-9-1 5'	380	14	130	7300	121
S2 L-10	9	5	73	1100	225
S2 L-10-1	8	6	85	890	244
S2 L-11	15	3	65	1000	262
S2 L-12	6	4	70	1100	260
S2 L-12-1 2'	42	18	88	890	466
S2 L-12-1 5'	14	6	82	890	212
S2 L-12-1 10'	6	4	94	1000	290
S2 L-13	10	9	111	1100	138
S2 L-13-1 2'	54	8	110	960	171
S2 L-13-1 5'	8	3	89	920	148
S2 L-13-1 10'	5	1	67	830	210

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
STLC	**5**	**5**	**24**	**100**	**5**
TTLC	**1000**	**500**	**2400**	**10000**	**2500**
S2 I-14	17	9	101	1100	155
S2 I-15	14	6	105	1200	179
S2 I-15-1 2'	32	6	101	1000	171
S2 I-15-1 5'	7	4	86	890	384
S2 I-15-1 10'	5	2	76	870	193
S2 I-16	11	6	99	960	216
S2 I-16-1	86	10	139	870	127
S2 L-17	11	8	113	11100	137
S2 I-18	25	5	76	960	176
S2 L-19	16	7	88	1100	170
S2 M-1	12	6	106	970	113
S2 M-1-2 2'	10	7	101	970	143
S2 M-1-2 5'	11	11	106	1100	113
s2 M-1-2 8'	12	3	112	830	89
S2 M-2	17	18	144	1000	117
S2 M-3	12	8	123	1000	173
S2 M-4	20	16	115	880	129
S2 M-5	37	7	89	1000	213
S2 M-6	14	5	82	890	161
S2 M-6-1 2' 'A'	23	8	108	1000	159
S2 M-6-1 2' 'B'	28	6	83	1100	170
S2 M-6-1 5'	10		95	1000	217
S2 M-6-1 10'	6	4	91	1000	194
S2 M-7	23	5	79	970	204
S2 M-7-1	87	5	79	970	182
S2 M-7-2 2'	14	4	90	1000	308
S2 M-7-2 5'	12	3	85	880	229
S2 M-8	17	4	93	860	1198
S2 M-9	58	5	77	950	197
sz M-10	11	6	86	1100	228
S2 M-11	8	4	62	1100	184
S2 M-12 2'	7	4	66	1000	251
S2 M-12 5'	6	2	55	12000	264
S2 M-12 10'	223	14	149	2500	143
S2 M-13	7	3	67	1100	221
S2 M-14	17	8	94	1000	162
S2 M-15	11	6	96	1000	131
S2 M-15-1 2'	19	4	86	1200	159
S2 M-15-1 5'	20	4	89	1100	244
S2 M-16	17	5	91	1200	160
S2 M-17	23	9	120	940	118

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
STLC	**5**	**5**	**24**	**100**	**5**
TTLC	**1000**	**500**	**2400**	**10000**	**2500**
S2 M-18	12	8	123	1100	74
S2 M-19	15	16	128	1100	87
S2 M-20	14	6	106	920	131
S2 N-1	26	4	74	900	201
S2 N-2	14	4	102	1000	194
S2 N-3	9	8	85	980	132
S2 N-4	9	4	66	1100	190
S2 N-5	9	4	78	1100	136
S2 N-6	70	7	99	1100	168
S2 N-7	16	8	83	1100	140
S2 N-8	14	9	1113	920	115
S2 N-9	15	10	1111	840	72
S2 N-10	81	25	123	830	81
S2 N-10-t 2'	9	4	92	8111	136
S2 N-10-1 5'	13	7	128	790	114
S2 N-10-1 10'	15	16	107	700	146
S2 N-11	13	11	118	1200	195
S2 N-17	15	6	121	880	108
S2 N-18	13	3	111	950	98
S2 N-19	13	4	117	920	116
S2 0-15	24	11	69	980	459
S2 0-17 2'	12	8	103	820	96
s2 o-11 5'	15	9	119	880	88
S2 0-17 10'	9	4	94	870	145
S2 0-18	13	7	114	940	99
S2 0-19	27	8	107	2100	131
S2 0-20	12	8	106	880	109
S2 P-18	8	4	89	840	216
S2 P-18-1 2'	15	8	109	870	55
S2 P-18-1 5'	14	6	107	770	42
S2 P-18-1 10'	10	3	92	790	123
S2 P-19	12	6	106	920	127
S2 P-20	10	6	110	860	96
S2 P-21	12	8	105	920	109
S2 P-27 12	12	8	107	870	73

NOTES: Cells Highlighted in Yellow indicate samples that exceed 10 times the STLC value.

TABLE A-2: SUMMARY OF 1989 SOIL SAMPLING COMPARED TO ECOLOGICAL CRITERIA

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
ER-L	**47**	**8**	**NA**	**NA**	**81**
ER-M	**218**	**81**	**NA**	**NA**	**370**
Wetland Beneficial Use (Foundation)	**43.2**	**15.3**	**NA**	**NA**	**112**
Wetland Beneficial Use (Surface)	**218**	**70**	**NA**	**NA**	**370**
S2 A-1	14	11	122	960	52
S2 A-1-4	26	6	95	1100	124
S2 A-1-5	6	1	77	840	185
S2 A-1-6	11	7	123	920	60
S2 A-1-7 2'	21	5	89	980	210
S2 A-1-7 5'	13	8	115	930	122
S2 A-1-7 10'	15	13	151	1000	97
S2 A-1-8	10	6	97	1000	147
S2 A-2	14	10	138	1000	83
S2 A-2-6 2'	12	11	131	990	58
S2 A-2-6 5'	14	9	123	830	57
S2 A-2-6 10'	10	10	104	840	77
S2 A-3	15	10	107	990	59
S2 A-3-6 2'	14	11	135	830	59
S2 A-3-6 5'	10	5	111	890	60
S2 A-3-6 10'	7	6	89	830	125
S2 A-4	10	11	107	900	32
S2 A-5	15	12	127	990	60
S2 A-6	15	13	146	1100	61
S2 A-7	16	6	111	960	186
S2 A-8	9	4	102	1100	148
S2 A-9	6	3	75	910	95
S2 A-10	11	7	100	930	134
S2 B-1	11	8	112	980	82
S2 B-1-2	27	8	1211	1100	128
S2 B-1-3	12	12	119	920	58
S2 B-1-4	10	7	103	950	151
S2 B-1-5	12	10	135	920	60
S2 B-1-7	37	10	117	960	166
S2 B-1-8	54	3	101	780	207
S2 B-2	21	7	119	1000	219
S2 B-2-8	8	5	96	960	147
S2 B-3 2'	19	6	107	1400	184
S2 B-3 5'	12	10	119	970	97
S2 B-3 10'	8	5	96	900	94

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
ER-L	**47**	**8**	**NA**	**NA**	**81**
ER-M	**218**	**81**	**NA**	**NA**	**370**
S2 B-4	10	7	104	920	105
S2 B-5	12	10	131	1100	59
S2 B-6	11	2	85	1100	213
S2 B-7	16	9	111	9711	54
S2 B-8	9	3	120	1000	114
S2 C-1	110	7	113	970	57
S2 C-1-3	17	12	131	910	48
S2 C-1-4	18	9	143	1000	52
S2 C-1-5	16	11	167	800	51
S2 C-1-6	7	3	811	860	160
S2 C-1-8	159	10	93	1100	241
S2 C-2	281	8	138	940	54
S2 C-2-5	31	12	129	1300	66
s2 C-J	14	8	143	950	64
S2 C-4	7	3	90	9100	88
S2 c-5	13	9	125	1000	54
S2 C-6	16	10	136	1100	85
S2 C-7	31	9	93	1100	195
S2 D-1	17	4	160	1000	114
S2 D-1-1	15	3	159	990	60
S2 D-1-2	12	6	117	940	51
S2 D-1-4	15	12	150	910	55
S2 D-1-5 2'	19	12	167	910	54
S2 D-1-5 5'	15	12	141	970	75
S2 D-1-5 10'	9	4	100	910	109
S2 D-2	261	6	140	980	60
S2 D-3	18	15	144	1100	60
S2 D-4 2'	18	5	111	900	90
S2 D-4 5'	8	7	144	1100	102
S2 D-4 10'	12	8	146	810	70
S2 D-5	20	5	78	1100	202
S2 D-6	16	14	177	890	57
S2 D-7	20	7	125	930	119
SZ E-1	12	3	86	1200	141
S2 E-1-2	13	8	127	930	84
S2 E-1-4	10	7	122	900	132
S2 E-1-5 2'	283	8	110	4800	84
S2 E-1-5 5'	367	7	88	5100	127
S2 E-1-5 10'	381	6	92	5100	91
S2 E-2	13	8	125	920	73
S2 E-3	11	8	116	790	48

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
ER-L	**47**	**8**	**NA**	**NA**	**81**
ER-M	**218**	**81**	**NA**	**NA**	**370**
S2 E-4	9	6	109	1000	237
S2 E-5	15	10	147	970	57
S2 E-6	15	8	133	1000	140
S2 F-1	14	8	138	980	46
S2 F-1-2	18	6	79	890	190
S2 F-1-3	13	10	151	990	50
S2 F-2-2	15	9	155	970	58
S2 F-2-3	15	6	146	850	68
S2 F-3	21	11	149	1100	55
S2 F-3	15	9	133	900	55
S2 F-3	19	20	172	1100	75
S2 F-3 2'	16	11	168	930	54
S2 F-3-2 5'	306	8	157	990	108
S2 F-4 10'	11	8	124	970	60
S2 F-5	9	4	107	8711	91
S2 G-1	19	18	158	910	59
S2 G-1-2	19	8	114	1000	190
S2 G-1-2	16	13	119	840	54
S2 G-1-2 2'	7	6	95	830	121
S2 G-2 5'	30	10	121	980	208
S2 G-3 10'	12	9	136	860	54
S2 G-4	10	4	77	930	171
S2 H-1	12	8	136	890	58
S2 H-2	11	9	130	880	56
S2 K-1	9	5	104	900	169
S2 K-2	10	5	119	890	195
S2 K-3	19	4	93	1100	134
S2 K-4	13	6	130	1000	157
S2 K-5	82	6	129	1200	144
S2 K-6	21	6	135	1100	172
S2 K-7	13	6	117	930	173
S2 K-8	11	6	118	980	82
S2 K-9	24	9	133	1100	194
S2 K-10	21	4	87	970	230
S2 K-11	8	2	68	1000	383
S2 K-12	77	10	73	1200	323
S2 K-13	11	4	92	1000	108
S2 K-14	25	8	119	900	88
S2 K-15	21	7	134	940	130
S2 K-16	23	6	80	970	184
S2 K-17	12	12	116	1200	58

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
ER-L	**47**	**8**	**NA**	**NA**	**81**
ER-M	**218**	**81**	**NA**	**NA**	**370**
S2 K-18 2'	13	8	101	960	123
S2 K-18 5'	12	8	131	1000	9
S2 K-18 10'	7	2	91	830	50
S2 L-1	126	9	89	1100	214
S2 L-1-3 2'	21	3	82	880	681
S2 L-1-3 5'	35	4	68	1000	534
S2 L-1-3 8'	12	9	136	810	112
S2 L-2	10	6	105	1000	139
S2 L-3	29	4	79	900	225
S2 L-4	23	4	74	980	207
S2 L-5	9	6	102	860	81
S2 L-6	33	4	75	1100	308
S2 L-7	13	4	80	1100	196
S2 L-8	24	8	86	1000	198
S2 L-9	26	5	74	1100	265
S2 L-9-1 2'	6	4	80	1100	280
S2 I-9-1 5'	380	14	130	7300	121
S2 L-10	9	5	73	1100	225
S2 L-10-1	8	6	85	890	244
S2 L-11	15	3	65	1000	262
S2 L-12	6	4	70	1100	260
S2 L-12-1 2'	42	18	88	890	466
S2 L-12-1 5'	14	6	82	890	212
S2 L-12-1 10'	6	4	94	1000	290
S2 L-13	10	9	111	1100	138
S2 L-13-1 2'	54	8	110	960	171
S2 L-13-1 5'	8	3	89	920	148
S2 L-13-1 10'	5	1	67	830	210
S2 I-14	17	9	101	1100	155
S2 I-15	14	6	105	1200	179
S2 I-15-1 2'	32	6	101	1000	171
S2 I-15-1 5'	7	4	86	890	384
S2 I-15-1 10'	5	2	76	870	193
S2 I-16	11	6	99	960	216
S2 I-16-1	86	10	139	870	127
S2 L-17	11	8	113	11100	137
S2 I-18	25	5	76	960	176
S2 L-19	16	7	88	1100	170
S2 M-1	12	6	106	970	113
S2 M-1-2 2'	10	7	101	970	143
S2 M-1-2 5'	11	11	106	1100	113

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
ER-L	**47**	**8**	**NA**	**NA**	**81**
ER-M	**218**	**81**	**NA**	**NA**	**370**
s2 M-1-2 8'	12	3	112	830	89
S2 M-2	17	18	144	1000	117
S2 M-3	12	8	123	1000	173
S2 M-4	20	16	115	880	129
S2 M-5	37	7	89	1000	213
S2 M-6	14	5	82	890	161
S2 M-6-1 2' 'A'	23	8	108	1000	159
S2 M-6-1 2' 'B'	28	6	83	1100	170
S2 M-6-1 5'	10		95	1000	217
S2 M-6-1 10'	6	4	91	1000	194
S2 M-7	23	5	79	970	204
S2 M-7-1	87	5	79	970	182
S2 M-7-2 2'	14	4	90	1000	308
S2 M-7-2 5'	12	3	85	880	229
S2 M-8	17	4	93	860	1198
S2 M-9	58	5	77	950	197
sz M-10	11	6	86	1100	228
S2 M-11	8	4	62	1100	184
S2 M-12 2'	7	4	66	1000	251
S2 M-12 5'	6	2	55	12000	264
S2 M-12 10'	223	14	149	2500	143
S2 M-13	7	3	67	1100	221
S2 M-14	17	8	94	1000	162
S2 M-15	11	6	96	1000	131
sz M-15-1 2'	19	4	86	1200	159
s2 M-15-1 5'	20	4	89	1100	244
S2 M-16	17	5	91	1200	160
S2 M-17	23	9	120	940	118
S2 M-18	12	8	123	1100	74
S2 M-19	15	16	128	1100	87
S2 M-20	14	6	106	920	131
S2 N-1	26	4	74	900	201
S2 N-2	14	4	102	1000	194
S2 N-3	9	8	85	980	132
S2 N-4	9	4	66	1100	190
S2 N-5	9	4	78	1100	136
S2 N-6	70	7	99	1100	168
S2 N-7	16	8	83	1100	140
S2 N-8	14	9	1113	920	115
S2 N-9	15	10	1111	840	72
S2 N-10	81	25	123	830	81

	Lead (PPM)	Arsenic (PPM)	Vanadium (PPM)	Barium (PPM)	Chromium (PPM)
ER-L	**47**	**8**	**NA**	**NA**	**81**
ER-M	**218**	**81**	**NA**	**NA**	**370**
S2 N-10-t 2'	9	4	92	8111	136
S2 N-10-1 5'	13	7	128	790	114
S2 N-10-1 10'	15	16	107	700	146
S2 N-11	13	11	118	1200	195
S2 N-17	15	6	121	880	108
S2 N-18	13	3	111	950	98
S2 N-19	13	4	117	920	116
S2 0-15	24	11	69	980	459
S2 0-17 2'	12	8	103	820	96
s2 o-11 5'	15	9	119	880	88
S2 0-17 10'	9	4	94	870	145
S2 0-18	13	7	114	940	99
S2 0-19	27	8	107	2100	131
S2 0-20	12	8	106	880	109
S2 P-18	8	4	89	840	216
S2 P-18-1 2'	15	8	109	870	55
S2 P-18-1 5'	14	6	107	770	42
S2 P-18-1 10'	10	3	92	790	123
S2 P-19	12	6	106	920	127
S2 P-20	10	6	110	860	96
S2 P-21	12	8	105	920	109
S2 P-27 12	12	8	107	870	73

NOTES: Cells highlighted in Yellow exceed ER-L or Wetland Beneficial Use (Surface) values
Cells highlighted in Red exceed ER-M and Wetland Benefic Use (Foundation) values

TABLE A-3 SUMMARY OF 1988 INTERNATIONAL TECHNOLOGY SOIL SAMPLING COMPARED TO HUMAN HEALTH CRITERIA

	Lead	Arsenic	Vanadium	Barium	Chromium
ESL (mg/kg)	81.8	0.3	393.1	15305	234.3
RSL (mg/kg)	400	1	390	15,000	-
S2 A-1	14	11	122	960	52
S2 A-1-4	26	6	95	1100	124
S2 A-1-5	6	1	77	840	185
S2 A-1-6	11	7	123	920	60
S2 A-1-7 2'	21	5	89	980	210
S2 A-1-7 5'	13	8	115	930	122
S2 A-1-7 10'	15	13	151	1000	97
S2 A-1-8	10	6	97	1000	147
S2 A-2	14	10	138	1000	83
S2 A-2-6 2'	12	11	131	990	58
S2 A-2-6 5'	14	9	123	830	57
S2 A-2-6 10'	10	10	104	840	77
S2 A-3	15	10	107	990	59
S2 A-3-6 2'	14	11	135	830	59
S2 A-3-6 5'	10	5	111	890	60
S2 A-3-6 10'	7	6	89	830	125
S2 A-4	10	11	107	900	32
S2 A-5	15	12	127	990	60
S2 A-6	15	13	146	1100	61
S2 A-7	16	6	111	960	186
S2 A-8	9	4	102	1100	148
S2 A-9	6	3	75	910	95
S2 A-10	11	7	100	930	134
S2 B-1	11	8	112	980	82
S2 B-1-2	27	8	1211	1100	128
S2 B-1-3	12	12	119	920	58
S2 B-1-4	10	7	103	950	151
S2 B-1-5	12	10	135	920	60
S2 B-1-7	37	10	117	960	166
S2 B-1-8	54	3	101	780	207
S2 B-2	21	7	119	1000	219
S2 B-2-8	8	5	96	960	147
S2 B-3 2'	19	6	107	1400	184
S2 B-3 5'	12	10	119	970	97
S2 B-3 10'	8	5	96	900	94
S2 B-4	10	7	104	920	105
S2 B-5	12	10	131	1100	59
S2 B-6	11	2	85	1100	213
S2 B-7	16	9	111	9711	54

	Lead	Arsenic	Vanadium	Barium	Chromium
S2 B-8	9	3	120	1000	114
S2 C-1	110	7	113	970	57
S2 C-1-3	17	12	131	910	48
S2 C-1-4	18	9	143	1000	52
S2 C-1-5	16	11	167	800	51
S2 C-1-6	7	3	811	860	160
S2 C-1-8	159	10	93	1100	241
S2 C-2	281	8	138	940	54
S2 C-2-5	31	12	129	1300	66
s2 C-J	14	8	143	950	64
S2 C-4	7	3	90	9100	88
S2 c-5	13	9	125	1000	54
S2 C-6	16	10	136	1100	85
S2 C-7	31	9	93	1100	195
S2 D-1	17	4	160	1000	114
S2 D-1-1	15	3	159	990	60
S2 D-1-2	12	6	117	940	51
S2 D-1-4	15	12	150	910	55
S2 D-1-5 2'	19	12	167	910	54
S2 D-1-5 5'	15	12	141	970	75
S2 D-1-5 10'	9	4	100	910	109
S2 D-2	261	6	140	980	60
S2 D-3	18	15	144	1100	60
S2 D-4 2'	18	5	111	900	90
S2 D-4 5'	8	7	144	1100	102
S2 D-4 10'	12	8	146	810	70
S2 D-5	20	5	78	1100	202
S2 D-6	16	14	177	890	57
S2 D-7	20	7	125	930	119
SZ E-1	12	3	86	1200	141
S2 E-1-2	13	8	127	930	84
S2 E-1-4	10	7	122	900	132
S2 E-1-5 2'	283	8	110	4800	84
S2 E-1-5 5'	367	7	88	5100	127
S2 E-1-5 10'	381	6	92	5100	91
S2 E-2	13	8	125	920	73
S2 E-3	11	8	116	790	48
S2 E-4	9	6	109	1000	237
S2 E-5	15	10	147	970	57
S2 E-6	15	8	133	1000	140
S2 F-1	14	8	138	980	46
S2 F-1-2	18	6	79	890	190
S2 F-1-3	13	10	151	990	50

	Lead	Arsenic	Vanadium	Barium	Chromium
S2 F-2-2	15	9	155	970	58
S2 F-2-3	15	6	146	850	68
S2 F-3	21	11	149	1100	55
S2 F-3	15	9	133	900	55
S2 F-3	19	20	172	1100	75
S2 F-3 2'	16	11	168	930	54
S2 F-3-2 5'	306	8	157	990	108
S2 F-4 10'	11	8	124	970	60
S2 F-5	9	4	107	8711	91
S2 G-1	19	18	158	910	59
S2 G-1-2	19	8	114	1000	190
S2 G-1-2	16	13	119	840	54
S2 G-1-2 2'	7	6	95	830	121
S2 G-2 5'	30	10	121	980	208
S2 G-3 10'	12	9	136	860	54
S2 G-4	10	4	77	930	171
S2 H-1	12	8	136	890	58
S2 H-2	11	9	130	880	56
S2 K-1	9	5	104	900	169
S2 K-2	10	5	119	890	195
S2 K-3	19	4	93	1100	134
S2 K-4	13	6	130	1000	157
S2 K-5	82	6	129	1200	144
S2 K-6	21	6	135	1100	172
S2 K-7	13	6	117	930	173
S2 K-8	11	6	118	980	82
S2 K-9	24	9	133	1100	194
S2 K-10	21	4	87	970	230
S2 K-11	8	2	68	1000	383
S2 K-12	77	10	73	1200	323
S2 K-13	11	4	92	1000	108
S2 K-14	25	8	119	900	88
S2 K-15	21	7	134	940	130
S2 K-16	23	6	80	970	184
S2 K-17	12	12	116	1200	58
S2 K-18 2'	13	8	101	960	123
S2 K-18 5'	12	8	131	1000	9
S2 K-18 10'	7	2	91	830	50
S2 L-1	126	9	89	1100	214
S2 L-1-3 2'	21	3	82	880	681
S2 L-1-3 5'	35	4	68	1000	534
S2 L-1-3 8'	12	9	136	810	112
S2 L-2	10	6	105	1000	139

	Lead	Arsenic	Vanadium	Barium	Chromium
S2 L-3	29	4	79	900	225
S2 L-4	23	4	74	980	207
S2 L-5	9	6	102	860	81
S2 L-6	33	4	75	1100	308
S2 L-7	13	4	80	1100	196
S2 L-8	24	8	86	1000	198
S2 L-9	26	5	74	1100	265
S2 L-9-1 2'	6	4	80	1100	280
S2 l-9-1 5'	380	14	130	7300	121
S2 L-10	9	5	73	1100	225
S2 L-10-1	8	6	85	890	244
S2 L-11	15	3	65	1000	262
S2 L-12	6	4	70	1100	260
S2 L-12-1 2'	42	18	88	890	466
S2 L-12-1 5'	14	6	82	890	212
S2 L-12-1 10'	6	4	94	1000	290
S2 L-13	10	9	111	1100	138
S2 L-13-1 2'	54	8	110	960	171
S2 L-13-1 5'	8	3	89	920	148
S2 L-13-1 10'	5	1	67	830	210
S2 l-14	17	9	101	1100	155
S2 l-15	14	6	105	1200	179
S2 l-15-1 2'	32	6	101	1000	171
S2 l-15-1 5'	7	4	86	890	384
S2 l-15-1 10'	5	2	76	870	193
S2 l-16	11	6	99	960	216
S2 l-16-1	86	10	139	870	127
S2 L-17	11	8	113	11100	137
S2 l-18	25	5	76	960	176
S2 L-19	16	7	88	1100	170
S2 M-1	12	6	106	970	113
S2 M-1-2 2'	10	7	101	970	143
S2 M-1-2 5'	11	11	106	1100	113
s2 M-1-2 8'	12	3	112	830	89
S2 M-2	17	18	144	1000	117
S2 M-3	12	8	123	1000	173
S2 M-4	20	16	115	880	129
S2 M-5	37	7	89	1000	213
S2 M-6	14	5	82	890	161
S2 M-6-1 2' 'A'	23	8	108	1000	159
S2 M-6-1 2' 'B'	28	6	83	1100	170
S2 M-6-1 5'	10		95	1000	217
S2 M-6-1 10'	6	4	91	1000	194

	Lead	Arsenic	Vanadium	Barium	Chromium
S2 M-7	23	5	79	970	204
S2 M-7-1	87	5	79	970	182
S2 M-7-2 2'	14	4	90	1000	308
S2 M-7-2 5'	12	3	85	880	229
S2 M-8	17	4	93	860	1198
S2 M-9	58	5	77	950	197
sz M-10	11	6	86	1100	228
S2 M-11	8	4	62	1100	184
S2 M-12 2'	7	4	66	1000	251
S2 M-12 5'	6	2	55	12000	264
S2 M-12 10'	223	14	149	2500	143
S2 M-13	7	3	67	1100	221
S2 M-14	17	8	94	1000	162
S2 M-15	11	6	96	1000	131
sz M-15-1 2'	19	4	86	1200	159
s2 M-15-1 5'	20	4	89	1100	244
S2 M-16	17	5	91	1200	160
S2 M-17	23	9	120	940	118
S2 M-18	12	8	123	1100	74
S2 M-19	15	16	128	1100	87
S2 M-20	14	6	106	920	131
S2 N-1	26	4	74	900	201
S2 N-2	14	4	102	1000	194
S2 N-3	9	8	85	980	132
S2 N-4	9	4	66	1100	190
S2 N-5	9	4	78	1100	136
S2 N-6	70	7	99	1100	168
S2 N-7	16	8	83	1100	140
S2 N-8	14	9	1113	920	115
S2 N-9	15	10	1111	840	72
S2 N-10	81	25	123	830	81
S2 N-10-t 2'	9	4	92	8111	136
S2 N-10-1 5'	13	7	128	790	114
S2 N-10-1 10'	15	16	107	700	146
S2 N-11	13	11	118	1200	195
S2 N-17	15	6	121	880	108
S2 N-18	13	3	111	950	98
S2 N-19	13	4	117	920	116
S2 0-15	24	11	69	980	459
S2 0-17 2'	12	8	103	820	96
s2 o-11 5'	15	9	119	880	88
S2 0-17 10'	9	4	94	870	145
S2 0-18	13	7	114	940	99

	Lead	Arsenic	Vanadium	Barium	Chromium
S2 0-19	27	8	107	2100	131
S2 0-20	12	8	106	880	109
S2 P-18	8	4	89	840	216
S2 P-18-1 2'	15	8	109	870	55
S2 P-18-1 5'	14	6	107	770	42
S2 P-18-1 10'	10	3	92	790	123
S2 P-19	12	6	106	920	127
S2 P-20	10	6	110	860	96
S2 P-21	12	8	105	920	109
S2 P-27 12	12	8	107	870	73

NOTES: Cells highlighted in Red indicate samples that exceed the ESL value

Results of the Phase 1 1988 Earth Technology Corporation Site Investigation at Texaco Bryant Lease

The following tables shows the results of the sediment sampling of the Phase 1 1988 Earth Technology Corporation Site Investigation at the Texaco Bryant Lease.

TABLE A-4: 1988 TPHC SOIL SAMPLING RESULTS FROM LCWA PHASE 1 PROPERTY COMPARED TO HUMAN HEALTH CRITERIA

Analyte	units	RSL	B-11-1	B-12-1	MW-1-1	MW-2-1	MW-2-2	MW-3-1	MW-3-2
TPHC	mg/kg	8.2	ND	3,300	ND	320	4	4	4
Depth	feet		8	10	5	5	10	5	10

Notes: Cells highlighted in Red exceed ESL value of 100 mg/kg

TABLE A-5: BTEX GROUNDWATER SAMPLING RESULTS FROM LCWA PHASE I PROPERTY COMPARED TO HUMAN HEALTH CRITERIA

			MW-1			MW-2	MW-3
Analyte	Unit	ESL	7/6/1987	10/20/1987	1/7/1988	1/7/1988	1/7/1998
Benzene	µg/l	0.15	NT	ND	6.4	ND	ND
Toluene	µg/l	1500	NT	ND	ND	2.3	2.3
Ethyl benzene	µg/l	1.5	NT	ND	ND	1.8	1.8
Xylene	µg/l	1,900	NT	ND	ND	2.3	2.3
TPHC	µg/l	0.017	1	2.5	3	2	2

Note: Cells highlighted in Red exceed ESL values

Results of the 1989 Engineering Enterprises, Inc. (EEI) Environmental Assessment

Table A-6 show the results of the 1989 Engineering Enterprises Environmental Assessment compared to human health criteria.

TABLE A-6: SUMMARY OF ENGINEERING ENTERPRISES SOIL SAMPLING COMPARED TO HUMAN HEALTH CRITERIA

Analyte	Unit	Residential ESL	Residential RSL	B-01	B-01	B-02	B-02	B-03	B-03	B-04	B-04	B-05	B-05	B-06	B-06	B-07	B-07	B-08	B-08	B-09	B-09	B-10	B-10	B-11	B-12	B-12	B-13	B-13
Depth	**ft.**			5	15	5	20	5	15	10	20	10	20	10	20	5	20	3	15	10	20	5	20	15	5	20	5	20
TPH	µg/g		8.2	6.6	ND	ND	ND	ND	ND	ND	ND	5.4	5	ND	18.6	217	62.5	189568	47.6	8.5	ND	12.6	24.8	8.1	43.9	ND	ND	ND
Benzene	µg/g	0.044		ND(g)	ND	<0.10	ND	ND	ND	ND	ND	ND	ND	0.54	0.5	0.6	0.32	11.9	<0.10	0.28	<0.10	<0.10	<0.10	ND	ND	ND	ND	ND
Toluene	µg/g	2.9		0.12	0.14	0.31	<0.10	0.34	<0.10	0.59	0.4	0.28	0.16	0.42	<0.10	<0.10	0.15	81.94	0.25	0.48	ND	<0.10	<0.10	ND	<0.10	ND	ND	ND
Ethyl-Benzene	µg/g	3.3		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21.14	0.22	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (O-, M- & P-)	µg/g	2.3		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.10	<0.10	ND	ND	217.25	1.34	<0.10	<0.10	ND	<0.10	ND	ND	ND	ND	ND

Notes: Cells highlighted in Red exceed RSL or ESL values

TABLE A-6 (CONTINUED) SUMMARY OF ENGINEERING ENTERPRISES SOIL SAMPLING COMPARED TO HAZARDOUS WASTE CRITERIA

Analyte	Unit	Residential ESL	Residential RSL	B-14	B-15	B-16	B-17	B-18	B-18	B-18	B-19	B-20	B-20	B-21	B-21	B-22	B-23	N-23	B-24	B-25	B-25	B-27	B-27	B-28	B-28	B-29	B-29	B-30	B-30	B-31	B-31	B-32	B-32
Depth	**ft.**			10	10	10	10	2	10	20	10	5	10	10	20	10	2	10	10	5	20	5	10	5	20	5	15	5	15	5	15	10	20
TPH	µg/g		8.2	ND	ND	ND	8.1	ND	ND	103.6	ND	1503.1	ND	ND	ND	ND	21671	7139	3118.8	69.2	ND	98.7	7.5	14.1	28.2	9.4	14.7	7	7.2	6.7	12.2	ND	11.8
Benzene	µg/g	0.044		ND	ND	ND	ND	ND	ND	<0.10	ND	0.24	ND	ND	ND	ND	0.24	<0.10	<0.10	<0.10	<0.10	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	µg/g	2.9		ND	ND	ND	<0.10	<0.10	<0.10	1.14	ND	0.7	<0.10	<0.10	<0.10	<0.10	1.38	0.19	0.26	1.07	<0.10	1.39	<0.10	<0.10	ND	<0.10	<0.10	0.4	0.34	<0.10	<0.10	ND	ND
Ethyl-Benzene	µg/g	3.3		ND	ND	ND	ND	ND	ND	ND	ND	>0.10	ND	ND	ND	ND	2.13	<0.10	ND	1.25	ND	0.55	<0.10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (O-, M- & P-)	µg/g	2.3		ND	ND	ND	ND	ND	ND	ND	ND	0.8	ND	ND	ND	ND	19.54	1.43	ND	3.45	6.64	0.47	<0.10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes: Cells highlighted in Red exceed RSL or ESL values

Results of the 1991 Camp Dresser & McKee Inc. Phase II Environmental Assessment

Table A-7 shows the samples that exceeded 1000 mg/kg TPHC from the 1991 Camp Dresser & McKee Inc. Phase II Environmental Assessment. Table A-8 shows the results compared to ecological criteria and Table A-9 compares samples to human health criteria.

TABLE A-7: TRPH SAMPLES GREATER THAN 1000 MG/KG

Sample ID	TRPH (mg/kg)
T1-20-19	ND
T1A-20-4	1900
T1A-20-7	1500
T3-20-4	13000
T3-20-8	320
T4-40-8	2800
T4-80-5	19000
T4-100-4	60000
T4-110-4	110000
T4a-120-3	15000
T4A-0-4	67000
T4A-80-2	34000
T5-0-8	21
T5-70-2	40000
T5-80-1.5	50000
T5-100-2	65000
T6-0-8	60000
T6-0-10	130000
T6A-120-1	2100
T7-0-2	1000
T7-20-2	56000
T7-20-7	440
T8B-10-15	15000
T8B-2015	3100
T8C-10-5	18000
T10-10-5	110
TG11-69-5	5500
T11-80-6	76000
T11-100-5	37000
T11A-0-10	17000
T11A-10-5	11000
T12-10-10	62
T12B-3-5	88000

Sample ID	TRPH (mg/kg)
T12B-5-3	11000
T12B-8-6	16000
T13-16-1-	4700
T13-100-5	9400
T13A-0-5	1000
T13B-10-5	29000
T14-0-2	21000
T14-20-5	110000
T14-40-5	109000
T14A-0-3	45000
T14A-20-4	80111
T15-60-5	1300
T15A-40-7	ND
T16A-20-2	4000
T16A-20-4	2100
T16A-30-4	880
T17-120-3	20000
T17-130-3	28000
T180-0-10	6600
T180-20-5	2900
T18-20-10	4500
T18E-10-10	3200
T18E-20-10	1500
T19H-0-1.5	2000
T22-80-5	2500
T22-80-10	470
T22-40-10	1300
T23-10-2	47000
T23-10-5	3100
T23-20-5	8700
T23B-10-5	6500
T24-10-4	27000
T24-30-5	10000
T25-90-3	1200
T25-0-10	8.9
T25-10-5	43000
T25-0-5	520
T25b-0-5	22000
T28B-2-3	12000

TABLE A-8SAMPLES COMPARED TO ECOLOGICAL CRITERIA

	ER-L	ER-M	T1A-20-4	T3-20·4	T4·100·4	T4-110-4	TS-70-2	T6-0·8	n-20-2	TSB-10-15	T11-80-6	T12B-3-5	T13·160-10	T14·0-2	T14-COMP	T16A·20-2	T17·120·3	T18-0·1	T22-80-5	DET.	T23-10-2	T24-10-4	T25·10-5	T258-0-5	T288-2-3
Antimony	NA		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	ND	ND	ND	ND	ND
Arsenic	8.2	70	21	1.9	6.1	3.8	10	4.9	3.2	10	3.5	4.3	3.1	5.9	2.4	3.1	2.2	4.6	2.6	0.05	14	4.1	10	2.9	1.4
Barium			160	56	140	130	160	120	2800	130	140	150	300	110	130	590	57	1600	14	0.036	170	200	160	700	85
Beryllium			0.56	0.19	0.61	0.27	0.58	0.38	0.3	0.58	0.44	0.31	0.29	0.29	0.36	0.12	0.21	0.4	0.18	0.012	0.57	0.48	0.6	0.48	0.32
Cadmium	1.2	9.6	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.16	0.11	0.27	ND	ND	0.73	ND
Chromium	81	370	25	17	27	28	25	17	34	23	20	20	16	22	21	7.9	19	21	7.7	0.32	29	22	0.27	19	16
Cobalt			16	6.6	12	7.4	13	8.4	13	12	11	12	11	9.6	10	4.5	7.3	9.6	5.1	0.13	15	11	14	11	9.6
Copper	34	270	34	16	32	24	36	23	20	26	34	25	21	33	30	8.1	14	110	5.8	0.14	44	26	32	37	17
lead	46.7	218	13	48	99	13	51	26	11	7.6	35	5.4	5.4	45	78	4.2	68	82	2.8	0.8	18	13	16	100	6.6
Mercury	0.15	0.71	0.08	ND	0.06	0.05	0.25	ND	ND	ND	0.17	0.03	ND	ND	0.04	ND	ND	ND	ND	0.02	ND	ND	ND	0.19	ND
Molybdenum			1.2	1.1	1.7	2.9	1.7	1.4	0.76	0.49	1.1	0.4	0.56	2.8	4.1	0.22	1.1	1.2	1.8	0.11	0.98	1.2	2	1.6	0.61
Nickel	20.9	51.6	22	14	23	24	21	15	97	17	19	18	13	20	21	6.3	15	18	5.3	0.13	23	20	22	20	14
Selenium			0.14	0.25	0.29	1.8	0.21	0.19	0.11	ND	0.17	0.48	0.03	0.37	ND	ND	0.23	0.3	0.15	0.05	0.14	0.28	0.29	0.09	0.38
Silver	1	3.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19	ND	ND	ND	ND	ND
Thallium			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	ND	ND	ND	ND	ND
Vanadium			48	24	8	40	54	35	30	42	42	45	33	46	41	17	27	39	17	0.12	55	46	55	39	36
Zinc	150	410	67	71	82	59	160	51	60	59	220	45	44	54	75	24	69	170	21	0.012	330	62	66	1800	49

Notes: Cells highlighted in Yellow exceed ER-L values. Cells highlighted in Red exceed ER-M values

TABLE A-9SAMPLES COMPARED TO HUMAN HEALTH CRITERIA

	ESL	T1A-20-4	T3-20·4	T4·100·4	T4-110-4	TS-70-2	T6-0·8	n-20-2	TSB-10-15	T11-80-6	T12B-3-5	T13·160-10	T14·0-2	T14-COMP	T16A·20-2	T17·120·3	T18-0·1	T22-80-5	DET.	T23-10-2	T24-10-4	T25·10-5	T258-0-5	T288-2-3
Antimony	3.1E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	ND	ND	ND	ND	ND
Arsenic	0.0674819	21	1.9	6.1	3.8	10	4.9	3.2	10	3.5	4.3	3.1	5.9	2.4	3.1	2.2	4.6	2.6	0.05	14	4.1	10	2.9	1.4
Barium	3019.0991	160	56	140	130	160	120	2800	130	140	150	300	110	130	590	57	1600	14	0.036	170	200	160	700	85
Beryllium	41.558402	0.56	0.19	0.61	0.27	0.58	0.38	0.3	0.58	0.44	0.31	0.29	0.29	0.36	0.12	0.21	0.4	0.18	0.012	0.57	0.48	0.6	0.48	0.32
Cadmium	38.9973	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.16	0.11	0.27	ND	ND	0.73	ND
Chromium	1.0E+04	25	17	27	28	25	17	34	23	20	20	16	22	21	7.9	19	21	7.7	0.32	29	22	0.27	19	16
Cobalt	23.399764	16	6.6	12	7.4	13	8.4	13	12	11	12	11	9.6	10	4.5	7.3	9.6	5.1	0.13	15	11	14	11	9.6
Copper	3128.5714	34	16	32	24	36	23	20	26	34	25	21	33	30	8.1	14	110	5.8	0.14	44	26	32	37	17
lead	80	13	48	99	13	51	26	11	7.6	35	5.4	5.4	45	78	4.2	68	82	2.8	0.8	18	13	16	100	6.6
Mercury	12.510606	0.08	ND	0.06	0.05	0.25	ND	ND	ND	0.17	0.03	ND	ND	0.04	ND	ND	ND	ND	0.02	ND	ND	ND	0.19	ND
Molybdenum	391.07143	1.2	1.1	1.7	2.9	1.7	1.4	0.76	0.49	1.1	0.4	0.56	2.8	4.1	0.22	1.1	1.2	1.8	0.11	0.98	1.2	2	1.6	0.61
Nickel	86.342551	22	14	23	24	21	15	97	17	19	18	13	20	21	6.3	15	18	5.3	0.13	23	20	22	20	14
Selenium	391.06604	0.14	0.25	0.29	1.8	0.21	0.19	0.11	ND	0.17	0.48	0.03	0.37	ND	ND	0.23	0.3	0.15	0.05	0.14	0.28	0.29	0.09	0.38
Silver	391.07143	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19	ND	ND	ND	ND	ND
Thallium	0.7821429	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	ND	ND	ND	ND	ND
Vanadium	393.10739	48	24	8	40	54	35	30	42	42	45	33	46	41	17	27	39	17	0.12	55	46	55	39	36
Zinc	23464.286	67	71	82	59	160	51	60	59	220	45	44	54	75	24	69	170	21	0.012	330	62	66	1800	49

Notes: Cells in Red exceed ESL values

Results of the 2004 Anchor LCWA Hellman Ranch (South LCWA) Soil and Groundwater Sampling

Tables A-10 through A-12 compare the results of the 2014 LCWA Hellman Ranch sampling to hazardous waste criteria, ecological criteria, and human health. H

TABLE A-10: SUMMARY OF 2004 SAMPLES COMPARED TO HAZARDOUS WASTE CRITERIA.

Group	Analyte	Units	TTLC	STLC	Mean Concentration	Minimum Concentration	Maximum Concentration
Metals	Arsenic (As)	mg/kg	500	5	7.87	0.96	40
	Chromium (Total)	mg/kg	2500	560	32.1	8.58	57.6
	Copper	mg/kg	2500	25	31.3	7.17	65.6
	Lead	mg/kg	1000	5	30.1	7.17	65.6
	Mercury	mg/kg	20		0.18	ND	0.919
	Nickle	mg/kg	2000	20	24.9	5.78	49.1
	Selenium	mg/kg	100	1	0.38	ND	1.27
	Silver	mg/kg	500	5	0.09	ND	0.23
	Thallium	mg/kg	700	7	0.24	ND	0.52
	Zinc	mg/kg	5000	250	94.4	31.2	207
Pesticides	4,4”-DDD	µg/kg			0.7	ND	2.8
	4,4”-DDE	µg/kg	1	0.1	1.99	ND	42
	4,4”-DDT	µg/kg	1	0.1	1.89	ND	22
	Aldrin	µg/kg			NA	ND	ND
	Alpha-BHC	µg/kg			NA	1.8	1.8
	Beta-BHC	µg/kg			NA	ND	ND
	Chlordane	µg/kg	2.5	0.25	7.19	ND	49
	Delta-BH	µg/kg			NA	ND	ND

Notes: Cells highlighted in Yellow exceed ten times STLCL values. Cells highlighted in Red exceed TTLC values

TABLE A-11: SUMMARY OF 2004 SAMPLES COMPARED TO ECOLOGICAL CRITERIA

Group	Analyte	Units	ER-Ls	ER-Ms	Mean Concentration	Minimum Concentration	Maximum Concentration
Metals	Arsenic (As)	mg/kg	8.2	70	7.87	0.96	40
	Chromium (Total)	mg/kg	81	370	32.1	8.58	57.6
	Copper	mg/kg	34	270	31.3	7.17	65.6
	Lead	mg/kg	46.7	218	30.1	7.17	65.6
	Mercury	mg/kg	0.15	0.71	0.18	ND	0.919
	Nickle	mg/kg	20.9	51.6	24.9	5.78	49.1
	Selenium	mg/kg	NA	NA	0.38	ND	1.27
	Silver	mg/kg	1	3.7	0.09	ND	0.23
	Thallium	mg/kg	NA	NA	0.24	ND	0.52
	Zinc	mg/kg	150	410	94.4	31.2	207
Pesticides	4,4”-DDD	µg/kg	2	7.81(a)	0.7	ND	2.8
	4,4”-DDE	µg/kg	2.2	374	1.99	ND	42
	4,4”-DDT	µg/kg	1	4.77(a)	1.89	ND	22
	Aldrin	µg/kg	NA	NA	NA	ND	ND
	Alpha-BHC	µg/kg	NA	NA	NA	1.8	1.8
	Beta-BHC	µg/kg	NA	NA	NA	ND	ND
	Chlordane	µg/kg	0.5	4.79(a)	7.19	ND	49
	Delta-BH	µg/kg	NA	NA	NA	ND	ND
	Dieldrin	µg/kg	0.02	4.3	0.98	2.4	24
	Endosulfan I	µg/kg	NA	NA	NA	ND	ND
	Endosulfan II	µg/kg	NA	NA	NA	ND	ND
	Endosulfan Sulfate	µg/kg	NA	NA	NA	ND	ND
	Endrin	µg/kg	NA	NA	NA	ND	ND
	Endrin Aldehyde	µg/kg	NA	NA	NA	ND	ND
	Endrin Ketone	µg/kg	NA	NA	NA	ND	ND
	Gamme-BHC	µg/kg	NA	0.99	NA	ND	ND
	Heptachlor	µg/kg	NA	NA	NA	ND	ND
	Heptachlor Epoxide	µg/kg	NA	NA	NA	1.8	1.8
	Methoxychlor	µg/kg	NA	NA	NA	1.2	1.2
	Toxaphene	µg/kg	NA	NA	NA	ND	ND
Polychlorinated biphenyls (PCBs)	Aroclor-1016	mg/kg	NA	NA	NA	ND	ND
	Aroclor-1221	mg/kg	NA	NA	NA	ND	ND
	Aroclor-1232	mg/kg	NA	NA	NA	ND	ND
	Aroclor-1242	mg/kg	NA	NA	NA	ND	ND
	Aroclor-1248	mg/kg	NA	NA	NA	ND	ND
	Aroclor-1254	mg/kg	NA	NA	NA	ND	ND
	Aroclor-1260	mg/kg	NA	NA	NA	ND	ND
	Aroclor-1262	mg/kg	NA	NA	NA	ND	ND

Group	Analyte	Units	ER-Ls	ER-Ms	Mean Concentration	Minimum Concentration	Maximum Concentration
	Total PCBs	mg/kg	22.7	180	NA	Na	NA
PAHs	Acenapthene	mg/kg	0.016	0.5	NA	0.059	0.059
Low molecular weight	Acenaphthlene	mg/kg	0.044	0.64	NA	ND	ND
	Anthracene	mg/kg	0.0853	1.1	NA	0.02	0.02
	Flourene	mg/kg	0.019	0.54	0.02	ND	0.53
	Napthalene	mg/kg	0.16	2.1	0.05	ND	1.4
	Phenathrene	mg/kg	0.24	1.5	0.04	ND	0.76
PAHs	Benzo(a) Anthracene	mg/kg	0.261	1.6	0.013	ND	0.045
High molecular weight	Benzo (a)Pyrene	mg/kg	0.43	1.6	0.01	ND	0.21
	Benzo (b) Flouranthene	mg/kg	Na	NA	0.01	ND	0.052
	Benzo (g,h,I) Perylene	mg/kg	Na	NA	0.01	ND	0.05
	Benzo (k) Flouranthene	mg/kg	Na	NA	0.01	ND	0.047
	Chrysene	mg/kg	0.384	2.8	0.02	ND	0.13
	Dibenz (a,h) Anthracene	mg/kg	0.0634	NA	Na	ND	ND
	Flouranthene	mg/kg	0.6	5.1	0.02	0.025	0.53
	Indeno (1,2,3-c,d) Pyrene	mg/kg	NA	NA	0.01	0.022	0.023
	Pyrene	mg/kg	NA	2.6	0.04	ND	0.76

Notes: Cells highlighted in Yellow exceed ER-L values. Cells highlighted in Red exceed ER-M values

TABLE A-12: SUMMARY OF 2004 SAMPLES COMPARED TO HUMAN HEALTH CRITERIA

Group	Analyte	Units	Residential ESL (mg/kg)	Mean Concentration	Minimum Concentration	Maximum Concentration
Metals	Arsenic (As)	mg/kg	0.07	7.87	0.96	40
	Chromium (Total)	mg/kg	0.30	32.1	8.58	57.6
	Copper	mg/kg	3129	31.3	7.17	65.6
	Lead	mg/kg	80.00	30.1	7.17	65.6
	Mercury	mg/kg	12.5	0.18	ND	0.919
	Nickle	mg/kg	391.1	24.9	5.78	49.1
	Selenium	mg/kg	391.1	0.38	ND	1.27
	Silver	mg/kg	391.1	0.09	ND	0.23
	Thallium	mg/kg	0.78	0.24	ND	0.52
	Zinc	mg/kg	23464	94.4	31.2	207
Pesticides	4,4”-DDD	µg/kg	1.89	0.7	ND	2.8
	4,4”-DDE	µg/kg	1.89	1.99	ND	42
	4,4”-DDT	µg/kg		1.89	ND	22
	Aldrin	µg/kg	0.04	NA	ND	ND
	Alpha-BHC	µg/kg		NA	1.8	1.8
	Beta-BHC	µg/kg		NA	ND	ND
	Chlordane	µg/kg	0.48	7.19	ND	49
	Delta-BH	µg/kg		NA	ND	ND
	Dieldrin	µg/kg	0.04	0.98(b)	2.4	24
	Endosulfan I	µg/kg		NA	ND	ND
	Endosulfan II	µg/kg		NA	ND	ND
	Endosulfan Sulfate	µg/kg		NA	ND	ND
	Endrin	µg/kg	20.98	NA	ND	ND
	Endrin Aldehyde	µg/kg		NA	ND	ND
	Endrin Ketone	µg/kg		NA	ND	ND
	Gamme-BHC	µg/kg		NA	ND	ND
	Hptachlor	µg/kg	0.14	NA	ND	ND
	Heptachlor Epoxide	µg/kg	0.07	NA	1.8	1.8
	Methoxychlor	µg/kg	349.6	NA	1.2	1.2
	Toxaphene	µg/kg	0.51	NA	ND	ND
PCBs	Aroclor-1016	mg/kg		NA	ND	ND
	Aroclor-1221	mg/kg		NA	ND	ND
	Aroclor-1232	mg/kg		NA	ND	ND
	Aroclor-1242	mg/kg		NA	ND	ND
	Aroclor-1248	mg/kg		NA	ND	ND
	Aroclor-1254	mg/kg		NA	ND	ND
	Aroclor-1260	mg/kg		NA	ND	ND
	Aroclor-1262	mg/kg		NA	ND	ND
	Total PCBs	mg/kg		NA	Na	NA

Group	Analyte	Units	Residential ESL (mg/kg)	Mean Concentration	Minimum Concentration	Maximum Concentration
PAHs	Acenapthene	mg/kg	3586.5	NA	0.059	0.059
Low molecular weight	Acenaphthlene	mg/kg		NA	ND	ND
	Anthracene	mg/kg		NA	0.02	0.02
	Flourene	mg/kg	2391.0	0.02	ND	0.53
	Napthalene	mg/kg	3.28	0.05	ND	1.4
	Phenathrene	mg/kg		0.04	ND	0.76
PAHs	Benzo(a) Anthracene	mg/kg	0.16	0.013	ND	0.045
High molecular weight	Benzo (a)Pyrene	mg/kg	0.02	0.01	ND	0.21
	Benzo (b) Flouranthene	mg/kg	0.16	0.01	ND	0.052
	Benzo (g,h,I) Perylene	mg/kg		0.01	ND	0.05
	Benzo (k) Flouranthene	mg/kg	1.57	0.01	ND	0.047
	Chrysene	mg/kg	14.73	0.02	ND	0.13
	Dibenz (a,h) Anthracene	mg/kg	0.02	Na	ND	ND
	Flouranthene	mg/kg	2391.0	0.02	0.025	0.53
	Indeno (1,2,3-c,d) Pyrene	mg/kg	0.16	0.01	0.022	0.023
	Pyrene	mg/kg	1793.2	0.04	ND	0.76

Notes: Cells highlighted in Red exceed ESL values

Results of the 2014 Pacific Coast Environmental Conservancy (PCEC) Geotechnical Assessment

The following tables show the results of the 2014 sampling at Zedler Marsh and the State Lands Parcel.

TABLE A-13: SUMMARY OF 2004 SAMPLES COMPARED TO ECOLOGICAL CRITERIA

PAH Analyte	ER-L	ER-M	ZM1	ZM2	ZM3	ZM4	ZM5	ZM6	ZM7	ZM8	SLP9	SLP10 R1	SLP10 R2	SLP 10 MS1	SLP10 MS2
								ppb							
d10-Acenaphthene)			68	67	66	67	60	60	64	65	65	66	70	68	66
(d10-Phenanthrene)			82	86	84	84	81	74	83	83	81	84	88	88	87
(d12-Chrysene)			92	113	108	105	101	95	103	106	92	110	113	114	110
(d12-Perylene)			114	112	113	114	107	103	106	117	112	103	106	98	99
(d8-Naphthalene)			49	49	45	48	40	40	43	48	48	47	50	50	49
1-Methylnaphthalene			1.2	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	24.3	23.7
1-Methylphenanthrene			2.3	7.2	1	1	ND	ND	ND	2.2	ND	1.6	1.5	38.1	38.6
2,3,5-Trimethylnaphthalene			ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	28.8	28.7
1,6-Dimethylnaphthalene			1.7	2.3	1	1	ND	ND	ND	1.3	ND	ND	ND	26.3	26
2-Methylnaphthalene			2.3	2.7	1.1	1.2	ND	ND	ND	1.4	ND	ND	ND	24.5	24.1
Acenaphthene	16.00	500.00	1.3	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	27.1	27
Acenaphthylene	44.00	640.00	3.4	1.8	ND	ND	ND	ND	ND	ND	ND	1.1	1	29.2	27.6
Anthracene	85.30	1100.00	15.4	12.7	1.1	1.8	ND	ND	ND	2.9	ND	1.8	1.3	33.6	33.5
Benz[a]anthracene	261.00	1600.00	6.5	85.2	3.1	9.8	ND	ND	1.9	11.8	2.5	11.9	10.4	64.8	61.9
Benzo[a]pyrene	430.00	1600.00	3.6	101.8	5	12.6	1	1.2	3.3	12.6	3.7	15.3	13.8	72.7	70.5
Benzo[b]fluoranthene			5.7	105.3	4.8	14.3	ND	ND	3.6	11.3	3.9	14.7	13.5	69.2	68.1
Benzo[e]pyrene			15.4	93.2	10.4	16.6	1	3.2	4.9	28.4	5.9	17.6	17.8	69.9	67.2
Benzo[g,h,i]perylene			37.7	71.2	10.6	15.4	ND	3.4	4.8	30.1	6.1	17.9	17.7	57.8	57.8
Benzo[k]fluoranthene			2.8	60.3	2.7	6.9	ND	ND	2.1	6.2	1.9	8.5	8	62.5	62.9
Biphenyl			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	24.9	24.4
Chrysene	384.00	2800.00	10.4	138.8	8.5	13.2	1.1	1.2	4.6	21.4	6.4	19.7	18.6	74.1	66.9
Dibenz[a,h]flouranthene			ND	22.3	2.2	3.8	ND	ND	1	6	1.4	4	4.5	41	44.2
Dibenzothiophene			ND	2.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	33.3	32.9
Fluoranthene	600.00	5100.00	15.6	139.1	4.9	17.6	ND	1.2	4.1	21.9	6.4	17.3	12.6	75.9	59.4
Fluorene	19.00	540.00	ND	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	31.1	30.6
Indeno[1,2,3-c,d]pyrene			8.3	70.7	4.8	11.7	ND	ND	3.3	10.5	3.1	10.6	10.2	54.4	55.9
Naphthalene	160.00	2100.00	1.2	2.1	ND	1.2	ND	ND	ND	ND	ND	ND	ND	20.6	20.9
Perylene			111.8	54.2	11.7	19.1	ND	3.8	4	130.5	4.7	7.3	7.9	59.9	56.6
Phenanthrene			14.2	48.3	2.8	4.9	ND	ND	2.3	11.6	3.5	8.5	5.2	48.8	41.3
Pyrene			15.8	140	6.7	13.4	1.7	1.4	4.4	20.8	7.6	18.7	15.7	79.5	63.9

Note: Cells I n Yellow exceed ER-L values

TABLE A-14: SUMMARY OF 2014 SAMPLES COMPARED TO HUMAN HEALTH CRITERIA

PAH Analyte	ESL (mg/kg)	ZM1	ZM2	ZM3	ZM4	ZM5	ZM6	ZM7	ZM8	SLP9	SLP10 R1	SLP10 R2	ZM1	ZM2	ZM3	ZM4	ZM5	ZM6	ZM7	ZM8	SLP9	SLP10 R1	SLP10 R2
		ppb											mg/kg (mg/kg = ppb/1000)										
d10-Acenaphthene)		68	67	66	67	60	60	64	65	65	66	70	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.07	0.07	0.07	0.07
(d10-Phenanthrene)		82	86	84	84	81	74	83	83	81	84	88	0.08	0.09	0.08	0.08	0.08	0.07	0.08	0.08	0.08	0.08	0.09
(d12-Chrysene)		92	113	108	105	101	95	103	106	92	110	113	0.09	0.11	0.11	0.11	0.10	0.10	0.10	0.11	0.09	0.11	0.11
(d12-Perylene)		114	112	113	114	107	103	106	117	112	103	106	0.11	0.11	0.11	0.11	0.11	0.10	0.11	0.12	0.11	0.10	0.11
(d8-Naphthalene)		49	49	45	48	40	40	43	48	48	47	50	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.05	0.05	0.05	0.05
1-Methylnaphthalene		1.2	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00	ND	ND	ND	ND	ND	ND	ND	ND	ND
1-Methylphenanthrene		2.3	7.2	1	1	ND	ND	ND	2.2	ND	1.6	1.5	0.00	0.01	0.00	0.00	ND	ND	ND	0.00	ND	0.00	0.00
2,3,5-Trimethylnaphthalene		ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,6-Dimethylnaphthalene		1.7	2.3	1	1	ND	ND	ND	1.3	ND	ND	ND	0.00	0.00	0.00	0.00	ND	ND	ND	0.00	ND	ND	ND
2-Methylnaphthalene		2.3	2.7	1.1	1.2	ND	ND	ND	1.4	ND	ND	ND	0.00	0.00	0.00	0.00	ND	ND	ND	0.00	ND	ND	ND
Acenaphthene	16.29	1.3	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	1.3E+01	3.4	1.8	ND	ND	ND	ND	ND	ND	ND	1.1	1	0.00	0.00	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
Anthracene		15.4	12.7	1.1	1.8	ND	ND	ND	2.9	ND	1.8	1.3	0.02	0.01	0.00	0.00	ND	ND	ND	0.00	ND	0.00	0.00
Benz[a]anthracene	1.6E-01	6.5	85.2	3.1	9.8	ND	ND	1.9	11.8	2.5	11.9	10.4	0.01	0.09	0.00	0.01	ND	ND	0.00	0.01	0.00	0.01	0.01
Benzo[a]pyrene	0.02	3.6	101.8	5	12.6	1	1.2	3.3	12.6	3.7	15.3	13.8	0.00	0.10	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.02	0.01
Benzo[b]fluoranthene	0.16	5.7	105.3	4.8	14.3	ND	ND	3.6	11.3	3.9	14.7	13.5	0.01	0.11	0.00	0.01	ND	ND	0.00	0.01	0.00	0.01	0.01
Benzo[e]pyrene		15.4	93.2	10.4	16.6	1	3.2	4.9	28.4	5.9	17.6	17.8	0.02	0.09	0.01	0.02	0.00	0.00	0.00	0.03	0.01	0.02	0.02
Benzo[g,h,i]perylene	2.50	37.7	71.2	10.6	15.4	ND	3.4	4.8	30.1	6.1	17.9	17.7	0.04	0.07	0.01	0.02	ND	0.00	0.00	0.03	0.01	0.02	0.02
Benzo[k]fluoranthene	1.57	2.8	60.3	2.7	6.9	ND	ND	2.1	6.2	1.9	8.5	8	0.00	0.06	0.00	0.01	ND	ND	0.00	0.01	0.00	0.01	0.01
Biphenyl	6.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	3.84	10.4	138.8	8.5	13.2	1.1	1.2	4.6	21.4	6.4	19.7	18.6	0.01	0.14	0.01	0.01	0.00	0.00	0.00	0.02	0.01	0.02	0.02
Dibenz[a,h]flouranthene		ND	22.3	2.2	3.8	ND	ND	1	6	1.4	4	4.5	ND	0.02	0.00	0.00	ND	ND	0.00	0.01	0.00	0.00	0.00
Dibenzothiophene		ND	2.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	60.45	15.6	139.1	4.9	17.6	ND	1.2	4.1	21.9	6.4	17.3	12.6	0.02	0.14	0.00	0.02	ND	0.00	0.00	0.02	0.01	0.02	0.01
Fluorene	8.94	ND	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno[1,2,3-c,d]pyrene	0.16	8.3	70.7	4.8	11.7	ND	ND	3.3	10.5	3.1	10.6	10.2	0.01	0.07	0.00	0.01	ND	ND	0.00	0.01	0.00	0.01	0.01
Naphthalene	0.03	1.2	2.1	ND	1.2	ND	ND	ND	ND	ND	ND	ND	0.00	0.00	ND	0.00	ND	ND	ND	ND	ND	ND	ND
Perylene		111.8	54.2	11.7	19.1	ND	3.8	4	130.5	4.7	7.3	7.9	0.11	0.05	0.01	0.02	ND	0.00	0.00	0.13	0.00	0.01	0.01
Phenanthrene	10.69	14.2	48.3	2.8	4.9	ND	ND	2.3	11.6	3.5	8.5	5.2	0.01	0.05	0.00	0.00	ND	ND	0.00	0.01	0.00	0.01	0.01
Pyrene	85.06	15.8	140	6.7	13.4	1.7	1.4	4.4	20.8	7.6	18.7	15.7	0.02	0.14	0.01	0.01	0.00	0.00	0.00	0.02	0.01	0.02	0.02

Appendix B
Ocean Disposal

OCEAN DISPOSAL

On-site sediment that is not used for on-site beneficial use as wetland surface, wetland foundation or upland placement may be designated for alternative placement depending on final cut and fill balance quantities. The suitability of on-site excavated sediment for placement at a designated ocean dredged material disposal sites would require a Tier III evaluation in accordance with Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual (ITM; USEPA/USACE 1998, Section 6.7) and Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual (OTM; USEPA/USACE 1991) guidelines. Sampling and testing requirements under these protocols include:

- **Sampling Frequency** - The general rule is a minimum of two composite samples will be used for the first 100,000 cubic yards (CY) and one composite sample will be used per subsequent 100,000 CY. However, additional composites or analyses of individual cores may be required if contaminant hot spots are identified.
- **Geotechnical Testing** - Physical analysis should include grain size, specific gravity, and total solids. Atterberg limits are also recommended to estimate strength and settlement characteristics of the sediment.
- **Chemical Testing** - Chemical analysis of bulk sediment should include general chemistry (i.e., ammonia, total sulfides, and total organic carbon [TOC]), trace metals, chlorinated pesticides, PCB Congeners, PAHs, other semi volatile organic compounds (i.e., phenols and phthalates), and organotin.

Similar to the assessment of the suitability of the project's excavated sediment for use as on-site wetland surface and foundation materials, the chemical analyses results may be compared to ER-L and ER-M values. The values are helpful in assessing the potential significance of elevated sediment-associated contaminants of concern, in conjunction with biological analysis. While these screening level values are useful for identifying elevated sediment-associated contaminants, they should not be used to infer causality because of the inherent variability and uncertainty of the approach. As presented previously, the results of chemical analyses of on-site sediment samples indicated concentrations of many constituents (lead, chromium, arsenic, copper, mercury, nickel, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, chlordane, and dieldrin., and zinc above the ER-L and ER-M thresholds. s. Concentrations were not above the ER-Ms.

The additional biological testing that is required under the ocean disposal guidance includes:

- **Solid Phase Toxicity Testing** - Two solid phase (SP) 10-day acute tests performed on whole sediment are conducted to estimate potential adverse effects of ocean disposed dredged material on benthic organisms. One SP test may be conducted using an amphipod species. The species should be selected based on grain size tolerance (i.e., *Eohaustorius estuarius* prefer primarily coarse-grained sediment while *Ampelisca abdita* prefer fine-grained sediment) to reduce confounding effects unrelated to contaminants. The polychaete *Neanthes arenaceodentata* may be used.

- **Suspended particulate phase (SPP) Toxicity Testing** – Three suspended particulate phase (SPP) tests are required. SPP tests are conducted to estimate the potential adverse effects of ocean disposed dredged material on organisms that live in the water column. These tests are performed on sediment elutriates, prepared at a ratio of one part sediment and four parts site water in accordance with ITM (USEPA/USACE 1998) and OTM (USEPA/USACE 1991) guidelines. SPP tests may be performed using the mysid shrimp *Americamysis bahia* (formerly *Mysidopsis bahia*), the fish *Menidia beryllina*, and the larvae of a bivalve. The bivalve species may include *Mytilus galloprovincialis*; however, if gravid mussels are not available, an alternate species should be selected in consultation with USEPA and USACE. Both the mysid shrimp and fish SPP tests are 96-hour acute tests, while the *M. galloprovincialis* SPP test is a 48-hour chronic test that measures both survival and development.
- **Bioaccumulation Potential Testing**—The Bioaccumulation Potential (BP) testing consists of a 28-day test performed on whole sediment. The purpose of the BP tests is to estimate the potential of benthic organisms to bioaccumulate contaminants of concern from ocean disposed dredged material. BP tests may be conducted using the bivalve *Macoma nasuta* and the polychaete *Nereis virens*; however, *Nephthys caecoides* may be used as an alternative polychaete species. At test termination, bioaccumulation tissue samples should be submitted for chemical analysis. The tissue analyte list should focus on those chemicals present at levels of concern in sediment (i.e., greater than ER-M values) and based on approval by the Contaminated Sediment Task Force prior to analysis of tissue samples.

The biological testing that has been performed to date on the on-site sediment for assessing suitability for on-site beneficial use has included solid phase toxicity testing. As discussed previously, the result of this toxicity testing indicated a significant difference from the control for one of the three species tested. The differences from the control sample were observed for the *Eohaustorius estuaries,* which is likely the result of the fine-grained nature of the sediment samples as discussed.

Based on the available results, the placement of on-site excavated sediments (not used for on-site wetland restoration and upland habitat) at a designated ocean disposal or open water placement site remains a potential option, if needed. However, the determination of suitability will require further biological testing in accordance with ITM (USEPA/USACE 1998) and OTM (USEPA/USACE 1991) guidelines as outlined above. The additional testing will include running the solid phase toxicity testing using a fine-grained control, and SSP and BP testing as discussed above.

For SPP testing, results are compared to the control. If a median lethal concentration (LC50) or median effective concentration (EC50) can be calculated, a dilution water model should be used to perform a comparison with water quality standards. A short-term fate (STFATE) mixing zone model should be used to determine if LPC requirements will be met; water column concentrations must not exceed 1 percent of the LC50 or EC50 outside the mixing zone 4 hours after dredged material disposal.

For BP testing, tissue concentrations are compared with applicable U.S. Food and Drug Administration (FDA) action levels, and tissue concentrations of organisms exposed to reference sediment. If tissue concentrations of organisms exposed to test sediment are statistically elevated

compared to the organisms exposed to reference sediment, results should be assessed based on the criteria specified in the OTM (USEPA/USACE 1991; e.g., toxicological importance of contaminants, magnitude of exceedance, and propensity to biomagnify).

The biological testing for the evaluation of suitability for on-site beneficial use and ocean disposal was performed using a phased approach to avoid the need for unnecessary testing. Additional testing will be performed as needed in accordance with applicable requirements.

Appendix K
Noise Analysis Report

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LOS CERRITOS WETLANDS RESTORATION PROGRAM

Noise And Vibration Technical Report

Prepared for
Los Cerritos Wetlands Authority

April 2020

ESA

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Noise And Vibration Technical Report

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SECTION 1
Introduction

The Los Cerritos Wetlands Authority (the Applicant) proposes to implement the Los Cerritos Wetland Restoration Program (program). The program area is located within the City of Seal Beach, which is within the northwestern portion of Orange County, California, and the City of Long Beach, which is within the southeastern portion of Los Angeles County, California. The program would restore wetland, transition, and upland habitats throughout the plan area.

This report analyzes potential noise and vibration impacts that would result from the program. The analysis characterizes the existing noise environment of the program area and surrounding area, estimates noise and vibration levels from construction and operation on the program area and at surrounding sensitive land uses, evaluates the potential for significant impacts, and provides mitigation measures to address any significant impacts. In addition, this section evaluates the potential cumulative noise and vibration impacts resulting from the program together with related projects and other future growth.

The program area includes approximately 503 acres of land located within an urbanized and industrialized area. The regional location of the program area is shown in **Figure 1**, *Program Area and Local Vicinity*. Regional access to the program area is provided by Interstate 405 (I-405) and Interstate 605 (I-605) as well as State Route 22 (SR-22), which terminates as 7th Street. Pacific Coast Highway (SR-1) traverses the area from the northwest corner to the southeast corner. The program area is located on four individual areas (South, Isthmus, Central, and North). The proposed program would restore wetland, transition, and upland habitats throughout the program area. This would involve remediation of contaminated soil and groundwater, grading, revegetation, construction of new public access opportunities (including trails, visitor center, parking lot, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities.

SOURCE: ESRI

Los Cerritos Wetlands Restoration Plan

Figure 1

Program Area and Local Vicinity

ESA

SECTION 2
Environmental Setting

2.1 Noise Fundamentals

Noise Principals and Descriptors

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air). Noise is generally defined as unwanted sound (i.e., loud, unexpected, or annoying sound). Acoustics is defined as the physics of sound. In acoustics, the fundamental scientific model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. Acoustics addresses primarily the propagation and control of sound.

Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) that is measured in decibels (dB), which is the standard unit of sound amplitude measurement. The dB scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound, with 0 dB corresponding roughly to the theoretical threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude. When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The typical human ear is not equally sensitive to this frequency range. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that deemphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to these extremely low and extremely high frequencies. This method of frequency filtering or weighting is referred to as A-weighting, expressed in units of A-weighted decibels (dBA), which is typically applied to community noise measurements. Some representative common outdoor and indoor noise sources and their corresponding A-weighted noise levels are shown in **Table 1**, *Decibel Scale and Common Noise Sources*.

TABLE 1
TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at 3 feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

SOURCE: Caltrans, 2013a.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time; a noise level is a measure of noise at a given instant in time, as presented in Table 1. However, noise levels rarely persist at that level over a long period of time. Rather, community noise varies continuously over a period of time with respect to the sound sources contributing to the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with many of the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources, such as changes in traffic volume. What makes community noise variable throughout a day, besides the slowly changing background noise, is the addition of short-duration, single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment change the community noise level from instant to instant, requiring the noise exposure to be measured over periods of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. The following noise descriptors are used to characterize environmental noise levels over time, which are applicable to the program.

L_{eq}: The equivalent sound level over a specified period of time, typically, 1 hour ($L_{eq(1)}$). The L_{eq} may also be referred to as the average sound level.

L_{max}: The maximum, instantaneous noise level experienced during a given period of time.

L_{min}: The minimum, instantaneous noise level experienced during a given period of time.

L_x: The noise level exceeded a percentage of a specified time period. For instance, L_{50} and L_{90} represent the noise levels that are exceeded 50 percent and 90 percent of the time, respectively.

L_{dn}: The average A-weighted noise level during a 24-hour day, obtained after an addition of 10 dB to measured noise levels between the hours of 10:00 P.M. to 7:00 A.M. to account for nighttime noise sensitivity. The L_{dn} is also termed the day-night average noise level (DNL).

CNEL: The Community Noise Equivalent Level (CNEL) is the average A-weighted noise level during a 24-hour day that includes an addition of 5 dB to measured noise levels between the hours of 7:00 A.M. to 10:00 P.M. and an addition of 10 dB to noise levels between the hours of 10:00 P.M. to 7:00 A.M. to account for noise sensitivity in the evening and nighttime, respectively.

Effects of Noise on People

Noise is generally loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity that is a nuisance or disruptive. The effects of noise on people can be placed into four general categories:

- Subjective effects (e.g., dissatisfaction, annoyance);
- Interference effects (e.g., communication, sleep, and learning interference);
- Physiological effects (e.g., startle response); and
- Physical effects (e.g., hearing loss).

Although exposure to high noise levels has been demonstrated to cause physical and physiological effects, the principal human responses to typical environmental noise exposure are related to subjective effects and interference with activities. Activities most affected by noise include rest, relaxation, recreation, study, and communications.

With regard to the subjective effects, the individuals' responses to similar noise events are diverse and influenced by many factors, including the type of noise, the perceived importance of the

noise, the appropriateness of the noise to the setting, the duration of the noise, the time of day and the type of activity during which the noise occurs, and individual noise sensitivity. Overall, there is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction on people. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which a person has adapted (i.e., comparison to the ambient noise environment). In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships generally occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA in ambient noise levels cannot be perceived.
- Outside of the laboratory, a 3 dBA change in ambient noise levels is considered to be a barely perceivable difference.
- A change in ambient noise levels of 5 dBA is considered to be a readily perceivable difference.
- A change in ambient noise levels of 10 dBA is subjectively heard as doubling of the perceived loudness.

These relationships occur in part because of the logarithmic nature of sound and the dB scale. The human ear perceives sound in a non-linear fashion; therefore, the dBA scale was developed. Because the dBA scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. Under the dBA scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two sources are each producing sound of the same loudness, the resulting sound level at a given distance would be approximately 3 dBA higher than one of the sources under the same conditions. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA. Under the dB scale, three sources of equal loudness together produce a sound level of approximately 5 dBA louder than one source, and ten sources of equal loudness together produce a sound level of approximately 10 dBA louder than the single source.

Noise Attenuation

When noise propagates over a distance, the noise level reduces with distance depending on the type of noise source and the propagation path. Noise from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern, referred to as "spherical spreading." Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (i.e., reduce) at a rate between 6 dBA for acoustically "hard" sites and 7.5 dBA for "soft" sites for each doubling of distance from the reference measurement, as their energy is continuously spread out over a spherical surface (e.g., for hard surfaces, 80 dBA at 50 feet attenuates to 74 at 100 feet, 68 dBA at 200 feet, etc.). Hard sites, such as asphalt or concrete surfaces or smooth bodies of water, act as a reflective surface between the source and the receiver. No excess ground attenuation is assumed for hard sites and the reduction in noise

levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees, which in addition to geometric spreading, provides an excess ground attenuation value of 1.5 dBA (per doubling distance).

Roadways and highways consist of several localized noise sources on a defined path, and hence are treated as "line" sources, which approximate the effect of several point sources. Noise from a line source propagates over a cylindrical surface, often referred to as "cylindrical spreading." Line sources (e.g., traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement. Therefore, noise due to a line source attenuates less with distance than that of a point source with increased distance.

Additionally, receptors located downwind from a noise source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Atmospheric temperature inversion (i.e., increasing temperature with elevation) can increase sound levels at long distances (e.g., more than 500 feet). Other factors such as air temperature, humidity, and turbulence can also have significant effects on noise levels (Caltrans 2013a).

2.2 Vibration Fundamentals

Vibration can be interpreted as energy transmitted in waves through the ground or man-made structures, which generally dissipate with distance from the vibration source. Because energy is lost during the transfer of energy from one particle to another, vibration becomes less perceptible with increasing distance from the source.

In contrast to airborne noise, ground-borne vibration is not a common environmental problem, as it is unusual for vibration from sources, such as buses and trucks, to be perceptible to humans, even in proximity to major roads. Some common sources of ground-borne vibration are train movement, heavy trucks traveling on rough roads, and construction activities, such as blasting, pile-driving, and operation of heavy earth-moving equipment.

The effects of ground-borne vibration include movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Vibration sensitive receptors include buildings where vibration would interfere with operations or equipment within the building or cause structural damage (especially older masonry structures), or annoy people within the building.

Vibration can potentially cause structural damage to buildings, however, vibration is not a factor for most projects, with the exception of rock blasting or pile-driving during construction, or when operating heavy construction equipment adjacent to buildings. Annoyance from vibration often occurs when the vibration levels exceed the threshold of human perception by only a small margin. A vibration level that causes annoyance would be well below the structural damage threshold for modern buildings.

Vibration levels are typically quantified as the peak particle velocity (PPV) defined as the maximum instantaneous peak of the vibration signal in inches per second (in/sec) and used to determine vibration impacts to buildings, as well as, to humans.

2.3 Existing Conditions

Noise-Sensitive Receptors Locations

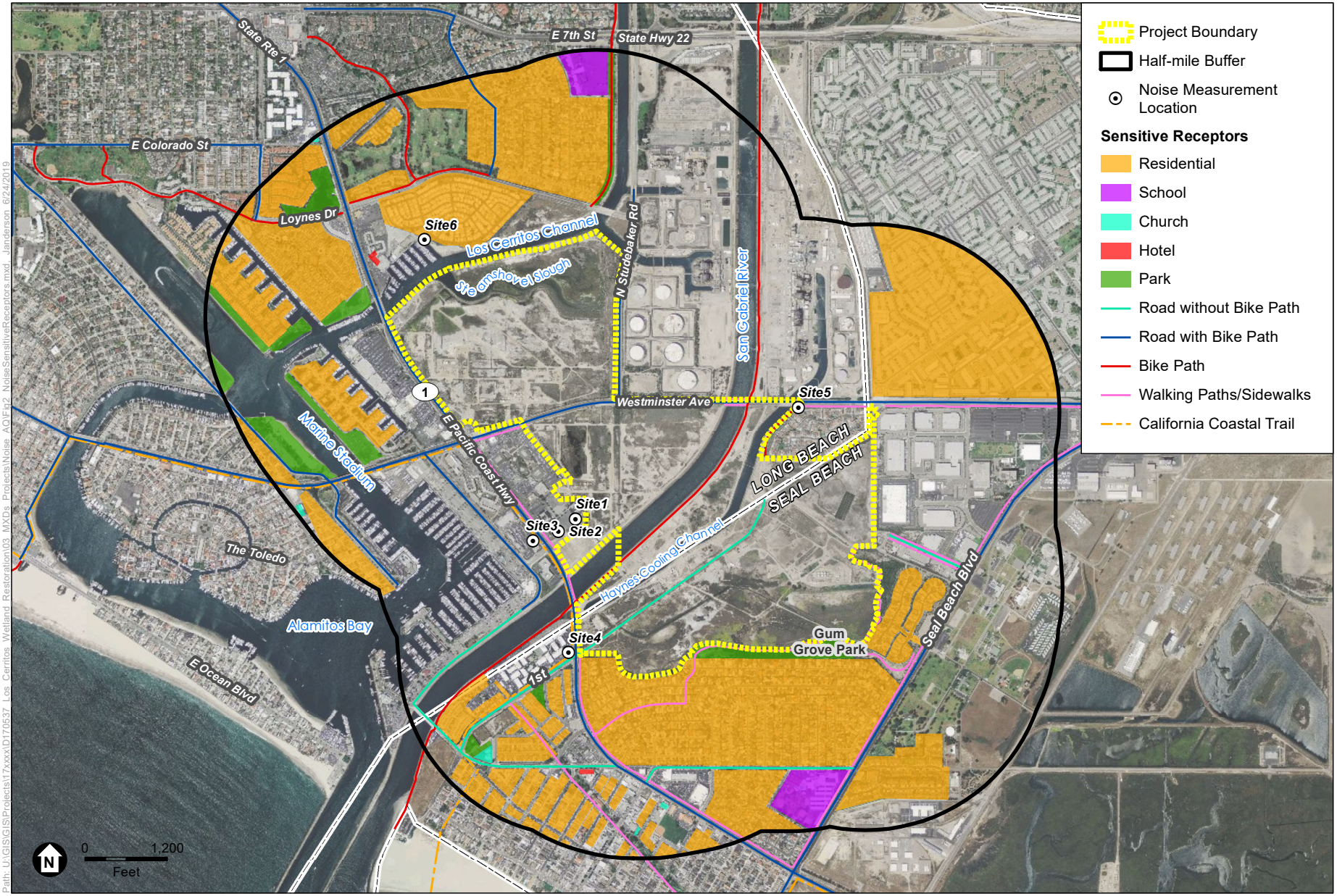
Certain land uses can be more sensitive to noise than other land uses based on the types of activities typically conducted at the land use (i.e., land uses for sleeping, concentration, and convalescence are considered noise-sensitive). Therefore, people at residences, motels and hotels, schools, libraries, religious facilities, hospitals, nursing homes, natural areas, parks, and other passive outdoor recreation areas are generally more sensitive to noise than people at commercial and industrial land uses. Consequently, noise standards for noise-sensitive land uses are more stringent than for those less sensitive uses.

The land uses of the program area are mainly vacant and industrial uses. Noise-sensitive receptors located in the program area are associated with passive recreational areas of the San Gabriel River Trail, which bisects the program area east-west along the southern bank of the San Gabriel River; the outdoor recreation amenities at Zedler Marsh; the fishing area at the Haynes Cooling Channel; and the boating and kayaking opportunities at the Los Cerritos Channel. The areas surrounding the program area are industrial, commercial, parks and open space, and single- and multifamily residential. The existing noise-sensitive land uses within 500 feet of the program area boundary include residences, Gum Grove Park, and bicycle and pedestrian trails, with two elementary schools within a one-half mile. **Figure 2,** *Noise Sensitive Receptors*, illustrates the program area and its immediate surrounding land uses.

Vibration-Sensitive Receptor Locations

Typically, groundborne vibration generated by anthropogenic activities (i.e., rail and roadway traffic, operation of mechanical equipment and typical construction equipment) diminishes rapidly with distance from the vibration source. FTA uses a screening distance of 50 feet for residential uses and schools; when inhabited buildings are within 50 feet from a project site with non-impact construction activities (i.e., no pile driving), detailed vibration impact analysis is required.

There are no existing inhabited structures located within the program area. Outside of the program area boundary, there are no inhabited structures within 50 feet of the proposed operation of heavy equipment (e.g., bulldozer) for restoration activities in the program area. The nearest inhabited structures are located at distances greater than 50 feet from the operation of heavy equipment for restoration activities within the program area.



SOURCE: Mapbox, LCWA

Los Cerritos Wetlands Restoration Plan

Figure 2

Noise Sensitive Receptors

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Ambient Noise Levels

The existing noise sources of the program area include primarily the operating oil wells, and in surrounding areas, vehicle traffic on adjacent roadways. Secondary noise sources of surrounding areas include general residential-related activities, such as landscaping; and commercial-related activities, such as loading dock/delivery truck activities, trash compaction, and refuse service activities.

Ambient noise measurements were previously conducted at commercial and residential uses in proximity to the program area in 2017 for the Los Cerritos Wetland Oil Consolidation and Restoration Project (Greve & Associates 2017). The noise measurements were short-term (15-minute duration), conducted to characterize the existing ambient noise environment at residences and commercial facilities. Overall, the average noise level measurements ranged from 50.1 to 71.1 dBA L_{eq} based on proximity of the measurement locations to various noise sources, primarily vehicle traffic on area roadways. Measurements at residences, as shown on Figure 2, included:

- 71.1 dBA L_{eq} at Site 5 represents the housing development southeast of the LCWA site, the loudest of the sites measured. Noise sources were vehicle traffic on 2nd Street including trucks and motorcycles, and the operating power plant across 2nd Street from the housing development producing a continuous noise level of 55 to 60 dBA.
- 50.1 dBA L_{eq} at Site 6 represents the mobile home park, the quietest of the six sites measured. Noise sources were distant vehicle traffic on Pacific Coast Highway, nearby chirping birds, and occasional aircraft flyovers.

SECTION 3
Regulatory Setting

3.1 Federal

There are no federal noise or vibration standards that directly regulate environmental noise and vibration related to the construction or operation of the proposed program. FTA provides vibration criteria to evaluate potential vibration impacts of structural damage to buildings and human annoyance, similar to the California Department of Transportation (Caltrans) vibration criteria, which is provided below.

3.2 State

There are no State noise or vibration standards that directly regulate environmental noise and vibration related to the construction or operation of the proposed program. However, the Caltrans *Transportation and Construction Vibration Guidance Manual* (Caltrans 2013b) provides vibration criteria to evaluate potential vibration impacts of building structural damage and human annoyance from project construction and operation, depending upon transient or continuous/frequent intermittent sources, as shown in **Table 2** *Caltrans Vibration Damage Potential Threshold Criteria* and **Table 3**, *Caltrans Vibration Annoyance Potential Criteria*, respectively.

TABLE 2
CALTRANS VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

NOTE: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile-drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, 2013b.

As shown in Table 2, the vibration damage potential criteria from transient vibration sources (i.e., the operation of heavy equipment for program restoration) to various types of buildings, ranges from 0.12 in/sec PPV for extremely fragile historic buildings, ruins and ancient monuments to 2.0 in/sec PPV or higher for modern industrial/commercial buildings, and for old to new residential structures at 0.50 to 1.0 in/sec PPV, respectively.

TABLE 3
CALTRANS VIBRATION ANNOYANCE POTENTIAL CRITERIA

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

NOTE: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile-drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, 2013b.

As shown in Table 3, the vibration annoyance potential criteria from transient sources ranges from 0.04 in/sec PPV for "barely perceptible" at to 2.0 in/sec PPV for "severe".

3.3 Local

Local noise regulation involves implementation of the noise goals and policies of the noise element of the General Plan, and the noise standards of the noise ordinance. The project site is located in the Cities of Long Beach and Seal Beach; therefore, the Cities' General Plan Noise Element and Noise Ordinance are applicable to the project.

City of Long Beach

General Plan, Noise Element

The Noise Element of the City of Long Beach General Plan (City of Long Beach 1975) identifies an interior noise goal of 45 L_{dn} for residential uses, but does not identify standards for other land uses. The City of Long Beach is in the process of updating its General Plan with an updated Noise Element, currently in public review (City of Long Beach 2019) with the goal of providing a tailored approach to noise policy across Long Beach neighborhoods. The updated Noise Element will contain a set of goals, policies, and implementation measures to limit noise exposure, particularly in areas with nearby housing, hospital, school or day care center uses.

Municipal Code, Noise Ordinance

Long Beach Municipal Code (LBMC) Chapter 8.80 represents the City's Noise Ordinance, which governs construction and operational noise. Section 8.80.202, Construction Activity, regulates

construction noise and exempts noise generated by construction activities during daytime hours depending on the day of the week. Construction is prohibited between 7:00 p.m. and 7:00 a.m. on weekdays and federal holidays. On Saturdays, construction is prohibited between 7:00 p.m. on Friday and 9:00 a.m. on Saturday, and after 6:00 p.m. on Saturday. On Sundays, construction is prohibited all day.

Chapter 8.80 also governs operational noise generated on one property, potentially impacting an adjacent property. The City of Long Beach Noise Ordinance establishes operational noise criteria of allowable noise levels for percentages of an hour over a given time of day period within a land use district as shown on the Noise District Map provided in the City of Long Beach Noise Ordinance. The program area is located within land use District 1 and 4. The noise levels allowed by the City of Long Beach's Noise Ordinance for Districts 1 and 4 are listed in Error! Reference source not found.***4, Error! Reference source not found.***.

TABLE 4
ERROR! REFERENCE SOURCE NOT FOUND.

Time Period	L_{max}	L_{eq}
District 1		
Daytime (7:00 a.m. to 10:00 p.m.)	70	50
Nighttime (10:00 p.m. to 7:00 a.m.)	65	45
District 4		
Anytime	90	70

SOURCE: City of Long Beach, 2016.

As shown in **Error! Reference source not found.**4, higher noise level limits are allowed during the daytime (7:00 a.m. to 10:00 p.m.) as compared to the more noise-sensitive nighttime period (10:00 p.m. to 7:00 a.m.). If a location is on a boundary between two different districts, the applicable noise level limit is the arithmetic mean of the two districts. The noise level limits are provided by district for the day- and nighttime periods as L_{max} (the maximum noise level) and L_{eq} (the hourly average noise level). District 1 includes the Northern Synergy Oil Field, Southern Synergy Oil Field, Alamitos Bay Partners, Pumpkin Patch, and Long Beach City Property sites (which is generally defined predominantly residential with other land use types also present), and District 4 includes the Central LCWA and Bryant sites (which is generally defined as predominantly industrial with other land types use also present). City of Long Beach Noise Ordinance Section 8.80.150C allows for adjustments to the noise criteria if the existing ambient noise level is higher than criteria levels, where, the limits should be increased in 5 dB increments as necessary to encompass the ambient noise level.

City of Seal Beach

General Plan, Noise Element

The Noise Element of the City of Seal Beach General Plan (City of Seal Beach 2003), identifies residences as the most noise sensitive land use in Seal Beach. Additionally, The City of Seal

Beach has a number of public and private educational facilities that are considered noise sensitive. The Noise Element includes the Plan for Control and Management of Noise, of which Issue 3- Community Noise Control for Non-Transportation Noise Sources requires construction activity to comply with the limits established in the City of Seal Beach Noise Ordinance.

Municipal Code, Noise Ordinance

City of Seal Beach Municipal Code, Chapter 7.15 represents the City of Seal Beach Noise Ordinance, which establishes noise criteria for noise that impacts adjacent properties. Similar to the City of Long Beach Noise Ordinance, the City of Seal Beach Noise Ordinance provides noise level limits for L_{max} (the maximum noise level) and L_{eq} (the hourly average noise level) for land use zones. The program area is located within land use Zone 2 and 3, with adjacent residential (Zone 1). The noise levels allowed by the City of Seal Beach Noise Ordinance are listed below by land use zone in Error! Reference source not found.5, ***Error! Reference source not found.***.

TABLE 5
ERROR! REFERENCE SOURCE NOT FOUND.

Time Period	L_{max}	L_{eq}
Zone 1 (Residential)		
Daytime (7:00 a.m. to 10:00 p.m.)	75	55
Nighttime (10:00 p.m. to 7:00 a.m.)	70	50
Zone 2 (Commercial)		
Anytime	85	65
Zone 3 (Industrial)		
Anytime	90	70

SOURCE: City of Seal Beach, 2016.

As shown in **Error! Reference source not found.**5, greater noise levels are allowed during the daytime period (7:00 a.m. to 10:00 p.m.) as compared to the nighttime period (10:00 p.m. to 7:00 a.m.). Of note is that the City of Seal Beach's Noise Ordinance criteria, are 5 dB less stringent for residential districts/zones (i.e., District/Zone 1) than the City of Long Beach Noise Ordinance criteria, as previously shown in **Error! Reference source not found.**2. If the ambient noise level is higher than the criteria levels shown in **Error! Reference source not found.**3, then the City of Seal Beach Noise Ordinance Section 7.15.015C allows the noise level limits to be increased to the ambient noise level.

City of Seal Beach's Noise Ordinance Section 7.15.025E exempts noise generated by construction activities during certain hours depending on the day of the week. Construction is exempt between 7:00 a.m. and 8:00 p.m. on weekdays, and on Saturdays between 8:00 a.m. and 8:00 p.m. On Sundays, construction is prohibited all day.

SECTION 4
Significance Thresholds and Methodology

4.1 Significance Thresholds

For the purposes of this Program Environmental Impact Report and consistency with Appendix G of the State *CEQA Guidelines,* the project would have a significant impact related to noise and vibration if it would 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;

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

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

For the issues related to airports and airstrips, the program area is not located within two miles of a public airport or public use airport. The nearest public airports or airfields to the program area are the Los Alamitos Army Airfield, approximately 2.7 miles northeast, and the Long Beach Airport, approximately 3.2 miles northwest. The Joint Forces Training Base (JFTB) Los Alamitos boundary is located approximately 2.32 miles from the program area boundary, and the program area is located within the Airport Influence Area of the airport land use plan of the Los Alamitos JFTB. However, the program Area is outside of the aircraft noise contours for the JFTB; i.e., the area is not exposed to noise levels greater than 60 dBA CNEL due to operations at JFTB (Orange County ALUC, 2016). Thus, the implementation of the program would not expose people visiting or working in the program area (at the proposed visitor centers or as part of wetland restoration maintenance activities) to excessive aircraft noise levels. Therefore, airport/airstrip-related noise impacts will not be discussed further in this report.

4.2 Methodology

Noise

The evaluation of noise impacts is based on the development assumptions for the proposed project, as described in Section 1. The program would include the remediation of contaminated soil and groundwater, soil grading, revegetation, construction of new public access opportunities (including trails, a visitor center and parking lot, and viewpoints), construction of flood

management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities.

Implementation of the program would generate noise primarily from project construction, and to a lesser degree, the operation of constructed facilities on the program site (i.e., Visitor Center), with minimal construction and operational-related traffic generated on local roadways. The primary sources of construction noise associated with the program would be construction activities within the program site and construction-related traffic volumes generated by daily worker commuting trips, and the truck trip for the transport of construction equipment and materials.

On-site construction noise impacts were evaluated by determining the noise levels generated by the different types of construction activity anticipated, calculating the construction-related noise levels produced by the mix of equipment assumed for all construction activities at the source and at nearby sensitive receptor locations. Estimated noise levels generated by project construction activities and operational sources were compared to the applicable noise standards and thresholds of significance of the applicable city noise ordinances in Section **Error! Reference source not found.**, **Error! Reference source not found.**. For construction noise, the noise ordinances of both cities set allowable hours of construction (i.e., daytime) in which construction activities are exempt from noise regulations; however, the Cities' noise ordinances do not establish construction noise level limits. For operational noise, established criteria noise levels for noise-sensitive uses must not be exceeded by the project traffic noise.

Vibration

In addition to noise levels, groundborne vibration would also be generated on site during construction by various construction-related activities and equipment. The groundborne vibration levels generated by these sources have also been estimated and compared to applicable Caltrans vibration criteria (Caltrans 2013b).

SECTION 5
Program Impacts and Mitigation Measures

Threshold a): Would the program 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 local general plan or noise ordinance, or applicable standards of other agencies?

5.1 Construction and Operational Noise

Construction Noise

Program construction would require the use of heavy equipment during the construction activities on site. The program would include the remediation of contaminated soil and groundwater, soil grading, revegetation, construction of new public access opportunities (including trails, a visitor center and parking lot, and viewpoints), construction of flood management facilities (including earthen levees and berms, and walls), and modification of existing infrastructure and utilities.

Subphases of program construction would include demolition and site preparation, grading/excavation for levees and berms, drainage/utilities/subgrade, building construction for the visitor center, paving for access roads and parking, and architectural coating for the visitor center and traffic markings. The demolition and site preparation includes removal of pipelines, tanks, and other oil infrastructure. Solid waste is assumed to be hauled to the Montebello landfill located approximately 23 miles away. The main wetland restoration activities are covered in the grading/excavation phase, which includes construction, modifying, and removing berms, as well as, establishing tidal channels.

During each construction stage, a different mix of construction equipment would be used. As such, construction activity noise levels at and near the program site would fluctuate depending on the particular type, number, and duration of use of the various pieces of construction equipment. Individual pieces of construction equipment expected to be used during program construction could produce maximum noise levels of 75 to 90 dBA L_{max} and hourly average noise levels of 65 to 83 dBA L_{eq} at a reference distance of 50 feet from the noise source, as shown in **Table 6**, *Construction Equipment Noise Levels*. These maximum noise levels would occur when equipment is operating at full power. The estimated usage factor for the equipment is also shown in Table 6. The usage factors are based on FHWA's Roadway Construction Noise Model (RCNM) User's Guide.

TABLE 6
CONSTRUCTION EQUIPMENT NOISE LEVELS

Construction Equipment	Estimated Usage Factor, %	Maximum Noise Level at 50 Feet (dBA Lmax)	Average Noise Level at 50 Feet (dBA Leq)
Air Compressors	40%	78	74
Bore/Drill Rig	20%	79	72
Cement and Mortar Mixer	40%	79	75
Concrete Saw	20%	90	83
Crane	16%	81	73
Excavator	40%	81	77
Forklift	10%	75	65
Generator Sets	50%	81	78
Grader	40%	85	81
Off-highway Trucks	20%	76	69
Other Equipment	50%	85	82
Paver	50%	77	74
Paving Equipment	20%	90	83
Pump	50%	81	78
Roller	20%	80	73
Rough Terrain Forklift	10%	75	65
Rubber Tired Dozer	40%	82	78
Rubber Tired Loader	50%	79	76
Scraper	40%	84	80
Tractor/Loader/Backhoe	25%	80	74
Welder	40%	74	70

FHWA, 2006

Construction activities could occur at different locations within the 503-acre program area. Actual construction for the program will vary over the three phases of near-, mid-, and long-term (next 10 years, 10-20 years, and 20+ years). Construction noise levels at off-site noise sensitive receptors would be higher when construction activities and equipment are used in proximity to off-site noise sensitive receptors compared to when construction activities and equipment are used in centrally located areas of the program area away from off-site sensitive receptors. For example, assuming that up to four pieces of construction equipment (ranging from 85 – 79 dBA L_{eq} at 50 feet) are operating on the program area, the combined noise level from the equipment would be approximately 88 dBA L_{eq} at 50 feet. However, with distance, for example 500 feet, the combined noise level from up to four pieces of construction equipment would be attenuated (reduced) to approximately 68 dBA L_{eq}, based on a 6 dBA reduction in noise level per doubling of distance.

As discussed in Section 3.3, the Noise Ordinances of the cities of Long Beach and Seal Beach, exempts noise generated by construction activities during daytime hours depending on the day of the week. Per the Noise Ordinances, project construction would be required to occur within these

defined daytime hours. The Cities' Noise Ordinances do not establish construction noise level limits. Therefore, program construction noise would not generate a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance.

Nonetheless, while program construction activities occurring within the allowed times as per the City of Long Beach and City of Seal Beach municipal codes would not exceed the applicable standards and thus result in a less than significant impact, because some of the construction activities within the program area would occur in proximity to noise sensitive receptors (i.e., residences and passive recreation trails and waterways), as shown above in Figure 2, noise reduction measures are recommended to minimize noise levels to off-site noise sensitive receptors. These recommended noise reduction measures are provided in Section 7.

Off-site construction noise associated with the program would be the construction-related traffic volumes generated by daily worker commuting trips and the truck trips required for the transport of construction equipment and materials to and from the site. The program is not likely to generate a substantial number of vehicle trips during construction and operation compared to traffic volumes on existing roadways; therefore, a detailed traffic study has not been prepared for the program. Worst-case program construction traffic volumes, with all construction phases occurring simultaneously, are estimated at approximately 142 average daily trips (ADT) consisting of construction trucks and worker vehicles. Program construction traffic would access the program area via 2nd Street or Pacific Coast Highway, which in the vicinity of the program area, has ADT volumes of approximately 38,000 and 40,000, respectively. Therefore, the addition of the estimated worst-case daily construction trips on these major roadways would be a minimal increase in traffic volumes, which traffic noise is primarily based on. As discussed in Section 2.1, a doubling of traffic volumes results in a 3 dBA increase, which is an increase barely perceptible to the human ear. Program construction traffic would not double existing traffic volumes on area roadways; therefore, program construction traffic noise would be a negligible, non-perceptible increase. Therefore, program off-site construction traffic noise would not generate a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance.

Operational Noise

Operational noise associated with the program would be the daily traffic volumes anticipated by visitors to the proposed visitor centers on site. Though a detailed traffic study has not been prepared for the program, the visitors centers and recreational trails are assumed to generate the most visitors on Sundays, estimated at approximately 1,102 ADT. The visitors would access the visitor centers via 2nd Street or Pacific Coast Highway, which in the vicinity of the program area has ADT volumes of approximately 38,000 and 40,000, respectively. As discussed in Section 2.1, a doubling of traffic volumes results in a 3 dBA increase, which is an increase barely perceptible to the human ear. Program operational traffic would not double existing traffic volumes on area roadways. Therefore, the addition of the estimated worst-case daily visitor trips on these major roadways would be a minimal increase in traffic volumes. As with program construction traffic, program operational traffic would be a negligible, non-perceptible increase. Therefore, program

operational noise would not generate a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance.

Threshold b): Would the program result in generation of excessive groundborne vibration or groundborne noise levels?

5.2 Groundborne Vibration

Construction Vibration

Construction activities at the program site have the potential to generate relatively low levels of groundborne vibration, as the operation of heavy equipment (e.g., backhoe, dozer, excavators, drill rig, loader, scraper, and haul trucks) generates vibrations that propagate though the ground and diminish in intensity with distance from the source. No rock blasting with explosives or pile driving would be used during program construction.

Program construction would generate varying degrees of ground vibration, depending on the construction procedures and the construction equipment used. The PPV vibration velocities for several types of construction equipment measured at increasing distances are identified in **Table 7,** *Construction Equipment Vibration Levels with Distance*.

TABLE 7
CONSTRUCTION EQUIPMENT VIBRATION LEVELS WITH DISTANCE

	Approximate PPV (in/sec)			
Equipment	**25 Feet**	**50 Feet**	**75 Feet**	**100 Feet**
Large Bulldozer	0.089	0.031	0.017	0.011
Loaded Trucks	0.076	0.027	0.015	0.010
Small Bulldozer	0.003	0.001	0.0006	0.0004

SOURCE: FTA, 2018; ESA, 2018.

As shown in Table 7, at 50 feet, the maximum vibration levels would be up to approximately 0.031 in/sec PPV, respectively, from the operation of a large bulldozer with typical soil conditions.

As previously shown in Table 2, Caltrans vibration criteria for potential structural damage from transient sources for old residential buildings is 0.5 in/sec PPV (Caltrans 2013b). Therefore, the program would generate vibration levels at 50 feet that would not exceed the structural damage potential criteria of 0.5 in/sec PPV. Residences are located as close as approximately 50 feet outside of the program area boundary and the program restoration activities with the operation of heavy equipment (i.e., bulldozer) would not occur at or in proximity to the program area boundary. As such, the potential vibration impacts for structural damage at offsite residences would be less than significant; therefore, no mitigation measures would be required.

In addition to structural damage, the residences adjacent to the program area boundary would be considered as potential vibration sensitive receptors for human annoyance. As shown in Table 3, Caltrans vibration criteria for human annoyance from transient sources for "barely perceptible" is 0.04 in/sec PPV. As shown in Table 7, at 50 feet, the maximum vibration levels would be approximately 0.031 in/sec PPV, respectively, from the operation of a large bulldozer with typical soil conditions, which would be less than the "barely perceptible" criteria of 0.04 in/sec PPV. As such, the potential vibration impacts for human annoyance at offsite inhabited residences would be less than significant; therefore, no mitigation measures would be required. Therefore, the program construction would not result in the generation of excessive groundborne vibration or groundborne noise levels.

Operation Vibration

The program would construct and operate visitor centers, which would potentially include typical commercial-grade stationary mechanical and electrical equipment, such as air handling units, condenser units, and exhaust fans, which would produce low level vibration that would not result in structural damage or human annoyance impacts. According to America Society of Heating, Refrigerating and Air-Conditioning Engineers, pumps or compressor would generate groundborne vibration levels of 0.5 in/sec PPV at a reference distance of 1 foot, which would dissipate rapidly with distance. As such, vibration impacts associated with operation of the program would be below the structural damage and human annoyance criteria of 0.5 in/sec PPV, therefore, the impacts would be less than significant. Therefore, the program operation would not result in the generation of excessive groundborne vibration or groundborne noise levels.

SECTION 6
Cumulative Impacts

The geographic scope for the consideration of cumulative program noise impacts are primarily the areas immediately surrounding the program site, and to a lesser degree, along designated roadways, where program traffic would travel. Generally, noise impacts are limited to the area directly surrounding the noise sources, as noise attenuates logarithmically with distance at a higher rate in proximity to the source, and only has the potential to combine with other noise sources occurring simultaneously in the immediate vicinity. The program's potential noise impacts, when viewed together with the environmental impacts from past, present, and probably future projects, could be cumulatively considerable if program impacts exceed impact thresholds, resulting in significant impacts.

6.1 Construction

Program construction activities would generate noise from the operation of heavy equipment during construction activities, which would increase ambient noise levels at the activity and, to a lesser extent as attenuated by distance, at sensitive receptors. However, the increase in ambient levels due to project construction noise was determined to not expose persons to, or generate, noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies. Therefore, the noise impacts would be less than significant. Therefore, program construction noise would not be of the magnitude to potentially combine with other cumulative projects potentially located in immediate proximity to the project site, where the noise could combine together to cumulatively increase the ambient noise environment in the project area. Therefore, program construction would not be a cumulatively considerable noise impact. Furthermore, implementation of recommended construction noise reduction measures (i.e., construction best management practices) would further reduce the construction noise levels at the sources, thereby, reducing noise levels at the nearest sensitive receptors.

As previously discussed for vibration, program construction would not generate high levels of vibrations at the source and construction activities would not occur in proximity to structures and inhabited buildings to be impacted for structural damage and/or human annoyance. Therefore, vibration impacts would be less than significant. Therefore, program construction would not be a cumulatively considerable vibration impact.

6.2 Operation

Operational noise associated with the program would be the daily traffic volumes anticipated by visitors to the proposed visitor centers on site. As with program construction traffic, program operational traffic would be a negligible, non-perceptible increase. Therefore, program

operational noise would not generate a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance. Therefore, the impact would be less than significant. Therefore, future operational noise levels would not be cumulatively significant.

Program operation would not result in the generation of excessive groundborne vibration or groundborne noise levels. Therefore, program operation would not be a cumulatively considerable vibration impact.

SECTION 7
Mitigation Measures

7.1 Construction

As discussed above, the program would result in less-than-significant impacts associated with construction noise. Therefore, no construction noise mitigation measures would be required.

However, to reduce and minimize the construction noise generated on the program area and attenuated at the nearest off-site residences, the following construction noise reduction measures are recommended:

> **Noise Reduction Measure NOISE-1: Staging Areas and Mufflers.** Staging areas for construction shall be located away from existing off-site residences. All construction equipment shall use properly operating mufflers. These requirements shall be included in construction contracts.
>
> **Noise Reduction Measure NOISE-2: Noise Barriers.** Grading plans and specifications shall include temporary noise barriers for all grading, hauling, and other heavy equipment operations that would occur within 300 feet of sensitive off-site receptors and occur for more than 20 working days. The noise barriers shall be 12-feet high, but may be shorter if the top of the barrier is at least one foot above the line of sight between the equipment and the receptors. The barriers shall be solid from the ground to the top of the barrier, and have a weight of at least 2.5 pounds per square foot, which is equivalent to ¾ inch thick plywood. The barrier design shall optimize the following requirements: (1) the barrier shall be located to maximize the interruption of line-of-sight between the equipment and the receptor, which is normally at the top-of-slope when the grading area and receptor are at different elevations. However, a top-of-slope location may not be feasible if the top-of-slope is not on the Project site; (2) the length, width, and height of the barrier shall be selected to block the line-of-sight between the grading area and the receptors; (3) the barrier shall be located as close as feasible to the receptor or as close as feasible to the grading area; a barrier is least effective when it is at the midpoint between noise source and receptor.

As discussed above, the program would not result in significant impacts associated with construction vibration. Therefore, no construction vibration mitigation measures would be required.

7.2 Operational

As discussed above, the program would result in less-than-significant impacts associated with operational noise Therefore, no operational noise mitigation measure would be required.

As discussed above, the program would not result in significant impacts associated with operational vibration. Therefore, no operational vibration mitigation measures would be required.

SECTION 8
References

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Appendix L

Summary of Environmental Effects and Mitigation Measures for the Los Cerritos Wetlands Oil Consolidation and Restoration Project

ESA

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
3.1 Aesthetics		
Impact AES-1: The project would not have a substantial adverse effect on a scenic vista.	None required.	Less than Significant
Impact AES-2: The project would not substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	None required.	Less than Significant
Impact AES-3: The project would not result in substantial degradation of the visual character or quality of the site.	**Mitigation Measure AES-1:** Construction contractors shall be required to strictly control the staging and cleanliness of construction equipment stored on the project site. Staging areas shall be screened from view at street level with solid wood fencing or green fence. Prior to the issuance of a building permit, the Applicant shall submit a Construction Staging, Access, and Parking Plan to the City of Long Beach Planning and Development Services Department for review and approval. Construction workers would be required to park on the Synergy Oil Field site and would be bussed to their respective construction site. Construction worker vehicles and work vehicles shall be kept clean and free of mud and dust before leaving the project site. Project contractors shall be required to sweep surrounding streets used for construction access on a daily basis to keep them free of construction-related dirt and debris.	Less than Significant
Impact AES-4: The project would not create a new source of substantial light or glare that would adversely affect day or night views in the area or that would substantially impact other people or properties.	**Mitigation Measure AES-2: Lighting Plan.** Prior to issuance of a grading permit for each site, a Lighting Plan for the site shall be developed and implemented that requires all exterior lighting to be directed downward and focused away from adjacent sensitive uses and habitats to encourage wayfinding and provide security and safety for individuals walking to and from parking areas.	Less than Significant
Cumulative	Mitigation Measure AES-1 would apply.	Less than Significant
3.2 Air Quality		
Impact AQ-1: The project would not conflict with or obstruct implementation of the applicable air quality plan.	None required.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
Impact AQ-2a: The project would violate the air quality standard and contribute substantially to an existing or projected air quality violation for construction-related VOC and NO_X emissions.	**Mitigation Measure AQ-1: Construction-Period Use of Low-VOC Paints.** The proposed project shall use paints with a VOC content of 75 grams per liter or less. **Mitigation Measure AQ-2: Construction NO_X Reduction Measures.** ● Require all off-road diesel-powered construction equipment greater than 50 hp (e.g., excavators, graders, dozers, scrappers, tractors, loaders, etc.) to comply with EPA-Certified Tier IV emission controls where commercially available. Documentation of all off-road diesel equipment used for this project including Tier IV certification, or lack of commercial availability if applicable, shall be maintained and made available by the contractor to the City for inspection upon request. In addition, all construction equipment shall be outfitted with Best Available Control Technology (BACT) devices certified by CARB such as certified Level 3 Diesel Particulate Filter or equivalent. A copy of each unit's certified tier specification, BACT documentation, and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit of equipment. ● Eliminate the use of all portable generators. Require the use of electricity from power poles rather than temporary diesel or gasoline power generators. ● Provide temporary traffic controls such as a flag person, during all phases of construction to maintain smooth traffic flow. ● Provide dedicated turn lanes for movement of construction trucks and equipment on and off site. ● Reroute construction trucks away from congested streets or sensitive receptor areas.	Significant and Unavoidable
Impact AQ-2b: The project would not violate the air quality standard and contribute substantially to an existing or projected air quality violation for operational-related NO_X emissions.	**Mitigation Measure AQ-3: Operational NO_X Reduction Measures.** Require all diesel-powered drilling rigs located at the Pumpkin Patch and LCWA sites to comply with EPA-certified Tier IV emission controls. This drilling rig equipment shall be outfitted with Best Available Control Technology (BACT) devices certified by CARB.	Less than Significant
Impact AQ-3a: The project would result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) during construction.	Mitigation Measures AQ-1 and AQ-2 would apply.	Significant and Unavoidable
Impact AQ-3b: The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) during operations.	Mitigation Measure AQ-3 would apply.	Less than Significant
Impact AQ-4: The project would not expose sensitive receptors to substantial pollutant concentrations in excess of the localized significance thresholds and would not result in CO hotspot impacts.	Mitigation Measures AQ-2 and AQ-3 would apply.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
Impact AQ-5: The project would not create objectionable odors affecting a substantial number of people.	Mitigation Measures AQ-1 and AQ-2 would apply.	Less than Significant
Cumulative	Mitigation Measures AQ-1 through AQ-3 would apply.	Cumulatively Significant
3.3 Biological Resources		
Impact BIO-1: The project would not have a substantial adverse effect, either directly or through habitat modifications, on southern tarplant, estuary seablite and woolly seablite, which are special-status plant 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.	**Mitigation Measure BIO-1: Avoidance of Special-Status Plants.** Prior to vegetation or ground disturbance, a qualified botanist/biologist shall flag special-status plants located within 25 feet of proposed disturbance areas on the project site including southern tarplant, estuary seablite, and woolly seablite. Individual plants shall be marked or flagged for avoidance and a minimum no-disturbance buffer of 10 feet shall be established. The appropriate buffer distance shall be determined by the qualified botanist/biologist. If southern tarplant plants cannot be avoided, Mitigation Measure BIO-2 shall be implemented. **Mitigation Measure BIO-2: Re-establish Southern Tarplant on Synergy Oil Field, City Property, and Pumpkin Patch Sites.** Prior to any disturbance to special-status plants, a Southern Tarplant Restoration Plan shall be prepared and approved by CDFW. At a minimum, the Restoration Plan shall include the following: ● A map showing the areas to be restored following temporary impacts ● Weed management procedures to prevent introduction of invasive plant species on site prior to and during construction, and during maintenance ● Seed collection protocol ● Seed dispersal protocol ● Performance standards for the areas to be re-established ● Maintenance and monitoring procedures for the areas to be re-established ● Adaptive management strategies ● Reporting requirements	Less than Significant
Impact BIO-2: The project would not have a substantial adverse effect, either directly or through habitat modifications, on any special-status wildlife 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.	**Mitigation Measure BIO-3: Biological Monitoring.** All proposed project implementation shall occur under the supervision and direction of a qualified biologist. The biologist shall ensure maximum avoidance and minimization of impacts to wildlife and wetland vegetation during implementation of project activities on the Synergy Oil Field site, Pumpkin Patch site, and City site. Prior to the daily start of cleanup activities and at the end of the work day, wildlife monitoring by a qualified biologist shall include inspection of any hazardous features (e.g., open trenches) that would trap, displace, injure, or kill wildlife. Prior to the end of daily cleanup activities, the biologist shall ensure all trash is properly disposed of such that it would not be accessible to wildlife. For areas that contain suitable habitat for special-status wildlife, prior to and during all vegetation and ground-disturbing activities, a qualified biologist shall monitor work areas. If any special-status wildlife species are encountered during biological monitoring or by construction workers, work shall halt until the biologist determines appropriate actions to	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	avoid and minimize harm to the species. California Fully-Protected species shall be avoided. Other actions may include relocation of the species for non-listed wildlife; however, relocation shall not be allowed for any listed species without first obtaining take authorization from USFWS and/or CDFW. To the extent feasible, non-listed wildlife shall be relocated to a CDFW/USFWS-approved relocation site that contains suitable habitat adjacent to the habitat where the species is found. **Mitigation Measure BIO-4: Belding's Savannah Sparrow Breeding Habitat.** Suitable breeding habitat shall be created on the Synergy Oil Field site at a minimum acreage of 1:1 (created: impacted). Suitable breeding habitat shall consist of areas dominated by pickleweed and Parish's glasswort with a minimum 60 percent cover with a hydrologic regime similar to that currently present in the northern area, with suitable slope, inundation and soil salinity. The re-establishment requirements for Belding's savannah sparrow suitable breeding habitat (dominated by pickleweed and Parish's glasswort) shall be addressed in the Restoration Plan for the Synergy Oil Field site as outlined in Mitigation Measure BIO-5. **Mitigation Measure BIO-5: Re-establish Sensitive Natural Community Vegetation Alliances Subject to Permanent and Temporary Impacts.** Sensitive natural communities located on the project site include California cordgrass marsh, Parish's glasswort patches, alkali heath marsh, pickleweed mats, Emory's baccharis thickets, black willow thicket, southern coastal brackish marsh, southern coastal salt marsh, and alkali meadow. Prior to any vegetation or ground disturbance associated with the Synergy Oil Field or City Property site, comprehensive restoration plans shall be prepared and implemented within 1 year of impacts to sensitive natural communities. The Restoration Plan for the Synergy Oil Field site will be subject to review and approval of the Interagency Review Team (IRT) led by the Corps, and evidence of the IRT's approval shall be submitted to the City prior to initiation of grading activity on the Synergy Oil Field site. The Revegetation Plan for the City Property site shall be reviewed and approved by the CCC. The plans shall include, at a minimum, the following: ● A map showing the areas to be restored following permanent and temporary impacts. ● Identify specific restoration actions (e.g., revegetation requirements, removal of non-native plants) to be implemented during restoration. ● Quantity and quality of vegetation communities to be restored on site. Permanent impacts shall be restored at a minimum of 2:1 and temporary impacts restored at 1:1. The amount and extent of restoration shall be identified and determined based on habitat quality prior to implementation of the Restoration Plan and the initiation of any vegetation or ground disturbance. ● Plant palette for each Sensitive Natural Communities subject to re-establishment. ● Specific measurable performance standards for the areas to be re-established to evaluate habitat development, species composition and ecosystem functions. ● A timeline for implementation (within 1 year of impacts to sensitive natural communities).	

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	● Provide specific protocols for monitoring, including sample design (e.g., number of replicates, locations for sample points, transects, etc.), sampling methods to be implemented, and statistical methods for analyzing the data. ● Maintenance procedures for areas to be re-established. ● Identify contingency plans (i.e., adaptive management procedures) to be implemented if specific performance goals are not met within the timeframe anticipated. ● Performance goals for the restoration that shall focus on habitat development, species composition, and ecosystem functions. ● Reporting requirements. **Mitigation Measure BIO-6: Nesting Bird and Raptor Avoidance.** A qualified biologist shall identify areas where nesting habitat for birds and raptors is present. To ensure the avoidance of impacts to native nesting avian species, the following measures shall be implemented pursuant to the MBTA and California Fish and Game Code: ● Construction and maintenance activities during operations within and adjacent to known and potential avian nesting habitat shall be limited to the non-breeding season (September 1 through December 31) to the extent feasible. If construction or maintenance activities will occur during the avian nesting season (generally March 1 through August 31 for passerines and January 1 through August 31 for raptors), a qualified biologist shall conduct pre-construction nesting avian surveys within 5 days of the initiation of construction to determine the presence or absence of active nests. If a lapse in work of 5 days or longer occurs, another survey shall be conducted prior to work being reinitiated. Surveys shall include any potential habitat, including trees, shrubs, and on the ground, or on nearby structures that might be impacted by construction or maintenance activities that may cause nest destruction or abandonment, such as vegetation or weed removal, earth work, and vector control actions. ● If active nests are observed, an avoidance buffer shall be demarcated with exclusion fencing and shall be maintained until the qualified biologist determines that the young have fledged. Fence stakes designed with bolt holes shall be plugged with bolts or other materials to avoid entrapping birds. The initial avoidance buffer(s) shall extend a minimum of 500 feet in all directions for raptors and listed passerines such as Belding's savannah sparrow and Ridgway's rail, and 300 feet in all directions for all other native passerines. A reduced buffer may be implemented at the discretion of the biologist for non-listed passerines based on such factors as species-tolerance to human presence, location of the nest, and the timing of nest construction, such as whether the nest was constructed after construction is initiated; however, for raptors and listed passerines, the biologist shall obtain approval from USFWS and/or CDFW prior to allowing work to commence within the 500-foot buffer. **Mitigation Measure BIO-7: Habitat Assessment and Pre-Construction Surveys for Burrowing Owl.** A qualified biologist shall conduct a pre-construction burrowing owl survey of the project site prior to construction activities. If burrowing owls are detected, a Burrowing Owl Management Plan shall be prepared and approved by CDFW prior to commencement of construction. The Burrowing Owl Management Plan shall be prepared in accordance with the CDFW 2012 Staff Report on Burrowing Owl Mitigation and shall address specific	

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	minimization and avoidance measures for burrowing owls, and measures to protect occupied habitat, such as avoidance and revegetation. **Mitigation Measure BIO-8: Avoidance of White-Tailed Kite Nesting.** Remove all trees on the site outside the white-tailed kite nesting season (February 1 through June 30). If it is not possible to remove trees during the non-breeding season, a qualified biologist shall conduct a survey no more than 5 days prior to tree removal to document the absence of nests. If active nests are detected, they shall be avoided and a 500-foot no-disturbance buffer established (or reduced as specified in BIO-6). The qualified biologist shall monitor the site weekly until the nestlings have fledged and are no longer dependent on the nest. **Mitigation Measure BIO-9: Minimization of Light Spillage.** A Project Lighting Plan shall be designed to minimize light trespass and glare into the avoided wetland habitat in the northeast portion of the site. Artificial lights shall be directed away from or shielded to prevent spillage into the avoided wetland habitat.	
Impact BIO-3: The project would not have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	Mitigation Measure BIO-5 would apply.	Less than Significant
Impact BIO-4: The project would not have a substantial adverse effect on federally or state protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	**Mitigation Measure BIO-10: Avoid or Minimize Impacts to Aquatic Habitat.** Temporary disturbance to, and permanent loss of, all aquatic habitat shall be avoided to the maximum extent feasible. All temporary staging areas and access roads, if necessary, shall be located away from aquatic habitats to the extent practicable, and aquatic habitats abutting impacted areas shall be clearly demarcated with fencing, rope, or signage to avoid inadvertent disturbance during restoration activities and operations. As detailed grading plans are prepared, they shall be designed to avoid temporary and permanent impacts to aquatic habitats to the extent practicable. **Mitigation Measure BIO-11: Post-Restoration Functional Lift Assessments of Wetland Waters of the U.S./State and Coastal Wetlands.** Upon completion of restoration activities, the project shall demonstrate a no net loss of aquatic resource functions and demonstrate a substantial increase in wetland functions and values throughout the entire site. An assessment of habitat functions, such as biotic structure and hydrology, shall be conducted as part of the project's monitoring and reporting program outlined in the Final Restoration Plan for the Upper Los Cerritos Wetlands Mitigation Bank, so that these agencies can verify that the functional values have been achieved and/or provide measures that need to be implemented to meet the appropriate level of functionality.	Less than Significant
Impact BIO-5: The project would not 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.	None required.	Less than Significant
Impact BIO-6: The project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	None required.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
Cumulative	None required.	Less than Significant
3.4 Cultural Resources		
Impact CUL-1: The project would not cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5.	**Mitigation Measure CUL-1: Recordation.** Prior to the issuance by the City of Long Beach of a grading or building permit for the relocation of the Bixby Ranch Field Office and a grading permit for the wetlands restoration work on the Synergy Oil Field, a recordation document in accordance with the Historic American Landscape Survey (HALS) and the Historic American Buildings Survey (HABS) Level II requirements shall be completed for the Bixby No. 2 Discovery Well and the Bixby Ranch Field Office, both of which are individually eligible. The HABS/HALS document shall be prepared by a qualified architectural historian or historic preservation professional. These documents shall include a historical narrative on the industrial and historical importance of the Synergy Oil Field and Seal Beach Oil Field for background information, in addition to recording the existing appearance of the Bixby Ranch Field Office and the Bixby No. 2 Discovery Well in professional large format HABS/HALS photographs. For HALS, the Bixby No. 2 Discovery Well, the property setting and contextual views shall be documented. For HABS, the exteriors of the Bixby Ranch Field Office, representative interior spaces, character-defining features, as well as the setting and contextual views shall be documented. All documentation shall be completed in accordance with the Secretary of the Interior's Standards and Guidelines for Architectural and Engineering Documentation (HABS/HALS standards). Original archivally sound copies of the report shall be submitted to the HABS/HALS collection at the Library of Congress and the archives of the South Central Coastal Information Center, California State University, Fullerton, CA. Non-archival digital copies shall be distributed to the City of Long Beach, City of Long Beach Public Library, and the Long Beach Historical Society. In addition, any existing and available design and/or as-built drawings and pertinent supporting materials such as maps and aerial photographs shall be compiled, reproduced, and incorporated into the recordation document. **Mitigation Measure CUL-2: Retention of the Bixby No. 2 Discovery Well.** The Bixby No. 2 Discovery Well and sign shall be retained and preserved along with a 5-foot buffer around the furthest point from the concrete pad. Necessary maintenance to the sign shall be performed, see National Park Service Preservation Brief 25, "The Preservation of Historic Signs," by Michael J. Auer. A path for pedestrian traffic from the visitors center to the Discovery Well shall be developed and installed. At the Discovery Well site, a wayside sign shall be installed interpreting the Seal Beach Oil Field and the importance of the Bixby No. 2 Discovery Well. The interpretation of the Bixby No. 2 Discovery Well shall be overseen and prepared by a qualified architectural historian or historic preservation professional. **Mitigation Measure CUL-3: Historic Preservation Consultation, Preparation of a Relocation and Rehabilitation Plan, and Construction Monitoring.** The project design for Bixby Ranch Field Office is presently conceptual and detailed architectural drawings showing the proposed rehabilitation have not been prepared. A qualified architectural historian shall provide input to the project architect to revise the design in accordance with the Standards to retain the character-defining features of the exterior and interior of the Bixby Ranch Field Office. Once the design has been finalized, the architectural historian	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	shall prepare a Standards plan review for submittal to the City of Long Beach Planning for a Certificate of Appropriateness. Following the approval of the Bixby Ranch Field Office project plans, a Relocation and Rehabilitation Plan (Plan) shall be developed by a qualified historic preservation consultant. The Plan shall include relocation and rehabilitation methodology recommended by the National Park Service (NPS), which are outlined in the booklet entitled "Moving Historic Buildings," by John Obed Curtis (1979). The Plan shall include an assessment of the building condition by a qualified engineer, and a shoring plan for relocation and storage, and guidelines for relocation to the final site. If temporary storage is required, the storage conditions should closely follow the recommendations of NPS Preservation Brief 31: Mothballing Historic Buildings with regard to recommendations for structural stabilization, pest control, protection against vandalism, fire, and moisture, adequate ventilation which should be applied to the building at the temporary storage location to ensure the safety of the building during storage. A periodic maintenance and monitoring plan shall also be included in the Plan and implemented during the storage period in accordance with the guidance outlined in NPS Preservation Brief 31. The Plan shall be reviewed and approved by the City prior to issuance by the City of permits to relocate the Bixby Ranch Field Office. Upon relocation of the Bixby Ranch Field Office, any maintenance, repair, stabilization, rehabilitation, preservation, conservation, or reconstruction work performed in conjunction with the relocation of the building shall be undertaken in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Properties. The relocation and rehabilitation process shall be monitored by a qualified historic preservation consultant at key intervals to ensure conformance with the Standards and NPS guidelines. The preservation consultant shall also be available to provide technical expertise to reduce potential impacts to historical resources from unforeseen circumstances. Lastly, a permanent metal plaque shall be affixed to the primary elevation or a marker shall be imbedded in the pavement in front of the primary elevation of the relocated Bixby Ranch Field Office, which will briefly explain where the building was originally located (original and second location) and that the building was relocated to a third location. A qualified architectural historian or historic preservation professional shall provide oversight to the design and fabrication of an interpretive plaque/marker. **Mitigation Measure CUL-4: Interpretation.** Interpretation about the significant history of the Synergy Oil Field shall be placed within the Bixby Ranch Field Office (the proposed visitors center), and along the proposed walking trails. The interpretation shall use the recommendations from Mitigation Measures CUL-2 (Retention) and CUL-3 (Recordation) to interpret the history of the Los Angeles Basin Oil Industry, Long Beach Oil Industry, Seal Beach Oil Field (including the Bixby and McGrath leases), Rancho Los Alamitos Company, Synergy Oil Field, Marland Oil Company, and Continental Oil Company. Furthermore, oral histories shall be conducted of previous employees who worked on the Synergy Oil Field or Seal Beach Oil Field, or experts with knowledge of the abovementioned themes to incorporate within the interpretive exhibit. Historical photographs, aerials, topographic maps, and newspapers shall compliment the interpretive exhibit to visually demonstrate the activities that took place on the Synergy Oil Field. A qualified architectural historian or	

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	historic preservation professional shall provide oversight to the design and installation of an interpretive program. **Mitigation Measure CUL-5: Retention of Qualified Archaeologist and Worker Training.** Prior to the issuance of a grading permit for project implementation, evidence shall be provided to the City that a qualified archaeologist meeting the Secretary of the Interior's Standards for professional archaeology (U.S. Secretary of the Interior 2008) has been retained by the City to conduct any required training, evaluation, or treatment of archaeological resources that might be encountered during implementation of the project. As part of this, prior to the start of grading, the qualified archaeologist shall conduct cultural resources sensitivity training for all construction personnel. Construction personnel must be informed of the types of archaeological resources that may be encountered (both prehistoric and historical), and of the proper procedures to be enacted in the event of an inadvertent discovery of archaeological resources or human remains. The City must ensure that construction personnel are made available for and attend the training and retain documentation demonstrating attendance. **Mitigation Measure CUL-6: Native American Monitoring.** A Native American monitor from the Gabrieleño Band of Mission Indians—Kizh Nation, a consulting party for the project under AB 52, shall be present during all earth-moving construction activities. The Native American monitor shall be given the opportunity to participate in the cultural resources sensitivity training described in Mitigation Measure CUL-5. At least 30 days prior to issuance of grading permits, a Native American Monitoring Agreement (Monitoring Agreement) shall be developed between the City and the Gabrieleño Band of Mission Indians—Kizh Nation. The agreement shall pertain to prehistoric archaeological resources and Tribal cultural resources, respectively, and shall identify any monitoring requirements and treatment of cultural resources to meet both the requirements of CEQA and those of the Tribal representative. The Monitoring Agreement shall also address communication protocols in the event of an unanticipated discovery of cultural materials, and the roles, responsibilities, and authorities of the Native American Monitor. The Monitoring Agreement shall also detail the protocols for treatment and final disposition of any Native American cultural resources, sacred sites, and human remains discovered on the site that the Native American Monitor shall implement in consultation and coordination with the Native American Most Likely Descendant, as identified by the NAHC. In accordance with Mitigation Measure CUL-9, discussed below, discovery and treatment of human remains shall comply with State Health and Safety Code Section 7050.5 and PRC Section 5097.98. **Mitigation Measure CUL-7: Archaeological Resource Discovery and Treatment.** In the event of the unanticipated discovery of archaeological or other cultural resources, whether discovered through Native American monitoring or not, all work activities in the area (within approximately 100 feet of the discovery) shall be halted or redirected until the discovery can be evaluated by a qualified archaeologist. Construction shall not resume until a qualified archaeologist has conferred with the City and, in the case of prehistoric archaeological resources, the Native American monitor, on the significance of the resource. If it is determined that the discovered archaeological resource is significant under CEQA, avoidance and preservation in place shall be the preferred manner of mitigation, pursuant to PRC Section 21083.2(b). Preservation in place may be accomplished by, but is not limited to, avoidance, incorporating the resource into open space, capping, or deeding the site into	

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	a permanent conservation easement. In the event that preservation in place is demonstrated to be infeasible and data recovery through excavation is the only feasible mitigation available, a Treatment Plan shall be prepared and implemented by a qualified archaeologist, in consultation with the City, that provides for the adequate recovery of the scientifically consequential information contained in the archaeological resource. The City shall also consult with appropriate Native American representatives in determining treatment for prehistoric or Native American resources to ensure cultural values ascribed to the resources, beyond those that are scientifically important, are considered. Any evaluation and treatment shall be supervised by an individual or individuals that meet the Secretary of the Interior's Professional Qualification Standards.	
Impact CUL-2: The project would not cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	Mitigation Measures CUL-5 through CUL-7 would apply.	Less than Significant
Impact CUL-3: The project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	**Mitigation Measure CUL-8: Paleontological Monitoring.** Prior to commencement of any grading or excavation activity on site, the City shall retain a qualified paleontologist, defined as a paleontologist meeting the guidelines of the Society of Vertebrate Paleontology (SVP) (2010). The qualified paleontologist, or a designated paleontological monitor working under the guidance of the qualified paleontologist, shall attend and participate in any preconstruction meetings and worker training (as discussed in Mitigation Measure CUL-5), and shall be on site during all excavation and other significant ground-disturbing activities that reach a depth of 15 feet or greater below the modern ground surface. This is the minimum depth at which Young Alluvial Fan and Channel Deposits, Undivided may be encountered. These deposits are considered to have low paleontological sensitivity near the top of the geologic unit (which may not necessarily correspond with the modern ground surface), and a high paleontological sensitivity greater than 15 feet below the top of the unit. In the event that paleontological resources (e.g., fossils) are unearthed during ground-disturbing activity, the paleontological monitor shall have the authority to temporarily halt or divert grading activity to allow recovery of paleontological resources. The area of discovery shall be roped off with a 50-foot-radius buffer. Once documentation and collection of the find is completed, the monitor shall allow grading to recommence in the area of the find. Daily field logs shall be prepared during the course of the monitoring, and upon completion of monitoring a final report shall be prepared.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
Impact CUL-4: The project would not disturb any human remains, including those interred outside of formal cemeteries.	**Mitigation Measure CUL-9: Treatment of Human Remains.** In accordance with California Health and Safety Code Section 7050.5, if human remains are found, the Los Angeles County Coroner shall be immediately notified of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains (100 feet or as determined by the project archaeologist) shall occur until the procedures set forth in this measure have been implemented. If the County Coroner determines that the remains are, or are believed to be, Native American, he or she shall notify the Native American Heritage Commission (NAHC) within 24 hours. In accordance with California PRC Section 5097.98, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) from the deceased Native American. The MLD shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.	Less than Significant
Cumulative	Mitigation Measures CUL-1 through CUL-9 would apply.	Less than Significant
3.5 Geology and Soils		
Impact GEO-1: The project would not expose people or structures to potential substantial adverse effects as a result of rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map.	None required.	Less than Significant
Impact GEO-2: The project would not expose people or structures to potential substantial adverse effects as a result of strong seismic ground shaking.	**Mitigation Measure GEO-1: Implement Geotechnical Recommendations.** The Applicant shall prepare final geotechnical investigations for the following project components: ● Visitors center on the Synergy Oil Field site; ● Building on Pumpkin Patch site; ● All well cellars on the Pumpkin Patch and LCWA sites; and ● All tank battery areas on the Pumpkin Patch and LCWA sites. The geotechnical investigations shall provide recommendations as necessary to address relevant geotechnical issues such as active faults, seismic shaking, seismic-related ground failure including liquefaction, and other soil stability issues including expansive soils, as needed. These types of issues are addressed through compliance with the CBC, which requires geotechnical investigations to identify geotechnical hazards along with recommendations to reduce the identified risks. Risks from seismic shaking of structures such as the building to be constructed on the Pumpkin Patch site shall be reduced by designing the structures to withstand the anticipated maximum level of seismic shaking. The preliminary geotechnical investigation for the Pumpkin Patch site estimates the Maximum Credible Earthquake of 7.0 magnitude would result in a PGA of 0.604 g (KCG 2016a). Damage from seismic shaking of structures is reduced by designing buildings capable of withstanding or accommodating strong ground motion by using various bracing and anchoring techniques. Damage from soils susceptible to liquefaction can be addressed by driving piles through susceptible materials; conditioning the soils by deep soil mixing, jet or pressure grouting, or dynamic compaction techniques; or by removing the susceptible soils. Damage from placing structures on unstable materials (e.g., the landfill materials on the	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	Pumpkin Patch site) can be addressed by driving piles through unstable materials into underlying stable units or by removing the susceptible soils and replacing the materials with properly compacted imported fill. Damage from expansive soils can be addressed by removing and replacing expansive soils with imported non-expansive fill, or with proper mixing and grading of site materials. The Applicant shall provide the geotechnical investigations along with the plans, specifications, grading plans, and building plans to the City for review as a condition of approval to acquire the necessary grading and building permits. Upon approval by the City, implementation by the Applicant of the recommendations in the geotechnical investigations will mitigate geotechnical hazards.	
Impact GEO-3: The project would not expose people or structures to potential substantial adverse effects as a result of seismic-related ground failure, including liquefaction.	Mitigation Measure GEO-1 would apply.	Less than Significant
Impact GEO-4: The project would not expose people or structures to potential substantial adverse effects as a result of seismic-induced landslides.	None required.	Less than Significant
Impact GEO-5: The project would not result in substantial soil erosion or the loss of topsoil.	None required.	Less than Significant
Impact GEO-6: The project would not 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.	Mitigation Measure GEO-1 would apply.	Less than Significant
Impact GEO-7: The project could be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property.	Mitigation Measure GEO-1 would apply.	Less than Significant
Cumulative	Mitigation Measure GEO-1 would apply.	Less than Significant
3.6 Greenhouse Gas Emissions		
Impact GHG-1: The proposed project would generate GHG emissions, either directly or indirectly, but would not result in a significant impact on the environment.	**Mitigation Measure GHG-1: Cap-and-Trade Program.** The project shall comply with the Cap-and-Trade Program as administered by CARB for covered sources. In accordance with the Cap-and-Trade Program, the project shall retire GHG allowances or offsets equal to the project's GHG emissions for covered sources. Retiring the GHG allowances or offsets means the project would acquire them through a number of means carefully controlled by CARB, including obtaining allowances and offsets in CARB-controlled auctions with variable and increasing cost, according to projections and decreasing supply. The project shall also comply with all applicable and required reporting requirements and GHG reduction and trading requirements. The project shall also comply with all applicable Cap-and-Trade regulations as they continue to evolve, such as revisions to the Climate Change Scoping Plan, and become adopted by the California Legislature and/or through CARB's rulemaking process.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
Impact GHG-2: The proposed project would not conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.	Mitigation Measure GHG-1 would apply.	Less than Significant
3.7 Hazardous and Hazardous Materials		
Impact HAZ-1: The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal, or reasonable foreseeable upset and accident conditions that release hazardous materials.	None required.	Less than Significant
Impact HAZ-2: The project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	None required.	No Impact
Impact HAZ-3: The project would 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.	**Mitigation Measure HAZ-1: Health and Safety Plan.** The construction contractor(s) shall prepare and implement site-specific Health and Safety Plans as required by and in accordance with 29 CFR 1910.120 to protect construction workers and the public during all excavation and grading activities. This Plan shall be submitted to the project applicant and the Long Beach Hazardous Materials Division for review prior to commencement of construction. The Health and Safety Plan shall include, but is not limited to, the following elements: ● Designation of a trained, experienced site safety and health supervisor who has the responsibility and authority to develop and implement the site Health and Safety Plan; ● A summary of all potential risks to construction workers and maximum exposure limits for all known and reasonably foreseeable site chemicals; ● Specified personal protective equipment and decontamination procedures, if needed; ● Emergency procedures, including route to the nearest hospital; and ● Procedures to be followed in the event that evidence of potential soil or groundwater contamination (such as soil staining, noxious odors, debris or buried storage containers) is encountered. These procedures shall be in accordance with hazardous waste operations regulations and specifically include, but are not limited to, the following: immediately stopping work in the vicinity of the unknown hazardous materials release, notifying The Long Beach Hazardous Materials Division, the LARWQCB, and DOGGR, as appropriate, and retaining a qualified environmental firm to perform sampling and remediation. **Mitigation Measure HAZ-2: Soil, Landfill Materials, and Groundwater Management Plan.** In support of the Health and Safety Plan described in Mitigation Measure HAZ-1, the contractor shall develop and implement a Soil, Landfilled Materials, and Groundwater Management Plan that includes a materials disposal plan specifying how the construction contractor will remove, handle, transport, and dispose of all excavated material in a safe, appropriate, and lawful manner. The Plan must identify protocols for soil and landfilled materials testing and disposal, identify the approved disposal site, and include written documentation that the disposal site can accept the waste. Contract specifications shall mandate full compliance with all applicable local, state, and federal regulations related to	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	the identification, transportation, and disposal of hazardous materials, including those encountered in excavated soil or dewatering effluent. As part of the Soil and Groundwater Management Plan, the contractor shall develop a groundwater dewatering control and disposal plan specifying how groundwater (dewatering effluent), if encountered, will be handled and disposed of in a safe, appropriate and lawful manner. The Plan must identify the locations at which groundwater dewatering is likely to be required, the test methods to analyze groundwater for hazardous materials, the appropriate treatment and/or disposal methods, and approved disposal site(s), including written documentation that the disposal site can accept the waste. The contractor may also discharge the effluent under an approved permit to a publicly owned treatment works, in accordance with any requirements the treatment works may have. This Plan shall be submitted to the project applicant and Long Beach Hazardous Materials Division for review and approval prior to commencement of construction.	
Impact HAZ-4: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	None required.	Less than Significant
Impact HAZ-5: The project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	None required.	No Impact
Cumulative	None required.	Less than Significant
3.8 Hydrology and Water Quality		
Impact HY-1: The project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality.	None required.	Less than Significant
Impact HY-2: The project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the groundwater table.	None required.	Less than Significant
Impact HY-3: The project would not substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion, siltation or flooding off site.	None required.	Less than Significant
Impact HY-4: The project 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.	None required.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
Impact HY-5: The project would not place buildings, oil production infrastructure, workers, or the public within areas anticipated to be inundated due to sea level rise.	None required.	Less than Significant
Impact HY-6: The project would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.	None required.	Less than Significant
Impact HY-7: The project would not expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.	None required.	Less than Significant
Cumulative	None required.	Less than Significant
3.9 Land Use and Planning		
Impact LU-1: The project would not physically divide an established community.	None required.	Less than Significant
Impact LU-2: The project would not conflict with most applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, adopted for the purpose of avoiding or mitigating an environmental effect.	None required.	Less than Significant
Cumulative	None required.	Less than Significant
3.10 Mineral Resources		
Impact MR-1: The project would not result in the loss of availability of a known or locally important mineral resource that would be of value to the region and the residents of the state or is delineated on a local General Plan, Specific Plan, or other land use plan.	None required.	No Impact
Cumulative	None required.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
3.11 Noise		
Impact NOI-1: The project would not result in exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	**Mitigation Measure NOI-1:** Prior to issuance of the permits for the drilling and drilling equipment at the Pumpkin Patch and LCWA sites, a detailed noise assessment shall be prepared to demonstrate that the resultant noise levels from oil production activities will meet the City of Long Beach Noise Ordinance limits. The operational noise assessment shall be prepared by a qualified acoustical consultant who is a Registered Engineer in the State of California. The report shall document the specific sources of noise and detail any measures, if any are required, to ensure that operational noise is maintained within the City's standards. These measures will be incorporated into the project plans. The report shall be completed and approved by the City prior to issuance of building permits. Additionally, once the sites are in operation, noise measurements should be conducted within 60 days that demonstrate both oil production sites are in compliance with the City's Noise Ordinance. If any exceedances are detected, the City shall require that noise attenuation measures, such as equipment enclosures, mufflers, etc. are implemented, and require additional noise measurements be taken to demonstrate compliance with the City's Noise Ordinance.	Less than Significant
Impact NOI-2: The project would not result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels.	None required.	Less than Significant
Impact NOI-3: The project would not result in substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.	Mitigation Measure NOI-1 would apply.	Less than Significant
Impact NOI-4: The project would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	**Mitigation Measure NOI-2: Staging Areas and Mufflers.** Staging areas for construction shall be located away from existing off-site residences. All construction equipment shall use properly operating mufflers. These requirements shall be included in construction contracts. **Mitigation Measure NOI-3: Limit Grading and Pile Driving.** All grading and sheet pile driving activities shall be conducted outside of the nesting season for sensitive bird species. The nesting season has been identified as extending from March 1 to August 15. (Refer to the Biological section of the EIR for more information on potential impacts to bird species and the corresponding mitigation.) **Mitigation Measure NOI-4: Prohibit Impact Sheet Pile Driving.** Impact sheet pile driving should be prohibited on the Synergy Oil Field site. Only vibratory sheet pile driving shall be employed.	Less than Significant
Cumulative	None required.	Less than Significant
3.12 Population and Employment		
Impact PE-1: The project would not induce substantial indirect population growth.	None required.	Less than Significant
Cumulative	None required.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
3.13 Public Services		
Impact PS-1: The project would not result in the need for new or physically altered facilities in order to maintain acceptable response times for fire protection and emergency medical services.	**Mitigation Measure PS-1: Fire Prevention and Protection Training.** Prior to the start of construction activities, the Applicant shall prepare and conduct a fire prevention and protection training for all construction personnel associated with the proposed project. Topics shall include general fire prevention practices such as avoiding smoking on site as well as specific preventative measures pertaining to high-fire-risk activities including handling of oil and welding and cutting. Personal protection measures including the locations of fire extinguishers on the project site and site exit routes should also be disclosed to ensure construction worker safety in the event of a fire. The material for the training shall be obtained in consultation with the Long Beach Fire Department.	Less than Significant
Impact PS-2: The project would not result in the need for new or physically altered facilities in order to maintain acceptable response times for police protection services.	None required.	Less than Significant
Cumulative	None required.	Less than Significant
3.14 Recreation		
Impact RE-1: The project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated.	None required.	Less than Significant
Impact RE-2: The project would include recreational facilities but would not require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.	None required.	Less than Significant
Cumulative	None required.	Less than Significant
3.15 Transportation and Traffic		
Impact TRA-1: The project would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.	None required.	Less than Significant
Impact TRA-2: The project would not conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.	None required.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
Impact TRA-3: The project would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.	None required.	No Impact
Impact TRA-4: The project would not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	None required.	Less than Significant
Impact TRA-5: The project would not result in inadequate emergency access.	None required.	Less than Significant
Cumulative	None required.	Less than Significant
3.16 Tribal Cultural Resources		
Impact TCR-1: The project would not cause a substantial adverse change in the significance of a tribal cultural resource, as defined in CEQA PRC Section 21074(a) or (b).	Mitigation Measures CUL-5 through CUL-7 would apply.	Less than Significant
Cumulative	Mitigation Measures CUL-5 through CUL-7 would apply.	Less than Significant
3.17 Utilities and Service Systems		
Impact UT-1: The project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.	None required.	Less than Significant
Impact UT-2a: The project would not require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	None required.	Less than Significant
Impact UT-2b: The project would not require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	None required.	No Impact
Impact UT-3: The project would not require or result in the construction of new stormwater drainage facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects.	None required.	Less than Significant
Impact UT-4: The project would have sufficient water supplies available to serve the project from existing entitlements and resources.	None required.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
Impact UT-5: The project would not result in a determination by the wastewater treatment provider that would serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	None required.	Less than Significant
Impact UT-6: The project would be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.	None required.	Less than Significant
Impact UT-7: The project would comply with federal, state, and local statutes and regulations related to solid waste.	None required.	Less than Significant
Cumulative	None required.	Less than Significant
3.18 Energy Consumption		
Impact EN-1: The project would not result in the wasteful, inefficient, and unnecessary consumption of energy during construction, operation, and/or maintenance.	Mitigation Measure AQ-3 would apply.	Less than Significant
Impact EN-2: The project would not increase demand on local and regional energy supplies, resulting in the need for additional capacity.	None required.	Less than Significant
Impact EN-3: The project would be consistent with existing energy standards, policies, and regulations.	Mitigation Measures AQ-2 and AQ-3 would apply.	Less than Significant
Cumulative	None required.	Less than Significant

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Pages ES-12 to ES-31, Table ES-5, Summary of Environmental Effects and Mitigation Measures/Project Requirements, cells shown below, is revised as follows:

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
3.1 Aesthetics		
…		
Impact AES-4: The project would not create a new source of substantial light or glare that would adversely affect day or night views in the area or that would substantially impact other people or properties.	**Mitigation Measure AES-2: Lighting Plan.** Prior to issuance of a grading permit for each site, a Lighting Plan for the site shall be developed and ~~implemented~~ submitted to the City of Long Beach Planning and Development Services Department that requires all exterior lighting to be directed downward and focused away from adjacent sensitive uses and habitats to encourage wayfinding and provide security and safety for individuals walking to and from parking areas and working at the oil facilities on the Pumpkin Patch and the LCWA sites. Compliance with the approved Lighting Plan shall be implemented through the City's development review and building plan check process.	Less than Significant
…		
3.2 Air Quality		
…		
Impact AQ-2a: The project would violate the air quality standard and contribute substantially to an existing or projected air quality violation for construction-related VOC and NO_X emissions.	**Mitigation Measure AQ-1: Construction-Period Use of Low-VOC Paints.** The Applicant for the proposed project shall be responsible for the use of SCAQMD Rule 1113–compliant paints with a VOC content of ~~75~~50 grams per liter or less. **Mitigation Measure AQ-2: Construction NO_X Reduction Measures.** The Applicant for the proposed project shall be responsible for the implementation of the following construction-related NO_X reduction measures: ● Require all off-road diesel-powered construction equipment greater than 50 hp (e.g., excavators, graders, dozers, scrappers, tractors, loaders, etc.) to comply with EPA-Certified Tier IV emission controls where commercially available. Documentation of all off-road diesel equipment used for this project, including Tier IV certification, or lack of commercial availability if applicable, shall be maintained and made available by the contractor to the City for inspection upon request. In addition, all construction equipment shall be outfitted with Best Available Control Technology (BACT) devices certified by CARB such as certified Level 3 Diesel Particulate Filter or equivalent. A copy of each unit's certified tier specification, BACT documentation, and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit of equipment. If Tier IV construction equipment is not available, the City shall require the contractor to implement other feasible alternative measures, such as reducing the number and/or hp rating of construction equipment, and/or limiting the number of individual construction phases occurring simultaneously. The determination of commercial availability of Tier IV construction equipment shall be made by the City prior to issuance of grading or building permits based on applicant-provided evidence of the availability or unavailability of Tier IV equipment and/or evidence obtained by the City from expert sources such as construction contractors in the region. ● Eliminate the use of all portable generators. Require the use of electricity from power poles rather than temporary diesel or gasoline power generators.	Significant and Unavoidable

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	● Provide temporary traffic controls such as a flag person, during all phases of construction to maintain smooth traffic flow, including during the transportation of oversized equipment and vehicles. ● Provide dedicated turn lanes for movement of construction trucks and equipment on and off site. The location of these dedicated lanes shall be addressed in the Construction Trip Management Plan. ● Reroute construction trucks away from congested streets or sensitive receptor areas. ● Prohibit the idling of on-road trucks and off-road equipment in excess of 5 continuous minutes, except for trucks and equipment where idling is a necessary function of the activity, such as concrete pour trucks. The Applicant or construction contractor(s) shall post signs at the entry/exit gate(s), storage/lay down areas, and at highly visible areas throughout the active portions of the construction site of the idling limit. ● On-road heavy-duty diesel haul trucks with a gross vehicle weight rating of 19,500 pounds or greater used to transport construction materials and soil to and from the project site shall be engine model year 2010 or later or shall comply with the USEPA 2007 on-road emissions standards.	
…		
3.4 Cultural Resources		
Impact CUL-1: The project would not cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5.	… **Mitigation Measure CUL-2: Retention of the Bixby No. 2 Discovery Well.** Prior to the issuance of a grading permit for the Synergy Oil Field site by the City of Long Beach, a plan shall be implemented by the Applicant for the retention and preservation of t~~T~~he Bixby No. 2 Discovery Well and sign ~~shall be retained and preserved~~ along with a 5-foot buffer around the furthest point from the concrete pad. ~~Necessary~~ The plan shall define the necessary maintenance to the sign that shall be performed~~,~~ (see National Park Service Preservation Brief 25, "The Preservation of Historic Signs," by Michael J. Auer). The plan shall describe a~~A~~ path for pedestrian traffic from the visitors center to the Discovery Well that shall be developed and installed. At the Discovery Well site, a wayside sign shall be installed interpreting the Seal Beach Oil Field and the importance of the Bixby No. 2 Discovery Well. The interpretation of the Bixby No. 2 Discovery Well shall be overseen and prepared by a qualified architectural historian or historic preservation professional. The ongoing maintenance of the Bixby No. 2 Discovery Well site shall be the responsibility of the owner of this area of the Synergy Oil Field site. **Mitigation Measure CUL-3: Historic Preservation Consultation, Preparation of a Relocation and Rehabilitation Plan, and Construction Monitoring.** Prior to the issuance of a grading permit for the Synergy Oil Field site by the City of Long Beach, a Relocation and Rehabilitation Plan and plans for Construction Monitoring shall be submitted by the Applicant for review and approval. The project design for Bixby Ranch Field Office is presently conceptual and detailed architectural drawings showing the proposed rehabilitation have not been prepared. A qualified architectural historian shall provide input to the project architect to revise the design in accordance with the Standards to retain the character-defining features of the exterior and interior of the Bixby Ranch Field Office. Once the design has been finalized, the architectural historian shall prepare a Standards plan review for submittal to the City of Long Beach Planning for a Certificate of Appropriateness. Following the approval of the Bixby Ranch Field Office project plans, a Relocation and Rehabilitation Plan (Plan) shall be developed by a qualified historic preservation consultant. The Plan shall include relocation and rehabilitation methodology recommended by the National Park Service (NPS), which are outlined in the booklet entitled "Moving Historic Buildings," by John Obed Curtis (1979). The Plan shall include an assessment of the building condition by a qualified engineer, and a shoring plan for relocation and storage, and guidelines for relocation to the final site. If temporary storage is required, the storage conditions should	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	closely follow the recommendations of NPS Preservation Brief 31: Mothballing Historic Buildings with regard to recommendations for structural stabilization, pest control, protection against vandalism, fire, and moisture, adequate ventilation which should be applied to the building at the temporary storage location to ensure the safety of the building during storage. A periodic maintenance and monitoring plan shall also be included in the Plan and implemented during the storage period in accordance with the guidance outlined in NPS Preservation Brief 31. The Plan shall be reviewed and approved by the City prior to issuance by the City of permits to relocate the Bixby Ranch Field Office. Upon relocation of the Bixby Ranch Field Office, any maintenance, repair, stabilization, rehabilitation, preservation, conservation, or reconstruction work performed in conjunction with the relocation of the building shall be undertaken in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Properties. The relocation and rehabilitation process shall be monitored by a qualified historic preservation consultant at key intervals to ensure conformance with the Standards and NPS guidelines. The preservation consultant shall also be available to provide technical expertise to reduce potential impacts to historical resources from unforeseen circumstances. Lastly, a permanent metal plaque shall be affixed to the primary elevation or a marker shall be imbedded in the pavement in front of the primary elevation of the relocated Bixby Ranch Field Office, which will briefly explain where the building was originally located (original and second location) and that the building was relocated to a third location. A qualified architectural historian or historic preservation professional shall provide oversight to the design and fabrication of an interpretive plaque/marker. … **Mitigation Measure CUL-5: Retention of Qualified Archaeologist and Worker Training.** Prior to the issuance of a grading permit for ~~project implementation~~ each of the four individual sites and any off-site improvements by the City of Long Beach, evidence shall be provided to the City that a qualified archaeologist meeting the Secretary of the Interior's Standards for professional archaeology (U.S. Secretary of the Interior 2008) has been retained by the City to conduct any required training, evaluation, or treatment of archaeological resources that might be encountered during implementation of the project. As part of this, prior to the start of grading, the qualified archaeologist shall conduct cultural resources sensitivity training for all construction personnel. Construction personnel must be informed of the types of archaeological resources that may be encountered (both prehistoric and historical), and of the proper procedures to be enacted in the event of an inadvertent discovery of archaeological resources or human remains. The ~~City~~ Applicant must ensure that construction personnel are made available for and attend the training and retain documentation demonstrating attendance. This documentation shall be made available to the City upon request. **Mitigation Measure CUL-6: Native American Monitoring.** A Native American monitor from the Gabrieleño Band of Mission Indians—Kizh Nation, a consulting party for the project under AB 52, shall be present during all earth-moving construction activities. The Native American monitor shall be given the opportunity to participate in the cultural resources sensitivity training described in Mitigation Measure CUL-5. At least 30 days prior to issuance of grading permits by the City of Long Beach for each of the four individual sites and any off-site improvements, a Native American Monitoring Agreement (Monitoring Agreement) shall be developed between the City and the Gabrieleño Band of Mission Indians—Kizh Nation. The ~~agreement~~ Monitoring Agreement shall pertain to prehistoric archaeological resources and Tribal cultural resources, respectively, and shall identify any monitoring requirements and treatment of cultural resources to meet both the requirements of CEQA and those of the Tribal representative. The Monitoring Agreement shall also address communication protocols in the event of an unanticipated discovery of cultural materials, and the roles, responsibilities, and authorities of the Native American Monitor. The Monitoring Agreement shall also detail the protocols for	

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	treatment and final disposition of any Native American cultural resources, sacred sites, and human remains discovered on the site that the Native American Monitor shall implement in consultation and coordination with the Native American Most Likely Descendant, as identified by the NAHC. In accordance with Mitigation Measure CUL-9, discussed below, discovery and treatment of human remains shall comply with State Health and Safety Code Section 7050.5 and PRC Section 5097.98. **Mitigation Measure CUL-7: Archaeological Resource and/or Tribal Cultural Resource Discovery and Treatment.** In the event of the unanticipated discovery of archaeological or other cultural resources, whether discovered through Native American monitoring or not, all work activities in the area (within approximately 100 feet of the discovery) shall be halted or redirected until the discovery can be evaluated by a qualified archaeologist. Construction shall not resume until a qualified archaeologist has conferred with the City and, in the case of prehistoric archaeological resources and tribal cultural resources, the Native American monitor, on the significance of the resource. If it is determined that the discovered archaeological resource and/or tribal cultural resource is significant under CEQA, avoidance and preservation in place shall be the preferred manner of mitigation, pursuant to PRC Section 21083.2(b) and Section 21084.3. Preservation in place may be accomplished by, but is not limited to, avoidance, incorporating the resource into open space, capping, or deeding the site into a permanent conservation easement. In the event that preservation in place is demonstrated to be infeasible and data recovery through excavation is the only feasible mitigation available, a Treatment Plan shall be prepared and implemented by a qualified archaeologist, in consultation with the City, that provides for the adequate recovery of the scientifically consequential information contained in the archaeological resource or cultural information in the event of a tribal cultural resource. The City shall also consult with appropriate Native American representatives in determining treatment for prehistoric or Native American resources to ensure cultural values ascribed to the resources, beyond those that are scientifically important, are considered. Any evaluation and treatment shall be supervised by an individual or individuals that meet the Secretary of the Interior's Professional Qualification Standards.	
Impact CUL-2: The project would not cause a substantial adverse change in the significance of an archaeological resource pursuant to *CEQA Guidelines* Section 15064.5.	Mitigation Measures CUL-5 through CUL-7 would apply.	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
Impact CUL-3: The project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	**Mitigation Measure CUL-8: Paleontological Monitoring.** Prior to commencement of any grading or excavation activity on site, the ~~City~~ Applicant shall retain a qualified paleontologist, defined as a paleontologist meeting the guidelines of the Society of Vertebrate Paleontology (SVP) (2010) and approved by the City of Long Beach. The qualified paleontologist, or a designated paleontological monitor working under the guidance of the qualified paleontologist, shall attend and participate in any preconstruction meetings and worker training (as discussed in Mitigation Measure CUL-5), and shall be on site during all excavation and other significant ground-disturbing activities that reach a depth of 15 feet or greater below the modern ground surface. This is the minimum depth at which Young Alluvial Fan and ~~Channel~~ Valley Deposits, Undivided may be encountered. These deposits are considered to have low paleontological sensitivity near the top of the geologic unit (which may not necessarily correspond with the modern ground surface), and a high paleontological sensitivity greater than 15 feet below the top of the unit. In the event that paleontological resources (e.g., fossils) are unearthed during ground-disturbing activity, the paleontological monitor shall have the authority to temporarily halt or divert grading activity to allow recovery of paleontological resources. The area of discovery shall be roped off with a 50-foot-radius buffer. Once documentation and collection of the find is completed, the monitor shall allow grading to recommence in the area of the find. Daily field logs shall be prepared during the course of the monitoring, and upon completion of monitoring a final report shall be prepared for submittal to the City of Long Beach.	Less than Significant
…		
3.5 Geology and Soils		
…		
Impact GEO-2: The project would not expose people or structures to potential substantial adverse effects as a result of strong seismic ground shaking.	**Mitigation Measure GEO-1: Implement Geotechnical Recommendations.** ~~The Applicant shall prepare final geotechnical investigations for the following project components~~ As recommended in the geotechnical studies prepared for project implementation on each project site, at such time the details for the following site specific improvements and their locations are finalized, a design-level geotechnical investigation shall be prepared to develop final site- and development-specific recommendations based upon the potential geologic conditions that are described and evaluated in the geotechnical studies and this EIR. Design-level geotechnical investigation shall be prepared for the following project components and shall be submitted to the City of Long Beach, Building Department and Planning Department: ● Visitors center on the Synergy Oil Field site; ● Office b~~B~~uilding and warehouse on the Pumpkin Patch site; ● All well cellars on the Pumpkin Patch and LCWA sites; and ● All tank battery and containment areas on the Pumpkin Patch and LCWA sites. The design-level geotechnical investigations shall provide recommendations as necessary to address ~~relevant~~ the geotechnical issues that were identified for each site in the EIR~~ such as active faults, seismic shaking, seismic-related ground failure including liquefaction, and other soil stability issues including expansive soils, as needed. These types of issues are addressed through compliance with the CBC, which requires geotechnical investigations to identify geotechnical hazards along with recommendations to reduce the identified risks~~. In addition to compliance with the CBC, design-level measures shall be provided for the following specific geotechnical issues: ● Risks from seismic shaking of structures such as the building to be constructed on the Pumpkin Patch site shall be reduced by designing the structures to withstand the anticipated maximum level of seismic ground	Less than Significant

Table ES-5 Summary of Environmental Effects and Mitigation Measures/Project Requirements

Impacts	Mitigation Measures and/or Project Requirements	Level of Significance after Mitigation
	shaking, and incorporating bracing and anchoring techniques to withstand a~~. The preliminary geotechnical investigation for the Pumpkin Patch site estimates the~~ Maximum Credible Earthquake of 7.0 magnitude ~~would result in a PGA of 0.604 g (KCG 2016a). Damage from seismic shaking of structures is reduced by designing buildings capable of withstanding or accommodating strong ground motion by using various bracing and anchoring techniques. Damage from soils~~ ● For those project sites that have been identified as susceptible to liquefaction~~ can be addressed by~~, the design-level geotechnical investigations shall identify the specific measures recommended to address liquefaction potential, which could include driving piles through susceptible materials; conditioning the soils by deep soil mixing, jet or pressure grouting, or dynamic compaction techniques; or by removing the susceptible soils. ● ~~Damage from placing structures on unstable materials (e.g.,~~ If the landfill ~~materials~~ on the Pumpkin Patch site~~) can be addressed~~ is not removed, any structures proposed to be placed on top of the landfill shall be stabilized by one of two measures: by driving piles through unstable materials into underlying stable units or by removing the susceptible soils and replacing the materials with properly compacted imported fill. ~~Damage from~~ ● For those sites on which structures may be placed in areas of expansive soils~~ can be addressed by removing and replacing expansive soils~~, the design-level geotechnical study shall identify whether the expansive soils should be removed and replaced with imported non-expansive fill, or with proper mixing and grading of site materials. ● The Applicant shall provide the design-level geotechnical investigations along with the plans, specifications, grading plans, and building plans to the City for review as a condition of approval to acquire the necessary grading and building permits.~~ Upon approval by the City,~~ ● I~~i~~mplementation by the Applicant of the recommendations in the geotechnical investigations will mitigate geotechnical hazards to a level of less than significant.	
…		