Final Addendum To
Environmental Impact Report

Bombay Beach Plot Study

Prepared for:

Imperial Irrigation District
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Imperial, California 92251

Prepared by:

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January 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	**Description**
AB	Assembly Bill
AFY	acre-feet per year
ALOC	*Allenrolfea occidentalis* (iodine bush)
amsl	above mean sea level
AOI	Area of Interest
APE	Area of Potential Effects
ATCA	*Atriplex canescens* (fourwing saltbush)
ATLE	*Atriplex lentiformis* (big saltbush)
ATV	all-terrain vehicle
bgs	below ground surface
BLM	U.S. Bureau of Land Management
BMPs	Best Management Practices
bsl	below sea level
CAA	Clean Air Act
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	methane
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Levels
CNPS	California Native Plant Society
CNRA	California Natural Resources Agency

LIST OF ACRONYMS AND ABBREVIATIONS

Term	**Description**
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRHR	California Register of Historic Places
CUP	Conditional Use Permit
CUSD	Calipatria Unified School District
CVWD	Coachella Valley Water District
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibels
DCMs	dust control measures
DHS	California Department of Health Services
DOC	California Department of Conservation
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
°F	Fahrenheit
FHSZ	Fire Hazard Severity Zone
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GDE	groundwater dependent ecosystem
GHG	greenhouse gas
gpm	gallons per minute
GRIA	Groundwater Resources Impact Assessment
HCP	Habitat Conservation Plan
Hz	hertz
ICAPCD	Imperial County Air Pollution Control District
ICPDS	Imperial County Planning and Development Services Department
IID	Imperial Irrigation District
IPCC	Intergovernmental Panel on Climate Change
ITAs	Indian Trust Assets
L_{dn}	day/night noise level
L_{eq}	equivalent noise levels
LF	linear feet
MBTA	Migratory Bird Treaty Act
MDAQMD	Mojave Desert Air Quality Management District

LIST OF ACRONYMS AND ABBREVIATIONS

Term	**Description**
MHMP	Multi-Jurisdictional Hazard Mitigation Plan
MLD	Most Likely Descendent
mph	miles per hour
MMRP	Mitigation Monitoring and Reporting Program
MWD	Metropolitan Water District
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCAG	Natural Communities Commonly Associated with Groundwater
NCCP	Natural Communities Conservation Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OPR	Office of Planning and Research
PEIR	Programmatic Environmental Impact Report
PDCP	Proactive Dust Control Plan
$PM_{2.5}$	Particulate Matter Less than 2.5 Microns in Diameter
PM_{10}	Particulate Matter Less than 10 Microns in Diameter
PPV	peak particle velocity
PRC	Public Resources Code
PVC	polyvinyl chloride
QSA	Quantification Settlement Agreement
Reclamation	Bureau of Reclamation
RMS	root mean square
ROG	Reactive Organic Gas
RWQCB	Regional Water Quality Control Board
USACE	U.S. Army Corps of Engineers
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SCIC	South Coastal Information Center
SDCWA	San Diego County Water Authority
SIP	State Implementation Plan
SLF	Sacred Lands File
SO_2	sulfur dioxide
SR	State Route

LIST OF ACRONYMS AND ABBREVIATIONS

Term	**Description**
SSAB	Salton Sea Air Basin
SSAQMP	Salton Sea Air Quality Mitigation Program
SSMP	Salton Sea Management Plan
SUNI	*Suaeda nigra* (bush seepweed)
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminants
TCRs	Tribal Cultural Resources
TDS	total dissolved solids
TNC	The Nature Conservancy
Transfer Project	IID's Water Conservation and Transfer Project
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UV	ultraviolet
VdB	vibration velocity
VOC	volatile organic compound
VRI	Visual Resource Inventory
WDR	Waste Discharge Requirements

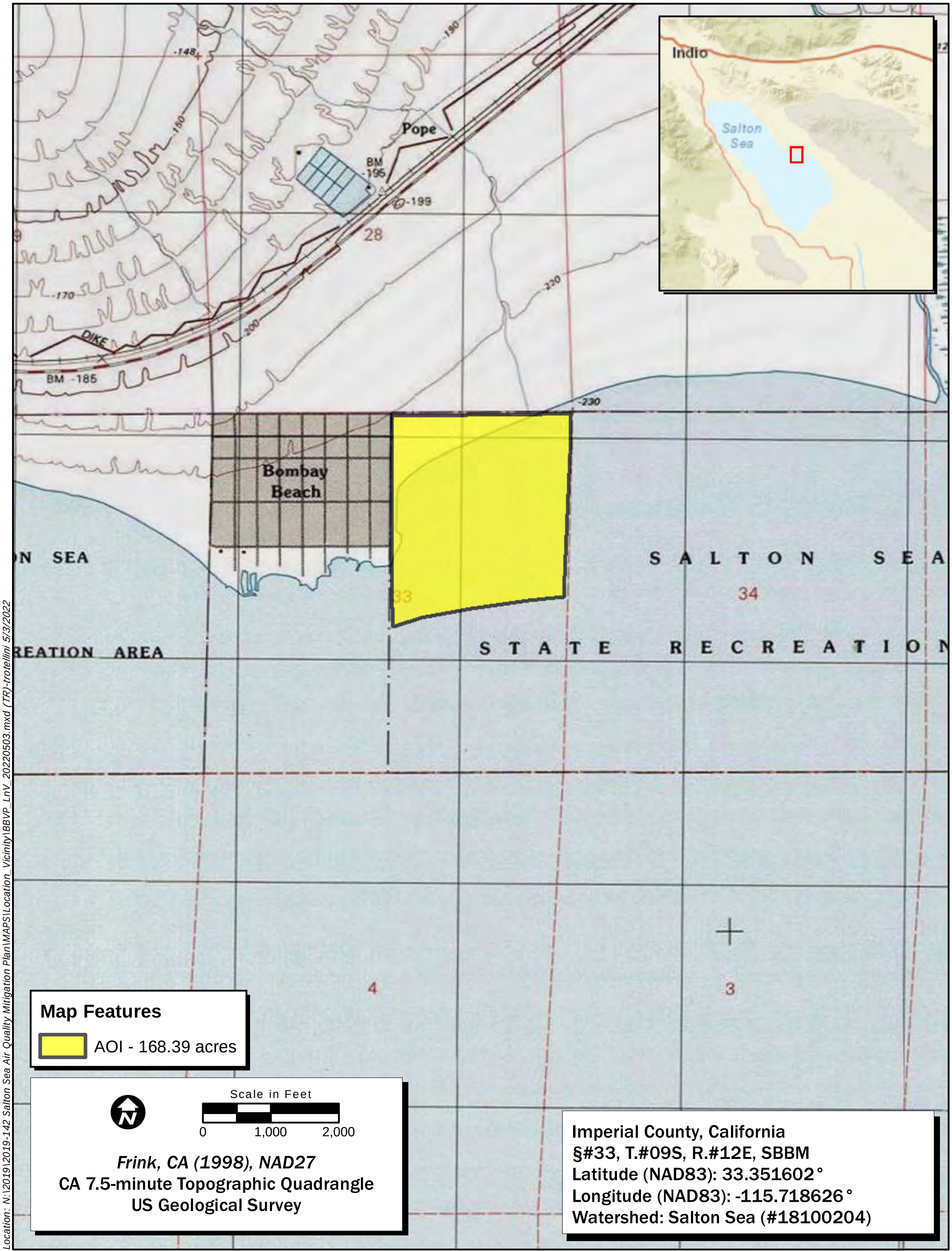
1.0 BACKGROUND

1.1 Summary

Project Title:	Bombay Beach Plot Study
Lead Agency Name and Address:	Imperial Irrigation District (IID) Water Department 333 East Barioni Boulevard Imperial, California 92251
Contact Person and Phone Number:	Jessica Humes Senior Environmental Project Manager IID Water Department (760) 339-9703 jllhumes@iid.com
Project Location:	The Project Area consists of approximately 168.39 acres of property located in the northeastern quarter of Section 33 of Township 9 South, Range 12 East, San Bernardino Base and Meridian as depicted on the 1998 Frink, California U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map (Figure 1). The northwestern corner of the Project Area is one block east of the intersection of 1st Street and Avenue G in the community of Bombay Beach. The Proposed Project entails the evaluation of the efficacy of several surface treatments to provide dust control and habitat enhancements to the south of the community of Bombay Beach.

1.2 Introduction

The purpose of this California Environmental Quality Act (CEQA) Environmental Impact Report (EIR) Addendum (Addendum) is to discuss the details and environmental impacts associated with implementation of air quality mitigation measures required for IID's Water Conservation and Transfer Project (Transfer Project) and Habitat Conservation Plan (HCP) analyzed in a Final Environmental Impact Report and Environmental Impact Statement (Final EIR/EIS or EIR/EIS), certified in June 2002 (Bureau of Reclamation [Reclamation] and IID 2002a, 2002b), and as amended (IID 2003; IID 2008). This Addendum documents the potential environmental impacts associated with implementation of a portion of the Salton Sea Air Quality Mitigation Program (SSAQMP), required mitigation by the EIR/EIS. Specifically, this Addendum discusses and analyzes the impacts associated with implementation of the Bombay Beach Plot Study (Proposed Project), which is identified as part of IID's 2019/2020 Proactive Dust Control Plan (PDCP) under the SSAQMP.



Map Features

🟨 AOI - 168.39 acres

Frink, CA (1998), NAD27
CA 7.5-minute Topographic Quadrangle
US Geological Survey

Imperial County, California
§#33, T.#09S, R.#12E, SBBM
Latitude (NAD83): 33.351602°
Longitude (NAD83): -115.718626°
Watershed: Salton Sea (#18100204)

Location: N:\2019\2019-142 Salton Sea Air Quality Mitigation Plan\MAPS\Location_Vicinity\BBVP_LnV_20220503.mxd (TR)-trotellini 5/3/2022

Map Date: 5/3/2022

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community, Copyright:© 2013 National Geographic Society, i-cubed

Figure 1. Project Location and Vicinity

2022-061 Bombay Beach Vegetation Plots

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The SSAQMP was developed by IID to provide a comprehensive, science-based, adaptive approach to address air quality mitigation requirements associated with the Transfer Project. The Proposed Project Area comprises approximately 168.39 acres which has been identified as a priority area to evaluate groundwater supply and quality and development, vegetation establishment options, maintenance of existing vegetation, stormwater retention and spreading features (bunds), and waterless dust control measures (DCMs). Critical to the success of this Project is development of sufficient groundwater suitable to establish and sustain vegetation cover within the Project Area. Waterless DCMs will include placement of hay bales and perimeter sand-fencing.

1.3 Final Environmental Impact Report/Environmental Impact State for the Imperial Irrigation District Water Conservation and Transfer Project and Habitat Conservation Plan

The Final EIR/EIS or EIR/EIS for the IID's Transfer Project and HCP was certified by IID (as CEQA Lead Agency) in June 2002 (Reclamation and IID 2002a). The EIR/EIS was amended by the Amended and Restated Addendum to the EIR/EIS for the IID Water Conservation and Transfer Project (09/03 Addendum) in September 2003 to document the potential environmental impacts of certain changes made to the Transfer Project, as well as by a Supplemental EIR certified in 2008 to implement a managed marsh complex associated with the Transfer Project (IID 2003, 2008).

The EIR/EIS, as amended, evaluates a water conservation and transfer project that would conserve and transfer up to 300,000 acre-feet per year (AFY) of IID's Colorado River entitlement. The water, which could be conserved by a variety of methods, would be transferred by IID to the San Diego County Water Authority (SDCWA), the Coachella Valley Water District (CVWD) and/or the Metropolitan Water District (MWD). The terms of the water conservation and transfer transactions are set forth in the Agreement for Transfer of Conserved Water (IID/SDCWA Transfer Agreement) executed by IID and SDCWA in 1998, as amended, and the Quantification Settlement Agreement (QSA) executed by IID, CVWD, and MWD. These transfers, which are to remain in effect for up to 75 years, facilitate efforts to reduce California's diversions of Colorado River water in normal years to its annual 4.4 million AFY apportionment.

The Transfer Project also includes implementation of an HCP to address impacts to covered species and habitats within the IID water service area associated with the water transfer; implementation of certain operations and maintenance activities by IID associated with water conservation and water transfer; and implementation of mitigation measures required in the EIR/EIS. The HCP was not adopted by resource agencies but is analyzed as part of the Transfer Project in the EIR/EIS.

The Final EIR/EIS identified potential air quality impacts from windblown dust from exposed Salton Sea playa as a result of the conservation of up to approximately 300,000 acre-feet reducing the volume of agricultural inflows to the Sea. The requirements for monitoring and mitigating dust emissions from the exposed Salton Sea playa are identified in the Final EIR/EIS and as Mitigation Measure AQ-7. The Salton Sea air quality monitoring and mitigation requirements established by Final EIR/EIS Mitigation Measure AQ-7, in pertinent part, are as follows:

1. **Restrict Access:** Public access, especially off-highway vehicle access, would be limited, to the extent legally and practicably feasible, to minimize disturbance of natural crusts and soils surfaces in future exposed shoreline areas.
2. **Research and Monitoring:** A research and monitoring program would be implemented incrementally as the Sea recedes. The research phase would focus on development of information to help define the potential for problems to occur in the future as the Sea elevation is reduced slowly over time. Research would:
    a. Study historical information on dust emissions from exposed shoreline areas.
    b. Determine how much land would be exposed over time and who owns it.
    c. Conduct sampling to determine the composition of "representative" shoreline sediments and the concentrations of ions and minerals in salt mixtures at the Sea.
    d. Analyze [data] to predict responses of Salton Sea salt crusts and sediments to environmental conditions, such as rainfall, humidity, temperature, and wind.
    e. Implement a meteorological, course particulate matter (PM_{10}) and toxic air contaminant (TAC) monitoring program to begin under existing conditions and continue as the [Sea recedes]. The goal of the monitoring program would be to observe PM_{10} problems or incremental increases in TAC concentrations associated with [receding Sea levels] and to provide a basis for mitigation efforts.
    f. If incremental increases in TACs (such as arsenic or selenium, for example) are observed at the receptors and linked to emissions from exposed shoreline caused by [receding Sea levels], conduct a health risk assessment to determine whether the increases exceed acceptable thresholds established by the governing air districts and represent a significant impact.
    g. If potential PM_{10} or health effects problem areas are identified through research and monitoring and the conditions leading to PM_{10} emissions are defined, study potential dust control measures specific to the identified problems and the conditions at the Salton Sea.
3. **Create or Purchase Offsetting Emission Reduction Credits:** This step would require negotiations with the local air pollution control districts to develop a long-term program for creating or purchasing offsetting PM_{10} emission reduction credits. Credits would be used to offset emissions caused by the Proposed Project, as determined by monitoring.
4. **Direct Emission Reductions at the Sea:** If sufficient offsetting emission reduction credits are not available or feasible, Step 4 of this mitigation plan would be implemented. It would include either, or a combination of:
    a. Implementing feasible dust mitigation measures; and/or

b. If feasible, supplying water to the Sea to re-wet emissive areas exposed by the [receding Sea], based on research and monitoring program.

The EIR/EIS concludes that windblown dust from exposed shoreline caused by the Transfer Project may result in potentially significant and unavoidable air quality impacts that could not be mitigated. This conclusion was based upon (1) uncertainty regarding the actual air quality impacts of Salton Sea shoreline exposure, because of the lack of sufficient records or research regarding emissive potential, and (2) uncertainty regarding the availability or feasibility of mitigation measures. The SSAQMP, therefore, was developed as result of Mitigation Measure AQ-7 to reduce air quality impacts and health effects associated with particulate matter less than 10 microns in diameter (PM_{10}) as described below.

1.4 The Salton Sea Air Quality Mitigation Program

The SSAQMP was developed by IID in July 2016 to provide a comprehensive, science-based, adaptive approach to address air quality mitigation requirements associated with the transfer of up to approximately 300,000 AFY of conserved water in compliance with Mitigation Measure AQ-7 of the EIR/EIS. The conserved water transfer reduces the volume of agricultural return flow to the Salton Sea, thereby contributing to an increase in the rate of playa exposure and increasing the potential for dust emissions that could affect communities near and around the Sea. The SSAQMP expands upon these general mitigation measures with detailed methods to assess playa dust emissions and identify options to mitigate them.

The SSAQMP has three main components: (1) an annual Emissions Monitoring Program to estimate emissions and to identify high-priority areas of exposed playa for proactive dust control, (2) an annual PDCP with recommendations and design for site-specific DCMs, and (3) implementation and monitoring of DCMs (e.g., surface roughening and vegetation establishment) to mitigate potential PM_{10} dust source areas proactively as playa becomes exposed. The annual Emissions Monitoring Program is designed to work hand-in-hand with the development of the annual PDCP and subsequent implementation and monitoring of DCMs (IID 2016).

Based on the results of the 2020/2021 Emission Estimates, the 2021/2022 PDCP reports progress on the implementation of the dust mitigation recommended in the 2019/2020 PDCP. The 2021/2022 PDCP also provides performance monitoring results of existing dust control areas and an update on program-level planning activities (IID 2022a). IID prepared the 2019/2020 PDCP as part of the SSAQMP to identify priority playa areas for dust control using the prioritization results from the 2018/2019 Emissions Estimates performed under the SSAQMP, and considering other stakeholder-planned projects at the Salton Sea. The PDCP recommends dust mitigation projects on approximately 7,000 acres, including a series of plot studies and irrigation water supply development implemented in a series of steps over three years. These plot studies are designed to test the effectiveness of various DCMs including their operation, maintenance, and cost. Results of the plot studies will inform larger scale implementation of dust control in each planning area identified in the SSAQMP. Implementation of the following DCMs are considered in the SSAQMP and PDCP:

- Surface roughening;

- Vegetation enhancement;
- Vegetated swales;
- Moat and row;
- Surface stabilizers;
- Physical barriers;
- Gravel cover;
- Shallow flooding; and
- Brine stabilization.

Most of these activities involve ground disturbance. Vegetation enhancement may involve use of groundwater and/or irrigation water and installation of infrastructure to facilitate irrigation (IID 2020).

In the 2019/2020 PDCP, Planning Areas were identified within the 7,000-acres for implementation of DCMs and no new areas were recommended in the 2021/2022 PDCP. The areas are identified as follows:

- Alamo North;
- Alamo South;
- Bombay Beach;
- Clubhouse;
- Mundo;
- New East;
- New West;
- Poe Road;
- San Felipe;
- Tule Fan;
- Travertine; and
- Whitewater West

This CEQA Addendum addresses implementation of a proposed dust control plot study in the Bombay Beach Planning Area identified in the 2019/2020 PDCP under the SSAQMP.

1.5 Bombay Beach Plot Study Project Description

The Proposed Project Area comprises approximately 168.39 acres that has been identified as a priority playa area to evaluate groundwater supply and quality, vegetation establishment in hedgerows, enhancement of existing vegetation through rainwater harvesting (bund) techniques, and waterless DCMs. The Project Area is located adjacent to the town of Bombay Beach on the eastern playa of the Salton Sea in Imperial County (County) one block east of the intersectino of 1st Street and Avenue G in the community of Bombay Beach (a 1). As shown on Figure 2, the Proposed Project would include:

- Development (drilling, testing, and operations) of up to three shallow supply wells (approximately 100 feet deep) on approximately 86 acres;
- Installation of approximately 5,000 feet, with a footprint of 4 acres, of perimeter sand-fencing;
- Placement of physical exclusion barriers including hay bales, sand-fencing, and concrete barriers around site perimeter;
- Installation of access routes totaling 5,250 linear feet (LF);
- Installation and operations of solar-powered electric submersible groundwater pumps;
- Placement and use of approximately three 5,000-gallon water storage tanks;
- Installation of irrigation system from wells to storage tanks and from storage tanks to vegetation on the exposed playa;
- Enhancement of up to 53 acres of existing vegetation through rainwater harvesting (bund) techniques and establishment of 86.5 acres of vegetated hedgerows, including site preparation, seeding and transplanting, and installation of managed irrigation systems. Vegetation would be seeded or transplanted iodine bush; and
- Ongoing operations, maintenance, and monitoring of the Project components.

The purpose of the Project is the development of sufficient groundwater (both quantity and quality) to establish and sustain vegetation cover on the site and implementation of DCMs as described in the 2019/2020 PDCP. The primary DCMs would include vegetation establishment using irrigation from groundwater wells onsite and vegetation enhancement using bunds for surface water capture. Existing vegetation includes native species such as iodine bush (*Allenrolfea occidentalis* or ALOC), fourwing saltbush (*Atriplex canescens* or ATCA), big saltbush (*Atriplex lentiformis* or ATLE), and bush seepweed (*Suaeda nigra* or SUNI).

Vegetation establishment activities include earthworks, seeding, and the installation and operation of an irrigation system. The vegetated hedgerows will be planted with ALOC Playa Mix. Site preparation includes site staking, grubbing, construction of hedgerow seedbeds, and hedgerow seeding.

Bunds will be used to mimic the surface water retention achieved by natural beach ridges and promote vegetation expansion into areas where natural beach ridges do not occur. Bund construction will consist of staking, grubbing, excavation, compaction, and site restoration. Diversion swales will be installed to divert surface flow to the bund arrays.

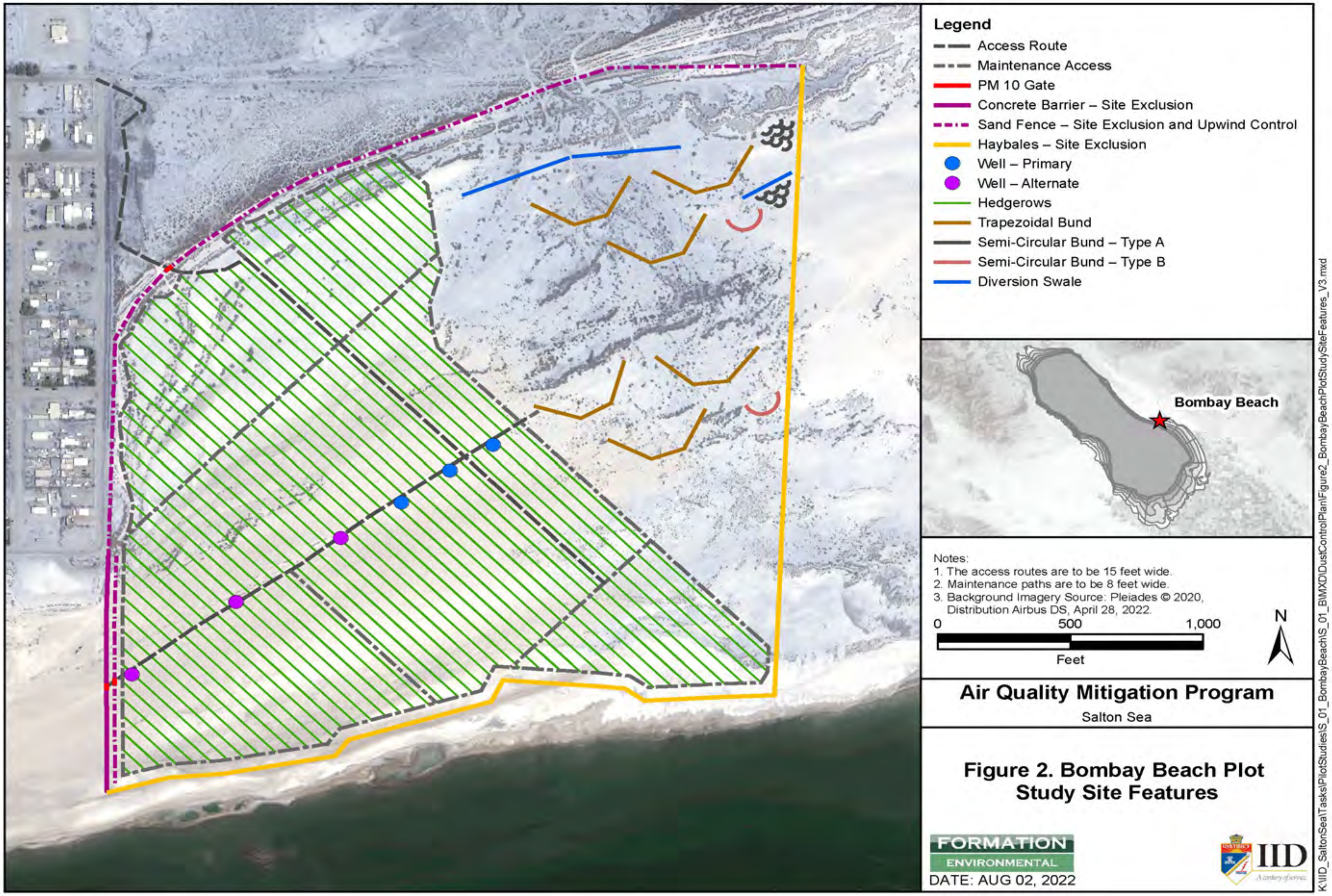

Figure 2. Site Plan

2019-142 Salton Sea Air Quality Mitigation Plan

Waterless DCMs include hay bales and sand fencing. Hay bales will be placed on the eastern and southern perimeter of the Project Area for site exclusion. Sand fencing will be installed on the western and northern perimeter of the Project Area for site exclusion and upwind control. A concrete barrier will also be placed along a portion of the western perimeter to prevent vehicle disturbance to the Plot Study site.

1.6 CEQA Requirements

According to Section 15164(a) of the *CEQA Guidelines*, "[t]he lead agency or responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred."

Section 15162 of the *CEQA Guidelines* provides that, for a project covered by a certified EIR, preparation of a Subsequent or Supplemental EIR rather than an addendum is required only if one or more of the following conditions occur:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.
2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of the previously identified significant effects; or
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete, shows any of the following:
    a. The project will have one or more significant effects not discussed in the previous EIR.
    b. Significant effects previously examined will be substantially more severe than shown in the previous EIR.
    c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measures or alternatives.
    d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measures or alternatives.

Implementation of the Proposed Project would not trigger any of the circumstances listed above to warrant preparation of a Subsequent or Supplemental EIR as discussed in more detail below. Specifically, the Proposed Project would not result in any new project specific impacts nor would result in any new impacts that would have a considerable contribution to cumulative impacts. The Proposed Project would not result in a substantial increase in the severity of previously identified impacts nor would result in a requirement for new mitigation measures.

1.7 Contents of the Addendum

This Section of the Addendum includes: the purpose of this Addendum; the previous environmental documentation and documents incorporated by reference; and a description of Project development and events following certification of the Final EIR/EIS.

Section 2.0 of the Addendum includes a description of the details associated with the Proposed Project including best management practices that have been incorporated into the Project to avoid and/or minimize environmental impacts.

Section 3.0 consists of an environmental checklist form focusing specifically on impacts caused by the Proposed Project. This form is based on the model prepared by the California Office of Planning and Research (OPR) and has been modified to reflect the significance criteria used in the Final EIR/EIS. Section 3.0 includes an explanation of each of the answers in the environmental checklist.

Section 4.0 contains a List of Preparers and references are included in Section 5.0.

1.8 Previous Environmental Documentation

The following environmental documentation was previously prepared for the Project:

1. A Notice of Preparation was circulated on September 29, 1999, for a 30-day public review period.
2. An Initial Study was prepared and circulated concurrently with the Notice of Preparation.
3. A Notice of Completion was filed with the OPR (State Clearinghouse) on January 17, 2002, indicating that the Draft EIR/EIS was available for review.
4. The Draft EIR/EIS (Reclamation and IID 2002a) was released on January 18, 2002, and made available for a 90-day public review period, which ended on April 26, 2002.
5. The Final EIR/EIS (Reclamation and IID 2002b) was certified by IID in June 2002. The Draft EIR/EIS is incorporated as part of the Final EIR/EIS.
6. An Addendum to the Final EIR/EIS dated December 2002 was adopted by IID on December 31, 2002, but the revised Project assessed in the Addendum was not implemented.
7. The *Amended and Restated Addendum to the EIR/EIS for the IID Water Conservation and Transfer Project* (09/03 Addendum) was approved by IID in September 2003 to document the potential environmental impacts of certain changes made to the Transfer Project, including changes to the 2002 Draft HCP (IID 2003). The 9/03 Addendum amends and replaces the December 2002 Addendum.

8. The IID Board of Directors approved a Mitigation Monitoring and Reporting Program (MMRP) for the Transfer Project on October 3, 2003 (2003 MMRP) that addressed the Transfer Project as described in the Transfer Project Final EIR/EIS and the 9/03 Addendum.

9. IID prepared the *Final Supplement to the IID Water Conservation and Transfer Project EIR/EIS for the Managed Marsh Complex* (Managed Marsh Complex Supplement) in June 2008 to provide additional environmental assessment that was required under CEQA to implement the managed marsh complex as described in the 2002 Draft HCP and in the Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP). The Managed Marsh Complex Supplement MMRP (2008 MMRP) is a revised version of the 2003 MMRP and includes all of the mitigation, monitoring, and reporting requirements from the 2003 MMRP and any additional requirements outlined in the Managed Marsh Complex Supplement.

10. The *Salton Sea Air Quality Mitigation Program (SSAQMP)* was prepared for the IID in July 2016 (IID 2016) to provide a comprehensive, science-based, adaptive approach to address air quality mitigation requirements associated with the transfer of up to approximately 300,000 AFY of conserved water under the QSA under Impact AQ-7 as identified in the Final EIR/EIS, and the associated mitigation measure AQ-7 found in the 2008 MMRP. The conserved water transfer reduces the volume of agricultural return flow to the Salton Sea, thereby exposing the playa and increasing the potential for dust emissions that could affect communities near and around the Sea. As stated in mitigation measure AQ-7, the required air quality mitigation measures to address these potential dust emissions are generally defined as:

    1) restricting access to the exposed playa;
    2) researching and monitoring the exposed playa;
    3) creating or purchasing offsetting emission reduction credits; and
    4) implementing direct emission reduction measures on the exposed playa.

    The SSAQMP expands upon these general mitigation measures with detailed methods to assess playa dust emissions and identify options to mitigate them.

11. The IID Board of Directors approved *Final Addendum to Environmental Impact Report Clubhouse Plot Study* for the Transfer Project in August 2021 addressing the environmental impacts of implementation of air quality mitigation measures required for the Transfer Project.

1.9 Documents Incorporated by Reference

Consistent with Section 15150 of the State CEQA Guidelines, the following documents were used in the preparation of this Addendum and are incorporated herein by reference:

- CVWD, IID, MWD, and SDCWA. *Addendum to the Program EIR for the Implementation of the Colorado River Quantification Settlement Agreement, September 2003* (IID 2003);
- The Draft EIR/EIS (Reclamation and IID 2002a);
- The Final EIR/EIS (Reclamation and IID. 2002b);
- Final Supplement to the IID Transfer Project EIR/EIS for the Managed Marsh Complex (Managed Marsh Complex Supplement) (IID 2008);
- *Salton Sea Air Quality Mitigation Program (SSAQMP)*. Prepared for the IID in coordination with the County of Imperial, (IID 2016);
- Order WR 2017-0134 (Stipulated Order) certified by the State Water Resources Control Board (SWRCB) on November 17, 2017, Order Accepting Stipulation and Revising State Water Board Revised Order WRO 2002-0013 approving IID's and SDCWA's *"Amended Joint Petition for Approval of a Long-Term Transfer of Conserved Water from IID to SDCWA and to Change the Point of Diversion, Place of Use and Purpose of Use Under IID's Permit 7642"* (originally issued by the SWRCB on December 20, 2002); and
- 2019/2020 Proactive Dust Control Plan. Prepared for Imperial Irrigation District by Formation Environmental LLC as part of the SSAQMP (IID 2020).
- 2021/2022 Proactive Dust Control Plan. Prepared for Imperial Irrigation District by Formation Environmental LLC as part of the SSAQMP (IID 2022a).

2.0 PROJECT DESCRIPTION

2.1 Project Background

As described in the PDCP for the SSAQMP, the Bombay Beach Plot Study (Project or Proposed Project) is proposed for implementation to the east of Bombay Beach to evaluate groundwater supply and quality, vegetation establishment in hedgerows, enhancement of existing vegetation through rainwater harvesting (bund) techniques, and waterless DCMs. An approximately 168.39-acre Project Area has been identified as the buffered area in which the Project would be implemented and is shown on Figure 1. A site plan for proposed physical improvements is shown on Figure 2.

Critical to the success of this Project is development of sufficient groundwater (both quantity and quality) to establish and sustain vegetation cover. In addition, the Project Area would include waterless DCMs, including the placement of hay bales and sand fencing. Formation Environmental, LLC (Formation) prepared a Dust Control Plan for the Proposed Project to provide site specific details on dust control design (Appendix A; Formation 2022a).

Information from this Proposed Project would be used to inform water supply development and planning for expanded future vegetation-based dust control on the east side of the Salton Sea. Test wells would be developed, tested, and operated; new vegetation would be established in hedgerows, irrigated, and monitored; and existing vegetation would be monitored and irrigated as needed to maintain plant vigor and prevent loss of existing vegetation cover. Vegetation would include the planting of ALOC, commonly known as iodine bush, to augment existing ALOC in the area. ALOC is native, drought-resistant, and suitable for establishment on the playa.

2.2 Project Components

The following elements are proposed in association with the Project:

- Development (drilling, testing, and operations) of up to three shallow supply wells (approximately 100 feet deep) on approximately 86 acres;
- Installation of approximately 5,000 feet, with a footprint of 4 acres, of perimeter sand-fencing;
- Placement of physical exclusion barriers including hay bales, sand-fencing, and concrete barriers around site perimeter;
- Installation of access routes totaling 5,250 linear feet (LF);
- Installation and operations of solar-powered electric submersible groundwater pumps;
- Placement and use of approximately three 5,000-gallon water storage tanks;
- Installation of irrigation system from wells to storage tanks and from storage tanks to vegetation on the exposed playa;

- Enhancement of up to 53 acres of existing vegetation through rainwater harvesting (bund) techniques and establishment of 86.5 acres of vegetated hedgerows, including site preparation, seeding and transplanting, and installation of managed irrigation systems. Vegetation would be seeded or transplanted iodine bush; and
- Ongoing operations, maintenance, and monitoring of the Project components.

2.3 Project Characteristics

2.3.1 Groundwater

2.3.1.1 Well Construction and Development

Up to three shallow groundwater supply wells would be constructed as described below.

Shallow Groundwater Wells

The three shallow wells, screened from approximately 50 to 100 feet below ground surface (bgs), are proposed for water supply development. The final location of the wells will be determined in the field. Well installation and evaluation will be conducted through the following steps: (1) drilling of a pilot boring to a depth of approximately 100 feet bgs to characterize subsurface conditions, sample water quality, and collect data necessary for design of the well; (2) determination of whether a suitable well can be developed at each location in the depth interval explored; (3) abandonment of the borehole if a well is not warranted, or design, install, and develop a 6-inch well; (4) pump testing of the well; (5) installation of a production pump; and, (6) connection of the pump to a solar-powered pump and water storage tank. After well construction, pump testing will be conducted to inform the proposed well design and pump selection.

Wells will be constructed using 6-inch diameter polyvinyl chloride (PVC) screen and rise casing, completed with approximately 50 feet of casing and 50 feet of PVC screen. The surface completion will be in a steel "stove pipe" rise centered on a concrete pad that measures approximately 3 feet by 3 feet. Wells will be fitted with submersible electric pumps powered by a series of four to six solar panels installed near each of the wellheads.

Drilling, well development, and power supply construction will take approximately four to six weeks. This work will require a drill rig and heavy and light duty trucks. Construction will take place in work areas measuring approximately 50 by 100 feet and would be enclosed by a temporary chain link construction fence. A 36-inch silt fence would be attached at the base of the temporary construction fence and embedded into the ground at least 4 inches deep and function as a wildlife exclusion barrier. No additional site preparation will be conducted.

The native drill soil cuttings from installation of all wells would be spread onsite. Any hazardous materials, such as the hydraulic oil and diesel fuel onboard the drill rig, would be handled pursuant to a project-specific management and spill prevention plan. Fuel service would be provided for drilling and other temporary equipment using a mobile fuel service or small portable fuel containers; bulk fuel storage would not be required.

Following installation, the wells will be developed by surging, air-lift pumping, and conventional pumping until the removed water becomes relatively clear and free of sediment. Well development water, albeit miniscule, is used for dust control and irrigation purposes on the playa and applied using an impact-type water cannon (Formation 2022a).

Aquifer Test and Commissioning

After well development, a step-drawdown and 24-hour constant discharge pumping test would be performed at one of the wells using a submersible pump. All pumped water will be discharged onsite using a Rain-Bird-type sprinkler. Following the initial pump testing, solar powered electric submersible pumps will be installed in each test well and a long-term pumping test will be conducted for a period of one month. A protective, locking, six-foot-high chain-link privacy fence enclosure topped with barbed wire and measuring about 40 feet by 40 feet will be installed around two of the three well locations and a central fence compound measuring 60 feet by 80 feet will be constructed around one of the well locations.

This work will require light and heavy-duty trucks. The initial pump testing will take approximately two days, while the construction of the fence will take up to five days (Formation 2022a).

Site Restoration

Following completion of the pumping tests and removal of all equipment and staged materials, all remaining waste materials will be removed from each work area. Rutting in the access road will be repaired and wheel ruts in pull-out areas will be leveled. The temporary security fences will be demobilized and replaced with the permanent security fences described above This work will require two heavy-duty trucks, a bulldozer, and take approximately three days (Formation 2022a).

2.3.2 Surface Water

There are no perennial surface water features. Several ephemeral washes originating from the Chocolate Mountains to the north enter the northeastern corner of the Project Area through a single breach of the 2003 historic shoreline of the Salton Sea. None of the ephemeral washes appear to reach the Salton Sea with any regular frequency and the recurrence interval of flood flows is infrequent based on the number and size of plants growing in the washes (Formation 2022a).

Using the Santa Barbara Unit Hydrograph, the 10-year California Department of Transportation (CalTrans) peak discharge flow rate was calibrated to estimate the total volume of each storm event (Stubchaer 1975). The total volume produced by a 10-year storm event is approximately 40 acre-feet. This information was used to inform the design of bunds to capture surface water and support the expansion and enhancement of existing vegetation.

2.3.3 Dust Control Measures

2.3.3.1 Vegetation Establishment

After groundwater supply wells have been established, water conveyance lines would then be run on the ground surface to support managed irrigation for vegetation establishment. Vegetation requires irrigation for establishment until root development is deep enough to access near-surface groundwater for long-term survival (IID 2020).

Site Preparation

Site preparation includes site staking, grubbing, construction of hedgerow seedbeds, and hedgerow seeding.

Hedgerows are planted on seedbeds and soil amendments including compost and fertilizer are applied along the seedbeds. Vegetated hedgerows will be planted with the ALOC Playa Mix with a spacing of 50 feet, oriented N45°W, over an area of approximately 86.5 acres. In this mix, ATLE is used as a nurse plant to protect the ALOC as it matures, however, this species' tolerance is much less than ALOC and it eventually dies back. Seeding is performed with a single-row seeder in two passes, one for each species. A total of 70,000 LF of seedbed will be prepared.

The hedgerows will be oriented relative to the predominant high wind direction to provide protection from the most common SWW high wind direction, as well as protection against wind erosion from the less frequent northernly wind direction. It is anticipated that plants will reach individual plant dimensions of 3 feet tall and 4 feet in diameter in two or three growing seasons (Formation 2022a).

Irrigation System

The groundwater wells will be configured to pump into a centralized water storage tank farm which will be located coincident with one of the groundwater wells. The remaining wells will supply the tank farm by a buried pipeline. Approximately 650 LF to 3,250 LF of buried mainline is anticipated but the length of pipeline will vary based on actual well locations. The polyethylene water storage tanks will consist of three 5,000-gallon tanks per well. The solar power from the groundwater wells will be used to pump and convey the water to the tank farm. The larger (approximately 60 feet by 80 feet) fenced compound installed during well commissioning will be used to contain the wellhead, pump solar arrays, and pump controllers, tank farm, connecting pipes, valves, booster pumps, filter station, and other equipment.

Hedgerows will be irrigated with a drip system which includes a booster pump, filter station, flow meter, mainline, block control valves, submains, and driplines. Approximately 4,500 LF of mainline, 14,000 LF of submain, and 70,000 LF of driplines will be installed. Lateral dripline runs range from 20 LF to 825 LF.

A buried mainline will convey water supply to the submains. The driplines will be installed both on the surface and subsurface. Typically, subsurface drip is installed with a shank. For areas with subsurface irrigation, a second, surface line is installed for reclamation and germination purposes. The surface line will be removed following reclamation and germination.

A solar powered booster pump will supply pressure to the irrigation system. Ten to twelve solar panels will be installed adjacent to the booster pump and wired to a pump controller, breaker, and lightning arrestor.

Installation activities of the buried mainline will require light-duty pickups, a mini-excavator, a backhoe, a bulldozer, and a motor-grader or other similar equipment as appropriate. The remaining irrigation system installation activities will require a light-duty tractor, three all-terrain vehicles (ATVs), and two light-duty pickups with trailers. This work will take approximately 30 days (Formation 2022a).

2.3.3.2 Vegetation Enhancement with Bunds

Bund construction will consist of staking, grubbing, excavation, compaction, and site restoration. All bund types utilize the same general construction methods. Bunds will be located to limit the disturbance to existing vegetation.

Type A semi-circular bunds will have a 20-foot radius, a top width and maximum height above existing grade of one foot, and side slopes of 1:1 (horizontal:vertical). Type B semi-circular bunds will have a 65-foot radius, a top width of one foot, maximum height above existing grade of two feet, and side slopes of 3:1. Trapezoidal bunds are to have one side installed on contour (center bund) that is 130 LF, a top width and maximum height above existing grade of two feet, and side slopes of 4:1. The remaining two sides of the trapezoidal bund (side bunds) are to be installed at an angle of 45 degrees upslope, referenced to the center bund, with a length of 184 LF. The tips of semi-circular type B and trapezoidal bunds will be armored with rip-rap.

Diversion swales will be installed to divert surface flow to the bund arrays. The swales will be excavated with a depth of nine inches, a bottom width of two feet, and side slopes of 3:1. Swales will have a downslope berm with an equivalent geometry. The termination of the swale will be armored with rip-rap and transitioned to a shallower and wider channel to ensure the water is dispersed as sheet or shallow concentrated flow.

Bund installation will take approximately 30 days and require a 130 horsepower (hp) excavator, 75 hp vibratory soil compactor, 125 hp bulldozer, 75 hp bulldozer, 75 hp skid steer, water truck, two ATVs, and two light-duty pickups with trailers. Following construction, all disturbed surfaces will be treated with stormwater erosion control features consisting of but not limited to coconut mats and straw rolls (Formation 2022a).

2.3.4 Waterless Dust Control Measures

In addition to establishing vegetation on the playa, the Project includes installation of waterless DCMs, including placement of hay bales and sand fencing.

Approximately 5,000 LF of sand fencing will be installed on the western and northern perimeter of the Project Area, with a dual purpose to (1) limit the intrusion of moving sand from upwind source areas outside of the Project Area, and (2) serve as a barrier to limit access to the site to non-project related vehicles. Sand fencing traps mobile soil particles behind individual barriers by increasing the threshold friction velocity required to move soil particles.

The sand fencing will be ultraviolet (UV) resistant, have a height of four feet, and will be fastened to T-posts. T-posts will be driven into the ground at a spacing of 6 feet between posts. Fencing material will be fastened to the T-posts with UV resistant zip ties with a wooden dowel between the fence and T-post. Additionally, a single 12.5-gauge wire will be installed on the bottom of the fence to keep the fence taut at the ground surface. Installation of the sand fence is expected to take approximately 10 days and will require two ATVs and two light-duty pickups with trailers (Formation 2022a).

Hay bales will be placed on the eastern and southern perimeter of the Project Area for site exclusion. A concrete barrier will also be placed along a portion of the western perimeter to prevent vehicle disturbance to the Project Area.

2.3.5 Access Roads

Approximately 5,250 LF of access roads would be installed for access to the wells and irrigation infrastructure from the nearest improved roadway. Access roads will minimize impacts to existing vegetation. Access routes will be approximately 15 feet wide and will be traded and track rolled for compaction. If unstable soils are encountered, then they will be stabilized using appropriate fill material. Unstable areas also may be compacted using vibratory rollers and moisture conditioned using water trucks, as appropriate.

PM_{10} gates will be used at strategic locations to allow vehicle access for operations and maintenance. A speed limit five miles per hour (mph) would be maintained by all vehicles to limit dust emissions. Access routes will be periodically moisture controlled using a water truck, as needed. Access roads may require periodic maintenance to flatten ruts, restore stability, or repair washouts.

Installation activities will require light-duty tractors, ATVs, light-duty pickups, bulldozers, motor-graders, water trucks, or other similar equipment as appropriate. Construction of access routes is anticipated to take approximately five days. Maintenance will be conducted using similar equipment as construction (Formation 2022a).

2.3.6 Operations, Monitoring, and Maintenance

Operations and maintenance are primarily focused on irrigation; however, gap-filling with seed or transplants may be required. In addition, the Project Area would be accessed periodically for monitoring Project performance. A light-duty truck would be required for access.

2.3.6.1 Operations

Operations include seedbed reclamation and irrigation. Following reclamation, the managed irrigation system would be used to establish and maintain vegetation. The establishment period would last for 16 weeks, with every lateral (surface and subsurface) irrigated every three days. After establishment, irrigation would revert to maintenance irrigation once per week for 20 weeks (Formation 2022a). Irrigation operations are implemented through cellular-based automation and staffed as necessary. Irrigation scheduling is dependent upon soil and vegetation monitoring, but is anticipated to include the following:

- Reclamation – An irrigation event every three days for one month

- Establishment – An irrigation event every three days for 16 weeks
- Maturation – An irrigation event every seven days for 16 weeks

2.3.6.2 Monitoring

Project monitoring includes groundwater production and sampling, irrigation system performance, vegetation monitoring and sampling, and soil sampling. Sand motion monitoring will also be conducted to evaluate the dust control performance of the plot studies.

The irrigation system and vegetation stand would be monitored and maintained during each irrigation event. Groundwater quality monitoring will include quarterly assessments, including field measurements of conductivity and pH. Soil quality, particularly soil salinity, will be monitored through periodic sampling to compare with baseline conditions.

Development of performance monitoring techniques and appropriate maintenance criteria have been a focus of IID and the Imperial County Air Pollution Control District (ICAPCD) collaborative efforts. Performance monitoring will help determine the feasibility and applicability of implemented DCMs for additional areas around the Salton Sea. Performance monitoring is anticipated to include a combination of visual surveillance network, sand flux monitoring, upwind/downwind PM_{10} monitoring, and saltation flux mapping (Formation 2022a).

2.3.6.3 Maintenance

Maintenance activities will include repairs to water supply and storage facilities as well as any needed repairs to drip laterals. Vegetation maintenance includes gap-filling and replanting of any dead or poorly performing plants. It is anticipated that all maintenance activities will be completed during an irrigation event. Maintenance of sand fence may include repair and replacement. Minor maintenance of the bunds to repair erosion associated with large storm flows may occur one to two times per year (Formation 2022a).

2.4 Project Timing

Drilling and testing of the wells is planned to occur in June 2023. Production of the wells and installation of plantings is planned to occur in the winter of 2023/2024, starting in November 2023.

2.5 Best Management Practices

The following best management practices (BMPs) will be implemented to ensure compliance with other mitigation measures required in the EIR/EIS and other laws and regulations.

2.5.1 Air Quality

Implement BMPs during construction and site restoration and operation following construction. BMPs could include, but are not limited to, the following:

- Equip diesel powered construction equipment with particulate matter emission control systems, where feasible.
- Use paved roads to access the construction sites when possible.
- Minimize the amount of disturbed area and apply water or soil stabilization chemicals periodically to areas undergoing ground-disturbing activities. Limit vehicular access to disturbed areas, and minimize vehicle speeds.
- Reduce ground disturbing activities as wind speeds increase.
- Suspend grading and excavation activities during windy periods (i.e., surface winds in excess of 20 mph).
- Limit vehicle speeds to no greater than 10 mph on unpaved roads.
- Cover trucks that haul soils or fine aggregate materials.
- Enclose, cover, or water excavated soil twice daily.
- Cover stockpiles of excavated soil at all times when the stockpile is not in use. Secure the covers.
- Replant vegetation in disturbed areas where water is available, following the completion of grading and/or construction activities.
- Designate personnel to monitor dust control measures to ensure effectiveness in minimizing fugitive dust emissions.

2.5.2 Nesting Birds

Complete all Project activities outside of the bird nesting season to avoid impacts to nesting birds. The nesting season for birds that could potentially establish ground nests at the Salton Sea is March 1 through October 31. If Project activities cannot be completed outside of the bird nesting season, a qualified biologist shall survey all areas to be disturbed within 7 days in advance of the start of ground-disturbing activities. Active bird nests identified during the survey effort shall be avoided until such time that the qualified biologist has determined that the nest(s) is/are vacant or is/are otherwise not active. Depending on the location of the active nest(s) the qualified biologist may establish a no-work buffer around an active nest(s). Work may resume within the active nest buffer only with the approval of the qualified biologist.

2.5.3 Cultural Resources Post-Review Discovery Procedures

If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior’s Professional Qualification Standards for prehistoric and historic archaeology, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

- If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately and no agency notifications are required.

- If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, the archaeologist shall immediately notify the IID and Reclamation. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures if the find is determined to be a Historical Resource under CEQA, as defined in Section 15064.5(a) of the CEQA Guidelines, or a Historic Property, as under Section 106 of the National Historic Preservation Act (NHPA), if applicable. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not a Historical Resource under CEQA or a Historic Property under Section 106; or 2) that the treatment measures have been completed to their satisfaction.

- If the find includes human remains, or remains that are potentially human, they shall ensure reasonable protection measures are taken to protect the discovery from disturbance (Assembly Bill [AB] 2641). The archaeologist shall notify the Imperial County Coroner (per Section 7050.5 of the Health and Safety Code). The provisions of Section 7050.5 of the California Health and Safety Code, Section 5097.98 of the California Public Resources Code (PRC), and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the Native American Heritage Commission (NAHC), which then will designate a Native American Most Likely Descendant (MLD) for the Project (Section 5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC may mediate (Section 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (Section 5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

2.5.4 Paleontological Resources

In the event of an unanticipated discovery of paleontological resources during construction, all ground disturbance within 200 feet of the discovery will be halted or redirected to other areas until the discovery has been recovered by a qualified paleontologist. All paleontological resources recovered will be appropriately described, processed, and curated in a scientific institution such as a museum or university.

2.5.5 Noise

Implement BMPs during construction. BMPs could include, but are not limited to, the following:

- All construction equipment, fixed or mobile, will be equipped with properly operating and maintained mufflers, consistent with manufacturer standards.

- All stationary construction equipment will be placed so that emitted noise is directed away from the noise sensitive receptors nearest the Project Area.
- As applicable, shut off all equipment when not in use.
- Equipment staging shall be located in areas that create the greatest distance between construction-related noise/vibration sources and sensitive receptors surrounding the Project Area.
- No amplified music and/or voice will be allowed on the construction site.
- In accordance with the County Guidelines, construction equipment shall be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. on Saturdays. No commercial construction operations are permitted on Sundays or holidays.

2.6 Regulatory Requirements, Permits, and Approvals

The following approvals and regulatory permits would be required for implementation of the Plot Study:

- National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Construction Activities (for grading over one acre associated with access improvements, and construction of furrows for vegetation);
- Coverage under the *Statewide General Waste Discharge Requirements (WDRs) for Discharges to Land with Low Threat to Water Quality (General WDRs)* (SWRCB Water Quality Order No. 2003-0003-DWQ) (for well development discharge);
- Well Construction Permit from Imperial County Planning and Development Services Department (ICPDS) to drill the new supply wells (the wells would be considered test wells, with no continued water use as defined by Title 8, Division 21, Water Well Regulations, of the Imperial County Code until the viability of the wells has been determined through testing); and
- Conditional Use Permit (CUP) from the Imperial County Planning Commission for the new supply wells to be put into production as a groundwater extraction facility (pursuant to the Imperial County Groundwater Management Ordinance [Title 9, Division 22 of the County Code]).
- Grading Permit from Imperial County for earthworks associated with implementation of the bunds, if determined necessary.
- A Nationwide Permit (NWP) 27 for Aquatic Habitat Restoration under Section 404 of the federal Clean Water Act (CWA) must be obtained from the U.S. Army Corps of Engineers (USACE).
- A Water Quality Certification or waiver pursuant to Section 401 of the CWA, as issued by the Regional Water Quality Control Board (RWQCB), must be obtained for Section 404 permit actions.
- A Waste Discharge Requirement for dredge and fill in Waters of the State under the Porter-Cologne Water Quality Control Act as issued by RWQCB.
- A Streambed Alteration Agreement pursuant to Section 1600 of the Fish and Game Code as issued by CDFW.

3.0 ENVIRONMENTAL CHECKLIST AND DISCUSSION

This Addendum addresses whether implementation of the Proposed Project would result in new significant environmental effects or a substantial increase in the severity of previously identified significant effects under the Transfer Project. Thus, the checklist and the explanations contained in this Section, pertain only to the effects of the changes to the Transfer Project. This section offers an explanation for all answers checked in the Initial Study and Checklist Form regarding the changes to the Transfer Project evaluated in the certified Final EIR/EIS (Reclamation and IID 2002a, 2002b). No environmental impacts in the Initial Study and Environmental Checklist Form were evaluated to be potentially significant. Thus, the proposed changes would not result in new significant environmental effects or a substantial increase in the severity of previously identified significant effects as described in the Draft and Final EIR/EIS (CEQA Guidelines, Section 15162).

3.1 Aesthetics

3.1.1 Existing Environmental Setting

A complete discussion of the aesthetic impacts of the Transfer Project as originally proposed is included in Section 3.11 of the 2002 Draft EIR/EIS (and incorporated into the Final EIR/EIS).

Visual resources in the area of the Salton Sea geographic subregion include various landforms, vegetation, structures, and the Sea itself (Imperial County 2016; Reclamation and IID 2002a). The Salton Sea covers approximately 330 square miles and is immediately surrounded by a sparsely vegetated desert landscape, which gives way to rocky, sandy hills (Reclamation and IID 2002a).

Imperial County's visual resources have been identified based on the U.S. Bureau of Land Management (BLM) Visual Resource Inventory (VRI) process and are shown in the County's Conservation and Open Space Element. Areas with a moderate to high value for maintenance of visual quality could represent opportunities for conservation and open space areas. The County also identifies areas with low value for maintenance of visual quality based upon the VRI process in the Conservation and Open Space Element. The Project Area is within an area of low value for maintenance of visual quality. There are no scenic highways in the vicinity of the Plot Study (Imperial County 2016). The County has not identified this area as having scenic resources (Imperial County 2016).

3.1.2 Adopted 2002 EIR/EIS

Please refer to Section 3.11 of the adopted 2002 Draft EIR/EIS for analyses of the potential effects of the Transfer Project related to Aesthetics. The adopted EIR/EIS found that the Transfer Project would not result in a significant impact on a scenic vista.

There are no scenic highways in the vicinity of the Proposed Project (Imperial County 2016). State Route (SR) 111, along the northeast shore of the Salton Sea is an eligible highway for official scenic highway designation from Bombay Beach in Imperial County to the City of Mecca in Riverside County. This area's gradual slopes allow for wide-open views of the Salton Sea and provides the best viewing opportunities to the Sea from public lands (Reclamation and IID 2002a).

Construction of an on-farm irrigation system and/or water delivery system conservation measures under the Transfer Project would occur solely within the IID water service area and the aesthetic character of desert areas, sand dunes, and mountains located outside the IID water service area would not be impacted. Equipment required for construction of conservation measures is commonly used for ongoing projects in the irrigated portions of the IID water service area and is therefore consistent with the visual character. If conservation were to be achieved through fallowing, up to 50,000 additional acres throughout the IID water service area would go into a fallowed state. About 18,000 acres are fallowed each year and although the additional fallowed acres are more than the current amount, it would be distributed throughout the subregion and would not become an obvious visual feature of the landscape. Many farms go fallow for part of the year so the landscape is constantly changing from cropped to fallow acres (Reclamation and IID 2002a).

The adopted 2002 EIR/EIS found that the Transfer Project would not require the installation of any lighting and therefore would not result in a new source of light or glare. No impacts were identified (Reclamation and IID 2002a).

The adopted 2002 EIR/EIS references impacts on aesthetics occurring from a decrease in the elevation of the Salton Sea. Under Impact A-1, implementation of 300 KAFY of water conservation under the Transfer Project would result in lowering the elevation of the Salton Sea, thus reducing the overall water surface area and exposing areas of shoreline that are currently inundated. The Transfer Project would primarily affect views of the Salton Sea landscape as seen from public shoreline locations such as Salton Sea Beach, Red Hill Marina County Park, Bombay Beach, and Sneaker Beach. Views from these areas would encompass noticeably greater amounts of foreground mudflat or shoreline while decreased amounts of open water vista would be available. Changes in elevation and thus vistas, though gradual, would be accelerated with the Transfer Project and these visual impacts are considered to be significant but would be less than significant with the implementation of Mitigation Measure A-1.

Impact A-2 discusses impacts on aesthetics from odors. The reduction of water flow into the Salton Sea could increase odors near the Salton Sea. This would occur if the Transfer Project were to decrease adversely affect water quality in the Salton Sea to the point that it (1) contributed to the death of flora or fauna, or (2) increased the existing summertime algae bloom, which produces large amounts of sulfuric odors. Under the Baseline, the salinity of the Salton Sea will increase in future years to the point that it will kill most aquatic invertebrates and fish. As a result, odor emissions from animal die-offs would occur in future years, with or without the implementation of the Transfer Project. Nutrient levels within the Salton Sea will also continue to increase under the Baseline, which will perpetuate or enhance algae blooms and their associated odor emissions. While the Transfer Project could somewhat accelerate the future rate of animal die-offs or algae blooms, because there will be ongoing objectionable odor episodes at the Salton Sea under the Baseline, this effect from the Project would be less than significant.

3.1.3 Analysis of Project Changes

The Bombay Beach Plot Study proposes water tanks, hay bales, concrete barriers, and sand fencing for the Project that may be visible to Bombay Beach residents and visitors on public roadways immediately adjacent to the Project Area. However, the size and height of the tanks, hay bales, and sand fencing would not be expected block views of the Salton Sea, mountains, or horizon from public locations. Therefore, the Project would not significantly alter scenic vistas in the area and impacts would be less than significant. Please see Chapter 2.0 for more information regarding the Proposed Project.

The water tanks would occupy a small area, and therefore, would not substantially degrade the existing visual character. Hay bales and sand fencing placed over a large area have the potential to be incompatible with the visual character of the surrounding area. However, the color of the hay bales would match the color of the natural landscape, and a color compatible with the natural landscape would be selected for the sand fencing. The Proposed Project would not substantially degrade the existing visual character or quality of public views of the site and its surroundings.

The Project Area and vicinity are not designated as a scenic view or vista in the Imperial County General Plan or any other applicable planning documents. Additionally, the County has designated the Project Area as an area of low value for maintenance of visual quality (Imperial County 2016).

Drill rigs would utilize lighting during nighttime operations. However, this would only occur over a short period of time. Otherwise, night work would not be expected. In addition, the Project would not introduce any materials that would be considered a source of glare. Therefore, impacts would be less than significant.

In consideration of all of the above, implementation of the Proposed Project would not require any major changes to the adopted 2002 EIR/EIS and will not result in any new significant environmental impacts.

3.1.3.1 Cumulative Impacts

The cumulative study area for aesthetic impacts is limited to the immediately adjacent area within view of the Project Area. The Proposed Plot Study would not have a significant cumulative impact on the visual environment, as the size and height of the tanks, hay bales, and sand fencing would not be expected block views of the Salton Sea, mountains, or horizon from public locations. The Proposed Plot Study would not generate significant adverse effects on adjacent land uses with respect to Aesthetics. There are no known visual incompatibilities between the Proposed Project and planned future projects located in the surrounding area, and the contribution of the Project to potential cumulative visual/aesthetic impacts in the study area is considered less than significant.

3.1.4 Findings Related to Aesthetics

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to aesthetics, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to aesthetics that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to aesthetics requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to aesthetics identified in and considered by the adopted 2002 EIR/EIS.

3.1.5 Mitigation Measures

Please refer to Section 3.11 of the adopted 2002 EIR/EIS for complete analyses of Project impacts and mitigation measures (Reclamation and IID 2002a).

Mitigation Measure A-1: With implementation of the Salton Sea Conservation Strategy the elevation of the Salton Sea in year 2077 would be -240 msl. This increase in elevation compared to the Proposed Project [Transfer Project] without the Salton Sea Habitat Conservation Strategy will significantly lessen aesthetic impacts. However, these following measures should be implemented on an ongoing basis as the Sea recedes until it reaches its lowest and stable elevation, at which point they should be permanent.

- Relocate recreation facilities and extend access to the new shoreline to provide quality public viewing opportunities of the Salton Sea and its shoreline. These facilities may be temporary until the Sea reaches its minimum and stable elevation
- Develop interpretive facilities and material to be made available to the public at recreation areas and along public roadways. Interpretive displays may include historical photographs of the Salton Sea landscape and information about water conservation measures including their effects on Salton Sea water levels

Based on the proposed modifications, the 2002 Transfer Project EIR/EIS was reviewed to determine whether or not changes to the Project would affect the mitigation measures contained therein. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with aesthetics.

3.2 Agriculture and Forestry Resources

A complete discussion of the agricultural impacts of the Transfer Project as originally proposed is included in Section 3.5 of the Draft EIR/EIS and in Section 4, Errata of the Final EIR/EIS. As discussed below, the changes to the Transfer Project would result in no new significant impacts or substantial increase in the severity of the impacts to agricultural resources identified in the EIR/EIS. The overall impacts to agricultural resources would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below along with impacts from implementation of the Plot Study.

3.2.1 Existing Environmental Setting

Imperial County is an important California agricultural region ranking in the top five, in terms of value of production among California counties for 24 agricultural commodities. Imperial County ranks first among California counties in value of production for alfalfa hay, onions, wheat, sugar beets, carrots, sweet corn, watermelon, and sudan grass hay. The IID water service area is characterized by a mild climate that allows year-round agricultural production of a wide variety of commodities. Agricultural production is made possible only through the delivery of irrigation water from the Colorado River, and the availability of the Salton Sea as a repository for agricultural drainage (Reclamation and IID 2002a).

Soils within the Project Area have not been mapped by the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) because this area was inundated by the Salton Sea until very recently (NRCS 2022). Jennings et al. (2010) describes the geology of the Project Area as alluvium, lake, playa, and terrace deposits, both unconsolidated and consolidated, with most deposits being nonmarine (Q). There is no mapped Prime Farmland, Unique Farmland, or Farmland of Statewide Importance in the Project Area under the State’s Farmland Mapping and Monitoring Program (Department of Conservation [DOC] 2022). The Project Area is zoned for Open Space/Preservation (S-2-G) with a Community Area land use designation by Imperial County, and the site is not under a Williamson Act contract (Imperial County 2007, 2015a, 2022). Therefore, there are no agriculture resources on the site. No forestry resources are present either.

3.2.2 Adopted 2002 EIR/EIS

Please refer to Section 3.5 of the adopted 2002 Draft EIR/EIS for analyses of the potential effects of the Transfer Project as related to Agriculture and Forestry Resources.

Gravity irrigation methods, such as furrow and border irrigation, account for the vast majority of irrigation application methods within the IID water service area. A few farmers have switched to level basin irrigation and others have installed tailwater return systems. Sprinkler irrigation is sometimes used in conjunction with gravity irrigation methods, in which seedbeds are irrigated by sprinklers until germination. At that point, a transition to furrow or border irrigation occurs (Reclamation and IID 2002a).

Depending on the location of specific improvements, the construction of on-farm or water delivery system improvements could convert lands within the IID water service area that historically have been in crop production to reservoirs, canals, or other uses in support of on-farm irrigation system improvements or water delivery system improvements. Such changes in land use would not result in a classification change from agricultural to something other than agricultural. The changes would, therefore, not result in an impact to agricultural resources (Reclamation and IID 2002a).

IID has identified the possibility that a fallowing program to conserve water for transfer could be implemented that would include permanent fallowing of crop lands, and that fallowing for mitigation and/or to conserve water to meet Inadvertent Overrun and Payback Policy obligations would be limited to rotational fallowing. In this analysis, rotational fallowing indicates that a particular parcel of land would be removed from crop production for no more than three consecutive years. To identify the maximum potential impact to agricultural resources, the analysis assumes the worst-case scenario that all lands fallowed to conserve water for transfer would be permanently fallowed (Reclamation and IID 2002a).

Under Impact AR-1, up to 50,000 acres of prime farmland or farmland of statewide importance would be reclassified. With implementation of the Transfer Project, up to a total of 300 KAFY could be conserved for transfer through one or more conservation measures, including fallowing. If fallowing were used as a conservation measure, it could be either rotational fallowing or non-rotational or a combination of the two. The worst-case impact of the Transfer Project would be the permanent fallowing of up to 50,000 acres of land. This represents approximately 11 percent of the total net acreage in agricultural production within the IID water service area. Assuming the water conservation program was implemented using non-rotational fallowing exclusively, this would represent a significant, unavoidable impact to the agricultural resources of the IID water service area. Impacts related to agriculture and forestry resources would be minimized with Mitigation Measure AR-1 (Reclamation and IID 2002a).

Impact HCP-AR-2 discusses impacts to the Project Area due to conversion of agricultural lands from implementation of the HCP. The worst-case impacts to agricultural resources from the implementation of these components of the Proposed HCP would result in approximately 700 acres of agricultural lands converted to marsh habitat, native forest habitat, or new drainage channels to the Salton Sea. This represents less than 0.5 percent of the average annual net acreage in agricultural production within the IID water service area. However, if these lands are located on Prime Farmland or Farmland of Statewide Importance, implementation of the HCP (IID Water Service Area Portion) would result in a significant, unavoidable impact to agricultural resources. Impacts related to agriculture and forestry resources would be minimized with Mitigation Measure HCP-AR-2 (Reclamation and IID 2002a).

3.2.3 Analysis of Project Changes

The Project Area is located on a parcel that is not mapped for Prime Farmland, Unique Farmland, or Farmland of Statewide Importance under the State’s Farmland Mapping and Monitoring Program (DOC 2022). The Project Area is zoned for Open Space/Preservation (S-2-G) with a Community Area land use designation by Imperial County, and the Project Area is not under a Williamson Act contract (Imperial County 2007, 2015a, 2022). The Project Area is not zoned for agriculture. Therefore, there are no agriculture resources in the Project Area. No forestry resources are present either.

The Proposed Project would require the issuance of a CUP for the supply wells that would be used to irrigate the vegetated hedgerows on approximately 86 acres. Existing vegetation will be enhanced through rainwater harvesting techniques such as the use of bunds. The enhancement of existing vegetation will occur on approximately 53 acres.

3.2.3.1 Cumulative Impacts

The cumulative study area for agricultural and forestry impacts is limited to the County. The Proposed Project would not have a significant cumulative impact on agricultural or forestry resources, as the resources would not be impacted by the Proposed Project. The Proposed Project would not affect lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance and would not affect lands under conservation through Williamson Act contracts. There are no lands within the Project

Area designated as forestry or timberland resources. Project implementation would not result in the conversion of lands designated for agricultural use to a non-agricultural use. The contribution of the Proposed Project to potential cumulative agricultural/forestry impacts in the study area is considered less than significant. Therefore, in consideration of all of the above, the changes to the Project do not require any major changes to the adopted 2002 EIR/EIS and would not result in any new significant cumulative impacts.

3.2.4 Findings Related to Agriculture and Forestry Resources

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to agriculture or forestry resources, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to agriculture and forestry resources that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to agriculture or forestry resources requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to agriculture or forestry resources identified in and considered by the adopted 2002 EIR/EIS.

3.2.5 Mitigation Measures

Please refer to Section 3.5 of the adopted 2002 EIR/EIS for complete analyses of Project impacts and mitigation measures (Reclamation and IID 2002a).

Mitigation Measure AR-1: The only way to avoid or minimize this impact is to prohibit the use of non-rotational fallowing under the Transfer Project. Otherwise, no mitigation measures have been proposed to avoid or minimize this impact.

Mitigation Measure HCP-AR-2: The only way to avoid or minimize this impact is to prohibit the conversion of agricultural lands under the HCP (IID Water Service Area Portion). Otherwise, no mitigation measures have been proposed to avoid or minimize this impact.

Based on the proposed modifications to , the 2002 Transfer Project EIR/EIS was reviewed to determine whether or not changes to the Project would affect the mitigation measures contained therein. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with agriculture and forestry resources.

3.3 Air Quality

A complete discussion of the air quality impacts of the Transfer Project as originally proposed is included in Section 3.7 of the Draft EIR/EIS and in the Final EIR/EIS in Section 4, Errata.

The environmental setting for the Project Area is discussed below. Emissions of criteria pollutants are discussed and evaluated for implementation of the Plot Study in a report contained in Appendix B and summarized below.

3.3.1 Existing Environmental Setting

Air quality in a region is determined by its topography, meteorology, and existing air pollutant sources. These factors are discussed below, along with the current regulatory structure that applies to the Salton Sea Air Basin (SSAB), which encompasses the Project Area, pursuant to the regulatory authority of the Imperial County Air Pollution Control District (ICAPCD).

3.3.1.1 Salton Sea Air Basin

The California Air Resources Board (CARB) divides the State into air basins that share similar meteorological and topographical features. Imperial County, which extends over 4,482 square miles in the southeastern corner of California, lies in the SSAB, which includes the Imperial Valley and the central part of Riverside County, including the Coachella Valley. The province is characterized by the large-scale sinking and warming of air within the semi-permanent subtropical high-pressure center over the Pacific Ocean. The elevation in Imperial County ranges from about 230 feet below sea level in the Salton Sea to more than 2,800 feet on the mountain summits to the east (ICAPCD 2010).

3.3.1.2 Temperature and Precipitation

The flat terrain near the Salton Sea, intense heat from the sun during the day, and strong radiational cooling at night create deep convective thermals during the daytime and equally strong surface-based temperature inversions at night. The temperature inversions and light nighttime winds trap any local air pollution emissions near the ground. The area is subject to frequent hazy conditions at sunrise, followed by rapid daytime dissipation as winds pick up and the temperature warms. The lack of clouds and atmospheric moisture creates strong diurnal and seasonal temperature variations ranging from an average summer maximum of 108 degrees Fahrenheit (°F) down to a winter morning minimum of 38°F. The most pleasant weather occurs from about mid-October to early May when daily highs are in the 70s and 80s with very infrequent cloudiness or rainfall. Imperial County experiences rainfall on an average of only four times per year (>0.10 inch in 24 hours). The local area usually has three days of rain in winter and one thunderstorm day in August. The annual rainfall in this region is less than three inches per year (ICAPCD 2010).

3.3.1.3 Wind

Wind patterns in the area generally align with the long axis of the Salton Sea. The prevailing wind direction during all seasons is from the northwest. During the spring and summer, winds from the east and southeast become a secondary component, while during the fall and winter, the secondary component is from the west and southwest. Wind speeds are generally moderate throughout the geographic subregion (Reclamation and IID 2002a).

3.3.1.4 Inversion

The entire county is affected by inversion layers, where warm air overlays cooler air. Inversion layers trap pollutants close to the ground. In the winter, these pollutant-trapping, ground-based inversions are formed during windless, clear-sky conditions, as cold air collects in low-lying areas such as valleys and canyons. Imperial County experiences surface inversions almost every day of the year. Due to strong surface heating, these inversions are usually broken allowing pollutants to be more easily dispersed (ICAPCD 2010).

3.3.1.5 Criteria Air Pollutants

Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health with a determined margin of safety. Ozone (O_3), PM_{10}, and $PM_{2.5}$ are generally considered to be regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) are considered to be local pollutants because they tend to accumulate in the air locally. PM is also considered a local pollutant. Reactive Organic Gases (ROGs) and nitrogen oxides (NO_x) are precursors to O_3.

3.3.1.6 Ambient Air Quality

The U.S. Environmental Protection Agency (USEPA) and CARB designate air basins or portions of air basins and counties as being in *attainment* or *nonattainment* for each of the criteria pollutants. Areas that do not meet the standards are classified as nonattainment areas. The National Ambient Air Quality Standards (NAAQS) (other than O_3, PM_{10}, and $PM_{2.5}$ and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. The NAAQS for O_3, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over one- to three-year periods, depending on the pollutant. The California Ambient Air Quality Standards are not to be exceeded during a three-year period. The attainment status for the portion of the SSAB encompassing the Project Area is included in Table 3.3-1.

Table 3.3-1. Attainment Status of Criteria Pollutants in the Imperial County Portion of the SSAB.

Pollutant	State Designation	Federal Designation
O_3	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Attainment

Table 3.3-1. Attainment Status of Criteria Pollutants in the Imperial County Portion of the SSAB.

Pollutant	State Designation	Federal Designation
$PM_{2.5}$	Attainment	Unclassified/Attainment
CO	Attainment	Unclassified/Attainment
NO_2	Attainment	Unclassified/Attainment
SO_2	Attainment	Unclassified/Attainment

Source: CARB 2019

The determination of whether an area meets the state and federal standards is based on air quality monitoring data. Some areas are unclassified, which means there is insufficient monitoring data for determining attainment or nonattainment. Unclassified areas are typically treated as being in attainment. Because the attainment/nonattainment designation is pollutant-specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the state and federal standards differ, an area could be classified as attainment for the federal standards of a pollutant and as nonattainment for the state standards of the same pollutant. The region is designated as a nonattainment area for the federal O_3 standard and is also a nonattainment area for the state standards for O_3 and PM_{10} (CARB 2019).

3.3.1.7 Sensitive Receptors

Sensitive receptors are defined as facilities or land uses that include members of the population who are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. The nearest sensitive receptors to the Project Area are residences located directly adjacent to the western Project Area boundary in Bombay Beach.

3.3.2 Adopted 2002 EIR/EIS

Air quality impacts associated with the Transfer Project and alternatives would result from the construction and operation of new systems and facilities, and from the potential wind erosion of soil from fallowed fields and/or shoreline sediments exposed by lowered water levels in the Salton Sea. The pollutants of greatest concern are ozone and the ozone precursors, NO_x, and volatile organic compounds (VOC), primarily from equipment exhaust, PM_{10}, and fine particulate matter ($PM_{2.5}$) from soil disturbance and wind erosion (fugitive dust). The main impacts would occur in the IID water service area because of the construction activities and land fallowing, and in the Salton Sea subregion from exposure of the shoreline (Reclamation and IID 2002a).

Construction activities result in pollutant emissions from mobile construction equipment and soil disturbance activities. Emission sources include engine exhaust from construction equipment, dust generated from the movement of construction equipment, and dust generated from soil disturbance activities. Soil disturbance activities, such as soil grading, excavation, and equipment and vehicle travel on unpaved roads, represent sources of windblown dust (Reclamation and IID 2002a).

No direct air quality impacts would be associated with the operation of the Transfer Project in the Salton Sea subregion. Operation of the on-farm conservation measures would not occur in this subregion. Two indirect impacts, Impacts AQ-7 and AQ-8, were associated with the Transfer Project in the Salton Sea. Impact AQ-7 addressed indirect air quality impacts due to the potential for windblown dust from exposed shoreline and Mitigation Measure AQ-7 was provided to mitigate this impact. Impact AQ-8 addressed potential for decreased water flow and quality to increase odorous impacts in proximity to the Salton Sea, however this impact was expected to be less than significant (Reclamation and IID 2002a).

Mitigation Measure AQ-7 would include additional conservation via fallowing or other measures to allow drain water to continue to flow to the Salton Sea at a rate equal to the Baseline, thereby avoiding impacts to the Salton Sea and shoreline associated with reduced flow. Impacts would be less than significant with implementation of this mitigation measure (Reclamation and IID 2002a).

3.3.3 Analysis of Project Changes

3.3.3.1 ICAPCD Significance Thresholds

The significance criteria established by the applicable air quality management or air pollution control district may be relied upon to determine if the Project would conflict with or obstruct implementation of an applicable air quality plan. The ICAPCD has identified significance thresholds for use in evaluating project impacts under CEQA. Accordingly, the ICAPCD-recommended thresholds of significance are used to determine whether implementation of the Proposed Project would result in a significant air quality impact. Significance thresholds for evaluation construction and operational air quality impacts are listed in Table 3.3-2.

Table 3.3-2. ICAPCD Significance Thresholds – Pounds per Day

Criteria Pollutant and Precursors	Construction Activities	Operations	
	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	
		Tier I Threshold	Tier II Threshold
ROG	75	<137	>137
NO_x	100	<137	>137
PM_{10}	150	<150	>150
$PM_{2.5}$	N/A	<550	>550
CO	550	<550	>550
SO_2	N/A	<150	>150

Source: ICAPCD 2017
lbs/day = pounds per day

Projects that are predicted to exceed Tier I thresholds require implementation of applicable ICAPCD standard mitigation measures to be considered less than significant. Projects exceeding Tier II thresholds are required to implement applicable ICAPCD standard mitigation measures, as well as applicable discretionary mitigation measures. Projects that exceed the Tier II thresholds after implementation of standard and discretionary mitigation measures would be considered to have a potentially significant impact to human health and welfare (ECORP 2022a).

3.3.3.2 U.S. Environmental Protection Agency Conformity Determination Analysis

General Conformity ensures that the actions taken by federal agencies do not interfere with a state's plans to attain and maintain national standards for air quality.

Established under the Clean Air Act (CAA) (section 176(c)(4)), the General Conformity rule plays an important role in helping states improve air quality in those areas that do not meet the NAAQS. Under the General Conformity rule, federal agencies must work with state and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the air quality plans established in the applicable state or tribal implementation plan.

The General Conformity Rule allows for exemptions for emissions that are not reasonably foreseeable, will not result in an increase in emissions, are below de minimis limits, are the result of emergency actions, are included in stationary source air permits, are for routine maintenance and repair of existing structures, or are included in a transportation conformity determination undertaken by the Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) (40 Code of Federal Regulations [CFR] 93.153(c)).

A conformity determination would be required if the annual emissions of non-attainment pollutants generated by the Proposed Project were to exceed the General Conformity de minimis thresholds. The de minimis limits represent a level of emissions that the USEPA has determined will have only de minimis impacts to the air quality of an area and are thus exempted from the General Conformity Rule. If the overall predicted increase in emissions of a criteria pollutant due to a federal action in a nonattainment area exceeds the de minimis limits as shown in Table 3.3-3, the lead federal agency (Reclamation) is required to make a conformity determination. As previously described, the Project Area is located in the Imperial County portion of the SSAB. Table 3.3-3 lists the attainment status for each criteria air pollutant and the de minimis threshold based on the NAAQS designation and classification.

Table 3.3-3. Federal General Conformity *De Minimis* Emissions Levels in Imperial County

Pollutant	Attainment Status	Classification	USEPA General Conformity Threshold (tons/year)
VOC (O_3 precursor)	Nonattainment	Marginal	100

Table 3.3-3. Federal General Conformity *De Minimis* Emissions Levels in Imperial County

Pollutant	Attainment Status	Classification	USEPA General Conformity Threshold (tons/year)
NO_x (O_3 precursor)	Nonattainment	Marginal	100
PM_{10}	Attainment	Maintenance	100
$PM_{2.5}$	Unclassified/Attainment	Maintenance	100
CO	Unclassified/Attainment	Maintenance	100
NO_2	Unclassified/Attainment	N/A	100
SO_2	Unclassified/Attainment	N/A	100

Source: USEPA 2022

3.3.3.3 Methodology

Air quality impacts were assessed in accordance with methodologies recommended by the ICAPCD and the USEPA. Where criteria air pollutant quantification was required, emissions were modeled using the California Emissions Estimator Model (CalEEMod), version 2016.3.2. CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with both construction and operations from a variety of land use projects. Project implementation-generated air pollutant emissions were calculated using CalEEMod model defaults for Imperial County as well as timing and equipment identified by the IID. Post implementation air pollutant emissions were based on the Project Area plans and the estimated traffic trip generation rates provided by the IID (ECORP 2022a).

3.3.3.4 Project Construction/Implementation-Generated Criteria Air Quality Emissions

ICAPCD Significance Thresholds

Emissions generated during Project implementation would be temporary and short-term but have the potential to represent a significant air quality impact. Three basic sources of short-term emissions will be generated through implementation of the Proposed Project: operation of the construction vehicles (i.e., excavators, trenchers, dump trucks), the creation of fugitive dust during clearing and grading, and the use of asphalt or other oil-based substances during paving activities associated with the concrete pads installed for the groundwater wells. Activities such as excavation and grading operations, worker vehicle traffic, and wind blowing over exposed soils would generate exhaust emissions and fugitive PM emissions that affect local air quality at various times during Project implementation. Effects would be variable depending on the weather, soil conditions, the amount of activity taking place, and the nature of dust control efforts. The dry climate of the area during the summer months creates a high potential for dust generation. Project implementation activities would be subject to ICAPCD Regulation VIII, which requires taking reasonable precautions to prevent the emissions of fugitive dust, such as stabilizing unpaved roads and bulk material that is being transported (ECORP 2022a).

Predicted emissions generated during Project implementation were calculated using the CARB-approved CalEEMod computer program, which is designed to model emissions for land use development projects, based on typical construction requirements. See Appendix B for more information regarding the construction assumptions, including construction equipment and duration, used in this analysis (ECORP 2022a).

Predicted maximum daily emissions associated with Project implementation are summarized in Table 3.3-4. Project-generated emissions would be short-term and of temporary duration, lasting only as long as construction activities occur, but would be considered a significant air quality impact if the volume of pollutants generated exceeds the ICAPCD's thresholds of significance.

Table 3.3-4. Project Construction-Generated Emissions

Construction Phase	Maximum Pollutant (pounds per day)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Vegetation Management (Year 1)	16.74	63.28	124.17	0.51	32.80	9.70
Well and Irrigation Installation (Year 1)	5.09	36.05	32.97	0.13	9.22	4.94
Total	**21.83**	**99.33**	**157.14**	**0.64**	**42.02**	**14.64**
ICAPCD Significance Threshold	75	100	550	N/A	150	N/A
Exceed ICAPCD Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod version 2016.3.2. Refer to Appendix B for Model Data Outputs.
Note: Pounds per day taken from the season with the highest output.

As shown in Table 3.3-4, emissions generated during Project construction would not exceed the ICAPCD significance threshold. Therefore, criteria pollutant emissions generated during Project construction would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard, and no health effects from Project criteria pollutants would occur (ECORP 2022a).

3.3.3.5 Operational Criteria Air Quality Emissions

Operational emissions impacts are long-term air emissions impacts that are associated with any changes in the permanent use of the Project Area by onsite stationary sources and offsite mobile sources that substantially increase emissions. Once construction is complete, no regular additional daily vehicle trips or personnel would be added to operate or maintain the Project Area. No major diesel-powered equipment would be required as part of ongoing Project operations. Thus, the Proposed Project would not include the provision of new permanent stationary or mobile sources of criteria air pollutant emissions. The operations of the Project focus on maintenance and monitoring of the irrigation system (ECORP 2022a). Implementation of the Project would result in negligible long-term operational emissions of criteria air pollutants.

3.3.3.6 Conflict with an Applicable Air Quality Management Plan

As previously described, the Project region is classified as nonattainment for federal O_3, PM_{10}, and $PM_{2.5}$ standards (CARB 2019). The USEPA, under the provisions of the CAA, requires each state with regions that have not attained the federal air quality standards to prepare a State Implementation Plan (SIP), detailing how these standards are to be met in each local area. The SIP is a legal agreement between each state and the federal government to commit resources to improving air quality. It serves as the template for conducting regional and project-level air quality analysis. CARB is the lead agency for developing the SIP in California. Local air districts, such as the ICAPCD, prepare air quality attainment plans or air quality management plans and submit them to CARB for review, approval, and incorporation into the applicable SIP. The air districts develop the strategies stated in the SIPs for achieving air quality standards on a regional basis (ECORP 2022a).

The region's SIP is constituted of the ICAPCD air quality plans: 2018 PM_{10} SIP, the 2018 Annual $PM_{2.5}$ SIP, the 2017 8-Hour Ozone SIP. Project compliance with all of the ICAPCD rules and regulations results in conformance with the ICAPCD air quality plans. These air quality attainment plans are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls describing how the state will attain ambient air quality standards. These SIP plans and associated control measures are based on information derived from projected growth in Imperial County in order to project future emissions and then determine strategies and regulatory controls for the reduction of emissions. Growth projections are based on the general plans developed by Imperial County and the incorporated cities in the county (ECORP 2022a).

As previously described, the Project proposes to implement several surface treatments to provide dust control and habitat enhancements adjacent to the community of Bombay Beach on vacant land. The Project would not result in population growth and would not cause an increase in currently established population projections. The Project does not include residential development or large local or regional employment centers, and thus would not result in significant population or employment growth. Further, the Project would reduce the amount of airborne PM and mitigate dust emissions resulting in improved air quality in the region. Once construction is complete, no regular additional daily vehicle trips or personnel would be added to operate or maintain the Project Area. No major diesel-powered equipment would be required as part of ongoing Project operations. Thus, the Proposed Project would not include the provision of new permanent stationary or mobile sources of criteria air pollutant emissions. Project operations would include maintenance and monitoring of the irrigation system. This poses a negligible impact and would not conflict with any local or regional plan and would result in a beneficial impact to the region's air quality (ECORP 2022a).

Exposure of Sensitive Receptors to Toxic Air Contaminants

As previously described, sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over age 65, children under age 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. The nearest sensitive receptors to the Project Area are several single-family residences located on the road, Aisle of Palms, which is directly adjacent to the Project Area (ECORP 2022a).

Construction/Implementation-Generated Air Contaminants

Construction of the Project would result in temporary, short-term Proposed Project-generated emissions of diesel particulate matter (DPM), ROG, NOx, CO, and PM_{10} from the exhaust of off-road, heavy-duty diesel equipment for Project construction; soil hauling truck traffic; paving; and other miscellaneous activities. The portion of the SSAB which encompasses the Project Area is designated as a nonattainment area for federal O_3 and $PM_{2.5}$ standards and is also a nonattainment area for the state standards for O_3 and PM_{10} (CARB 2019). Thus, existing O_3 and PM_{10} levels in the SSAB are at unhealthy levels during certain periods. However, as shown in Table 3.3-4, the Project would not exceed the ICAPCD significance thresholds for construction emissions.

The health effects associated with O_3 are generally associated with reduced lung function. Because Project construction would not result in O_3 precursor emissions (ROG or NO_x) in excess of the ICAPCD thresholds, the Project would not substantially contribute to regional O_3 concentrations and the associated health impacts.

CO tends to be a localized impact associated with congested intersections. In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions. The Project would not result in CO emissions in excess of the ICAPCD thresholds (ECORP 2022a). Thus, the Project's CO emissions would not contribute to the health effects associated with this pollutant.

Particulate matter (PM_{10} and $PM_{2.5}$) contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Particulate matter exposure has been linked to a variety of problems, including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms such as irritation of the airways, coughing, or difficulty breathing. For construction-type activity, DPM is the primary TAC of concern. PM_{10} exhaust is considered a surrogate for DPM as all diesel exhaust is considered to be DPM. Most PM_{10} exhaust derives from combustion, such as use of gasoline and diesel fuels by motor vehicles. As with O_3 and NOx, the Project would not generate emissions of PM_{10} or $PM_{2.5}$ that would exceed the ICAPCD's thresholds. Accordingly, the Project's PM_{10} and $PM_{2.5}$ emissions are not expected to cause any increase in related regional health effects for these pollutants (ECORP 2022a).

In summary, Project construction would not result in a potentially significant contribution to regional concentrations of nonattainment pollutants and would not result in a significant contribution to the adverse health impacts associated with those pollutants. Recommendations for best management practices during construction are incorporated into the project description (see Section 2.5) to avoid impacts on air quality.

Operational Air Contaminants

Operation of the Proposed Project would not result in the development of any substantial sources of air toxics. There would be no stationary sources associated Project operations; nor would the Project attract additional mobile sources that spend long periods queuing and idling at the site. Onsite Project emissions would not result in significant concentrations of pollutants at nearby sensitive receptors as the predominant operational emissions associated with the Proposed Project would be routine maintenance work, water deliveries, and site security. Therefore, the Project would not be a substantial source of TACs. The Project would not result in a high carcinogenic or non-carcinogenic risk during operation (ECORP 2022a).

Carbon Monoxide Hot Spots

It has long been recognized that CO exceedances are caused by vehicular emissions, primarily when idling at intersections. Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Under certain meteorological conditions, CO concentrations close to congested intersections that experience high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Given the high traffic volume potential, areas of high CO concentrations, or "hot spots", are typically associated with intersections that are projected to operate at unacceptable levels of service during the peak commute hours. It has long been recognized that CO hot spots are caused by vehicular emissions, primarily when idling at congested intersections. However, transport of this criteria pollutant is extremely limited, and CO disperses rapidly with distance from the source under normal meteorological conditions. Furthermore, vehicle emissions standards have become increasingly more stringent in the last 20 years. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams per mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration in the SSAB is designated as in attainment. Detailed modeling of Project-specific CO "hot spots" is not necessary and thus this potential impact is addressed qualitatively (ECORP 2022a).

A CO "hot spot" would occur if an exceedance of the state one-hour standard of 20 parts per million (ppm) or the eight-hour standard of 9 ppm were to occur. The analysis prepared for CO attainment in the South Coast Air Quality Management District's (SCAQMD's) *1992 Federal Attainment Plan for Carbon Monoxide* in Los Angeles County and a Modeling and Attainment Demonstration prepared by the SCAQMD as part of the 2003 Air Quality Management Plan can be used to demonstrate the potential for CO exceedances of these standards. The SCAQMD is the air pollution control officer for much of southern California. The SCAQMD conducted a CO hot spot analysis as part of the 1992 CO Federal Attainment Plan at four busy intersections in Los Angeles County during the peak morning and afternoon time periods. The intersections evaluated included Long Beach Boulevard and Imperial Highway (Lynwood), Wilshire Boulevard and Veteran Avenue (Westwood), Sunset Boulevard and Highland Avenue (Hollywood), and La Cienega Boulevard and Century Boulevard (Inglewood). The busiest intersection evaluated was at Wilshire Boulevard and Veteran Avenue, which has a traffic volume of approximately 100,000 vehicles per day. Despite this level of traffic, the CO analysis concluded that there was no violation of CO standards (SCAQMD 1992). In order to establish a more accurate record of baseline CO concentrations affecting the

Los Angeles, a CO "hot spot" analysis was conducted in 2003 at the same four busy intersections in Los Angeles at the peak morning and afternoon time periods. This "hot spot" analysis did not predict any violation of CO standards. The highest one-hour concentration was measured at 4.6 ppm at Wilshire Boulevard and Veteran Avenue and the highest eight-hour concentration was measured at 8.4 ppm at Long Beach Boulevard and Imperial Highway. Thus, there was no violation of CO standards.

Similar considerations are also employed by other air districts when evaluating potential CO concentration impacts. More specifically, the Bay Area Air Quality Management District, the air pollution control officer for the San Francisco Bay Area, concludes that under existing and future vehicle emission rates, a given project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour or 24,000 vehicles per hour where vertical or horizontal air does not mix in order to generate a significant CO impact.

The Proposed Project would not generate traffic volumes at any intersection of more than 100,000 vehicles per day (or 44,000 vehicles per day) and there is no likelihood of the Project traffic exceeding CO values (ECORP 2022a). Furthermore, as shown in Table 3.3-4, Project construction would result in the emission of CO below the ICAPCD significance threshold, which is a health-based threshold intended to reduce the health deleterious effects of air pollution.

3.3.3.7 Odor

Typically, odors are 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).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. Intensity refers to the strength of the odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Odor advisories in the northern area of Salton Sea have been required by the SCAQMD due to hydrogen sulfide concentrations in the air. Hydrogen sulfide in the air is released from sulfides in the water. Because the Project would be implemented in dry, upland areas, there is no potential for the Project to exacerbate hydrogen sulfide concentrations in the air.

During implementation, the Proposed Project presents the potential for generation of objectionable odors in the form of diesel exhaust in the immediate vicinity of the Project Area. However, these emissions are short term in nature and would rapidly dissipate and be diluted by the atmosphere downwind of the emission sources. Additionally, odors would be localized and generally confined to the Project Area (ECORP 2022a). Therefore, odors generated during Project implementation would not adversely affect a substantial number of people to odor emissions.

Land uses commonly considered to be potential sources of obnoxious odorous emissions include agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding. The Proposed Project does not include any land uses during Project operations identified as being associated with odors (ECORP 2022a).

3.3.3.8 Cumulative Impacts

By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's individual emissions exceed its identified significance thresholds, the project would be cumulatively considerable. Projects that do not exceed significance thresholds would not be considered cumulative considerable. As noted above, recommendations for best management practices during construction are incorporated into the project description (see Section 2.5) to avoid impacts on air quality.

3.3.4 Findings Related to Air Quality

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to air quality, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to air quality that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to air quality requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to air quality identified in and considered by the adopted 2002 EIR/EIS.

3.3.5 Mitigation Measures

Please refer to Section 3.5 of the adopted 2002 EIR/EIS for complete analyses of Project impacts and mitigation measures (Reclamation and IID 2002a).

Mitigation Measure AQ-7: To mitigate this impact, selection of HCP (Salton Sea Portion) Approach 2 would be the only effective measure. This approach would include additional conservation, via fallowing or other measures in the IID water service area, to allow drain water to continue to flow to the Sea at a rate equal to the Baseline, thereby avoiding impacts to the Sea and shoreline associated with the reduced flow. Additional details of Approach 2 can be found in Chapter 2, Description of the Proposed Project [Transfer Project] and Alternatives. With implementation of this approach, this impact would be avoided; without it, this impact would remain potentially significant and unavoidable.

Based on the proposed modifications, the 2002 Transfer Project EIR/EIS was reviewed to determine whether or not changes to the Project would affect the mitigation measures contained therein. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with air quality.

3.4 Biological Resources

Section 3.2 of the Draft EIR/EIS, and Section 4, Errata of the Final EIR/EIS, address the impacts of the Transfer Project on biological resources.

The environmental setting for the Salton Sea region and Project Area is discussed below. Impacts on biological resources from implementation of the Proposed Project are discussed in the Biological Resources Report contained in Appendix C and summarized below (ECORP 2022b).

3.4.1 Existing Environmental Setting

According to Imperial County's Conservation and Open Space Element, an extensive range of vegetation communities have been identified in the County, including native and nonnative communities on which sensitive and common plant and wildlife species are dependent. Native communities include wetland and riparian habitats within fresh and saltwater systems and high and low elevation woodland and scrub habitats, some with saline and alkali soil conditions. Nonnative communities include agriculture, annual grasslands, and tamarisk or salt cedar stands (Imperial County 2016).

The Project Area is primarily located within the exposed former bed of the Salton Sea (also referred to as the Salton Sea playa or playa), which has been exposed over the last 16 years as a result of seawater evaporation and decreased agricultural inflows. Slopes on the playa within the Project Area are very flat, ranging from 1 to 3 inches of vertical drop every 100 feet, generally grading from northwest to south-southeast. Exposed elevations within the Project Area range from approximately -221 feet below sea level (bsl) at the northwest Project Area corner, to approximately -230 feet bsl North American Vertical Datum 1988 (NAVD88) at the Salton Sea margin.

The site is characterized by expansive bare playa areas interspersed with patches of very-low density to moderate-density halophytic (salt loving) vegetation. No perennial surface water resources occur at the

Project Area. Rather, one prominent ephemeral wash originating from the Chocolate Mountains (to the north) enters the northeastern corner of the site. This ephemeral wash does not appear to reach the Salton Sea with any regular frequency. The recurrence interval of flood flows entering the Project Area through this wash is uncertain but appears to be very infrequent based on the number and size of plants growing in the washes. Plant condition (apparent health and vigor) appears to vary within the Project Area, likely reflecting the scarcity and sources of irrigation water over time.

3.4.1.1 Soils

Soils in Imperial County are formed by stratified alluvial deposits. A large portion of the County includes fine-textured lakebed sediments. Approximately 28 known soil types occur in Imperial County: Aco, Antho, Carrizo, Carsitas, Chuckwalla, Cibola, Coachella, Fluvaquents, Gadsden, Gilman, Glenbar, Holtville, Imperial, Indio, Kofa, Lagunita, Laposa, Laveen, Mecca, Meloland, Niland, Orita, Ripley, Rositas, Salorthids, Superstition, Torriorthents, and Vint. Parent material includes Glenbar, Holtville, and Imperial soils. Indio, Vint, Meloland, and Rositas soils are derived from windblown and channel silts. Rositas and Carsitas soils were formed in beach deposits. Sand and gravelly fan materials are the parent materials of Carsitas and Rositas soils (Imperial County 2016).

According to the U.S. Department of Agriculture's NRCS Web Soil Survey website (NRCS 2022), there is no digital data available for the Project Area.

3.4.1.2 Vegetation

Four general terrestrial wildlife habitats occur in the Salton Sea: drain habitat, tamarisk scrub habitat, desert habitat, and agricultural field habitat.

Drain habitat is located adjacent to the Salton Sea and occurs in association with the drainage and conveyance systems and unmanaged vegetation. Vegetation in the drains typically consists of species such as saltgrass (*Distichlis spicata*), saltbush (*Atriplex* sp.), Bermuda grass (*Cynodon dactylon*), common reed (*Phragmites australis*), and salt cedar (*Tamarix* sp.). Vegetation along the margins of the Salton Sea includes tamarisk, iodine bush, , cattails (*Typha* spp.), and common tule (*Schoenoplectus acutus*) in adjacent wetlands.

Tamarisk scrub habitat is a non-native plant community that supplant native vegetation following major disturbances. Characteristic species include salt cedar, big saltbush (*Atriplex lentiformis*), and saltgrass, and common reed. Tamarisk scrub occurs in the margins of the Salton Sea, wherever water is available. The shoreline of the Salton Sea also consists of iodine bush.

Desert habitats supported in the area include creosote bush scrub and dunes. Creosote bush scrub typically occurs on well-drained secondary soils of slopes, fans, and valleys. Characteristic species include creosote bush (*Larrea tridentata*), burro weed (*Ambrosia dumosa*), brittle brush (*Encelia farinosa*), and ocotillo (*Fouquieria splendens*). Succulents are common, and ephemeral annual herbs generally bloom during late February and March. Mesquite thickets, an important wildlife habitat component, are in creosote bush scrub habitat. Desert dune communities are barren expanses of actively moving wind-deposited sand with little or no stabilizing vegetation. Plant species include bee plant (*Cleome sparsifolia*), Desert dicoria (*Dicoria canescens*), evening primrose (*Oenothera avita*), and Plicate coldenia (*Tiquilia plicata*).

Agricultural field habitat is the predominant land cover type in the Imperial Valley. The crops grown vary but can include alfalfa, Sudan grass, Bermuda grass, and wheat (Reclamation and IID 2002a).

The Project Area is characterized by four coarse habitat types: upland iodine bush scrub, upland iodine bush/quail bush scrub, upland bare salt pan, and wetland iodine/bush seepweed scrub (ECORP 2022b).

Special-Status Plants

Special-status plant species with potential to occur in the desert habitat include Coachella Valley milk-vetch (*Astragalus lentiginosus var. coachellae*), Perison's milk-vetch (*Astragalus magdalenae* var. *peirsonii*), triple-ribbed milk-vetch (*Astragalus tricarinatus*), Parish's daisy (*Erigeron parishii*), and Orcutt's aster (*Xylorhiza orcuttii*). A full list of special-status plant species with potential to occur are listed in the Draft EIR/EIS for the IID Water Conservation and Transfer Project (Reclamation and IID 2002a).

Eleven special-status plant species were identified historically in the vicinity of the Project Area based on the literature review. Upon further analysis and after the special-status plant survey conducted in May 2022, all 11 species were determined to not occur within the Project Area.

3.4.1.3 Wildlife

Wildlife associated with drain habitat includes wading birds such as green-backed heron (*Butorides striatus*), great blue heron (*Ardea herodias*), and great egret (*Ardea alba*) and riparian and wetland bird species including red-winged blackbird (*Agelaius phoeniceus*), common yellowthroat (*Geothlypis trichas*), Yuma Ridgway's rail (*Rallus longirostris yumanensis*), and black phoebe (*Sayornis nigricans*).

Tamarisk is a non-native species that has invaded riparian areas and is considered poor quality habitat for native wildlife species, although some wildlife species have adapted to using tamarisk where it has displaced native vegetation. Bird species diversity and abundance are lower in tamarisk than in stands of native riparian vegetation. Bird species potentially using tamarisk scrub and other riparian habitat include yellow warbler (*Dendroica petechia*), southwestern willow flycatcher (*Empidonax traillii extimus*), mourning dove (*Zenaida macroura*), black-crowned night heron (*Nycticorax nycticorax*), cinnamon teal (*Anas cyanoptera*), and phainopepla (*Phainopepla nitens*). Two groups, large raptors and cavity-nesting species, are not known to occur in tamarisk. Mammals associated with the habitat include deer mouse (*Peromyscus maniculatus*), cotton rat (*Sigmodon hispidus*), muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), common gray fox (*Urocyon cinereoargenteus*), ringtail cat (*Bassariscus astutus*), and coyote (*Canis latrans*).

Desert habitat areas support birds, mammals, and reptiles that are adapted to arid desert conditions. Bird species include white-crowned sparrow (*Zonotrichia leucophrys*), greater roadrunner (*Geococcyx californianus*), great-horned owl (*Bubo virginianus*), and loggerhead shrike (*Lanius ludovicianus*). Mammals use this habitat, generally in low densities, including the Merriam's kangaroo rat (*Dipodomys merriami*), little pocket mouse (*Perognathus longimembris*), desert kangaroo rat (*Dipodomys deserti*), ground squirrels (*Spermophilus* sp.), striped skunk (*Mephitus mephitis*), and black-tailed hare (*Lepus californicus*). Reptile species include the zebra-tailed lizard (*Callisaurus draconoides*), side-blotched lizard (*Uta stansburiana*), and California whiptail (*Cnemidophorus tigris mundus*).

Wildlife associated with agricultural fields adjacent to the Salton Sea include geese (Anatidae), ibis (Threskiornithidae), gulls (Laridae), blackbirds (Icteridae), long-billed curlew (*Numenius americanus*), mountain plover (*Charadrius montanus*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus hudsonius*), brown-headed cowbird (*Molothrus ater*), wintering ferruginous hawk (*Buteo regalis*), and horned larks (*Eremophila alpestris*). Common mammals in agricultural and ruderal habitats include western harvest mouse (*Reithrodontomys megalotis*) and southern pocket gopher (*Thomomys umbrinus*) (Reclamation and IID 2002a).

Special-Status Wildlife

Special-status wildlife species with potential to occur in the Imperial Valley and Salton Sea area include desert pupfish (*Cyprinodon macularius*), desert tortoise (*Gopherus agassizi*), Flat-tailed horned lizard (*Phrynosoma mcallii*), Cooper's hawk (*Accipiter cooperi*), southwestern willow flycatcher, western snowy plover (*Charadrius alexandrinus nivosus*), black tern (*Chlidonias niger*), brown pelican (*Pelecanus occidentalis*), California least tern (*Sterna antillarum browni*), Leconte's thrasher (*Toxostoma lecontei*), burrowing owl (*Athene cunicularia*), and black skimmer (*Rynchops niger*). A full list of special-status wildlife species with potential to occur are listed in the Draft EIR/EIS for the IID Water Conservation and Transfer Project (Reclamation and IID 2002a).

Based on species occurrence information from the literature review and observations in the field, a list of special-status plant and animal species that have the potential to occur within the AOI was generated. Only special-status species were included in this analysis (ECORP 2022b).

After further analysis, the rare plant survey, and the reconnaissance site visit, it is determined that two amphibian species, one reptile species, one bird species, and one mammal species have a low potential to occur and four bird species have a high potential to occur within the AOI. The rest of the species identified in the literature review were excluded due to absence of suitable habitat.

The western snowy plover has a high potential to occur onsite. Ground nests are established on barren to sparsely vegetated sand beaches, dry salt flats, dredge spoils deposited on beach or dune habitat, levees and flats at salt-evaporation ponds, and sand/cobble river bars. The species was observed on the playa near shoreline pools at Bombay Beach Wetlands (east of and adjacent to AOI) in July 2021 and suitable nesting habitat occurs within open areas of sandy playa onsite (ECORP 2022b).

The black skimmer has a high potential to occur onsite. They prefer to nest on open sandy areas or sparsely vegetated gravel or shell bars or broad mats of seawrack on salt marsh. The open playa may provide suitable nesting habitat onsite (ECORP 2022b).

The gull-billed tern (*Gelochelidon nilotica*) has a high potential to occur onsite. The Salton Sea population nests on eroded earthen levees and gravel and barnacle islets or on constructed islets in shallow, brackish impoundments. Suitable nesting habitat occurs onsite in the open areas of the playa (ECORP 2022b).

The California brown pelican has a high potential to occur onsite. The brown pelicans nesting in California nest mainly on the ground. Suitable foraging habitat occurs onsite (ECORP 2022b).

3.4.2 Adopted 2002 EIR/EIS

Please refer to Section 3.2 of the adopted 2002 Draft EIR/EIS for analyses of the potential effects of the Transfer Project as related to Biological Resources.

The Draft EIR/EIS identifies potential impacts on biological resources due to the Transfer Project's use of on-farm irrigation system improvements, water delivery system improvements, and/or fallowing to conserve water. Under Impact BR-41, reduced drain flows could affect adjacent wetlands dominated by cattail and bulrush vegetation. Cattails and bulrushes cannot tolerate saline water and the Transfer Project would increase freshwater flows to the drains in the CVWD service area and potentially increase freshwater flows to the adjacent wetlands. Other areas identified as adjacent wetlands were misclassified and do not meet the definition of an adjacent wetland. Therefore, there is no impact.

Under Impact BR-42, reduced sea elevation could affect the acreage of adjacent wetlands dominated by tamarisk and shoreline strand. In areas where drain water or shallow groundwater is the predominant water source, no change in tamarisk-dominated adjacent wetlands is expected. Although it is not possible to predict the magnitude of change in the tamarisk adjacent to the Salton Sea, a reduction in the amount would not cause a significant impact because (1) tamarisk is an invasive, non-native species of poor habitat quality for wildlife and (2) no special-status species depend on tamarisk. Implementation of the Salton Sea Conservation Strategy under the HCP component of the Transfer Project would further ensure that no significant impacts occur. Therefore, impacts would be less than significant.

Under Impact BR-43, increased salinity would change invertebrate resources in the Salton Sea. The Transfer Project would accelerate the rate at which the Salton Sea transitions first to an invertebrate-dominated ecosystem, then to a system dominated by halotolerant organisms. In accord with the significance criteria, because no invertebrates are candidate, sensitive, or special-status species, the acceleration in the changes in the invertebrate community of the Salton Sea is not a significant impact.

Under Impact BR-44, changes in the invertebrate community could affect shorebirds and other waterbirds. he changes in the abundance and composition of the invertebrate community could alter the suitability of foraging conditions for birds using the Salton Sea. Mono Lake provides the best model of what the bird species diversity and abundance likely would resemble as salinity of the Salton Sea increases. Mono Lake is a saline, inland sea like the Salton Sea. The species of shorebirds that use Mono Lake also occur at the Salton Sea as migratory birds or winter residents. Given that the shorebird and waterbird (grebes and ruddy ducks) species that use the Sea also use Mono Lake, in which the brine flies and brine shrimp are the primary prey species, it is reasonable to expect that these species would similarly exploit brine flies and brine shrimp as they become the dominant invertebrate at the Salton Sea. Therefore, changes in the invertebrate community would have less-than-significant impacts on shorebirds and other waterbirds using this resource.

Under Impact BR-45, increased salinity would reduce fish resources in the Salton Sea. The salinity of the Salton Sea has increased because of high evaporative water loss and continued input of salts from irrigation drainage water. The Transfer Project could affect the rate of salinization and the overall outcome of increasing salinity would be the loss of fish. Under both the Baseline and the Transfer Project, the salinity of the Salton Sea would rise and exceed levels at which fish species inhabiting the Salton Sea could reproduce. The acceleration is considered a less-than-significant impact to fish resources for two reasons. First, the differences between when species-specific salinity thresholds would be exceeded are small (5 to 11 years). Second, based on the significance criteria, only effects to candidate, sensitive or special-status species or certain effects to native fish (e.g., nursery habitat, migratory routes) constitute significant biological impacts. Because all fish species are introduced, non-native species, the impacts are less than significant.

Under Impact BR-46, reduced fish abundance would affect piscivorous birds. The abundance of tilapia, which is the most abundant fish in the Salton Sea and the primary forage species for piscivorous birds, would decline substantially once the salinity of the Salton Sea reaches about 60 g/L. Water conservation under the Transfer Project would reduce inflows to the Salton Sea, which would increase its rate of salinization. Tilapia could persist in the Salton Sea if low salinity areas persist around the deltas and potentially near drain outlets, however, the total population supported in the Salton Sea would be reduced relative to existing conditions. The primary piscivorous birds of concern with respect to reduced fish abundance are white pelicans, brown pelicans, black skimmers, and double-crested cormorants (*Nannopterum auritum*). The adverse effect to piscivorous birds is considered a significant, but avoidable, impact of the water conservation and transfer component of the Transfer Project. Implementation of the HCP component of the Transfer Project would reduce this impact to less than significant.

Under Impact BR-47, changes to selenium in the Salton Sea would not affect fish and birds. The Transfer Project would decrease annual loading of selenium to the Salton Sea relative to the Baseline. However, selenium exhibits unusual behavior in the Salton Sea, concentrating in the sediment rather than the water column. Most selenium in the Sea is in sediments, and the sediments are the dominant source for exposure to aquatic organisms. The Transfer Project would decrease the amount of selenium entering the Salton Sea relative to the Baseline and in that way reduce the annual accumulation of selenium in sediments. However, because of the large amount of selenium stored in Sea sediments, the slight reduction in selenium loading relative to the Baseline would not substantially change the exposure of fish and birds to selenium in the sea, in general. Therefore, the Transfer Project would have no effect on exposure of fish and birds to selenium in the Salton Sea.

Under Impact BR-48, reduced sea elevation could affect colonial nest/roost sites for ground-nesting birds including black skimmers, terns and gulls, American white pelicans (*Pelecanus erythrorhynchos*), California brown pelicans (*Pelecanus occidentalis californicus*), and double-crested cormorants. The surface elevation of the Salton Sea is projected to decline but the Transfer Project would accelerate the decline by a few years. With 300 KAFY of conservation, the water surface elevation would fall by 3 feet and 4 feet, 3 and 7 years earlier than under the Baseline, respectively. The small temporal difference in when the islands would connect to the mainland would not result in a substantial adverse effect to colonial, ground-nesting birds at the Salton Sea and is considered less than significant.

Under Impact BR-49, reduced sea elevation could affect the availability of mudflat and shallow water habitat. Migratory birds, specifically shorebirds and waterfowl, could be affected by the changes in surface water elevation predicted under the Transfer Project due to changes physical habitat availability. The Transfer Project would result in less inflow to the Sea and result in a more rapid decline in water surface elevation than under the Baseline. Under both the Transfer Project and Baseline, shallow water/mudflat habitat could be lost or reduced as the Sea recedes, but under both alternatives, new areas of shallow water/mudflat habitat also would be created as the Sea recedes. Because the magnitude and likelihood of changes in the amount and characteristics of shallow water/mudflat habitat, either positively or negatively, would not differ substantially between the Transfer Project and the Baseline, the Transfer Project would not significantly affect the availability of shallow water/mudflat habitat.

Under Impact BR-50, water quality changes could increase the incidence of avian disease outbreaks. The Salton Sea is warm, shallow, and strongly eutrophic. These conditions, in combination with dense aggregations of water birds that use the Sea, create prime conditions for avian disease outbreaks. The links between lake enrichment, productivity, and bird disease are weak and ill-defined. Nevertheless, conditions contributing to avian disease outbreaks would persist under both the Baseline and Transfer Project. The Transfer Project would likely reduce phosphorus and sediment-associated loading, but nitrate loading would increase along with dissolved constituents in general. It is unknown what such a change in the mix of nutrient loads would have on lake productivity. Regardless, the lake is already highly eutrophic, and trophic states are not quantitatively linked to avian disease. As a result, a change in the mix of nutrient loading is not expected to increase the incidence of avian disease.

Under Impact BR-51, increased salinity could isolate drains supporting desert pupfish. Desert pupfish inhabit pools formed by barnacle bars in near-shore and shoreline areas of the Salton Sea. Desert pupfish have a high salinity tolerance, with 90 g/L used as the threshold for when pupfish could not longer move among drains via the Salton Sea. Under the Transfer Project, with conservation of 300 KAFY the salinity of the Sea would exceed 90 g/L by 2022. At this salinity, the Sea could become intolerable to pupfish and prevent them from moving among drains; they would be isolated to individual drains. Small, isolated populations are at risk of extinction because of environmental and genetic stochasticity. Implementation of the HCP component of the Transfer Project would reduce this impact to less than significant.

The Salton Sea Conservation Strategy of the Transfer Project's HCP has several components to address potential impacts to biological resources. The approaches include hatchery and habitat replacement and use of conserved water as mitigation.

3.4.3 Analysis of Project Changes

3.4.3.1 Literature Review

The following resources were reviewed to determine the special-status species that have been documented within or near the Project Area. Results of the species searches are included as Attachment B.

- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) data for the "Frink, California" 7.5-minute quadrangle as well as the eight surrounding USGS quadrangles (CDFW 2022a);

- U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Consultation System Resource Report List for the Project Area (USFWS 2022a);
- California Native Plant Society (CNPS) Rare Plant Inventory was queried for the "Frink, California" 7.5-minute quadrangle and the nine surrounding quadrangles (CNPS 2022).

Additional background information was reviewed regarding the documented or potential occurrence of special-status species within or near the Project Area from the following sources:

- Special Animals List (CDFW 2022b);
- Bird Species of Conservation Concern (USFWS 2021);
- USFWS Online Critical Habitat Mapper (USFWS 2022b); and
- NRCS Web Soil Survey (NRCS 2022).

Based on the literature review, 11 special-status plant species, 2 special-status fish species, 1 special-status invertebrate species, 3 special-status amphibian species, 2 special-status reptile species, 14 special-status bird species, and 7 special-status mammal species were identified as having the potential to occur within the Project Area (ECORP 2022b).

3.4.3.2 Reconnaissance Survey

A site reconnaissance survey was conducted on April 5 and May 10, 2022, to identify portions of the Project Area with the potential to support special-status species and sensitive habitats. During the field survey, biological communities occurring onsite were characterized and the following biological resource information was collected:

- Potential aquatic resources
- Vegetation communities
- Plant and animal species directly observed
- Animal evidence (e.g., scat, tracks)
- Existing active bird nest locations
- Burrows and any other special habitat features
- Representative Project Area photographs (Attachment C)

Impacts to Special-Status Birds

The Project Area provides suitable nesting and foraging habitat for special-status birds and birds protected by the Migratory Bird Treaty Act (MBTA) and Fish and Game Code. Nesting and/or foraging birds have potential to be adversely impacted by Project activities (all components) if present within and adjacent to the Project Area during implementation of the Project. The Project would avoid or minimize potential impacts to special-status birds and birds protected to comply with the regulatory measures of the MBTA and Fish and Game Code. Recommendations for best management practices during construction are incorporated into the project description (see Section 2.5) to avoid impacts on special-status birds.

3.4.3.3 Aquatic Resources Delineation Survey

An aquatic resources delineation of the Project Area was conducted on April 5 and May 10, 2022. A total of 63.433 acres of aquatic resources were mapped within the Project Area. Aquatic resources within the Project Area include Palustrine wetland (57.619 acres), Riverine (0.091 acre) and Lacustrine (5.723 acres) feature types.

The Project Area supports aquatic resources that are potential Waters of the U.S. and Waters of the State, subject to verification by the USACE and RWQCB, respectively. The following regulatory authorizations pertain to the Project component that will occur within the wetland habitat onsite: habitat enhancement activities, including construction of bunds and diversion swales (ECORP 2022b). Compliance with regulatory measures would ensure no-net-loss of wetland function and values as a result of the Proposed Project.

3.4.3.4 Rare Plant Survey

A rare plant survey was conducted on May 10, 2022, for the 168.39-acre Project Area. The survey was scheduled to coincide with the target species' blooming periods and during a period when target species were most likely identifiable.

The following rare plant were considered target plant species for their potential to occur in the survey area: chaparral sand-verbena (*Abronia villosa* var. *aurita*), Salton milk-vetch (*Astragalus crotalariae*), Harwood's milk-vetch (*Astragalus insularis* var. *harwoodii*), gravel milk-vetch (*Astragalus sabulonum*), triple-ribbed milk-vetch, ribbed cryptantha (*Johnstonella costata*), narrow-leaf sandpaper plant (*Petalonyx linearis*), Orocopia sage (*Salvia greatae*), and Chocolate Mountains tiquilia (*Tiquilia canescens* var. *pulchella*). Rare plant species were not observed within the Project Area during the rare plant survey (ECORP 2022b).

3.4.3.5 Regulatory Compliance Measures

As listed in Section 2.5 and 2.6 of this report, the Proposed Project would comply with the Migratory Bird Treaty Act through the following avoidance and minimization measures and permits:

Avoidance and Minimization Measures

- Complete all Project activities outside of the bird nesting season to avoid impacts to nesting birds. The nesting season for birds that could potentially establish ground nests at the Salton Sea is March 1 through October 31.
- If Project activities cannot be completed outside of the bird nesting season, a qualified biologist shall survey all areas to be disturbed within 7 days in advance of the start of ground-disturbing activities. Active bird nests identified during the survey effort shall be avoided until such time that

the qualified biologist has determined that the nest(s) is/are vacant or is/are otherwise not active. Depending on the location of the active nest(s) the qualified biologist may establish a no-work buffer around an active nest(s). Work may resume within the active nest buffer only with the approval of the qualified biologist.

Permits

- Coverage under Section 404 of the federal CWA must be obtained from USACE. The impacts from such actions are expected to be temporary/temporal loss only and solely associated with the habitat enhancement activities within wetland habitat. Therefore, no net loss of aquatic resources is likely to occur as a result of the Project (a net increase of wetland habitat in the long term is anticipated), and no compensatory mitigation is required.
- A Water Quality Certification or waiver pursuant to Section 401 of the CWA, as issued by RWQCB, must be obtained for Section 404 permit actions.
- A Waste Discharge Requirement for dredge and fill in Waters of the State under the Porter-Cologne Water Quality Control Act as issued by RWQCB must be obtained for impacts to waters of the State.

3.4.3.6 Cumulative Impacts

Potentially significant impacts related to biological resources would occur during construction and would be reduced to a less than significant level with implementation of avoidance and minimization measures which are regulatory in nature. Accordingly, the Plot Study would not otherwise combine with impacts of related development to add considerably to any cumulative impacts in the region. With adherence to regulatory requirements, the Plot Study would not have impacts that are individually limited, but cumulatively considerable. Therefore, the Proposed Project would have a less than cumulatively considerable impact.

3.4.4 Findings Related to Biological Resources

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that Project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to biological resources, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to biological resources that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to biological resources requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to biological resources identified in and considered by the adopted 2002 EIR/EIS.

3.4.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified (Reclamation and IID 2002a).

Based on the proposed modifications, the 2002 Transfer Project EIR/EIS was reviewed to determine whether or not changes to the Project would affect the mitigation measures contained therein. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with biological resources.

3.5 Cultural Resources

A complete discussion of the cultural resources impacts of the Transfer Project as originally proposed is included in Section 3.8 of the Draft EIR/EIS and Section 4, Errata of the Final EIR/EIS.

The environmental setting for the Project Area is discussed below. In addition, impacts on cultural resources from implementation of the Plot Study are discussed in a separate report incorporated by reference herein (ECORP 2022c) and summarized below.

3.5.1 Existing Environmental Setting

The previous studies conducted in the County identified resources including villages, rock shelters, habitation sites, lithic scatters, trails, rock art localities, and milling stations. Isolated artifacts not associated with the larger sites have also been identified in Imperial County (Imperial County 2016).

The Project Area consists of approximately 168.39 acres of property located in the northeastern quarter of Section 33 of Township 9 South, Range 12 East, San Bernardino Base and Meridian as depicted on the 1998 Frink, California USGS 7.5-minute topographic quadrangle map (Figure 1). The northwestern corner of the Project Area is one block east of the intersection of 1st Street and Avenue G in the community of Bombay Beach.

The Area of Potential Effects (APE) consists of the horizontal and vertical limits of a project and includes the area within which significant impacts or adverse effects to Historical Resources or Historic Properties could occur as a result of the project. The APE is defined for projects subject to regulations implementing Section 106 (federal law and regulations). For projects subject to the CEQA review, the term Project Area is used rather than APE. The terms Project Area and APE are interchangeable for the purpose of this document.

The horizontal APE consists of all areas where activities associated with a project are proposed and, in the case of this Project, equals the Project Area subject to environmental review under the National Environmental Policy Act (NEPA) and CEQA. This includes areas proposed for construction, vegetation removal, grading, trenching, stockpiling, staging, and other elements in the official Project description. The horizontal APE represents the survey coverage area. It measures approximately 0.6 mile in length by 0.5 mile in width.

The vertical APE is described as the maximum depth below the surface to which excavations for project foundations and facilities will extend. Therefore, the vertical APE for this Project includes all subsurface areas where archaeological deposits could be affected. The subsurface vertical APE varies across the Project, depending on depth of any grading or excavation. Without definitive construction plans, ground disturbance of up to 15 feet below the surface will be expected in order to accommodate Project-related activities, and therefore, a review of geologic and soils maps was necessary to determine the potential for buried archaeological sites that cannot be seen on the surface.

The vertical APE also is described as the maximum height of structures that could impact the physical integrity and integrity of setting of cultural resources, including districts and traditional cultural properties. For this Project, the above-surface vertical APE is presumed to be up to 20 feet above the surface.

3.5.1.1 Geology and Soils

Jennings (1967) describes the geology of the Project Area as recent dune sand (Qs). Jennings et al. (2010) describes the geology of the Project Area as alluvium, lake, playa, and terrace deposits, both unconsolidated and consolidated, with most deposits being nonmarine (Q). Additionally, the San Andreas Fault is located immediately north of the Project Area.

According to the U.S. Department of Agriculture's NRCS Web Soil Survey website (NRCS 2022), there is no digital data available for the Project Area.

There exists the potential for buried precontact archaeological sites in the Project Area due to the presence of alluvium within the Project Area and the likelihood of precontact archaeological sites located along perennial waterways (Reclamation and IID 2002a).

3.5.1.2 Ethnographic Context

Ethnohistorically documented tribes living in the Salton Sea region include the Kumeyayy/Kamia (part of the Salton Sea geographic subregion) and the Cahuilla (Salton Sea geographic subregion and southern Coachella Valley) (Reclamation and IID 2002a).

Kumeyayy/Kamia

South of the Salton Sea was home to the Kamia (a subdivision of the Kumeyaay), a sedentary agricultural people related culturally to the River Yumans (Reclamation and IID 2002a). The Kumeyaay (also known as Ipai and Tipai) are the Yuman-speaking native people of central and southwestern Imperial County, central and southern San Diego County, and the northern Baja Peninsula in Mexico. Spanish missionaries and settlers used the collective term Diegueño for these people, which referred to people living near the presidio and mission of San Diego de Alcalá. Today, these people refer to themselves as Kumeyaay or as Ipai and Tipai, which are northern and southern subgroups of Kumeyaay language speakers, respectively (Luomala 1978). The ancestral lands of the Kumeyaay extend north from Todos Santos Bay near Ensenada, Mexico to Agua Hedionda Lagoon in north San Diego County, and east to the Imperial Valley (ECORP 2022c).

While the Kumeyaay have been depicted as hunter/gatherers in ethnographic documents, some groups practiced agriculture in the Imperial Valley. Most groups had a mountain home base that provided acorns, greens, fruits, and abundant game. Each group operated out of its home base for most of the year. Seasonal campsites were scattered throughout their territory and used as needed, but their central villages were larger and permanently situated (Reclamation and IID 2002a).

Archaeological sites along the ancient shorelines of the Salton Trough are often recognized by a number of distinctive features, such as house rings with associated artifacts, sandstone slab hearths, cremations, artifacts sometimes covered with travertine, abundant obsidian and quartzite lithic debris, shell (abalone, *Olivella*, cardium, limpet, and mussel), fishbone, bird bones, and mammal bones (Reclamation and IID 2002a).

Cahuilla

The northern part of the Salton Sea was home to the Desert Cahuilla who practiced some agriculture. The southern border has been recorded as the San Felipe Creek and also as the Riverside/Imperial County line (Reclamation and IID 2002a).

The Cahuilla spoke a Takic language. The Takic group of languages is part of the Uto-Aztecan language family. The Cahuilla occupied a territory ranging from the San Bernardino Mountains in the north to the Chocolate Mountains and Borrego Springs in the south, and from the Colorado Desert in the east to Palomar Mountain in the west (ECORP 2022c).

Desert Cahuilla society was set up with a dozen or more land-holding clans, each with territory that ranged from desert or valley floor to mountain areas. Each clan included several lineages, each with an independent community area it owned within a larger clan area. Each lineage had ownership rights to various hunting and gathering areas. Hilly, rocky areas, cave sites, or walled cave sites were used for temporary camping, food storage, hunting blinds, and as fasting places for shamans (Reclamation and IID 2002a).

Cahuilla buildings consisted of dome-shaped or rectangular houses, constructed of poles covered with brush and above-ground granaries. Other material culture included baskets, pottery, and grinding implements; stone tools, arrow shaft straighteners and bows; clothing (e.g., loincloths, blankets, rope, sandals, skirts, and diapers); and various ceremonial objects made from mineral, plant, and animal substances (ECORP 2022c).

3.5.2 Adopted 2002 EIR/EIS

Please refer to Section 3.8 of the adopted 2002 Draft EIR/EIS for analyses of the potential effects of the Transfer Project as related to cultural resources.

Known or recorded archaeological resources within the Salton Sea geographic subregion include 83 prehistoric sites, 13 historical sites, and one other element of the historic built environment, a historic railroad grade. The Native American Heritage Commission (NAHC) reported that no sacred lands are present in the Salton Sea geographic subregion (Reclamation and IID 2002a).

The Draft EIR/EIS identifies potential impacts to cultural resources as a result of the Transfer Project. Impact CR-5 addresses reduced inflows to the Salton Sea. Reduced inflow would lower the Sea's level and expose submerged land which could potentially contain archaeological sites that could potentially be vandalized if not protected. Newly exposed land could also potentially be cultivated or developed, thus harming any archaeological sites, if they were not protected. Through the years, the rich sediment load of inflowing wastewaters has deposited silt on the lake bottom, probably covering the inundated archaeological sites with one or more inches of deposited sediment. Any archaeological sites that might be present would be only gradually exposed over a 20-year time period (as reduced inflows gradually result in lowered Sea levels). Such sites would be obscured by the deposited sediment, and would likely be recolonization of freshly exposed surfaces to invading plant life. Impacts would be reduced to less than significant with implementation of Mitigation Measure CR-5. However, if HCP Approach 2 (use of conserved water as mitigation) is implemented, impacts to cultural resources at the Salton Sea would be avoided and mitigation measures would not be necessary) (Reclamation and IID 2002a).

3.5.3 Analysis of Project Changes

ECORP prepared a Cultural Resources Inventory and Evaluations Report for the Proposed Project in July 2022. The cultural resources inventory included a records search, literature review, and field survey. A record search of the California Historical Resources Information System (CHRIS) at the South Coastal Information Center (SCIC) of San Diego State University revealed 12 cultural resource investigations were conducted in or within a 1-mile radius of the Project Area, with 4 of these overlapping the Project Area. Six previously recorded precontact and historic-era cultural resources recorded within 1 mile of the Project Area; however, no cultural resources have been previously identified within the Project Area. A search of the Sacred Lands File (SLF) was completed by the NAHC and resulted in a positive finding, meaning that Native American Sacred Lands have been recorded in the Project Area.

ECORP conducted an intensive pedestrian survey on June 9 and 10, 2022. As a result of the survey, five newly identified historic-period isolated cultural resources and no precontact cultural resources were recorded within the Project Area. BBVP-01-I, a historic-period umbrella tripod base; BBVP-002-I, a historic-period pottery sherd with partial Paden City Pottery maker's mark; BBVP-003-I, a historic-period complete amber glass bottle; BBVP-004-I, a historic-period complete amber beer glass bottle; and BBVP-005-I, a historic-period complete colorless alcohol bottle. The five newly identified historic-period isolated finds are not individually eligible for the California Register of Historical Resources (CRHR) or the National Register of Historic Places (NRHP). The isolated finds do not contribute to any known or suspected historic districts; and are neither considered to be Historic Properties for the purpose of Section 106 NHPA, nor Historical Resources under CEQA.

Due to the presence of alluvium within the Project Area and given the likelihood of precontact archaeological sites located along water sources, there exists the potential for buried precontact archaeological sites in the Project Area. Recommendations for best management practices during construction are incorporated into the project description (see Section 2.5) to avoid impacts on cultural resources. Impacts would be less than significant.

3.5.3.1 Cumulative Impacts

Potentially significant impacts related to cultural resources would occur during construction and would be mitigated to a less than significant level. No significant operational impacts were identified. Accordingly, the Plot Study would not otherwise combine with impacts of related development to add considerably to any cumulative impacts in the region. With mitigation, the Plot Study would not have impacts that are individually limited, but cumulatively considerable. Therefore, the Proposed Project would have a less than cumulatively considerable impact.

3.5.4 Findings Related to Cultural Resources

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to cultural resources, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to cultural resources that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to cultural resources requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to cultural resources identified in and considered by the adopted 2002 EIR/EIS.

3.5.5 Mitigation Measures

Please refer to Section 3.8 of the adopted 2002 EIR/EIS for complete analyses of Project impacts and mitigation measures (Reclamation and IID 2002a).

Mitigation Measure CR-5: Gradual exposure of submerged lands would potentially expose archaeological sites, if they are present. The same mitigation measures listed under Mitigation Measure CR-1 would apply to this impact to provide assurances in the event that if cultural resources are encountered during Project construction or operation, they will be handled appropriately. In addition, a series of archaeological surveys at regular intervals (once every 3 years) will be conducted to check freshly exposed lands for the presence/absence of archaeological sites.

Mitigation Measure CR-1: Construction of conservation measures can occur anywhere within the IID water service area; therefore, pre-Project surveys have not been conducted. The following mitigation measures have been designed to provide assurances in the event that if cultural resources are encountered during Project construction or operation, they will be handled appropriately.

- Archaeological and historical surface surveys to identify any cultural resources that may be affected. Areas that may contain buried archaeological resources also will be identified.

Archaeological Resources

- Modify Project design, when feasible, to avoid impacts to cultural resources, unless a qualified archaeologist conducts a field inspection and determines that the resource has no potential for significance because it is re-deposited, an isolated occurrence, modern, or otherwise lacks data potential.
- Develop and implement a pre-Project Phase II Testing and Evaluation Plan for all unavoidable potentially significant archaeological sites that will be directly impacted to evaluate the significance of the resource in terms of applicable criteria.
- Develop and implement a pre-Project Phase III Data Recovery Plan for all significant archaeological sites that will be directly impacted if the sites cannot be avoided through redesign.
- If impacts to significant resources cannot be reduced to less than significant levels through data recovery or other by other mitigation measures, then the Project will be redesigned to avoid the impact.
- Develop a Cultural Resources Construction Monitoring Plan prior to construction if ground disturbance will occur within any areas of archaeological sensitivity, such as recorded sites and areas that may contain buried archaeological sites.
- In the event of an unanticipated cultural resource discovery during construction, all ground disturbances within 200 feet of the discovery will be halted or re-directed to other areas until the discovery has been documented by a qualified archaeologist and its potential significance evaluated in terms of applicable criteria. Resources considered significant will be avoided or subject to a data recovery program as described above.
- Coordinate with SHPO and local Native American groups, if required, in compliance with applicable state laws.

Architectural Resources

- If avoidance of a potentially significant architectural resource is not feasible, then the resource will be documented on DPR forms and resource significance will be evaluated according to applicable criteria. If significant, then the architectural resource either will be relocated or integrated into construction design. Structural reuse will be consistent with the Secretary's Standards for the

Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (see CEQA Guidelines 1998 Section 15064.5 [b][3] and Section 9.

- If a significant resource is not avoidable or incorporated into construction design, then recordation will be conducted through large-format black-and-white archival photographs, building descriptions, and archival research to establish their regional context. The recordation report will be submitted to a local or regional historic society.

Paleontological Resources

- A literature review and paleontological field survey (as needed) will be conducted as part of site-specific CEQA review to identify potential impacts to rock units that may contain significant fossil remains.
- Modify construction design, when feasible, to avoid impacts to all significant paleontologic resources.
- Construction monitoring by a qualified paleontologist may be recommended for locations within paleontologically sensitive sediments. If so, a Paleontological Monitoring Plan shall be prepared prior to ground disturbance in sensitive areas.
- In the event of an unanticipated discovery during construction, all ground disturbance within 200 feet of the discovery will be halted or re-directed to other areas until the discovery has been recovered by a qualified paleontologist.
- All paleontological resources recovered will be appropriately described, processed, and curated in a scientific institution such as a museum or university.

3.6 Energy

A complete discussion of the energy impacts of the Transfer Project as originally proposed is included in Section 3.7 and 5.6 of the Draft EIR/EIS and Section 4, Errata of the Final EIR/EIS. As discussed below, the changes to the Project would result in no new impacts or a substantial increase in the severity of the impacts to energy as identified in the EIR/EIS. The overall impacts to energy would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below.

3.6.1 Existing Environmental Setting

Energy relates directly to environmental quality. Energy use can adversely affect air quality and other natural resources. The vast majority of California’s air pollution is caused by burning fossil fuels. Consumption of fossil fuels is linked to changes in global climate and depletion of stratospheric ozone. Transportation energy use is related to the fuel efficiency of cars, trucks, and public transportation; choice of different travel modes (auto, carpool, and public transit); vehicle speeds; and miles traveled by these modes. Construction and routine operation and maintenance of transportation infrastructure also consume energy. In addition, residential, commercial, and industrial land uses consume energy, typically through the usage of natural gas and electricity. This analysis focuses on the one source of energy that is relevant to the Proposed Project: the equipment fuel necessary for Project construction.

California relies on a regional power system comprised of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. Natural gas provides California with a majority of its electricity, closely followed by renewables, large hydroelectric and nuclear (California Energy Commission 2021). IID provides electric power to more than 150,000 customers in Imperial County and parts of Riverside and San Diego counties. IID Energy controls more than 1,100 megawatts of energy derived from a diverse resource portfolio that includes its own generation, and long- and short-term power purchases. IID produces 30 percent of its power supply locally, using efficient, low-cost hydroelectric facilities and steam generation facilities, as well as several natural gas turbines (Imperial County 2021a).

3.6.2 Adopted 2002 EIR/EIS

Certain aspects of the Transfer Project would result in the irretrievable commitment of resources, such as the construction associated with the water conservation program because construction activities would consume fossil fuels, which are finite sources of energy that cannot be regenerated (Reclamation and IID 2002a).

Electrical services for the construction effort would be provided by portable generators or by self-powered construction equipment; therefore, demand on existing electricity sources would be minimal (Reclamation and IID 2002a).

3.6.3 Analysis of Project Changes

The Plot Study would involve fuel (gasoline) consumption associated with operation of onsite mobile construction equipment and worker trips to the job site. Solar pumps would be used for the new wells. The Plot Study would not utilize electricity or natural gas. Fuel (gasoline) consumption would be minimal compared to the total combined fuel usage in Imperial County. Project implementation would have a nominal effect on local and regional energy supplies. Therefore, impacts would be less than significant.

3.6.3.1 Cumulative Impacts

No cumulative impacts relating to Energy are expected to occur as a result of the Proposed Project.

3.6.4 Findings Related to Energy

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to energy, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to energy that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to energy requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to energy identified in and considered by the adopted 2002 EIR/EIS.

3.6.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Based on the proposed modifications, the 2002 EIR/EIS was reviewed to determine whether or not changes to the Project would affect the mitigation measures contained therein. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with energy.

3.7 Geology and Soils

A complete discussion of the geology and soils impacts of the Transfer Project as originally proposed is included in Section 3.3 of the Draft EIR/EIS. As discussed below, the changes to the Transfer Project would result in no new impacts or substantial changes to the severity of the impacts to geology and soils identified in the EIR/EIS. The overall impacts to geology and soils would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below along with impacts from implementation of the Plot Study.

3.7.1 Existing Environmental Setting

3.7.1.1 Geomorphic Setting

Imperial County is underlain by three natural geomorphic provinces: the Peninsular Ranges, the Colorado Desert, and the Mojave Desert. Each of these provinces is a naturally defined geologic region that displays a distinct landscape or landform with defining features based on geology, faults, topographic relief, and climate (Imperial County 2016).

The Salton Sea is in the northern portion of the Salton Trough, a large, sediment-filled topographical depression and seismically active valley. Topographically, the Salton Trough is a broad, flat alluviated valley with an area of about 6,000 square miles. The entire valley lies below 500 feet above sea level, except for its rise into San Gorgonio Pass. More than 3,000 of its 6,000 square miles are below sea level (from the City of Indio to below the International Boundary). The Salton Trough is filled with approximately 21,000 feet of Cenozoic sediments derived predominantly from the Colorado River, which emptied into the Gulf of California during the Cenozoic period. The sediments formed a delta that spread and eventually separated the Salton Basin Region from the Gulf of California (Reclamation and IID 2002a).

3.7.1.2 Soils

Soils in Imperial County are formed by stratified alluvial deposits. A large portion of the County includes fine-textured lakebed sediments. Approximately 28 known soil types occur in Imperial County: Aco, Antho, Carrizo, Carsitas, Chuckwalla, Cibola, Coachella, Fluvaquents, Gadsden, Gilman, Glenbar, Holtville, Imperial, Indio, Kofa, Lagunita, Laposa, Laveen, Mecca, Meloland, Niland, Orita, Ripley, Rositas, Salorthids, Superstition, Torriorthents, and Vint. Parent material includes Glenbar, Holtville, and Imperial soils. Indio, Vint, Meloland, and Rositas soils are derived from windblown and channel silts. Rositas and Carsitas soils were formed in beach deposits. Sand and gravelly fan materials are the parent materials of Carsitas and Rositas soils (Imperial County 2016).

The clay material deposited in riverine environments during the formation of the Colorado River delta terrace is the source of the Holtville and Imperial soils. Niland soils occur in clayey lakebed. Several large gullies have formed from runoff water leading into the Salton Sea. The Antho, Laveen, Niland, and Superstition soils were formed from fan sediment. Fine-textured basin deposits provide the source material for Glenbar, Holtville, and Imperial soils (Imperial County 2016).

Soils within the Project Area have not been mapped by the U.S. Department of Agriculture NRCS because this area was inundated by the Salton Sea until very recently (NRCS 2022).

3.7.1.3 Regional Seismicity

Imperial County contains several major active faults, including the Brawley Fault Zone, the Coyote Creek Fault and the Elmore Ranch Fault (in the San Jacinto Fault Zone), the Elsinore Fault, the Imperial Fault, the Laguna Salada Fault (in the Elsinore Fault Zone), the San Andreas Fault, the Superstition Hills Fault, and the Wienert Fault (in the San Jacinto Fault Zone) (Imperial County 2016).

The San Jacinto-Coyote Creek and Elsinore-Laguna Salada fault zones form the western boundary of the Salton Trough. Branches of the San Andreas fault zone form the eastern boundary. The Salton Trough is characterized by northwest/southeast-trending transform fault zones with several crustal rift areas between them. The Salton Trough is the northern extension of the Gulf of California rift zone (Reclamation and IID 2002a).

The Project Area lies within the San Andreas Fault zone with the San Andreas Fault running southeast through the neighboring Bombay Beach community and into the western boundary of the Project Area (California Geological Survey [CGS] 2022).

3.7.1.4 Paleontological Resources

A paleontological records search was conducted of the University of California Museum of Paleontology (UCMP) online database (UCMP 2022) for the Project Area. There are no records in the plot study location.

3.7.2 Adopted 2002 EIR/EIS

The Adopted 2002 Draft EIR/EIS analyzed impacts to geology and soils based on the proximity of active faults, frequency and types of seismic events, existing ground acceleration data and models, and the type of existing soils. The Transfer Project's susceptibility and/or contribution to geotechnical hazards were described in terms of their potential impact on the public or geological resources. Implementation of the Transfer Project in the Salton Sea area would result in Impact GS-8, potential for increased soil erosion along exposed playa of Salton Sea. During operation of the Transfer Project, there might be an increased potential for impact from soil erosion in the Salton Sea area. Implementation of the Transfer Project would result in a decrease in the elevation of the Salton Sea, exposing up to 50,000 acres (over the life of the project) of previously inundated area (compared to the Baseline condition). The newly exposed shoreline could be subject to wind and water erosion. However, the high salt content of the Salton Sea and the soils underlying the Sea cause a crust to form on the soils as they dry, which minimizes both wind and soil erosion. Impact GS-8 is considered less than significant and no mitigation is required.

Impacts to paleontological resources is addressed in Section 3.5 (Cultural Resources) of this report and would be mitigated with Mitigation Measure CR-1 per the 2002 EIR/EIS.

3.7.3 Analysis of Project Changes

No habitable structures would be constructed in the Project Area and the Project would be completed completely within IID property. Therefore, there would be no substantial adverse effects, including the risk of loss, injury, or death involving due to rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, and landslides.

Ground disturbing activities such as access improvements and construction of furrows for vegetation would not be performed during rain events. Therefore, the Project would not be expected to increase soil erosion. An NPDES Permit for Stormwater Discharges from Construction Activities will be obtained for the Plot Study. Implementation of a Storm Water Pollution Prevention Plan (SWPPP) will be required through this process which would ensure that storm water runoff from the Project Area would not result in soil erosion. In addition, the goal of the Plot Study would be to reduce wind erosion of the Project Area. Therefore, impacts such as soil erosion or the loss of topsoil would be less than significant. Recommendations for best management practices during construction are incorporated into the project description (see Section 2.5) to avoid impacts on paleontological resources.

3.7.3.1 Cumulative Impacts

No cumulative impacts relating to geology and soils are expected to occur as a result of the Proposed Project.

3.7.4 Findings Related to Geology and Soils

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002

EIR/EIS. The Proposed Project will not result in new significant environmental impacts to geology and soils, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to geology and soils that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to geology and soils requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to geology and soils identified in and considered by the adopted 2002 EIR/EIS.

3.7.5 Mitigation Measures

See Mitigation Measure CR-1 in Section 3.5 Cultural Resources for measures applicable to paleontological resources.

3.8 Greenhouse Gas Emissions

The environmental setting for the Project Area is discussed below. Greenhouse gas emissions are discussed and evaluated for implementation of the Plot Study in a report contained in Appendix B and summarized below.

3.8.1 Existing Environmental Setting

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. Because the earth has a much lower temperature than the sun, it emits lower-frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead trapped, resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, the earth would not be able to support life as we know it.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Fluorinated gases also make up a small fraction of the GHGs that contribute to climate change. Fluorinated gases include chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride; however, it is noted that these gases are not associated with typical land use development. Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. 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 GHG concentrations and other anthropogenic factors together (Intergovernmental Panel on Climate Change [IPCC] 2014).

Table 3.8-1 describes the primary GHGs attributed to global climate change, including their physical properties, primary sources, and contributions to the greenhouse effect.

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH_4 traps over 25 times more heat per molecule than CO_2, and N_2O absorbs 298 times more heat per molecule than CO_2 (IPCC 2014). Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e), which weight each gas by its global warming potential. Expressing GHG emissions in CO_2e takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, or other forms. Of the total annual human-caused CO_2 emissions, approximately 55 percent is sequestered through ocean and land uptakes every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO_2 emissions remains stored in the atmosphere (IPCC 2013).

Table 3.8-1. Greenhouse Gases

Greenhouse Gas	Description
CO_2	$CO_2$is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere.
CH_4	CH_4 is a colorless, odorless gas and is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural

Table 3.8-1. Greenhouse Gases

Greenhouse Gas	Description
	sources. Human-related sources include fossil fuel production, animal husbandry (intestinal fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of CH_4 to the atmosphere. Natural sources of CH_4 include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. The atmospheric lifetime of CH_4 is about12 years.
N_2O	N_2O is a clear, colorless gas with a slightly sweet odor. Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years.

Sources: USEPA 2016a, 2016b, 2016c

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; it is sufficient to say the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature or to global, local, or microclimates. From the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

3.8.1.1 Sources of Greenhouse Gas Emissions

In 2020, CARB released the 2020 edition of the California GHG inventory covering calendar year 2018 emissions. In 2018, California emitted 425.3 million gross metric tons of CO_2e including from imported electricity. Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2018, accounting for approximately 30 percent of total GHG emissions in the state. This sector was followed by the industrial sector (21 percent) and the electric power sector including both in-state and out-of-state sources (15 percent) (CARB 2020). Emissions of CO_2 are byproducts of fossil fuel combustion. CH_4, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management. Carbon dioxide sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution (CO_2 dissolving into the water), respectively, two of the most common processes for removing CO_2 from the atmosphere.

3.8.2 Regulatory Framework

3.8.2.1 Executive Order S-3-05

Executive Order (EO) S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the EO established total GHG emission targets for the state. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

3.8.2.2 Assembly Bill 32 Climate Change Scoping Plan and Updates

In 2006, the California legislature passed AB 32 (Health and Safety Code Section 38500 et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 requires CARB to design and implement feasible and cost-effective emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions). Pursuant to AB 32, CARB adopted a Scoping Plan in December 2008, which outlines measures to meet the 2020 GHG reduction goals. California is on track to meet or exceed the target of reducing GHG emissions to 1990 levels by the end of 2020.

The Scoping Plan is required by AB 32 to be updated at least every five years. The latest update, the 2017 Scoping Plan Update, addresses the 2030 target established by Senate Bill (SB) 32 as discussed below and establishes a proposed framework of action for California to meet a 40 percent reduction in GHG emissions by 2030 compared to 1990 levels. The key programs that the Scoping Plan Update builds on include increasing the use of renewable energy in the state, the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, and reduction of methane emissions from agricultural and other wastes.

3.8.2.3 Senate Bill 32 and Assembly Bill 197 of 2016

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the state's continuing efforts to pursue the long-term target expressed in EOs S-3-05 and B-30-15 of 80 percent below 1990 emissions levels by 2050.

3.8.2.4 Senate Bill 100 of 2018

In 2018, SB 100 was signed by Governor Brown, codifying a goal of 60-percent renewable procurement by 2030 and 100 percent by 2045 Renewables Portfolio Standard.

3.8.3 Adopted 2002 EIR/EIS

The 2002 EIR/EIS does not evaluate impacts to GHGs as the need to analyze GHG emissions was not a required part of the CEQA process at the time. Senate Bill 97, enacted in 2007, amended the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directed OPR to develop draft CEQA Guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions" by July 1, 2009, and directed the Resources Agency to certify and adopt the CEQA Guidelines by January 1, 2010. The final draft of the Transfer Project was published prior to the provision requiring GHG emissions analysis.

3.8.4 Analysis of Project Changes

3.8.4.1 Thresholds of Significance

The impact analysis provided below is based on the following CEQA Guidelines Appendix G thresholds of significance. The Project would result in a significant impact to GHG emissions if it would:

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

The Appendix G thresholds for GHGs do not prescribe specific methodologies for performing an assessment, do not establish specific thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA. With respect to GHG emissions, the CEQA Guidelines Section 15064.4(a) states that lead agencies "shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions resulting from a project. The CEQA Guidelines note that an agency has the discretion to either quantify a project's GHG emissions or rely on a "qualitative analysis or other performance-based standards." (14 California Code of Regulations [CCR] 15064.4(b)). A lead agency may use a "model or methodology" to estimate GHG emissions and has the discretion to select the model or methodology it considers "most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change." (14 CCR 15064.4(c)). Section 15064.4(b) provides that the lead agency should consider the following when determining the significance of impacts from GHG emissions on the environment:

1. The extent a project may increase or reduce GHG emissions as compared to the existing environmental setting.
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
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 GHG emissions (14 CCR 15064.4(b)).

In addition, Section 15064.7(c) of the CEQA Guidelines specifies that "[w]hen adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence" (14 CCR 15064.7(c)). The CEQA Guidelines also clarify that the effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis (see CEQA Guidelines Section 15130(f)). As a note, the CEQA Guidelines were amended in response to SB 97. In particular, the CEQA Guidelines were amended to specify that compliance with a GHG emissions reduction plan renders a cumulative impact insignificant.

Per CEQA Guidelines Section 15064(h)(3), a project's incremental contribution to a cumulative impact can be found not cumulatively considerable if the project would comply with an approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the cumulative problem within the geographic area of the project. To qualify, such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency. Examples of such programs include a "water quality control plan, air quality attainment or maintenance plan, integrated waste management plan, habitat conservation plan, natural community conservation plans [and] plans or regulations for the reduction of greenhouse gas emissions." Put another way, CEQA Guidelines Section 15064(h)(3) allows a lead agency to make a finding of less than significant for GHG emissions if a project complies with adopted programs, plans, policies, or other regulatory strategies to reduce GHG emissions.

The significance of the Project's GHG emissions is evaluated consistent with CEQA Guidelines Section 15064.4(b)(2) by considering whether the Project complies with applicable plans, policies, regulations and requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. The ICAPCD has not adopted a GHG significance threshold yet recommends the 100,000-metric ton of CO_2e threshold established by the Mojave Desert Air Quality Management District (MDAQMD). As previously described, Section 15064.7(c) of the CEQA Guidelines specifies that "[w]hen adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence"(14 CCR 15064.7(c)). This ICAPCD-recommended threshold is appropriate as the MDAQMD GHG thresholds were formulated based on similar geography and climate patterns as found in Imperial County. Therefore, the 100,000-metric ton of CO2e threshold is appropriate for this analysis.

In *Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal. 4th 2014, 213, 221, 227, following its review of various potential GHG thresholds proposed in an academic study [Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203], the California Supreme Court identified the use of numeric bright-line thresholds as a potential pathway for compliance with CEQA GHG requirements. The study found numeric bright line thresholds designed to determine when small projects were so small as to not cause a cumulatively considerable impact on global climate change was consistent with CEQA. Specifically, PRC section 21003(f) provides it is a policy of the state that "[a]ll persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment." The Supreme Court-reviewed study noted, "[s]ubjecting the smallest projects to the full panoply of CEQA requirements, even though the public benefit would be minimal, would not be consistent with implementing the statute in the most efficient, expeditious manner. Nor would it be consistent with applying lead agencies' scarce resources toward mitigating actual significant climate change impacts." (Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203, 221, 227.)

3.8.4.2 Methodology

Where GHG emission quantification was required, emissions were modeled using CalEEMod, version 2020.4.0. CalEEMod is a statewide land use emissions computer model designed to quantify potential GHG emissions associated with both construction and operations from a variety of land use projects. Project GHG emissions were calculated using a combination of model defaults for Imperial County. The duration of Project construction and the specific construction equipment that would be employed are derived from the Project's Dust Control Plan for the Proposed Project (Formation 2022a). The operational phase of this Project would be limited to maintenance and monitoring, which would pose a negligible impact associated with GHG emissions and therefore is addressed qualitatively.

3.8.4.3 Impact Analysis

Generation of GHG Emissions

Project Construction

Construction-related activities that would generate GHG emissions include worker commute trips, haul trucks carrying supplies and materials to and from the Project Area, and off-road construction equipment (e.g., dozers, loaders, excavators). Table 3.8-2 illustrates the specific construction generated GHG emissions that would result from construction of the Project. Once construction is complete, the generation of these GHG emissions would cease.

Table 3.8-2. Construction-Related Greenhouse Gas Emissions

Emissions by Phase	CO_2e (Metric Tons/ Year)
Vegetation Management (Year 1)	1,041
Well and Irrigation Installation (Year 1)	216
Total	**1,257**
Significance Threshold	100,000
Exceed Significance Threshold?	**No**

Source: CalEEMod version 2020.4.0. Refer to Appendix B for Model Data Outputs.

As shown in Table 3.8-2, Project would result in the total generation of approximately 1,257 metric tons of CO_2e in the construction phase. Once complete, the generation of these GHG emissions would cease. Therefore, Project GHG emissions would not exceed the significance threshold.

Operations

Operations of the Project, which include the maintenance and monitoring of the irrigation system, would result in negligible amounts of long-term GHG emissions. Operational emissions impacts are long-term impacts that are associated with any changes in the permanent use of the Project Area by sources that substantially increase emissions. Once construction is complete, no regular additional daily vehicle trips or personnel would be added to operate or maintain the Project Area. No major diesel-powered equipment would be required as part of ongoing Project operations. The operations of the Project focus on maintenance and monitoring of the irrigation system. Thus, the Proposed Project would not include the provision of major sources of GHG emissions and implementation of the Project would result in negligible long-term operational GHG emissions.

The Project would not conflict with any adopted plans, policies, or regulations adopted for the purpose of reducing GHG emissions. The Proposed Project is subject to compliance with SB 32. As discussed previously, the Proposed Project-generated GHG emissions would not surpass either the ICAPCD-recommended GHG significance threshold, which was prepared with the purpose of complying with statewide GHG-reduction efforts.

3.8.4.4 Cumulative Impacts

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; it is sufficient to say the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature or to global, local, or microclimates. From the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

3.8.5 Findings Related to Greenhouse Gas Emissions

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to GHG emissions, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to GHG emissions that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to GHG emissions requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to GHG emissions identified in and considered by the adopted 2002 EIR/EIS.

3.8.6 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as the analysis of GHG was not included. Given the analysis and information provided above, the Proposed Project would not result in significant impacts related to GHG emissions. Therefore, no mitigation measures are required for impacts associated with GHG emissions.

3.9 Hazards and Hazardous Materials

The environmental setting for the Project Area is discussed below along with impacts from implementation of the Plot Study.

3.9.1 Existing Environmental Setting

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined by the California Health and Safety Code, Section 25501 as follows:

> “Hazardous material” means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

A hazardous material is defined in 22 CCR Section 662601.10 as follows:

> A substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, or disposed of or otherwise managed.

Transporters of hazardous waste in California are subject to several federal and state regulations. They must register with the California Department of Health Services (DHS) and ensure that vehicle and waste container operators have been trained in the proper handling of hazardous waste. Vehicles used for the transportation of hazardous waste must pass an annual inspection by the California Highway Patrol (CHP). Transporters must allow the CHP or DHS to inspect its vehicles and must make certain required inspection records available to both agencies. The transport of hazardous materials that are not wastes is regulated by the U.S. Department of Transportation through national safety standards.

Under Government Code Section 65962.5, both the Department of Toxic Substances Control (DTSC) and the SWRCB are required to maintain lists of sites known to have hazardous substances present in the environment. Both agencies maintain up-to-date lists on their websites.

3.9.2 Adopted 2002 EIR/EIS

No hazardous and hazardous materials section is included in the 2002 EIR/EIS because the Lead Agencies concluded that there are no potential impacts associated with hazards and hazardous materials that could result from implementation of the Transfer Project.

3.9.3 Analysis of Project Changes

3.9.3.1 Groundwater Resources Impact Assessment

The Groundwater Resources Impact Assessment (GRIA) report prepared for the Plot Study, shows Project Area relative to reported nearby contamination sites (Appendix D; Formation 2022b). Two sites have reported gasoline releases and five sites have the primary contaminant of concern listed as "explosives". These sites are located more than 0.5 mile from the proposed well sites. Thus, if any residual contamination exists at these sites, it is not expected to be affected by gradient changes that would interfere with required discharge requirements or cleanups. Furthermore, the Ski Inn gasoline leaking underground storage tanks release site, which is the nearest release location from the Plot Project (approximately 0.5 mile), was closed in 1992. The Hot Spa Waste Management facility is located approximately 5 miles to the north of the Plot Project Area, and simulated drawdown effects were not predicted in this area, thus, there are no predicted gradient changes in this area. The landfill has not been operated since 2018 and site reclamation was completed in 2020. Based on this information, pumping the proposed wells is not likely to interfere with ongoing cleanup or other water quality regulatory efforts, or to result in migration of contamination.

3.9.3.2 Hazard to the Public or Environment

Drilling of the new wells and use of mobile construction equipment for access improvements and creation of furrows for vegetation would require the routine use of oils, lubricants, and fuels. However, the use and management of these materials will be conducted following typical best management practices. In addition, no hazardous materials would be utilized as a diluent for drilling of the new wells. Therefore, the Project would have a less than significant impact on hazards associated with hazardous material use

The Project Area is not located within an airport land use plan or within two miles of an airport. The nearest airport, Desert Air Sky Ranch-63Ca, is located approximately 12.4 miles northwest of the Project Area.

Cortese List

Government Code Section 65962.5 requires the DTSC, the State Department of Health Services, the SWRCB, and the California Integrated Waste Management Board to compile and annually update lists of hazardous waste sites and land designated as hazardous waste property throughout the State.

The California Environmental Protection Agency (CalEPA) Cortese List Data Resources records were reviewed to help determine whether hazardous materials have been handled, stored, or generated in the Project Area or the adjacent properties and businesses (CalEPA 2022). The list, although mostly covering the requirements of Section 65962.5, has always been incomplete because it does not indicate if a specific site was at one time included in the abandoned site program.

The list is a compilation of five separate websites that includes:

1. DTSC's EnviroStor – identifies waste or hazardous substances sites.
2. SWRCB's GeoTracker – identifies underground storage tanks for which an unauthorized release report was filed, cleanup sites, and all solid waste disposal facilities from which there is a mitigation of hazardous waste for which a regional board has notified DTSC.
3. A pdf of solid waste disposal sites identified by the SWRCB with waste constituents above hazardous waste levels outside the waste management unit.
4. A list of cease-and-desist orders and clean up and abatement orders.
5. A list of hazardous waste facilities subject to corrective action.

DTSC's EnviroStor indicated that that Project Area was not identified as a hazardous waste or substances site. The nearest site, Salton Sea Bomb Target (FBT17) (#58), is located within the Salton Sea approximately 2.45 miles southwest of the Project Area.

- Salton Sea Bomb Target (FBT17) (#58)
  - Site Type: Military Evaluation
  - Past Use(s): Firing Range – Artillery, Firing Range – Small Arms
  - Potential Contaminants of Concern: Explosives (UXO, MEC)
  - Potential Media Affected: Soil, Surface Water Affected
  - Status: Inactive – Action Required as of 8/15/2018

Additionally, searches of SWRCB GeoTracker revealed a leaking underground storage tank (LUST) Cleanup Site within 0.5 mile of the Project Area.

- Ski Inn
  - Location: 9596 Avenue A, Bombay Beach, CA 92257
  - Site Type: LUST Cleanup Site
  - Potential Contaminants of Concern: Gasoline
  - Potential Media Affected: Soil
  - Status: Completed – Case Closed as of 9/14/1992

A list of solid waste disposal sites with waste constitutes above hazardous waste levels outside the waste management unit was also checked. No records in or near the Project Area were listed (CalEPA 2022).

The list of active cease-and-desist orders (CDO) and clean up and abatement orders (CAO) from the Water Board was checked. No records in the Project Area were listed (CalEPA 2022).

The list of hazardous facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code does not include the Project Area location (CalEPA 2022).

As the Proposed Project is not listed on one of the five websites provided to fulfill the Cortese List, the Proposed Project would not create a significant hazard to the public or the environment. There are no hazardous waste facilities and sites with known contamination, or sites where there may be reasons to investigate further located in the Project Area. There would be no impact.

3.9.3.3 Emergency Response/Evacuation Plan

The site is located away from populated areas and not in an area identified in an emergency evacuation plan. Plot study activities would not impair the implementation of, or physically interfere with, any adopted emergency response plan or emergency evacuation plan.

3.9.3.4 Cumulative Impacts

No cumulative impacts relating to hazards and hazardous materials are expected to occur as a result of the Proposed Project.

3.9.4 Findings Related to Hazards and Hazardous Materials

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to hazards and hazardous materials, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to hazards and hazardous materials that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to hazards and hazardous materials requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to hazards and hazardous materials identified in and considered by the adopted 2002 EIR/EIS.

3.9.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Based on the proposed modifications, the 2002 EIR/EIS was reviewed to determine whether or not changes to the project would affect the mitigation measures contained therein. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with hazards and hazardous materials.

3.10 Hydrology and Water Quality

A complete discussion of the hydrology and water quality impacts of the Transfer Project as originally proposed is included in Section 3.1 of the Draft EIR/EIS and Section 4, Errata of the Final EIR/EIS. As discussed below, the changes to the Transfer Project would result in no new impacts or substantial increase in the severity of the impacts to hydrology and water quality identified in the EIR/EIS. The overall impacts to hydrology and water quality would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below. Impacts on groundwater from implementation of the Plot Study are discussed in the GRIA prepared by Formation summarized below (Formation 2022b). Other impacts on hydrology and water quality are also discussed below.

3.10.1 Existing Environmental Setting

3.10.1.1 Salton Sea

The Salton Sea is a terminal lake with no surface water discharges. The main natural tributaries to the Salton Sea are the Whitewater River, which flows into the north end of the Sea, and the Alamo and New Rivers, which flow into the Sea from the south. A large component of inflow originates as agricultural and municipal drainage. Other components of inflow include precipitation and groundwater discharge. Inflows are generally higher in the spring and lower in the fall and winter (Reclamation and IID 2002a).

Agriculture drainage flowing into the Sea comes into contact with various agricultural chemicals and fertilizers, as well as the native mineral and organic substances contained in soils. Municipal wastewater, depending on the degree of treatment it receives, contains varying amounts of dissolved and suspended organic material, nutrients, metals, hydrocarbons, and other compounds that originate from domestic, industrial, and urban runoff sources. The water also carries with it sediment derived from soil erosion (Reclamation and IID 2002a).

The concentration of chemicals in the Salton Sea depends on both external loads and internal processes, such as sediment resuspension and chemical cycling. Dissolved or suspended constituents in inflows to the Sea constitute an external pollutant loading. The constituents most likely to be associated with impacts to beneficial uses of the Salton Sea include salinity, selenium, boron, nitrogen, and phosphorus (Reclamation and IID 2002a).

Salt loads and loads of other constituents entering the Salton Sea tend to accumulate in the Sea by virtue of lack of an outlet. Salinity of the Sea will continue to increase as long as dissolved salt loadings continue to be concentrated by evaporation. The proportions of major salt constituents in the inflows to the Sea vary by source. Sodium and chloride are the principal constituents of inflow from the New River, while sodium and sulfate are the principal constituents of Whitewater and Alamo River inflows (Reclamation and IID 2002a).

3.10.1.2 Site Hydrology and Groundwater

The Project Area is located in the East Salton Sea Groundwater Basin, which is bounded by rocks of the Chocolate Mountains on the north and east, by the San Andreas Fault on the south and west, and by the Sand Hills Fault on the south. The Easton Salton Sea Groundwater Basin is drained by Mammoth Wash and Iris Wash in the eastern portion and by Ken Wash and Pacific Wash in the western portion. Ken and Pacific Washes drain into the Bombay Beach wetland, east of the Plot Project Area, which drains directly into the Salton Sea. A relatively impermeable clay layer associated with deposits from ancient Lake Cahuillla is present in the shallow subsurface beneath these washes, keeping discharge from seeping into the subsurface and maintaining the flow in these washes. These washes converge at the Bombay Beach wetland, located approximately 1 mile east of the proposed test wells and is maintained by their flow (Formation 2022b).

Groundwater resources in the East Salton Sea Groundwater Basin are very sparsely developed. No evidence of current groundwater use has been observed or reported in the area within about 5 miles of the Plot Project Area (Formation 2022b).

3.10.1.3 Groundwater Quality

The groundwater quality in the basin is reported as not being suitable for domestic, municipal, or agricultural purposes (Formation 2022b).

3.10.2 Adopted 2002 EIR/EIS

Please refer to Section 3.1 of the adopted 2002 Draft EIR/EIS for analyses of the potential effects of the Transfer Project as related to Hydrology and Water Quality.

Impact WQ-11 addresses a potential change in COC concentrations of Salton Sea water column. The ecosystem of the Salton Sea effectively removes selenium from the water column to concentrations of 1 µg/L or less and it is unlikely that the Transfer Project would result in an increase in selenium concentrations in the Sea to levels equal to or greater than the 5.0-µg/L level stipulated in the significance criteria (Reclamation and IID 2002a).

Impact WQ-12 addresses a potential change in pesticide/herbicide deposition in Salton Sea sediments. Qualitative assumptions indicate that concentrations of herbicides and pesticides in sediment in the Salton Sea are expected to decrease under the Transfer Project. A reduction in herbicide and pesticide concentrations in sediment is expected because the mass input of TSS to the Sea is expected to decrease relative to the Baseline, along with the total inflow of water. As a result, impacts to sediment quality from the Transfer Project would be less than significant (Reclamation and IID 2002a).

Under the Transfer Project, up to 300 KAFY would be transferred by IID to SDCWA. The conveyance and distribution of water from MWD's facilities to the SDCWA service area would not change as a result of implementing the Transfer Project. No new facilities, operations, or maintenance practices would be required in the SDCWA service area or by member utilities to receive or deliver the water transferred from IID (Reclamation and IID 2002a).

3.10.3 Analysis of Project Changes

The Proposed Project will include groundwater supply development, establishment of new vegetation, maintenance of existing vegetation, stormwater retention and spreading features (bunds), and waterless DCMs. Specifically, the study will gather data to inform water supply development and planning for expanded future vegetation-based dust control on the east side of the Salton Sea. Test wells will be developed, tested, and if feasible, operated as supply wells; new vegetation will be established in hedgerows, irrigated, and monitored; and existing vegetation will be monitored and irrigated as needed to maintain plant vigor and prevent loss of existing vegetation cover.

3.10.3.1 Groundwater Dependent Ecosystems

Potential groundwater dependent ecosystems (GDEs) near the Project Area were identified using the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset developed for the California Department of Water Resources (DWR) by The Nature Conservancy (TNC) in cooperation with CDFW and downloaded from the GDE Pulse website (TNC 2022). These potential GDEs are shown in the GRIA (Formation 2022b). The mapped GDEs include the Bombay Beach wetland, aquatic and emergent wetland vegetation along Pacific and Ken Washes, and several areas of mapped alkali shrub wetland located north of the Salton Sea 2002 shoreline berm and near the Hot Mineral Spa and Frink areas. Additionally, recent vegetation mapping conducted by Formation in December 2021, identified local occurrences of ALOC and SUNI, which are classified as obligate phreatophyte species, at elevations below -201 feet above mean sea level (amsl) in the vicinity of the Project Area. Other potentially groundwater-dependent vegetation, including ATCA and ATLE, were also found below this elevation. Finally, tamarisk, a highly invasive phreatophyte species that utilizes large quantities of groundwater, are evident along Ken and Pacific Wash and in the upslope portions of the Bombay Beach wetland (Formation 2022b).

Field observations indicate that in some of the areas, these species may be dependent on the regional shallow groundwater table. The depth to the regional groundwater table increases with distance from the Salton Sea, which may explain the observed general limitation of these species below certain elevations. Near the Bombay Beach wetland and the perennial washes, perched water appears to occur perennially, whereas, further to the east and west, perching of shallow groundwater appears to occur only after significant precipitation events. Phreatophyte vegetation dependent on perched groundwater would not be expected to be affected by decreases of shallow groundwater levels. In the Durmid Hill area located north and northwest of the community of Bombay Beach, the depth to groundwater is inferred to be greater than 20 feet bgs and there are no continuous clay layers that perch water. Thus, no GDEs are expected to occur in this area (Formation 2022b).

Groundwater Extraction

Groundwater extraction will occur from three wells using solar-powered pumps, and irrigation water will only be applied during daylight hours; however, the pumping rates summarized in Table 3.10-1, below are presented as daily and long-term annual average rates. During vegetation establishment, it is assumed for this analysis that the average daily extraction over a 24-hour period from each of the shallow groundwater wells will be 3.75 gallons per minute (gpm) per well (Table 3.10-1), which is equivalent to pumping at 10 gpm for nine hours (maximum instantaneous pumping rate during daylight hours). It is assumed that the long-term average annual rate will be 18 AFY per well (Formation 2022b).

Table 3.10-1. Average Annual Water Demand and Groundwater Supply

Water Balance Component	Average Annual Water Demand and Supply		
	gallons/day	**AFY**	**gpm**
Irrigation Water Demand - ALOC (60 acres, assume up to 20% cover)			
Year 1 (1.8 feet/year for planted area, including soil reclamation (salt flushing) and establishment of seedlings)	11,120	12.5	7.7
Years 2 through 4 (1.8 feet/year to establish juvenile plants in planted areas)	11,120	12.5	7.7
Long Term (10 inches/year for planted area)	5,148	5.8	3.6
Groundwater Supply to Meet Irrigation Water Demand			
Shallow Zone Groundwater Pumping Capacity (assumes pumping for 24 hrs/day)	16,200 (5,400 per well)	18 (6 per well)	11.25 (3.75 per well)

Source: Formation 2022b
Note: Surplus groundwater would be used to irrigate existing vegetation in the Project Area and surrounding IID-owned land within the area potentially affected by project drawdown, and potentially to supply future vegetation-based dust control measures.

To evaluate impacts of the water demand associated with implementation of the Plot Study on groundwater, the potential drawdown of the groundwater was simulated over a 20-year period using a modeling approach with AnAqSim modeling code (Fitts Geosolutions 2020), a three-dimensional (multi-layer) analytical element modeling code capable of simulating groundwater flow to wells under confined, unconfined, or semiconfined aquifer conditions. The methods and results of the groundwater modeling performed for the Plot Study are presented in the GRIA report contained in (Formation 2022b).

Based upon a soil boring performed for the Plot Study and well logs from wells in the region, the following groundwater layers were evaluated in the model (Formation 2022b):

- Layer 1 represents a relatively thin (15 feet) unconfined upper groundwater zone occurring from approximately 5 to 20 feet bgs, comprised of sandy sediments. This layer has poor water quality and is in potential communication with GDEs.
- Layer 2 extends from approximately 20 to 40 feet bgs; although, this unit is represented as a continuous 10-foot-thick clay unit, because of the interbedded nature of the silts and sands in this zone. This layer represents the confining unit separating the upper and lower groundwater zones.

- Layer 3 represents the production aquifer extending from approximately 30 to 100 feet bgs. This 60-foot-thick layer is confined to semi-confined and is comprised of interbedded fine sand, silty sand, clayey sand, and clay. The water quality improves considerably in Layer 3, as compared to Layer 1.

The following additional assumptions are incorporated into the model:

- The pumped layer is homogeneous. This is a common simplifying assumption.
- The layers are uniform in thickness. This is a common simplifying assumption.
- The groundwater surface is flat in all layers. This is a common simplifying assumption used in "superposition" or "impact modeling," and is an appropriate assumption when the drawdown effects of project pumping are isolated by subtracting them from a baseline condition and exact groundwater elevations or flow rates do not need to be known.
- Predicted drawdown is measured from the initial heads, which are set at zero feet in all layers at time zero, this is appropriate when using a superposition or impact modeling approach.
- The model receives no recharge, and all flow from the pumping wells comes from storage. This simplifying assumption tends to produce a conservative result that over-predicts drawdown.
- The well pumping rates in the producing zone are constant and simulated as long-term averages. This is a reasonable assumption for a non-seasonal water supply project, especially when examining drawdown effects at distance from the pumping wells.
- The narrow-perched hydrostratigraphic unit overlies Layer 1 and is hydraulically separated from Layer 1 by a lacustrine clay aquitard. Therefore, the perched unit is not simulated in the model.
- To address uncertainty in the hydraulic properties of the faults in the model domain, the conductance term for the faults was varied from 1x10-6 to 1x10-2. A sensitivity analysis was conducted to simulate the effects of varying fault conductance and the low and high conductance terms were derived from this analysis. The conductance of the San Andreas fault, the nearest fault to the pumping wells, will be investigated during the pump testing planned for the test wells.
- The aquitard represented by Layer 2, is assumed to have a uniform thickness of 10 feet and accounts for interbedded sands described in the boring log. The available data suggest the combined thickness of clay units in this zone is likely closer to 15 feet near the proposed supply test well locations. According to Waters (1983), fine-grained lacustrine units reportedly thin to the east of the Project Area in the direction of the shoreline for paleo Lake Cahuilla, which is why a thinner aquitard thickness was modeled.
- Pumping was simulated for a period up to 20 years, after which drawdown is assumed to reach relatively stable conditions.

Scenario 1 simulated the lower bound fault conductance and the effects of pumping for 20 years from wells on either side of the San Andreas Fault (1a), wells on the eastside of the fault (1b), and wells on the westside of the fault (1c). Scenario 2 simulated the upper bound fault conductance and the effects of pumping for 20 years from wells on either side of the San Andreas fault (2a), wells on the eastside of the fault (2b), and wells on the westside of the fault (2c) (Formation 2022b).

Model results indicate that operation of the proposed test wells is predicted to result in limited drawdown in close proximity to the pumping wells. In Scenario 1 after 20 years of pumping, maximum drawdown of the groundwater table by 1.9 feet within Layer 1 is predicted at the IID property boundary and 3.3 feet within Layer 3 is predicted within the Bombay Beach Community. In Scenario 2, maximum predicted drawdowns for Layers 1 and 3 are less than those predicted for Scenario 1. In Scenario 2 after 20 years of pumping, maximum drawdown of the groundwater table by 1.3 feet within Layer 1 is predicted at the IID property boundary and 2.5 feet within Layer 3 is predicted within the Bombay Beach Community (Formation 2022b).

The maximum predicted drawdown in Layer 1 after 20 years of pumping the wells is predicted to be up to approximately 2 feet or less in the areas where potential GDEs or vegetation that is groundwater dependent may be present. Drawdown is predicted to occur slowly, and the potential groundwater-dependent vegetation species that could be affected would be expected to be able to adapt to such a small amount of drawdown over such a long period of time. Predicted drawdown in Layer 1 after 20 years of pumping the wells is not predicted to exceed approximately 0.75 feet in the Bombay Beach wetland area. Based on the available information, impacts to GDEs from operating the supply test wells will be less than significant (Formation 2022b).

The predicted area of drawdown in Layer 1 extends to the western portion of the Bombay Beach wetland and the southern shoreline of the Salton Sea. However, the magnitude of the predicted drawdown is limited in these areas and would not be distinguishable from seasonal fluctuations in the water table. Furthermore, the Bombay Beach wetland is believed to be hydraulically disconnected from the water table groundwater zone. Thus, no impact to interconnected surface water will occur (Formation 2022b).

The long-term groundwater extraction associated with the proposed test wells will be relatively limited. The maximum average annual water demand that is proposed to be met by the wells is at most 18 AFY which is equivalent to a long-term pumping rate just over 11.25 gpm (Table 3.10-1). This would be the only known anthropogenic groundwater demand in the Lacustrine Unit and is not anticipated to interfere with existing beneficial environmental groundwater uses by GDEs (Formation 2022b).

3.10.3.2 Water Quality

The total dissolved solids (TDS) concentrations for the Proposed Project are estimated to range from approximately 7,000 to 14,000 mg/L. This groundwater salinity exceeds agricultural water quality standards, and State Water Resources Control Board Resolution 88-63 states that water containing TDS concentrations over 3,000 mg/L would not be considered suitable as a municipal or domestic water supply; however, it would be suitable for irrigation of the salt tolerant vegetation planned for use as a dust control measure in the Plot Project Area. Based on this information, pumping of groundwater from the wells is unlikely to result in groundwater quality degradation that would impact existing or potential beneficial uses. Based on the likely limited water quality effect of pumping of the wells on groundwater salinity distribution and beneficial uses, operation of the proposed wells will not interfere with implementation of a Water Quality Control Plan (Formation 2022b).

3.10.3.3 Subsidence

Subsidence can occur especially in confined aquifer conditions, where the drawdown associated with groundwater extraction is greater than in unconfined aquifers. No subsidence has been reported in the vicinity of the Project Area. The proposed test wells will extract a relatively limited amount of water from the lower lacustrine groundwater system. Drawdown is predicted to attenuate rapidly with distance from the test wells (Formation 2022b).

A maximum drawdown of 3.3 feet is predicted during Scenario 1. The other scenarios simulated, predicted maximum drawdowns between 1.5 and 2.5 feet after 20 years of pumping. Less than 5 feet of drawdown is unlikely to result in measurable land subsidence or damage to infrastructure (Formation 2022b).

3.10.3.4 Cumulative Impacts

Groundwater resources in the West Salton Sea Groundwater Basin are very sparsely developed. No active groundwater production wells are located in the area, and the town of Bombay Beach is served by the CVWD. The maximum predicted drawdown at the water table after 20 years of pumping represents a small fraction of the anticipated groundwater level decline in the area as a result of existing trends (approximately 0.5 feet per year) and is not expected to be distinguishable from seasonal and interannual groundwater level fluctuations (Formation 2022b). Based on these considerations, the groundwater resources impacts associated with the Project will be less than cumulatively considerable.

3.10.4 Findings Related to Hydrology and Water Quality

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to hydrology and water quality, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to hydrology and water quality that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to hydrology and water quality requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to hydrology and water quality identified in and considered by the adopted 2002 EIR/EIS.

3.10.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Based on the proposed modifications, the 2002 EIR/EIS was reviewed to determine whether or not changes to the project would affect the mitigation measures contained therein. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with hydrology and water quality.

3.11 Land Use and Planning

A complete discussion of the land use and planning impacts of the Transfer Project as originally proposed is included in Section 3.4 of the Draft EIR/EIS. As discussed below, the changes to the Transfer Project would result in no new impacts or substantial increase in the severity of the impacts to land use and planning identified in the EIR/EIS. The overall impacts to land use and planning would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below along with impacts from implementation of the Proposed Project.

3.11.1 Existing Environmental Setting

The Imperial County General Plan sets forth land use and planning guidance for the portion of the Salton Sea located in Imperial County. The area surrounding the southern two-thirds of the Salton Sea contains the land use classifications of Agricultural, Urban Area, Community Area, and Rural Residential (Reclamation and IID 2002a).

Urban land uses surrounding the Salton Sea consist primarily of unincorporated communities adjacent to the Sea or in the Coachella and Imperial Valleys. Hot Mineral Spa/Bombay Beach is an unincorporated community that extends along the east shore of the Sea from the northern Imperial County line to Bombay Beach. Most urban land uses in this area are single-family homes and RV parks. Commercial uses mostly provide services for tourists and area residents. Industrial uses mostly consist of geothermal power production (Reclamation and IID 2002a).

The Proposed Project is located on the east side of the Salton Sea west of Highway 111 and is immediately east of the community of Bombay Beach, California. The Project Area is zoned for Open Space/Preservation (S-2-G) with a Community Area land use designation by Imperial County (Imperial County 2007, 2015a, 2022). The Project Area is located on IID-owned land on Assessor's Parcel Number 002-640-002, and is surrounded by private land to the north, the community of Bombay Beach to the west, land owned by the Bureau of Reclamation to the east, and the Salton Sea to the south (California Natural Resources Agency (CNRA 2021).

The State of California's Natural Resources Agency has an equivalent Salton Sea Management Plan (SSMP) and 10-year Plan to implement DCMs in areas adjacent to the Salton Sea as well as to protect and enhance habitat for fish and wildlife.

3.11.2 Adopted 2002 EIR/EIS

Existing land use around the Sea is designated as open space, agricultural, or rural residential. Some of the lands surrounding the Sea are specifically designated for recreational purposes (such as fishing and birdwatching). Over the term of the Transfer Project, these activities may decline (as compared to the Baseline) as water quality in the Sea changes and the shoreline recedes. These fluctuations in elevation would expose areas of the Seabed in the north and south shores. No conflicts with adopted land use plans would occur as a result of the decline in the Sea's elevation because the Transfer Project does not include the rezoning of the exposed seabed. Also, the exposed seabed would remain a recreational amenity (Reclamation and IID 2002a).

3.11.3 Analysis of Project Changes

The Project Area is zoned for Open Space/Preservation (S-2-G) with a Community Area land use designation by Imperial County (Imperial County 2007, 2015a, 2022). The Project Area is surrounded by private land to the north, the community of Bombay Beach to the west, land owned by the Bureau of Reclamation to the east, and the Salton Sea to the south.

The Project Area is located adjacent to the community of Bombay Beach on undeveloped land. Implementation of the Proposed Project would not occur in a populated area and therefore would not physically divide an established community. The Proposed Project would not conflict with any applicable land use plan, policy, or regulation. Additionally, the Plot Study is expected to result in a net benefit to air quality by reducing the emissivity of the Salton Sea playa in the area and is in alignment with the State of California's SSMP. Impacts to land use and planning would be less than significant.

3.11.3.1 Cumulative Impacts

No cumulative impacts relating to land use and planning are expected to occur as a result of the Proposed Project.

3.11.4 Findings Related to Land Use and Planning

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to land use and planning, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to land use and planning that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to land use and planning requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to land use and planning identified in and considered by the adopted 2002 EIR/EIS.

3.11.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with land use and planning.

3.12 Mineral Resources

A complete discussion of the mineral resources impacts of the Transfer Project as originally proposed is included in Section 3.3 of the Draft EIR/EIS. As discussed below, the changes to the Transfer Project would result in no new impacts or substantial increase in the severity of the impacts to mineral resources identified in the EIR/EIS. The overall impacts to mineral resources would be similar to those described in the EIR/EIS.

The environmental setting for the Proposed Project is discussed below along with impacts from implementation of the Plot Study.

3.12.1 Existing Environmental Setting

A number of mineral resources in Imperial County are currently being extracted. These mineral resources include gold, gypsum, sand, gravel, lime, clay, stone, kyanite, limestone, sericite, mica, tuff, salt, potash, and manganese. Several issues influence the extraction of mineral deposits in Imperial County, including the location of geologic deposition, the potential for impacts to the environment, and land use conflicts. As a result, the extraction of mineral resources is limited to a relatively small number of sites throughout the County (Imperial County 2016). The Project Area is not located near any mineral resources or mining sites.

The California Division of Mines and Geology recognizes the Salton Trough as an area underlain at shallow depths by thermal water of sufficient temperature for direct heat application. Separate geothermal anomalies are distributed throughout the Trough that have hotter fluids suitable for generation (Imperial County 2015b). Geothermal resource areas and sources of sand and gravel are generally located along the southern border of the Salton Sea; other resources are found in the surrounding hills (Reclamation and IID 2002a). Nine known geothermal resource areas (KGRAs) have been identified in Imperial County: the Dunes KGRA, East Brawley KGRA, East Mesa KGRA, Glamis KGRA, Heber KGRA, North Brawley KGRA, Salton Sea KGRA, South Brawley KGRA, and Westmorland KGRA. The nine KGRAs are located throughout the County and vary in temperature, pressure, and chemical composition of brine solutions found in each area (Imperial County 2015b).

The County has identified Renewable Energy/Geothermal and Geothermal Overlay Districts, where important mineral resources occur within Imperial County. The Project Area is not within a KGRA or any mapped overlay districts (Imperial County 2015b). Deep below the southern portion of the Salton Sea is hot, mineral-abundant geothermal brine that contains large deposits of lithium. Imperial County is estimated to hold approximately 15 million tons of lithium and this "Lithium Valley" has provided opportunity for the County for lithium and rare mineral extraction, processing and manufacturing, and renewable energy generation/storage in the form of geothermal, solar, wind, and energy storage (Imperial County 2021b). The Project Area is located approximately 6.45 miles northwest of Lithium Valley. Additionally, the Project would not include mineral extraction.

3.12.2 Adopted 2002 EIR/EIS

Impact GS-8 addresses the potential for increased soil erosion along exposed playa of Salton Sea during operation of the Transfer Project. Implementation of the Transfer Project would result in a decrease in the elevation of the Sea, exposing up to 50,000 acres of previously inundated area which could be subject to wind and water erosion. However, the high salt content of the Salton Sea and the soils underlying the Sea cause a crust to form on the soils as they dry, which minimizes both wind and soil erosion. Therefore, impacts are less than significant (Reclamation and IID 2002a).

3.12.3 Analysis of Project Changes

The Proposed Project is not located within a KGRA or near any mineral resources or mining sites. Additionally, the Proposed Project does not include the extraction of any mineral resources. The Plot Study would evaluate the efficacy of several surface treatments to provide dust control habitat enhancements to the south of the community of Bombay Beach. These treatments would minimize erosion. Impacts are less than significant.

3.12.3.1 Cumulative Impacts

No cumulative impacts relating to mineral resources are expected to occur as a result of the Proposed Project.

3.12.4 Findings Related to Mineral Resources

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to mineral resources, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to mineral resources that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to mineral resources requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to mineral resources identified in and considered by the adopted 2002 EIR/EIS.

3.12.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with mineral resources.

3.13 Noise

A complete discussion of the noise impacts of the Transfer Project as originally proposed is included in Section 3.10 of the Draft EIR/EIS. As discussed below, the changes to the Project would result in no new impacts or substantial increase in the severity of the impacts to noise identified in the EIR/EIS. The overall impacts to noise would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below. Noise impacts from implementation of the Plot Study are discussed in a report contained in Appendix E and summarized below (ECORP 2022d).

3.13.1 Existing Environmental Setting

3.13.1.1 Fundamentals of Noise and Environmental Sound

The decibel (dB) scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted (dBA), an increase of 10 dBA is generally perceived as a doubling in loudness. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be three dB higher than one source under the same conditions (FTA 2018).

3.13.1.2 Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB (dBA) for each doubling of distance from a stationary or point source (FHWA 2017). Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dBA for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (FHWA 2017). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dBA per doubling of distance is normally assumed. For line sources, an overall attenuation rate of three dB per doubling of distance is assumed (FHWA 2011).

3.13.1.3 Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise include the average hourly noise level (in L_{eq}) and the average daily noise levels/ community noise equivalent level (in L_{dn}/CNEL). The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL are measures of community noise (ECORP 2022d). Each is applicable to this analysis and defined in Table 3.13-1.

Table 3.13-1. Common Acoustical Descriptors

Descriptor	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.

Table 3.13-1. Common Acoustical Descriptors

Descriptor	Definition
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	A 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
Community Noise Equivalent Level, CNEL	A 24-hour average L_{eq} with a five dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.

The dBA sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events (ECORP 2022d).

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within approximately one dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source. Close to the noise source, the models are accurate to within approximately one to two dBA (ECORP 2022d).

3.13.1.4 Fundamentals of Environmental Groundborne Vibration

Vibration Sources and Characteristics

Sources of earthborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or manmade causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions) (ECORP 2022d).

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV), another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity (VdB) amplitudes are used to evaluate human response to vibration (ECORP 2022d).

Table 3.13-2 displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high-noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows (ECORP 2022d).

Ground vibration can be a concern in instances where buildings shake and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. For instance, heavy-duty trucks generally generate groundborne VdB levels of 0.006 PPV at 50 feet under typical circumstances, which as identified in Table 3.13-2 is considered very unlikely to cause damage to buildings of any type. Common sources for groundborne vibration are planes, trains, and construction activities such as earth moving, which requires the use of heavy-duty earthmoving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per second is used to evaluate construction-generated vibration for building damage and human complaints (ECORP 2022d).

Table 3.13-2. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

PPV (inches/second)	Approximate VdB	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception	Vibrations unlikely to cause damage of any type

Table 3.13-2. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

PPV (inches/second)	Approximate VdB	Human Reaction	Effect on Buildings
0.08	87	Vibrations readily perceptible	Threshold at which there is a risk of architectural damage to extremely fragile historic buildings, ruins, ancient monuments
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Threshold at which there is a risk of architectural damage to fragile buildings. Virtually no risk of architectural damage to normal buildings
0.25	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to historic and some old buildings
0.3	96	Vibrations may begin to feel severe to people in buildings	Threshold at which there is a risk of architectural damage to older residential structures
0.5	103	Vibrations considered unpleasant by people subjected to continuous vibrations	Threshold at which there is a risk of architectural damage to new residential structures and modern industrial/commercial buildings

Source: Caltrans 2020

3.13.1.5 Noise Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as hospitals, historic sites, cemeteries, and certain recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses (ECORP 2022d). Sensitive receptors may also be non-human species. Many riparian bird species are sensitive to excessive noise (Reclamation and IID 2002a).

The nearest existing sensitive receptors to the Project Area are several single-family residences located on the Aisle of Palms, which is directly adjacent to the western border of the Project Area.

3.13.1.6 Existing Ambient Noise Environment

Imperial County General Plan Noise Element

The County of Imperial General Plan Noise Element establishes maximum allowable average-hourly noise limits for various land use designations as shown in Table 3.13-3. The standards imply the existence of a sensitive receptor on the adjacent, or receiving, property. In the absence of a sensitive receptor, an exception or variance to the standards may be appropriate (Reclamation and IID 2002a). In instances where the adjoining land use designations differ from that of the noise-generating land use, the more restrictive noise standard shall apply. Where the ambient noise level is equal to or exceeds the property line noise standard, the increase of the existing or proposed noise shall not exceed 3 dBA L_{eq} , which is a just-perceivable increase in noise (ECORP 2022d).

Table 3.13-3. Imperial County Property Line Noise Standards

Land Use Zones	Time Period	Average-Hourly Noise Level (dBA L_{eq})
Residential	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	50 45
Multi-Residential	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	55 50
Commercial	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	60 55
Light Industrial/Industrial Park	Any time	70
General Industrial	Any time	75

Source: Imperial County 2015c; Reclamation and IID 2002a
Notes: When the noise-generating property and the receiving property have different uses, the more restrictive standard shall apply. When the ambient noise level is equal to or exceeds the Property Line noise standard, the increase of the existing or proposed noise shall not exceed 3 dBA L_{eq}.

Construction Noise Standards

Construction noise, from a single piece of equipment or a combination of equipment, shall not exceed 75 dB L_{eq}, when averaged over an eight (8) hour period, and measured at the nearest sensitive receptor. This standard assumes a construction period, relative to an individual sensitive receptor of days or weeks. In cases of extended length construction times, the standard may be tightened so as not to exceed 75 dB L_{eq} when averaged over a one (1) hour period (ECORP 2022d).

Construction equipment operations are required to be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. Saturday. No commercial construction operations are permitted on Sunday or holidays. In cases of a person constructing or modifying a residence for himself/herself, and if the work is not being performed as a business, construction equipment operations may be performed on Sundays and holidays between the hours of 9:00 a.m. and 5:00 p.m. Such non-commercial construction activities may be further restricted where disturbing, excessive, or offensive noise causes discomfort or annoyance to reasonable persons of normal sensitivity residing in an area (ECORP 2022d; Reclamation and IID 2002a).

3.13.2 Adopted 2002 EIR/EIS

In general, noise-generating activities include traffic and air travel, and industrial and agricultural. Noise-generating activities associated with the Transfer Project include construction and pump operation. Temporary and short-term impacts during construction and impacts from operation would occur, including impacts from vehicles and equipment required to construct, operate, and maintain new facilities (Reclamation and IID 2002a).

Construction of the water conservation components of the Transfer Project and Project Alternatives and of the habitat creation under the HCP would be typical of current on-farm building construction/ improvements in terms of equipment and traffic noise. Operation of the conservation components of the Transfer Project would include the use of various electric pumps similar to pumps currently in use on-farm (Reclamation and IID 2002a).

The Salton Sea subregion was not discussed in the impact analysis because under the Transfer Project, no new facilities would be constructed and no changes in operations would occur that would result in noise impacts (Reclamation and IID 2002a).

3.13.3 Analysis of Project Changes

3.13.3.1 Project Construction/Implementation Noise

Construction noise associated with the Proposed Project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for onsite construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, pile drivers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site.

The nearest existing noise-sensitive land use to the Project Area are several single-family residences located along the western border of the Project Area boundary. As previously described, the County's General Plan Noise Element states construction equipment operation shall be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. on Saturdays. No commercial construction operations are permitted on Sundays or holidays. Construction noise, from a single piece of equipment or a combination of equipment, must not exceed 75 dB L_{eq}, when averaged over an eight-hour period, and measured at the nearest sensitive receptor. This standard, established by the County to prevent physical and mental damage consistent with exposure to excessive noise, assumes a construction period, relative to an individual sensitive receptor of days or weeks.

It is assumed that construction would only take place during daytime hours (7:00 a.m. to 7:00 p.m.) (see Mitigation Measure NOI-1 below). The nearest off-site sensitive receptors to the Project Area are approximately 80 feet west of the Project Area boundary. However, it is acknowledged that the majority of construction equipment is not situated at any one location during construction activities, but rather spread throughout the Project Area and at various distances from sensitive receptors. Therefore, this analysis employs the FTA guidance for calculating construction noise, which recommends measuring construction noise produced by all construction equipment from the center of the Project Area (FTA 2018), which in this case is approximately 1,374 feet from the nearest sensitive receptor. The anticipated short-term construction noise levels generated for the necessary stationary and mobile equipment during each phase is presented in Table 3.13-4.

Table 3.13-4. Construction Average (dBA) Noise Levels at Nearest Receptor

Equipment	Estimated Exterior Construction Noise Level at Existing Residences	Construction Noise Standards (dBA L_{eq})	Exceeds Standards?
Access Road Equipment	57.0 dBA	75	No
Irrigation Equipment	56.8 dBA	75	No
Sand Fencing Equipment	44.0 dBA	75	No
Site Exclusion Equipment	57.2 dBA	75	No
Site Preparation Equipment	53.4 dBA	75	No
Vegetation Enhancement Equipment	53.0 dBA	75	No
Well Construction and Aquifer Testing Equipment	50.4 dBA	75	No

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Appendix E for Model Data Outputs.
Notes: Construction equipment used based on the Dust Control Plan for Bombay Beach Plot Study (Formation 2022a). The nearest residence is approximately 1,374 feet from the center of the Project Area. There is an estimated 3 dBA of shielding, due to the dirt berm along the western edge of the Project Area.
L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

As shown in Table 3.13-4, during construction activities no individual or cumulative piece of construction equipment would exceed the County's 75 dBA County construction noise standard during any phase of construction at the nearby noise-sensitive receptors.

3.13.3.2 Project Operational Noise

Operational noise impacts associated with the Project would include maintenance and monitoring of the irrigation system, would result in negligible noise impacts. Once construction is complete, no regular additional daily vehicle trips or personnel would be added to operate or maintain the Project Area. No major diesel-powered equipment would be required as part of ongoing Project operations. The operations of the Project include infrequent maintenance and monitoring of the irrigation system. This would produce brief, and in most cases, negligible noise levels.

3.13.3.3 Construction-Generated Vibration

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels attributable to the Proposed Project would be primarily associated with short-term, construction-related activities. Construction on the Project Area would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. It is not anticipated that pile drivers would be necessary during Project construction. Vibration decreases rapidly with distance and it is acknowledged that construction activities would occur throughout the Project Area and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with typical construction equipment are summarized in Table 3.13-5.

Table 3.13-5. Representative Vibration Source Levels for Construction Equipment

Equipment Type	PPV at 25 Feet (inches per second)
Large Bulldozer	0.089
Pile Driver	0.170
Loaded Trucks	0.076
Hoe Ram	0.089
Jackhammer	0.035
Small Bulldozer/Tractor	0.003
Vibratory Roller	0.210

Source: FTA 2018; Caltrans 2020

Imperial County does not regulate vibrations associated with construction. However, a discussion of construction vibration is included for full disclosure purposes. For comparison purposes, the Caltrans recommended standard of 0.3 inch per second PPV with respect to the prevention of structural damage for older residential buildings is used as a threshold (Caltrans 2020). This is also the level at which vibrations may begin to annoy people in buildings. Consistent with FTA recommendations for calculating construction vibration, construction vibration was measured from the center of the Project Area (FTA 2018). The nearest structure of concern to the construction site, with regard to groundborne vibrations, are the residences on the western boundary of the Project Area, which are approximately 1,374 feet from the center of the Project Area.

Based on the representative vibration levels presented for various construction equipment types in Table 3.13-6 and the construction vibration assessment methodology published by the FTA (2018), it is possible to estimate the potential project construction vibration levels. The FTA provides the following equation:

$$[PPVequip = PPVref \times (25/D)^{1.5}]$$

Table 3.13-6 presents the expected Project related vibration levels at a distance of 1,374 feet.

Table 3.13-6. Construction Vibration Levels at 1,374 Feet

Receiver PPV Levels (in/sec)					Peak Vibration	Threshold	Exceed Threshold?
Large Bulldozer, Caisson Drilling, and Hoe Ram	**Loaded Trucks**	**Jack-hammer**	**Pile Driver**	**Vibratory Roller**			
0.000	0.000	0.000	0.000	0.001	0.001	0.2	No

Notes: Based on the Vibration Source Levels of Construction Equipment included on Table 3.13-5 (FTA 2018).
Distance to the nearest structure of concern is approximately 1.374 feet measured from Project Area Boundary

As shown in Table 3.13-6, vibration as a result of construction activities would not exceed 0.2 PPV at the nearest structure. Thus, Project construction would not exceed the recommended threshold.

3.13.3.4 Operational Groundborne Vibration

Project operations would not include the use of any large-scale stationary equipment that would result in excessive vibration levels. Therefore, the project would not result groundborne vibration impacts during operations.

3.13.3.5 Excessive Airport Noise

The Project Area is located approximately 13.4 miles northeast of the Salton City Airport in Salton City and 16.5 miles northwest of the Calipatria Municipal Airport in Calipatria. The Imperial County Airport Land Use Commission has established a set of land use compatibility criteria for lands surrounding the airports in Imperial County in the Imperial County Airport Land Use Compatibility Plan (1996). As identified in the Imperial County Airport Land Use Compatibility Maps, the Proposed Project Area lays outside of the noise contours of all airports (Imperial County 1996). Therefore, the Project would not expose Project workers to excessive airport noise

3.13.3.6 Best Management Practices

As listed in Section 2.5 of this report, the Proposed Project would implement the following best management practices:

- All construction equipment, fixed or mobile, will be equipped with properly operating and maintained mufflers, consistent with manufacturer standards.
- All stationary construction equipment will be placed so that emitted noise is directed away from the noise sensitive receptors nearest the Project Area.
- As applicable, shut off all equipment when not in use.
- Equipment staging shall be located in areas that create the greatest distance between construction-related noise/vibration sources and sensitive receptors surrounding the Project Area.
- No amplified music and/or voice will be allowed on the construction site.
- In accordance with the County Guidelines, construction equipment shall be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. on Saturdays. No commercial construction operations are permitted on Sundays or holidays.

3.13.3.7 Cumulative Impacts

Cumulative Construction Noise

Construction activities associated with the Proposed Project and other construction projects in the area may overlap, resulting in construction noise in the area. However, construction noise impacts primarily affect the areas immediately adjacent to the construction site. Construction noise for the Proposed Project was determined to be less than significant following compliance with the County construction noise standards. Cumulative development in the vicinity of the Project Area could result in elevated construction noise levels at sensitive receptors in the Project Area. However, each project would be required to comply with the applicable noise limitations on construction. Therefore, the Project would not contribute to cumulative impacts during construction.

Cumulative Stationary Source Noise Impacts

Long-term stationary noise sources associated with the development in the Project Area, combined with other cumulative projects, could cause local noise level increases. Noise levels associated with the Proposed Project and related cumulative projects together could result in higher noise levels than considered separately. As previously described, onsite noise sources associated with the Proposed Project were found to be minimal and would not be a substantial source of stationary noise. Therefore, the Project would not contribute to cumulative impacts during operations.

3.13.4 Findings Related to Noise

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002

EIR/EIS. The Proposed Project will not result in new significant environmental impacts to noise, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to noise that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to noise requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to noise identified in and considered by the adopted 2002 EIR/EIS.

3.13.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with noise. Recommendations for best management practices during construction are incorporated into the project description (see Section 2.5) to avoid impacts related to noise.

3.14 Population and Housing

A complete discussion of the population and housing impacts of the Transfer Project as originally proposed is included in Section 3.14 and 5.2 of the Draft EIR/EIS and Section 3.17 of the Final EIR/EIS. As discussed below, the changes to the Project would result in no new impacts or substantial increase in the severity of the impacts to population and housing identified in the EIR/EIS. The overall impacts to population and housing would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below along with impacts from implementation of the Plot Study.

3.14.1 Existing Environmental Setting

The Project Area is located adjacent to the community of Bombay Beach, a census-designated place by the U.S. Census Bureau, within unincorporated Imperial County. Bombay Beach has a population of 215 and 415 total housing units (U.S. Census Bureau 2020). Of the 415 housing units, 88 units (approximately 21 percent) are occupied and 327 units are vacant (Census Reporter 2020).

The Plot Study Project Area is zoned for Open Space/Preservation (S-2-G) with a Community Area land use designation by Imperial County (Imperial County 2007, 2015a, 2022). The Project Area is surrounded by private land to the north, the community of Bombay Beach to the west, land owned by the Bureau of Reclamation to the east, and the Salton Sea to the south.

3.14.2 Adopted 2002 EIR/EIS

The Transfer Project analyzes population at the county level and using larger population centers. The population of Riverside County in 2000 was 1,545,387, mostly concentrated in the western portion of the County. In the vicinity of the Salton Sea, the larger population centers include Coachella (22,724), Indio (49,116), and Palm Desert (41,155). The combined population of all unincorporated areas in the County in 2000 was 32,773 (Reclamation and IID 2002a).

Under Impact S-5, implementation of the Transfer Project would result in an acceleration of the adverse effects on Riverside and Imperial Counties by up to 11 years as compared to the baseline conditions. Under the Transfer Project, all operational boat launching and mooring facilities would become non-operational in year 2007; salinization of the Salton Sea would be accelerated, resulting in changes to the Sea's sport fishing industry; and salinity of the Salton Sea would exceed the levels at which sargo, gulf croaker, and tilapia could successfully reproduce so populations of these sport fish would be expected to decline. The annual contribution to the regional economy associated with recreational uses of the Salton Sea would decrease. The value of the lost business output over this period would be about 790 million dollars. Additionally, the reduction of the elevation and increase in salinity of the Salton Sea could indirectly result in a decrease in population and/or housing growth in the communities surrounding the Sea as recreational resources associated with Salton Sea would be adversely impacted (Reclamation and IID 2002a).

3.14.3 Analysis of Project Changes

The population of Bombay Beach has decreased from 395 at the time of the 2002 Draft EIR/EIS to 215 in 2020. Additionally, housing vacancy has increased as 179 housing units were occupied in 2000 while 88 housing units are occupied as of 2020 (U.S. Census Bureau 2000, 2020).

The Plot Study does not involve construction of housing, and water generated under the study would be used to establish vegetation on the Salton Sea playa. Workers are expected to commute from nearby areas and construction would be short term in nature. Therefore, the Plot Study would not be expected to increase population or result in the need for additional housing in the area. Therefore, there would be no impact.

3.14.3.1 Cumulative Impacts

No cumulative impacts relating to population and housing are expected to occur as a result of the Proposed Project.

3.14.4 Findings Related to Population and Housing

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to population and housing, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to population and housing that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to population and housing requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to population and housing identified in and considered by the adopted 2002 EIR/EIS.

3.14.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with population and housing.

3.15 Public Services

A complete discussion of the public services impacts of the Transfer Project as originally proposed is included in Section 3.12 of the Draft EIR/EIS. As discussed below, the changes to the Transfer Project would result in no new impacts or substantial increase in the severity of the impacts to public services identified in the EIR/EIS. The overall impacts to public services would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below along with impacts from implementation of the Plot Study.

3.15.1 Existing Environmental Setting

3.15.1.1 Police Services

Police services are provided by the Imperial County Sheriff's Office (ICSO), through the Niland substation which is located approximately 13.9 miles southeast of the Project Area. Bombay Beach is a part of ICSO's North County Patrol Division, which also includes Niland, Palo Verde, Salton City, and rural areas of Brawley, Calipatria, and Westmorland (ICSO 2022).

3.15.1.2 Fire Services

Fire services to the area are provided by Imperial County Fire Department and further supplemented by the Bombay Beach Volunteer Fire Association (Imperial County Fire Department 2022; Imperial County 1999). The nearest station is located in the community of Niland, approximately 14 miles southeast of the Project Area.

3.15.1.3 Schools

The Bombay Beach community area is located in the Calipatria Unified School District (CUSD), which serves the communities of Calipatria, Niland, and Bombay Beach in Imperial County. CUSD encompasses approximately 480 square miles, bordering the southeastern part of the Salton Sea (CUSD 2022). The nearest school, Grace Smith Elementary School, is approximately 13.70 miles southeast of the Project Area.

3.15.2 Adopted 2002 EIR/EIS

The Transfer Project would not induce population growth in the Salton Sea region, therefore fire protection, police service, parks, and schools would not be affected. No impacts to public services are expected and no mitigation is required (Reclamation and IID 2002a).

3.15.3 Analysis of Project Changes

The Proposed Project does not involve construction of housing and will not induce population growth. Construction workers are expected to commute from nearby areas and construction would be short term in nature. Therefore, the Plot Study would not be expected to result in the need for additional public services in the area. No impact would occur and no mitigation is required.

3.15.3.1 Cumulative Impacts

No cumulative impacts relating to public services are expected to occur as a result of the Proposed Project.

3.15.4 Findings Related to Public Services

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to public services, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to public services that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to public services requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to public services identified in and considered by the adopted 2002 EIR/EIS.

3.15.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with Public Services.

3.16 Recreation

A complete discussion of the recreation impacts of the Transfer Project as originally proposed is included in Section 3.6 of the Draft EIR/EIS and Section 4, Errata of the Final EIR/EIS. As discussed below, the changes to the Project would result in no new impacts or substantially increase the severity of the impacts to recreation identified in the EIR/EIS. The overall impacts to recreation would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below along with impacts from implementation of the Plot Study.

3.16.1 Existing Environmental Setting

The varied terrain in the County allows for multiple parks and recreation opportunities including hiking, boating, fishing, hunting, and off-highway activities. Many of these opportunities are located on land under Federal or State jurisdiction, but multiple smaller parks are located in the urban areas of the County. The State and Federal governments manage large amounts of open space in Imperial County, the largest being the California Desert Conservation Area under BLM jurisdiction. State and Federal also has protected areas, including a number of wilderness areas (Imperial County 2016).

Five parks in the County are operated by ICPDS including Sunbeam Lake Park, Wiest Lake Park, Red Hill Marina Park, Ocotillo Community Park, and Palo Verde Park. These County parks offer a variety of passive and active recreation opportunities, including playground equipment, basketball courts, picnic tables, barbecue grills, campsites, walking trails, boating and fishing opportunities, and open space for passive recreation (Imperial County 2016).

Visitors travel to the Salton Sea year-round for recreational opportunities. In recent decades, recreational activities in the area of the Salton Sea have moved away from direct water/body contact activities, such as swimming and water skiing, to indirect water/body contact activities, such as sport fishing and boating. Additionally, the Salton Sea and surrounding areas provide other popular recreational activities, such as bird watching, wildlife observation, camping, hiking, picnicking, hunting, boating, and fishing (Reclamation and IID 2002a).

The east shore of the Sea extends from the community of Desert Beach to just south of the community of Bombay Beach. The relatively undifferentiated topography and low-growing desert scrub vegetation of the east shore afford the best views of the Salton Sea. Resort facilities along the east shore are in various stages of disrepair because of increasing water elevations during the late 1970s which caused problems with paving, picnic tables, and landscaped areas of the North Shore Yacht Club and Marina. The boat launching facility at North Shore Marina is nonoperational. Three operational boat-launching facilities exist along the east shore, including one at the Salton Sea State Recreation Area. Recreational uses along the east shore include camping, power boating, sailing, personal watercraft racing, windsurfing, fishing, and sunbathing (Reclamation and IID 2002a).

3.16.2 Adopted 2002 EIR/EIS

The discussion of impacts in the 2002 EIR/EIS is based in part on visitor use numbers for the three major recreational facilities at the Salton Sea (Sonny Bono Salton Sea National Wildlife Refuge, Salton Sea State Recreation Area, and Imperial Wildlife Area – Wister unit) and modeling conducted by Reclamation to predict the salinity, elevation, and surface area of the Salton Sea (Reclamation and IID 2002a).

Potential recreational impacts are closely linked to the quality and physical character of the aquatic environment within each subregion; therefore, the discussion of impacts is related to those in the biological resources and water quality and hydrology sections. Additionally, aesthetic values, such as visual quality and occurrence of odors, could impact recreational resources. Therefore, the discussion of impacts is also related to the aesthetic impact assessment. Furthermore, potential impacts to recreation would indirectly affect the economic health of the project region of influence, linking this section to the socioeconomic impact assessment (Reclamation and IID 2002a).

Under Impact R-5, implementation of the Transfer Project would result in the reduction in the amount of Salton Sea area available for water-related recreation. With the Transfer Project, the elevation of the Sea is anticipated to decline to approximately -250 feet msl and the surface area would be reduced to 167,000 acres by the year 2077. This decline is the worst-case scenario and assumes a maximum level of conservation of 300 KAFY accomplished via on-farm irrigation improvements and water delivery system improvements with no fallowing. The reductions in surface area would reduce the amount of total water area available for recreation on the Salton Sea. Public recreation use information for the Salton Sea reflects a mean visitor use of 475,000 people annually (approximately 1,301 visitors per day). A calculation of the total number of visitors per day divided by the total number of square miles available under existing conditions yields a current (2002) use density of the Salton Sea of about 3.6 people per square mile. Under the Baseline, the use density would be about 3.8 people per square mile. Assuming visitor use numbers remained somewhat constant in the future, calculations of the reduced surface area show that implementation of the Transfer Project would result in an increase from the Baseline density of 3.8 to a density of 5.0 people per square mile. This increase in density of slightly more than one person per square mile of lake area would not significantly impact recreational use on the Sea (Reclamation and IID 2002a).

Under Impact R-6, an increase in exposed playa could be used as additional recreation area. Reduced water areas would result in increased amounts of exposed playa surrounding the Salton Sea. These areas could provide more area for land-based recreation activities, including camping and picnicking. This could be viewed as a potential beneficial impact to land-based recreation at the Salton Sea. It should be noted, however, that use of exposed playa for off-road vehicles recreation would significantly increase the potential of fugitive dust. The estimated additional area available for recreation would be nearly 78 square miles, however, not all of this area would be accessible for recreation because of lack of access roads, for example, or access limitations by the property owners. Implementation of the Transfer Project accelerates shoreline exposure. The recreational impacts of acceleration of shoreline exposure would be minimal. Therefore, although exposure of the shoreline could be beneficial for land-based recreation, it is considered a less than significant impact (Reclamation and IID 2002a).

Under Impact R-7, a reduction in Salton Sea elevation would render boat launching and mooring facilities inoperable. The decline in Salton Sea elevation and surface area as a result of the Transfer Project would impact operational boat launching and mooring facilities that provide access to the Salton Sea for recreational boating. The Sea would recede from boating facilities gradually as inflows decline. Operational boat launching and mooring facilities currently extend an average of 20 to 30 feet from the existing shoreline and would be impacted if the shoreline of the Salton Sea receded beyond the extent of these facilities. This impact is anticipated when the elevation of the Salton Sea reaches -230 feet msl. Reduced inflows would result in areas of exposed playa primarily along the northern and southern shores of the Salton Sea where slope changes are gradual; however, areas of playa would also be exposed along the eastern and western shores where slope change is severe. The Transfer Project would be expected to reduce the elevation of the Sea to -230 feet msl by 2007, at which point all operational boat launching and mooring facilities would become nonoperational. By comparison, under the Baseline, the elevation of the Sea would decline to -230 feet msl by 2010. The Transfer Project would accelerate the occurrence of the impact by 3 years. In addition to accelerating the time when the boat launches are stranded in their existing location, the Transfer Project would result in an ultimate elevation of the Sea of approximately -250 feet msl compared to the Baseline, which results in an ultimate elevation of the Sea of approximately -235 feet msl. Impacts would be less than significant with the implementation of Mitigation Measure R-7 (Reclamation and IID 2002a).

Under Impact R-8, sport fishing opportunities would be reduced. Reduced inflow regimes from the Transfer Project would result in an accelerated increase in salinity in the Salton Sea. Increased salinity would impair fisheries, including sport fish and aquatic habitat and decrease the number of fish inhabiting the Sea. A reduction in the number of sport fish in the Salton Sea would potentially impact sport-fishing opportunities, as measured by a reduction in the number of visitor use days. As discussed in Section 3.14 of this Addendum, salinity of the Salton Sea under the Transfer Project would exceed the levels at which sargo, gulf croaker, and tilapia could successfully reproduce so populations of these sport fish would be expected to decline. Approximately 400,000 visitors use the Salton Sea for sport fishing every year (CVWD et al. 2002). This is a significant impact to recreation because it substantially decreases the opportunity for sport fishing by accelerating the decline projected under the Baseline. Impacts would be less than significant with implementation of Mitigation Measure R-8 (Reclamation and IID 2002a).

Under Impact R-9, there would be a reduced opportunity for bird watching and waterfowl hunting. Reduced inflow to the Salton Sea resulting from implementation of the Transfer Project would accelerate the increase in salinity in the Sea. Many avian species rely on the aquatic resources of the Salton Sea for food and habitat. Increasing salinity at the Sea would decrease food supply for fish-eating birds because the reproductive ability of fish would decline and would increase disease which would result in direct mortality of avian species and a loss of habitat for avian nesting and foraging sites. Section 3.2 of the Draft EIR/EIS details the biological impacts to birds. However, avian habitat and hunting opportunities provided by managed wetlands in the vicinity of the Sea would not be directly impacted by loss of habitat because the wetlands and fowl management areas are hydraulically separate from the Salton Sea and because the facilities are managed independently. Loss of habitat through a reduction in water level at the Salton Sea would not occur at the managed wetlands. However, the quality of bird viewing at the Salton Sea would decrease, and the ability of visitors to view wildlife might decline. The effect of the Transfer Project would be to accelerate changes in fish abundance and the subsequent response of piscivorous birds by about 11 years compared to the Baseline. Impacts would be less than significant with implementation of Mitigation Measure R-9 (Reclamation and IID 2002a).

Under Impact R-10, a reduction in Salton Sea elevation could impact campgrounds and ancillary facilities. When water levels at the Salton Sea State Responsibility Area drop to 230 feet below msl, it would be necessary to relocate facilities, such as Varner Harbor and campgrounds, that are now located near the water. It also would be necessary to re-establish existing roads and trails that lead to the water, particularly in areas such as Mecca Beach, Sneaker Beach, and Old Camp. Decreasing water levels would expose footings and other remnants of the campgrounds that were covered when the water elevation increased during the late 1970s. These would have to be removed for safety and aesthetic considerations. In addition to accelerating the time when campgrounds are stranded from their existing location, the Proposed Project would result in an ultimate elevation of the Sea of approximately -250 feet msl compared to the Baseline which results in an ultimate elevation of the Sea of approximately -235 feet msl. Impacts would be less than significant with implementation of Mitigation Measure R-10 (Reclamation and IID 2002a).

3.16.3 Analysis of Project Changes

The Plot Study Project Area is zoned for Open Space/Preservation (S-2-G) with a Community Area land use designation by Imperial County (Imperial County 2007, 2015a, 2022). The Project Area is surrounded by private land to the north, the community of Bombay Beach to the west, land owned by the Bureau of Reclamation to the east, and the Salton Sea to the south.

The Plot Study will evaluate groundwater supply and quality, vegetation establishment in hedgerows, enhancement of existing vegetation through rainwater harvesting (bunds) techniques, and waterless DCMs. Access routes to the Project Area will be installed to support project development, operations, and maintenance of the wells and irrigation infrastructure. A speed limit of five miles per hour will be maintained by all vehicles to limit dust emissions. Due to the recreational uses of the playa, physical barriers will be installed to prevent vehicle disturbance to the Plot Study or damage to site features. Exclusion barriers will include hay bales, sand-fencing, and concrete barriers placed around the perimeter of the Project Area (Formation 2022a).

The Plot Study would not result in an increase in the population of the area. Therefore, there would be no impact on existing recreational facilities in the area. Public access to the Project Area would be prevented through the implementation of physical barriers, however, the Plot Study would not preclude or significantly impact public access to the Salton Sea or other recreational uses in the area (Formation 2022a). Impacts would be less than significant.

3.16.3.1 Cumulative Impacts

No cumulative impacts relating to recreation are expected to occur as a result of the Proposed Project.

3.16.4 Findings Related to Recreation

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to recreation, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to recreation that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to recreation requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to recreation identified in and considered by the adopted 2002 EIR/EIS.

3.16.5 Mitigation Measures

Please refer to in Section 3.6 of the adopted 2002 EIR/EIS for complete analyses of Project impacts and mitigation measures (Reclamation and IID 2002a).

Mitigation Measure R-7: Implement one of the following two mitigations:

1. Select HCP (Salton Sea Portion) Approach 2. If Approach 2 is selected, impacts on elevation are avoided, and no impacts to boat launching facilities occur.
2. If HCP (Salton Sea Portion) Approach 1 is selected, impacts to the boat launching facilities would occur, so boat launching facilities and access to them must be relocated as the Sea declines to provide ongoing boat launching opportunities. The relocation of these facilities may be temporary and ongoing until the Sea reaches its minimum and stable elevation, at which point permanent facilities must be provided.

Mitigation Measure R-8: Selection of HCP (Salton Sea Portion) Approach 2 would be the only effective measure. This approach would include additional conservation via fallowing or other methods in the IID water service area to allow drain water to continue to flow to the Sea at a rate equal to the Baseline, thereby avoiding impacts to the Sea associated with reduced flow: increased salinity leading to elimination of the sport fishery, elevation decline, and decreased surface area. With implementation of HCP Approach 2, this impact would be avoided; otherwise, the impact remains significant and unavoidable. Until an HCP Approach for the Salton Sea is selected, this impact will remain significant and unavoidable.

Mitigation Measure R-9: Implement one of the following two mitigations:

1. HCP (Salton Sea Portion) Approach 1 would create a fish hatchery and 5000 acres of ponds that would be maintained for the duration of the Transfer Project and provide piscivorous birds with a food source to replace the Salton Sea fishery. The ponds would be accessible to the public for bird watching. This approach would mitigate the impact to bird watching to less than significant.
2. HCP (Salton Sea Portion) Approach 2 would include additional conservation via fallowing or other methods in the IID water service area to allow drain water to continue to flow to the Sea at a rate equal to the Baseline, thereby avoiding impacts to the Sea associated with the reduced flow: increased salinity leading to elimination of sport fishery, elevation decline, and decreased surface area. Implementation of this approach would avoid impacts to bird watching.

Mitigation Measure R-10: Implement one of the following two mitigations:

1. Select HCP (Salton Sea Portion) Approach 2. If Approach 2 is selected, impacts to the elevation are avoided, and no impacts to camping and ancillary facilities occur.
2. If HCP (Salton Sea Portion) Approach 1 is selected, impacts to the camping facilities would occur, so these must be relocated as the Sea declines to provide ongoing camping opportunities. The relocation of these facilities may be temporary and ongoing until the Sea reaches its minimum, stable elevation, at which point permanent facilities must be provided.

3.17 Transportation

A complete discussion of the transportation and traffic impacts of the Transfer Project as originally proposed is included in Section 3.13 of the Final EIR/EIS. As discussed below, the changes to the Project would result in no new impacts or substantial increase in the severity of the impacts to transportation identified in the EIR/EIS. The overall impacts to transportation and traffic would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below along with impacts from implementation of the Plot Study.

3.17.1 Existing Environmental Setting

The community of Bombay Beach, California is located south of Highway 111, a two-lane state highway/expressway providing regional access to Imperial County. Highway 111 travels along the northeast shore of the Salton Sea and is eligible for scenic highway designation from Bombay Beach to the County line (Imperial County 2008).

SR-78 is a two-lane east-west route running along the southwest shore of the Salton Sea. SR-78 is a two-lane conventional highway throughout its alignment, although some portions have been upgraded to a four-lane expressway and four-lane conventional highway (Imperial County 2008).

SR-86 is generally a north-south route and begins at the south near the Townsite of Heber as a two-lane conventional highway and ends to the north at the Riverside County line as a four-lane expressway and then to Interstate 10 (Imperial County 2008).

3.17.2 Adopted 2002 EIR/EIS

The 2002 EIR/EIS evaluation of transportation focused on the IID water service area because construction and operation of conservation measures could only occur there. The Salton Sea was not evaluated for impacts to traffic and transportation.

3.17.3 Analysis of Project Changes

The northwestern corner of the Project Area is east of the intersection of 1st Street and Aisle of Palms of the community of Bombay Beach.

Approximately 5,250 LF of access roads would be installed for access to the wells and irrigation infrastructure from the nearest improved roadway. Access roads will minimize impacts to existing vegetation. Access routes will be approximately 15 feet wide and will be traded and track rolled for compaction. A speed limit of five miles per hour will be maintained by all project-related vehicles to limit dust emissions. Access routes will be periodically moisture-conditioned using a water truck, as needed.

The Plot Study would generate a small amount of construction traffic on area roadways and occasional trips by employees involved in routine maintenance of the Project Area. The small number of irregular vehicle trips generated by these activities would not adversely affect the circulation in the area. Therefore, impacts would be less than significant.

The Project Area is not located in an area identified in an adopted emergency response plan or emergency evacuation plan. Plot Study activities would not impair the implementation of any adopted emergency response plan or emergency evacuation plan, or physically interfere with evacuation or emergency access to the area. Therefore, impacts would be less than significant.

3.17.3.1 Cumulative Impacts

No cumulative impacts relating to Transportation are expected to occur as a result of the Proposed Project.

3.17.4 Findings Related to Transportation

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to transportation, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to transportation and traffic that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to transportation requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to transportation identified in and considered by the adopted 2002 EIR/EIS.

3.17.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Based on the proposed modifications, the 2002 EIR/EIS was reviewed to determine whether or not changes to the Project would affect the mitigation measures contained therein. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with transportation and traffic.

3.18 Tribal Cultural Resources

A complete discussion of the cultural resources impacts, including on tribal cultural resources, of the Transfer Project as originally proposed is included in Sections 3.8 and 3.9 of the Draft EIR/EIS and Section 4, Errata of the Final EIR/EIS. As discussed below, the changes to the Project would result in no new impacts or a substantial increase in the severity of the impacts to tribal cultural resources identified in the EIR/EIS. The overall impacts to tribal cultural resources would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below.

3.18.1 Existing Environmental Setting

3.18.1.1 Ethnographic Context

Ethnohistorically documented tribes living in the Salton Sea region include the Kumeyayy/Kamia (part of the Salton Sea geographic subregion) and the Cahuilla (Salton Sea geographic subregion and southern Coachella Valley) (Reclamation and IID 2002a).

Kumeyayy/Kamia

South of the Salton Sea was home to the Kamia (a subdivision of the Kumeyaay), a sedentary agricultural people related culturally to the River Yumans (Reclamation and IID 2002a). The Kumeyaay (also known as Ipai and Tipai) are the Yuman-speaking native people of central and southwestern Imperial County, central and southern San Diego County, and the northern Baja Peninsula in Mexico. Spanish missionaries and settlers used the collective term Diegueño for these people, which referred to people living near the presidio and mission of San Diego de Alcalá. Today, these people refer to themselves as Kumeyaay or as Ipai and Tipai, which are northern and southern subgroups of Kumeyaay language speakers, respectively (Luomala 1978). The ancestral lands of the Kumeyaay extend north from Todos Santos Bay near Ensenada, Mexico to Agua Hedionda Lagoon in north San Diego County, and east to the Imperial Valley (ECORP 2022c).

While the Kumeyaay have been depicted as hunter/gatherers in ethnographic documents, some groups practiced agriculture in the Imperial Valley. Most groups had a mountain home base that provided acorns, greens, fruits, and abundant game. Each group operated out of its home base for most of the year. Seasonal campsites were scattered throughout their territory and used as needed, but their central villages were larger and permanently situated (Reclamation and IID 2002a).

Archaeological sites along the ancient shorelines of the Salton Trough are often recognized by a number of distinctive features, such as house rings with associated artifacts, sandstone slab hearths, cremations , artifacts sometimes covered with travertine, abundant obsidian and quartzite lithic debris, shell (abalone, *Olivella*, cardium, limpet, and mussel), fishbone, bird bones, and mammal bones (Reclamation and IID 2002a).

Cahuilla

The northern part of the Salton Sea was home to the Desert Cahuilla who practiced some agriculture. The southern border has been recorded as the San Felipe Creek and also as the Riverside/Imperial County line (Reclamation and IID 2002a).

The Cahuilla spoke a Takic language. The Takic group of languages is part of the Uto-Aztecan language family. The Cahuilla occupied a territory ranging from the San Bernardino Mountains in the north to the Chocolate Mountains and Borrego Springs in the south, and from the Colorado Desert in the east to Palomar Mountain in the west (ECORP 2022c).

Desert Cahuilla society was set up with a dozen or more land-holding clans, each with territory that ranged from desert or valley floor to mountain areas. Each clan included several lineages, each with an independent community area it owned within a larger clan area. Each lineage had ownership rights to various hunting and gathering areas. Hilly, rocky areas, cave sites, or walled cave sites were used for temporary camping, food storage, hunting blinds, and as fasting places for shamans (Reclamation and IID 2002a).

Cahuilla buildings consisted of dome-shaped or rectangular houses, constructed of poles covered with brush and above-ground granaries. Other material culture included baskets, pottery, and grinding implements; stone tools, arrow shaft straighteners and bows; clothing (e.g., loincloths, blankets, rope, sandals, skirts, and diapers); and various ceremonial objects made from mineral, plant, and animal substances (ECORP 2022c).

3.18.2 Adopted 2002 EIR/EIS

Cultural Resources

The Adopted 2002 EIR/EIS addresses ethnographic resources such as sites, areas, and materials important to Native Americans for religious, spiritual, or traditional uses. Ethnographic resources are often referred to as Tribal Cultural Resources (TCRs) under CEQA (Reclamation and IID 2002a).

For the Salton Sea geographic subregion, limited ethnographic existing setting information was collected from California Historical Resources Information System record searches conducted by the Imperial Valley College Desert Museum (Ocotillo) and University of California, Riverside. The NAHC was contacted to conduct a Sacred Lands File search for information on any sacred lands that might be present in the Salton Sea subregion and to secure a list of MLDs who should be contacted for information on TCRs. The NAHC reported no sacred lands within the Salton Sea geographic subregion (Reclamation and IID 2002a).

TCRs were identified through the joint efforts of Reclamation and Tetra Tech. Letters were sent to 29 tribal organizations in California and Arizona with traditional and historic ties to the area. The intent of correspondence was to initiate consultation on TCRs important to the tribes that may be affected by the Transfer Project. Of the 29 tribes contacted, 22 tribes stated they had no direct concerns about the Transfer Project. Four groups said they might have concerns. One group, the Torres-Martinez Desert Cahuilla Indians, stated specific concerns about cultural and ethnographic resources in and around the Salton Sea and about archaeological sites located on the US Navy Test Base that may be affected by restoration efforts. Several groups stated that they would like to participate in monitoring sensitive areas. The Kumeyaay Cultural Repatriation Committee stated they should be contacted immediately if human remains or buried goods are found during any construction activities (Reclamation and IID 2002a).

Indian Trust Assets

The 2002 EIR/EIS addresses existing Indian Trust Assets (ITAs) in the Salton Sea geographic subregion and potential impacts to ITAs associated with the implementation of federal components of the Transfer Project: (1) Reclamation's approval of the change in the point of diversion of up to 300 KAFY of Colorado River water conserved by IID (this action has the potential to affect ITAs along the Lower Colorado River); and (2) USFWS' approval of an Incidental Take Permit, under Section 10 of the Endangered Species Act (ESA) (this action has the potential to affect ITAs in the Salton Sea geographic subregion) (Reclamation and IID 2002a).

ITAs are legal assets associated with rights or property held in trust by the US for the benefit of federally recognized Indian Tribes or individuals. The US, as trustee, is responsible for protecting and maintaining rights reserved by, or granted to, Indian Tribes or individuals by treaties, statutes, and executive orders. All federal bureaus and agencies share a duty to act responsibly to protect and maintain ITAs. Reclamation's policy is to protect ITAs from adverse impacts resulting from its programs and activities whenever possible. Reclamation, in cooperation with Tribe(s) potentially impacted by a given Project, must inventory and evaluate assets, and then mitigate, or compensate, for adverse impacts to the asset. While most ITAs are located on a reservation, they can also be located off-reservation. Examples of ITAs include lands, minerals, water rights, and hunting and fishing rights. ITAs include property in which a Tribe has legal interest (Reclamation and IID 2002a).

Torres-Martinez Desert Cahuilla Indians

The Torres Martinez Reservation is located on about 24,000 acres along the northern shore of the Salton Sea . About 11,800 acres of the reservation are currently inundated by the Sea. The Torres Martinez Indians have sought damages and compensation for lands claimed to be inundated or damaged by the Salton Sea. In 1996, a Settlement Agreement was reached to provide compensation to the Tribe and provide a permanent flowage easement to IID and CVWD over the Indian Trust lands. The issue was resolved when legislation required to implement the settlement was passed in 2001 as Title VI of Public Law 106-568 (Torres Martinez Desert Cahuilla Settlement Claims Act) (Reclamation and IID 2002a).

The Tribe's existing water rights (surface water and groundwater rights) are held in trust by the US. No specific hunting or fishing rights other than those granted to all citizens with proper CDFW permits have been identified in the subregion. CDFW regulates hunting and fishing in and around the Salton Sea , except within the Torres-Martinez Indian Reservation, where the Tribe is the primary regulatory and management authority. Significant gold deposits have been located on the Torres Martinez Reservation and are considered an ITA. The Torres Martinez Indians have indicated that they consider cultural resources located within the Torres Martinez Reservation to be ITAs as well (Reclamation and IID 2002a).

Reclamation's ITA Policy and NEPA Implementing Procedures (1994) indicate that cultural resources on tribal lands are frequently considered ITAs. Regardless, Torres-Martinez owns such resources on lands owned by the Tribe. Currently, approximately 70 archaeological resources are known to exist on the Torres Martinez Reservation. Cultural resources located off-reservation are unlikely to be considered trust assets of the Torres Martinez Band (Reclamation and IID 2002a).

Under Impact ITA-1, reduced inflow to the Salton Sea (-250 feet msl over the 75-year duration of the Transfer Project compared to the Baseline elevation of -235 feet msl) would result in the exposure of land containing natural and cultural resources that are considered by the Torres Martinez Desert Cahuilla Indians to be ITAs. This could have both adverse and beneficial impacts. Beneficial impacts could result from allowing scientific investigations of exposed resources, including archaeological data collection and natural resource exploitation. Exposure also could result in damage from vandalism and erosion, however (Reclamation and IID 2002a).

The Tribe has also expressed concerns that exposed land might be spoiled by salts, DDT, or other contaminants in the soils. The soils have not been tested for contamination. If this land were found to be suitable for agriculture or other purposes, exposure of the land would be a beneficial impact to the Tribe. The Tribe has also indicated that possible benefits could result if lower water levels prevented the use of existing boat launching facilities that are not tribally owned. If public boat ramp access is lost and access moved onto tribal lands, the Torres Martinez Desert Cahuilla Indians would be able to charge boaters to launch their boats from tribal lands obtain revenues from public use of tribally-owned recreation facilities. There would be no impacts to ITAs under HCP (Salton Sea Portion) Approach 1 or Approach 2 (Reclamation and IID 2002a).

3.18.3 Analysis of Project Changes

A record search of the NAHC Sacred Lands File was completed for the Proposed Project and results were positive. The NAHC recommended contacting the Torres-Martinez Desert Cahuilla Indians for more information and provided a list of Native American tribes that may have knowledge of resources within the Project Area. These tribes include:

- Agua Caliente Band of Cahuilla Indians
- Quechan Tribe of the Fort Yuma Reservation
- Santa Rosa Band of Cahuilla Indians
- Soboba Band of Luiseno Indians
- Torres-Martinez Desert Cahuilla Indians

Pending the completion of agency consultation with Native American tribes, there are no Historical Resources, as defined by CEQA or Historic Properties, as defined by the NHPA, present within the Project Area. Recommendations for the management of unanticipated discoveries were provided and are incorporated into the Project Description (see Section 2.5) to avoid impacts on tribal cultural resources.

3.18.3.1 Cumulative Impacts

No cumulative impacts relating to tribal cultural resources are expected to occur as a result of the Proposed Project.

3.18.4 Findings Related to Tribal Cultural Resources

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to tribal cultural resources, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to tribal cultural resources that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to tribal cultural resources requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to tribal cultural resources identified in and considered by the adopted 2002 EIR/EIS.

3.18.5 Mitigation Measures

Please refer to Section 3.9 of the adopted 2002 EIR/EIS for complete analyses of Project impacts and mitigation measures (Reclamation and IID 2002a). As previously noted, recommendations for the management of unanticipated discoveries were provided and are incorporated into the Project description (see Section 2.5) to avoid impacts on tribal cultural resources.

HCP (Salton Sea Portion) Approach 1: Hatchery and Habitat Replacement: This HCP approach would provide for construction of 5,000 acres of ponds and one or more fish hatcheries on the Salton Sea. Final locations for the ponds have not been determined, but all would be located on the south end of the Sea, and none would impact the lands of the Torres Martinez Indian Reservation. Fish hatchery locations have also not been determined, but would not be located on the Torres Martinez Indian Reservation without the approval and cooperation of the Tribe. Supplemental environmental review will occur once final locations and design of this HCP alternative are complete, and prior to construction. However, based on the above information, there would be no impacts to ITAs under this approach.

HCP (Salton Sea Portion) Approach 2: Use of Conserved Water as Mitigation: This HCP approach would totally compensate for reduced inflow to the Sea, so that the impacts described in Impact ITA-1 would not occur. Since the inflow to the Sea would be maintained at Baseline levels, the impact from the reduced water surface elevation would be identical to the No Project condition, and there would be no impact to ITAs from the Proposed Project [Transfer Project].

3.19 Utilities and Service Systems

A complete discussion of the utilities and service system impacts of the Transfer Project as originally proposed is included in Section 3.12 of the Draft EIR/EIS. As discussed below, the changes to the Transfer Project would result in no new impacts or substantial increase in the severity of the impacts to utilities and service systems identified in the EIR/EIS. The overall impacts to utilities and service systems would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below along with impacts to utilities and service systems from implementation of the Plot Study.

3.19.1 Existing Environmental Setting

3.19.1.1 Water Service

CVWD supplies domestic water services to the Bombay Beach community area, not including the Project Area (Imperial County 1999). The Project Area is a part of IID's Imperial Unit, however there are no rights to water service (IID 2022b).

3.19.1.2 Wastewater and Storm Drainage

CVWD provides sewer service to the Bombay Beach community area. The CVWD sewage treatment plant is located on the north side of Highway 111 and the Southern Pacific Railroad (Imperial County 1999).

3.19.1.3 Electricity

Electrical service to the Bombay Beach area is provided by IID (Imperial County 1999). The IID energy service territory covers 6,471 square miles, including all of Imperial County along with parts of Riverside and San Diego counties (IID 2022c).

3.19.1.4 Natural Gas

There are no natural gas pipelines that serve the area (Imperial County 1999).

3.19.2 Adopted 2002 EIR/EIS

Public services and utilities related to potable water supply, treatment, and distribution; and wastewater collection, treatment, and disposal will not be impacted by the Transfer Project and alternatives because the water conservation and transfer would not result in the need for additional facilities, changes to distribution system components, or treatment of water delivered within any of the subregions. In addition, the Transfer Project and alternatives do not involve wastewater collection, treatment, or disposal or solid waste collection, disposal, or recycling. No impact would occur and no mitigation is required.

3.19.3 Analysis of Project Changes

The Proposed Project is not anticipated to require utility connections or the use of service systems. Solar-powered submersible electric pumps would be utilized to complete the new water wells and for initial testing. Four to six solar panels will be installed adjacent to each wellhead and wired to a pump controller, breaker, and lightning arrestor. Diesel generators or mobile equipment would be utilized for construction. Portable toilets would be utilized onsite for wastewater and the construction contractor would be responsible for bringing sufficient potable water onsite for their workers and disposing of any solid waste generated during construction in the nearest municipal landfill. Given the small number of workers anticipated and small amount of construction debris that would be generated, solid waste generated from the Plot Study would be minimal. Therefore, there would be less than significant impacts.

3.19.3.1 Cumulative Impacts

No cumulative impacts relating to utilities and service systems are expected to occur as a result of the Proposed Project.

3.19.4 Findings Related to Utilities and Service Systems

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to utilities and service systems, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to utilities and service systems that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to utilities and service systems requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to utilities and service systems identified in and considered by the adopted 2002 EIR/EIS.

3.19.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with utilities and service systems.

3.20 Wildfire

A complete discussion of the hazards, including wildfire hazard, impacts of the Project as originally proposed is included in the QSA Programmatic Environmental Impact Report (PEIR). As discussed below, the changes to the Project would result in no new impacts or substantial increase in the severity of the impacts to hazards, including wildfire hazards, identified in the EIR/EIS. The overall impacts to hazards, including wildfire hazards, would be similar to those described in the EIR/EIS.

The environmental setting for the Project Area is discussed below.

3.20.1 Existing Environmental Setting

Imperial County recently updated its Multi-Jurisdictional Hazard Mitigation Plan (MHMP). The potential for wildfire or a major fire in the unincorporated areas of Imperial County is generally low due to the desert and agriculture topography of the County. Two fire hazard sites exist in the County, namely the fuel storage farms located south of the City of Imperial and east of Niland (Imperial County 2021a).

In the event of a fire, assistance from various fire departments within the County would be required. The threat of fire spreading and causing major problems to other areas of the County are minimal due to the isolated locations of the fuel storage farms (Imperial County 2021a).

The only area that shows a wildfire potential in Imperial County is a small area west of Ocotillo where San Diego and Imperial County merge. This area has very minimum risks because it is isolated and not near any residences. All other areas of the County have medium risks due to brush, but not wildfire areas containing large timber that present large scale disaster incidents that occur in other areas of Southern California (Imperial County 2021a).

The California Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone (FHSZ) Viewer shows that the Project Area and the surrounding area are not within a FHSZ, but are within a Local Responsibility Area (CAL FIRE 2022).

3.20.2 Adopted 2002 EIR/EIS

The 2002 EIR/EIS relied upon information developed in the QSA PEIR in assessing impacts related to wildfire. According to the QSA PEIR, no aspects of the Project would impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan or increase the risk of or public exposure to wildland fires. The public would not be exposed to new hazardous situations. For the Salton Sea area, the QSA PEIR noted that the Transfer Project would accelerate the Sea’s water surface elevation which would expose additional shoreline. The amount of bottom sediment that would be exposed would be relatively small which would limit the potential for public exposure to significant new hazardous conditions. Impacts would be less than significant (CVWD et al. 2002).

3.20.3 Analysis of Project Changes

The Project Area is located to the east of the community of Bombay Beach within the exposed former bed, or playa, of the Salton Sea which has been exposed over the last 16 years a result of seawater evaporation and decreased agricultural inflows. Slopes in the Project Area are very flat, ranging from 1 to 3 inches of vertical drop every 100 feet (ECORP 2022b).

The Plot Study is not within or near a State Responsibility Area or lands classified as a FHSZ (CAL FIRE 2022). In addition, the Project Area is located on a bare playa and due to the lack of fuel for a wildland fire, Plot Study activities would not exacerbate a risk of wildland fire. The Project Area is not in an area identified in an adopted emergency response plan or emergency evacuation plan. Project activities would not impair the implementation of, or physically interfere with any adopted emergency response plan or emergency evacuation plan.

Maintenance activities will include repairs to water supply and storage facilities as well as any needed repairs to drip laterals. Vegetation maintenance includes gap-filling and replanting of any dead or poorly performing plants. Maintenance of sand fence may include repair and replacement. Minor maintenance of the bunds to repair erosion associated with large storm flows may occur one to two times per year. Access routes will be installed for access to the wells and irrigation infrastructure and will minimize impacts to existing vegetation. These routes will be graded and track rolled for compaction. They will be periodically moisture-conditioned using a water truck, as needed. Access routes would not exacerbate fire risk. No impact would occur and no mitigation is required (Formation 2022a).

3.20.3.1 Cumulative Impacts

No cumulative impacts relating to wildfire are expected to occur as a result of the Proposed Project.

3.20.4 Findings Related to Wildfire

No New Significant Effects Requiring Major Revisions. Based on the foregoing analysis and information, there is no evidence that project modifications require a major change to the adopted 2002 EIR/EIS. The Proposed Project will not result in new significant environmental impacts to wildfire, nor is there a substantial increase in the severity of impacts described in the adopted 2002 EIR/EIS.

No Substantial Change in Circumstances Requiring Major Revisions. There is no information in the record or otherwise available that indicates that there are substantial changes in circumstances pertaining to wildfire that would require major changes to the adopted 2002 EIR/EIS.

No New Information Showing Greater Significant Effects than the Adopted EIR/EIS. This Addendum has analyzed all available relevant information to determine whether there is new information that was not available at the time the 2002 EIR/EIS was adopted, which would indicate that a new significant effect not reported in that document might occur. Based on the information and analyses above, there is no substantial new information indicating that there would be a new significant impact to wildfire requiring major revisions to the adopted 2002 EIR/EIS.

No New Information Showing Ability to Reduce Significant Effects in Previous EIR/EIS. There are no alternatives to the Project or additional mitigation measures that would substantially reduce one or more significant impacts pertaining to wildfire identified in and considered by the adopted 2002 EIR/EIS.

3.20.5 Mitigation Measures

The 2002 EIR/EIS did not recommend mitigation measures as no significant impacts were identified. Based on the proposed modifications, the 2002 EIR/EIS was reviewed to determine whether or not changes to the Project would affect the mitigation measures contained therein. Given the analysis and information provided above, no changes to the analysis found in the 2002 EIR/EIS are required. Therefore, no mitigation measures are required for impacts associated with wildfire.

3.21 Mandatory Findings of Significance

3.21.1 Mandatory Findings of Significance (XXI) Environmental Checklist and Discussion

With implementation of standard BMPs discussed in Section 2.5, implementation of the Proposed Project would not substantially increase the severity of impacts to fish and wildlife beyond those impacts discussed in the EIR/EIS for the Transfer Project. The Plot Study would result in no new significant environmental impacts to humans, either directly or indirectly. Additionally, the Plot Study is expected to result in a net benefit to air quality by reducing the emissivity of the Salton Sea playa in the area. Implementation of the Plot Study would not create new cumulative impacts, or substantially increase the severity of cumulative impacts beyond those impacts discussed in the Transfer Project EIR/EIS. Therefore, impacts would be less than significant.

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LIST OF APPENDICES

APPENDIX A

Dust Control Plan for Bombay Beach Plot Study

Dust Control Plan for Bombay Beach Plot Study

(Dust Control Area S_01_B)

Prepared for:

Imperial Irrigation District

Prepared by:

Formation Environmental, LLC

AUGUST 4, 2022

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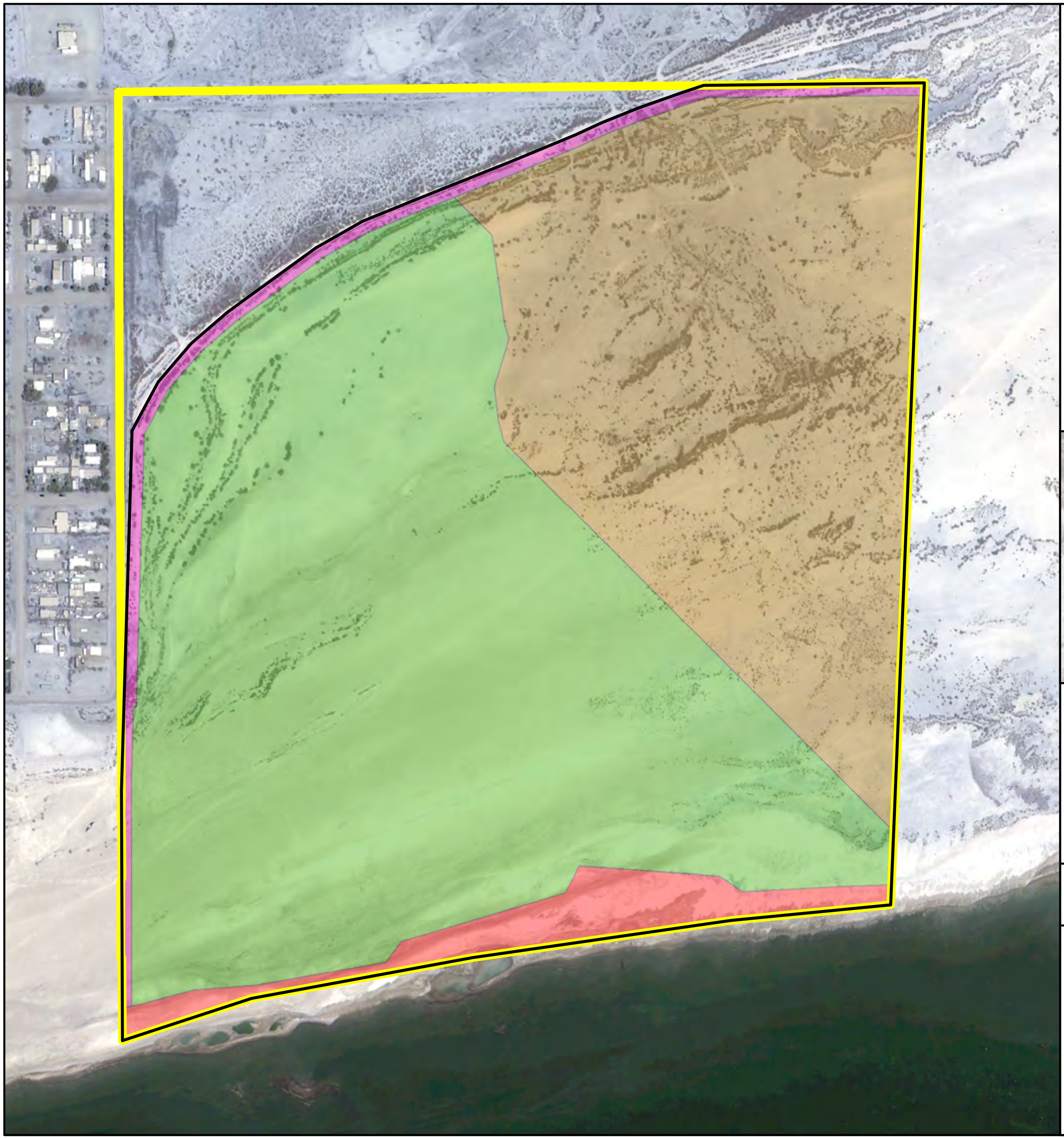
Figures

1 INTRODUCTION

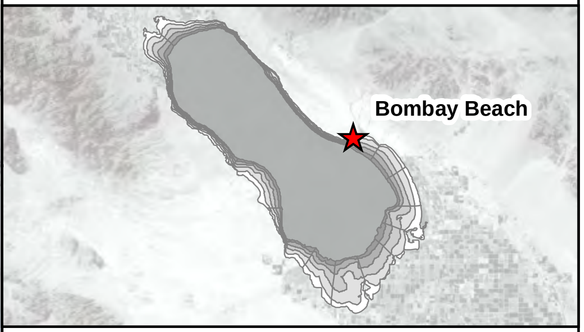
This document was prepared for the Imperial Irrigation District (IID) to provide site-specific detail on dust control design for the plot study at the Bombay Beach Planning Area at the Salton Sea, California. As described in the 2019/2020 Proactive Dust Control Plan (PDCP), recommended dust control at Bombay Beach includes a small plot study in Step 2b to evaluate dust control and irrigation approaches for larger-scale implementation in Step 3b (IID 2020b). The plot study will evaluate groundwater supply and quality, vegetation establishment in hedgerows, enhancement of existing vegetation through rainwater harvesting (bunds) techniques, and waterless dust control measures (DCMs) (Figure 1). The enhancement of existing vegetation will occur on approximately 53 acres. Water supply options to be evaluated include up to three shallow supply wells to irrigate vegetated hedgerows on approximately 86 acres (Figure 2). Approximately 5,000 feet, with a footprint of 4 acres, of perimeter sand-fencing (waterless dust control) will be installed to protect vegetation during establishment from moving (eroding) sand entering the site. Additionally, physical barriers will be installed to prevent vehicle disturbance to the plot study. Implementation is anticipated to commence with the installation of water supply wells in early 2023. Study results will inform whether groundwater can produce water suitable to meet vegetation water demand and quality, establishment, and enhancement approaches for vegetation, the effectiveness of sand fencing, and the effectiveness of vehicle exclusion methods.

This dust control plan describes site access and exclusion features for construction, operations, and maintenance (Section 2), groundwater supply development for irrigation of vegetated hedgerows and bunds for enhancement of existing vegetation (Section 3), dust control planning and dust control measure layout (Section 4), implementation (Section 5), and operations, maintenance, and monitoring (Section 6). In addition, environmental documentation under the California Environmental Quality Act (CEQA) and applicable permits (Section 7), as well as the schedule for implementation, operations, and maintenance are described (Section 8).



Legend

━ Area of Interest
━ Plot Study Boundary
🟩 Vegetation Enhancement
🟫 Habitat Enhancement Features
🟪 Waterless Dust Control
🟥 Inaccessable Area



Notes:
1. Background Imagery Source: Pleiades © 2020, Distribution Airbus DS, April 28, 2022.

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Air Quality Mitigation Program

Salton Sea

Figure 1. Overview of Bombay Beach Dust Control Measures

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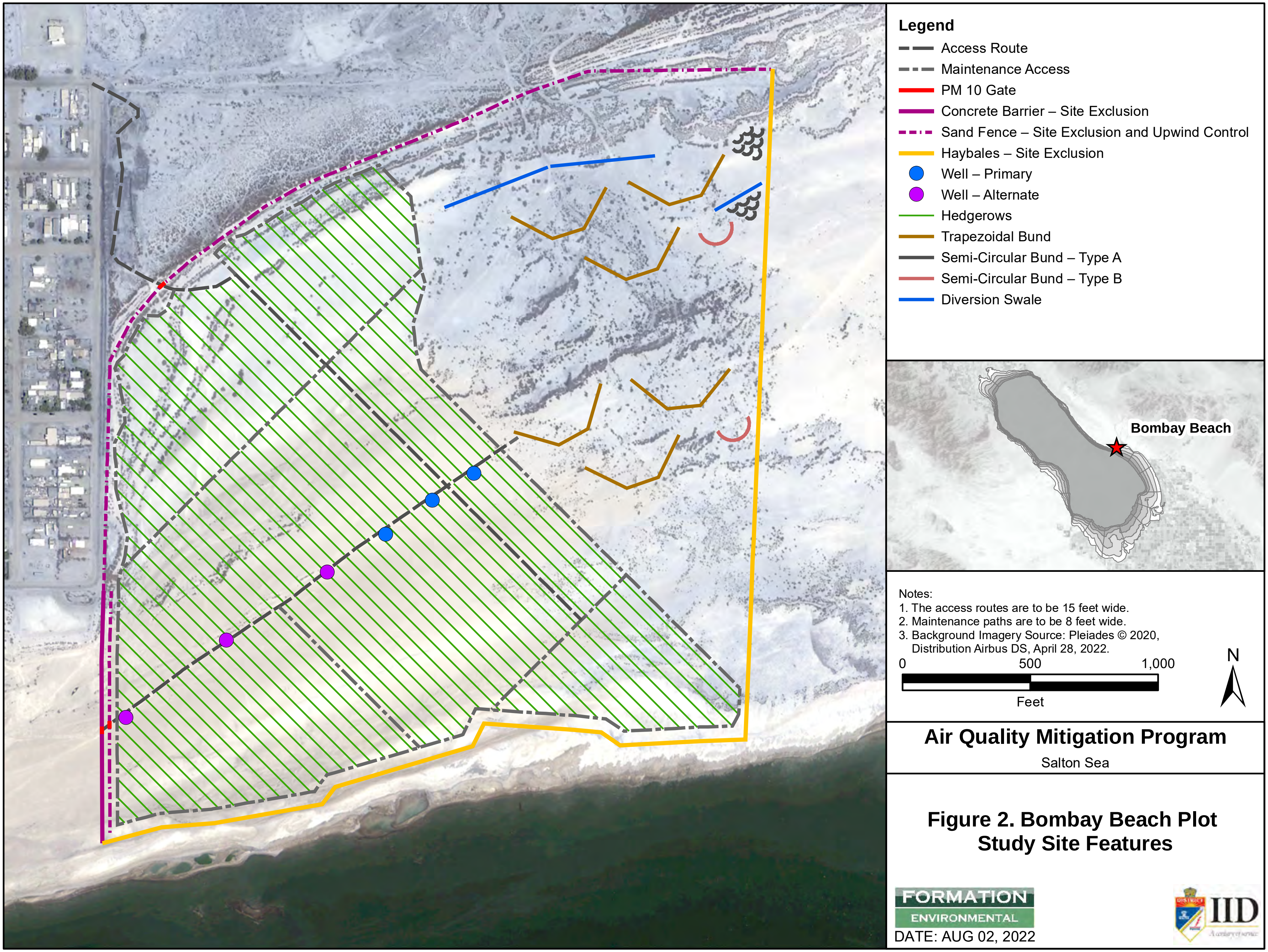

Notes:
1. The access routes are to be 15 feet wide.
2. Maintenance paths are to be 8 feet wide.
3. Background Imagery Source: Pleiades © 2020, Distribution Airbus DS, April 28, 2022.

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Figure 2. Bombay Beach Plot Study Site Features

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2 SITE ACCESS AND EXCLUSION

The plot study is adjacent to the town of Bombay Beach, a community known for its art interests and access to the Salton Sea playa for recreational purposes. Access routes will be installed for construction, operations, and maintenance vehicles. Exclusion features will be installed to reduce disturbance or damage to site features.

2.1 SITE ACCESS

Access routes are necessary to support project development, operations, and maintenance. Approximately 5,250 linear feet (LF) of access routes will be installed for access to the wells and irrigation infrastructure from the nearest improved roadway (Figure 2). Access routes will minimize impacts to existing vegetation. The access routes will be approximately 15’ wide and will be graded and track rolled for compaction. If unstable soils are encountered, then they will be stabilized using appropriate fill material. Unstable areas also may be compacted using vibratory rollers and moisture conditioned using water trucks, as appropriate.

PM10 gates will be used at strategic locations to allow vehicle access for operations and maintenance (Figure 2, Figure 3). A speed limit of five miles per hour will be maintained by all vehicles to limit dust emissions. Access routes will be periodically moisture-conditioned using a water truck, as needed. Access routes may require periodic maintenance to flatten ruts, restore stability or repair washouts.

Installation activities will require light-duty tractors (50-100 hp), ATVs, light-duty (1/4-ton) pickups, dozers, motor-graders, and water trucks, or other similar equipment as appropriate. It is anticipated that construction of the access routes will take approximately five days. Maintenance will be conducted using similar equipment as construction (e.g., skid loader, backhoe).

2.2 SITE EXCLUSION

Due to recreational uses of the playa, physical barriers will be installed to prevent vehicle disturbance to the plot study. Exclusion barriers will include hay bales, sand-fencing, and concrete barriers placed around the site perimeter (Figure 2, Figure 4). There is existing signage to exclude vehicles on the levee wall along the northern project boundary (Figure 5). Installation of exclusion barriers will require light-duty tractors (50-100 hp), ATVs, light-duty (1/4-ton) pickups, off road forklifts, skid steers, and water trucks, or other similar equipment as appropriate. Installation is expected to take approximately 10 days.

Figure 3. Example of PM10 Gate to Prevent Vehicle Disturbance to the Plot Study

Figure 4. Example of Concrete Barrier to Prevent Vehicle Disturbance to the Plot Study

FIGURE 5. BOMBAY BEACH LEVEE SIGNAGE

3 WATER SUPPLY

There is no readily available water supply onsite for irrigation use. Groundwater and surface water resources will be developed to support vegetation establishment and enhancement, as well as long-term maintenance. Each is described below.

3.1 GROUNDWATER

There are limited data regarding groundwater supply and suitability in the vicinity of the plot study. However, results from a recent geophysical survey suggest that groundwater, at depths between approximately 50 and 100 feet below ground surface (bgs), within the East Salton Sea Groundwater Basin could be developed as a water supply source for irrigation (Ramboll 2022). In addition, review of well completion records for monitoring wells completed approximately five miles north of the plot study indicates that the subsurface sediments are comprised of lacustrine deposits including water bearing sandy zones interbedded with finer grained silts and clays that appear to contain relatively fresh groundwater. Similar conditions were observed in the upper 100 feet of soil investigated as part of a pilot soil boring drilled within the Bombay Beach Planning Area in May 2020.

Water supply development will include up to three wells (Figure 2). Final location of the wells will be determined in the field. Well installation and evaluation will be conducted through the following steps: (1) drilling of a pilot boring to a depth of approximately 100 feet bgs to characterize subsurface conditions, sample water quality, and collect data necessary for design of the well; (2) determination of whether a suitable well can be developed at each location in the depth interval explored; (3) abandonment of the borehole if a well is not warranted, or design, install, and develop a 6-inch well; (4) pump testing of the well; (5) installation of a production pump; and (6) connection of the pump to a solar-powered pump and water storage tank. After well construction, pump testing will be conducted to inform the proposed well design and pump selection. All well and associated components will be constructed under permit by Imperial County following applicable code. Implementation will be consistent with the descriptions provided below.

3.1.1 WELL DESIGN

Wells will be constructed using 6” diameter PVC screen and riser casing, completed with approximately 50’ of casing and 50’ of screen. Installation depth and screen interval will ultimately depend on the geologic conditions observed in the field. A gravel pack will surround the screen, and a 50’-thick sanitary grout seal will be installed to the ground surface. The surface completion will be in a steel “stove pipe” riser centered on a concrete pad that measures approximately 3’ by 3’.

Wells will be fitted with submersible electric pumps powered by a series of solar panels installed near the wellheads. Four to six solar panels will be installed adjacent to each wellhead and wired to a pump controller, breaker, and lightning arrestor located at each wellhead.

3.1.2 WELL CONSTRUCTION AND DEVELOPMENT

Before construction activities begin, boring locations will be staked, and any utilities (i.e., electricity, natural gas lines, water lines, sewer lines, etc.) will be identified through an underground service alert. Underground utilities are not anticipated.

Construction will take place in work areas established at each well location. The work areas, measuring 50’ by 100’, will be enclosed by a temporary chain-link construction fence. A 36” silt fence will be attached at the base of the temporary construction fence and embedded into the ground at least 4” and function as a wildlife exclusion barrier. No additional site preparation will be conducted.

The boreholes will be logged. Zone water samples will be collected from three depth intervals. After completion of borehole drilling, each boring will be geophysically logged by lowering a sonde in the pilot borings and recording the readings. Data collected during the exploratory borehole drilling and testing will be evaluated to determine if a well at the selected location will meet the plot study’s water supply needs. If warranted, the well completion will be designed.

The well will be constructed using the drilling rig. After the casing and screen are assembled and suspended in the borehole, the well screen annulus will be filled with a sand filter-pack material and the remainder of the annulus will be sealed using a bentonite grout. Well construction materials will be delivered to the site by truck. The filter-pack will be delivered to the site in bags, and grout will be mixed on site.

The native drill soil cuttings will be spread on site and groundwater extracted from the well will be used on the playa for dust control and irrigation purposes. Any hazardous materials, such as the hydraulic oil and diesel fuel onboard the drill rig, will be handled pursuant to a project-specific management and spill prevention plan. Fuel service will be provided for drilling and other temporary equipment using a mobile fuel service or small portable fuel containers; bulk fuel storage will not be required.

Following installation, the wells will be developed by surging, air-lift pumping, and conventional pumping until the removed water becomes relatively clear and free of sediment. During this phase of construction, the drill rig, stem/pipe truck, and any unnecessary equipment will be demobilized, and a pump/development truck will be mobilized to the site. Well development water, albeit miniscule, is used for dust control and irrigation purposes on the playa and applied using an impact-type water cannon.

Drilling, well development, and power supply construction will take approximately four to six weeks. This work will require a drill rig and heavy and light duty trucks.

3.1.3 AQUIFER TEST AND COMMISSIONING

After well development, a step-drawdown and 24-hour constant discharge pumping test will be performed at one of the wells using a submersible pump. All pumped water will be discharged on site using a Rain-Bird-type sprinkler.

Water levels and discharge will be recorded during the step-drawdown test, the 24-hour constant discharge test, using pressure transducer with data loggers and a flow meter and totalizer, respectively. During the test, the groundwater discharge will be field measured for pH, specific conductance (SpC), dissolved oxygen (DO), oxidation-reduction potential (ORP), and temperature. Groundwater samples will be collected near the beginning, middle, and end of the test.

Following the initial pump testing, solar powered electric submersible pumps will be installed in each test well and a long-term pumping test will be conducted for a period of one month. During this time, groundwater levels will be monitored using transducers, and discharge will be monitored with flow meters and totalizers. Water quality, including field-measurements of pH, SpC, DO, ORP, and temperature, will be measured using a water quality meter approximately weekly. Daily drawdown and recovery trends will be assessed and compared to model predictions to validate or update drawdown impact predictions.

A protective, locking, 6’ high chain-link privacy fence enclosure topped with barbed wire and measuring about 40’ by 40’ will be installed around two of the three well locations and a central fence compound measuring 60’ by 80’ will be constructed around one of the well locations. The inside of the compounds will be surfaced with crushed rock.

This work will require light and heavy-duty trucks. The initial pump testing will take approximately two days, while the construction of the fence will take up to five days. During the 30-day long-term pumping test, the site will be visited once per week for a total of four visits.

3.1.4 SITE RESTORATION

Following completion of the pumping tests and removal of all equipment and staged materials, all remaining waste materials will be removed from each work area. Rutting in the access road will be repaired, and wheel ruts in pull-out areas will be leveled. Finally, the temporary security fences will be demobilized and replaced with the permanent security fences described above. This work will require two heavy duty trucks, a bulldozer, and take approximately three days.

3.2 SURFACE WATER

There are no perennial surface water features. Several ephemeral washes originating from the Chocolate Mountains (to the north) enter the northeastern corner of the plot study through a single breach of the 2003 historic shoreline of the Salton Sea. The watershed is estimated at 900 acres. None of the ephemeral washes appear to reach the Salton Sea with any regular frequency. The recurrence interval of flood flows entering the plot study through these washes is uncertain but appears to be infrequent based on the number and size of plants growing in the washes. The health and vigor of the existing vegetation appears to vary within the plot study, likely reflecting the nature of the ephemeral surface water supply.

The peak discharges of the watershed that pass through the breach from various storm recurrence intervals were quantified using the Cal Trans Regional Regression Equations for California's Desert Regions (Caltrans 2019). The peak discharges are 176 cubic feet per second (cfs) and 346 cfs for the 10-year and 25-year storm events, respectively. Using the Santa Barbara Unit Hydrograph (Stubchaer 1975) the 10-year Cal Trans peak discharge flow rate was calibrated to estimate the total volume of each storm event. The total volume produced by a 10-year storm event is approximately 40 acre-feet. This information was used to inform the design of bunds to capture surface water and support the expansion and enhancement of existing vegetation (Section 4.2).

4 DUST CONTROL MEASURES

Based on site suitability, the primary DCMs are vegetation establishment using irrigation from groundwater wells and vegetation enhancement using bunds for surface water capture. Sand fence is also included. This section describes the design process to determine vegetation spacing and the DCM layout within the plot study.

4.1 VEGETATION ESTABLISHMENT

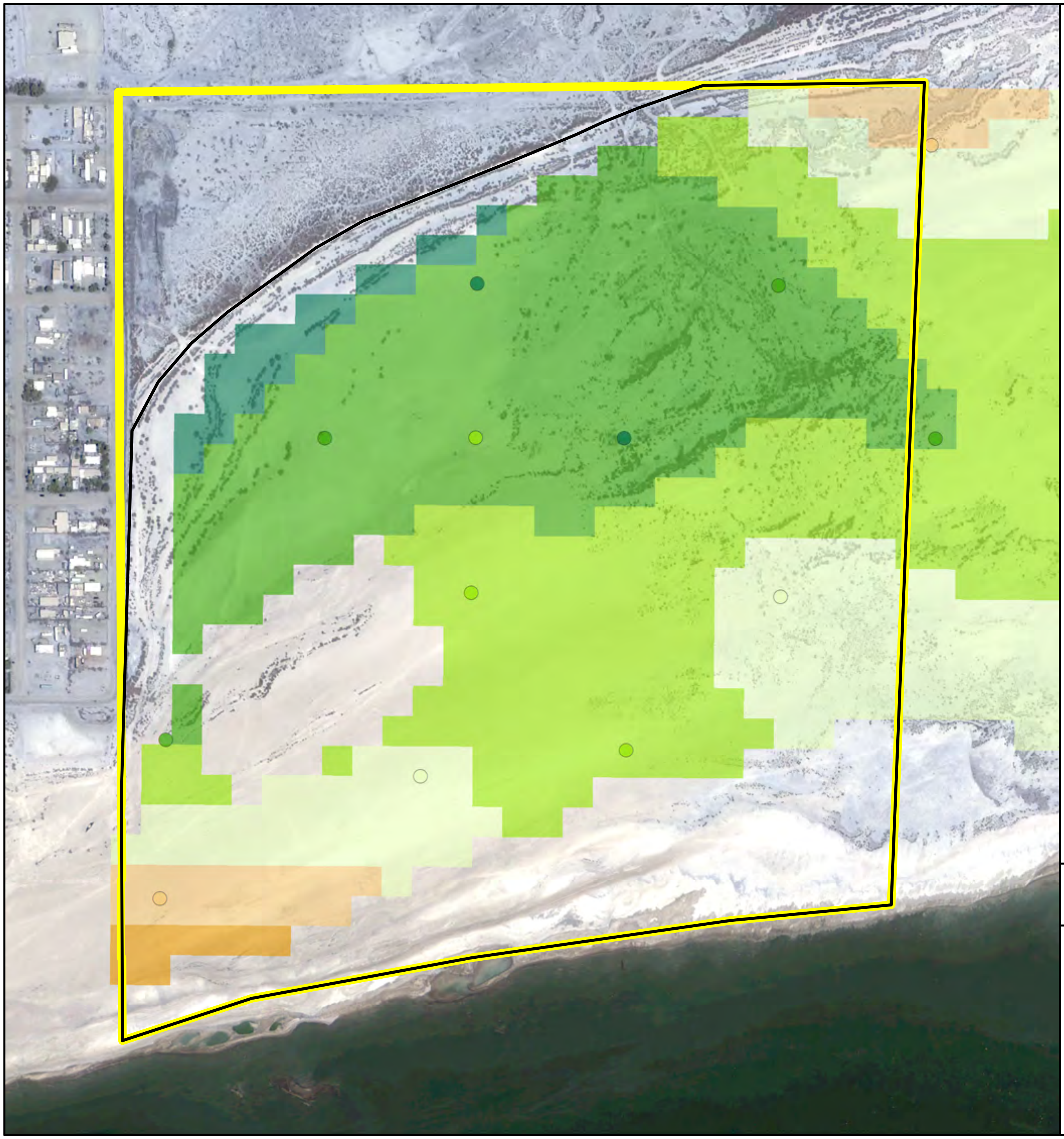
Vegetation is widely recognized as an effective dust control measure on bare, unprotected surfaces. Dust control design (i.e., vegetation spacing) was completed using the Single-event Wind Erosion Evaluation Program (SWEEP; Tatarko et al. 2016). SWEEP is a module of the Wind Erosion Prediction System (WEPS), a physically based model developed by the United States Department of Agriculture, Agricultural Research Service, to assess soil erosion and the effectiveness of control measures in reducing soil loss and the associated particulate matter 10-microns (PM_{10}) emissions (Wagner 2013, Tatarko et al. 2016). The WEPS model is used to evaluate annual erosion potentials for specific combinations of soils, surfaces, crops, climate, and roughness. SWEEP applies the same soil and erosion modules from WEPS to simulate the erosion and PM_{10} emissions potential over user-specified, "design," 24-hour wind events. Although SWEEP originates from an agricultural context, it has been successfully applied in the design of pilot studies for DCMs on disturbed lands (Tatarko et al. 2016), playa surfaces (Schaaf and Schreuder 2014), and at the Salton Sea (IID 2018a). Methods for using SWEEP as a dust control design tool at the Salton Sea are described in detail in the annual PDCPs (IID 2018b, 2019b, 2020b).

Input data for the design of the vegetated hedgerows was based on data collected on the Bombay Beach playa during the summer of 2018 and spring of 2019, the annual emissions estimates (IID 2018a, 2019a, 2020a), IID's soil mapping program, and wind data from the Salton City Station. Using this information, a suitability analysis was conducted to establish locations for vegetation establishment and the associated spacing.

Playa Surface Conditions. The area has coarse textured soils with approximately 85 percent sand and 15 percent combined clay and silt (Figure 6). The coarse nature of these soils makes them less suitable for creating stable surface roughness; hence, vegetation and waterless control measures were selected for the plot study. Playa surfaces were assumed to be weakly crusted with a presence of loose erodible material on the surface that is known to initiate sand motion during high winds. These assumptions were made to mimic the conditions present when playa surfaces become emissive. However, these conditions do not exist for all playa areas, and not throughout the entire year. Therefore, this represents a conservative condition for design purposes.

Design Wind Event. Design wind event conditions (speed) for a 24-hour period are needed as input to the SWEEP model to inform dust control planning. Attachment 3 of the 2019/2020 PDCP (IID 2020b) documents the approach for characterizing shoreline wind events for dust control planning. In general, wind conditions for events with 0.5- to 20-year return periods were characterized based on approximately nine years of measurements from the IID meteorological and air quality monitoring shoreline deployment network. Characteristic wind speeds and wind directions differ across the Sea. Conditions for a 1-in-5-year wind event at the Salton City station were used to drive subsequent saltation flux simulations performed with the SWEEP model (Figure 7). Although this station is located approximately 15 miles SW of the project area and on the western shore of the Sea, long-term monitoring data indicate that the highest wind speeds at this station are comparable to those observed at the Bombay Beach monitoring station which is located ~0.6 miles NW of the project sites. This choice of wind monitoring station is based on similarity between soil texture at the project site being consistent to those near Salton City. As such, the SWEEP runs from Salton City serve as the basis of design for the Bombay Beach site.

Playa emissions potentials were evaluated as a function of distance from the leading edge as saltation develops exponentially over distance to a maximum, equilibrium flux. A cumulative sand flux versus distance curve was developed to serve as the playa baseline. The anticipated reduction in potential sand motion was estimated for fully mature and semi-mature hedgerows (assuming half the plant size), at a spacing of 50' between rows. The relative reduction in sand motion was calculated by comparing the estimated controlled sand motion with uncontrolled baseline conditions.



Legend

- Area of Interest
- Plot Study Boundary

Soil, Sample (%Silt+Clay in Plow Depth)

- ● 81 - 100
- ● 61 - 80
- ● 51 - 60
- ● 41 - 50
- ● 31 - 40
- ● 21 - 30
- ● 11 - 20
- ● 5 - 10

Soil, Interpolated (%Silt+Clay in Plow Depth)

- ■ 81 - 100
- ■ 61 - 80
- ■ 51 - 60
- ■ 41 - 50
- ■ 31 - 40
- ■ 21 - 30
- ■ 11 - 20
- ■ 6 - 10

Notes:
1. The access routes are to be 15 feet wide.
2. Maintenance paths are to be 8 feet wide.
3. Background Imagery Source: Pleiades © 2020, Distribution Airbus DS, April 28, 2022.

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Figure 6. Plow Depth (60 cm) Soil Texture Map for Bombay Beach

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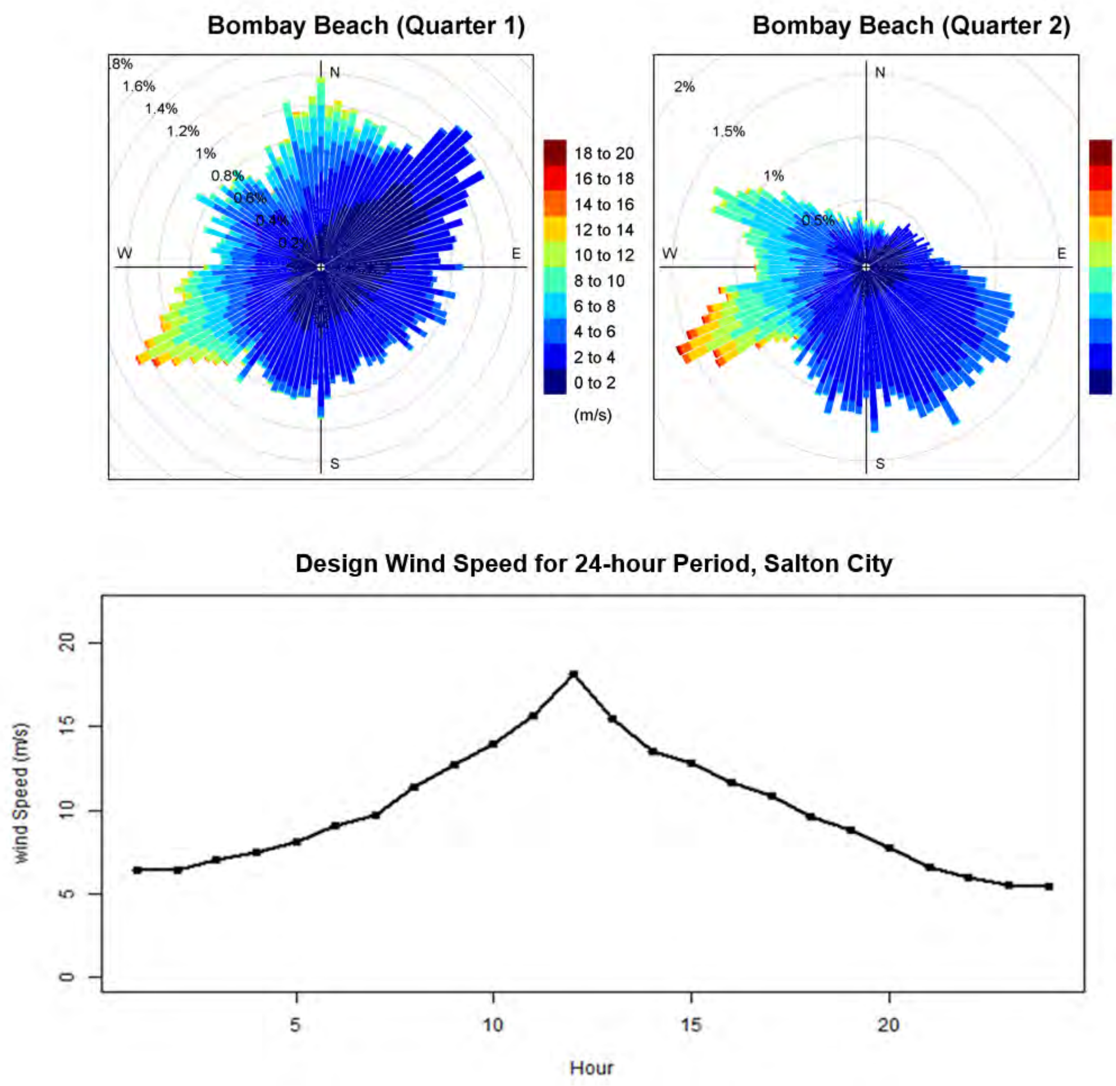
Figure 7. Wind Speed Profile Used for the SWEEP Runs (5-year return interval wind event, Salton City Station) and Wind Roses for Bombay Beach All Data and for the 99.9th Percentile Wind Speed.



SWEEP modeling results indicate that appropriately spaced hedgerows will generate a non-emissive surface under typical field conditions. The hedgerows will be oriented relative to the predominant high wind direction to provide protection from the most common SWW high wind direction, as well as protection against wind erosion from the less frequent northerly wind direction (Figure 7). Vegetated hedgerows will be planted with the ALOC Playa Mix with a spacing of 50', oriented N45°W, over an area of approximately 86.5 acres (Figure 2). It is anticipated that plants will reach individual plant dimensions of 3' tall and 4' in diameter in two to three growing seasons.

4.2 VEGETATION ENHANCEMENT WITH BUNDS

Vegetation monitoring conducted as a part of the Salton Sea Air Quality Mitigation Program (SS AQMP) shows that ALOC and other native species can establish in one to three growing seasons in both managed and naturally-occurring conditions. Natural establishment occurs most often on historical linear "beach ridges" formed by wave action. After initial establishment by beach ridge species, many other species fill in between the ridges, eventually leading to more continuous vegetation. Much of the existing vegetation at Bombay Beach occurs along these types of beach ridges. Consistent with many other exposed playa areas around the Salton Sea, *Allenrolfea occidentalis* (ALOC) dominates the plant composition, both with respect to the relative frequency of occurrence and relative cover. Existing vegetation is characterized as follows:

- **Moderate density vegetation above the 2003 shoreline berm**. Above the 2003 shoreline berm, ALOC and *Atriplex canescens* (ATCA) persist in xeric conditions, with ALOC appearing water-stressed. This area was presumably subject to more frequent inundation when the Salton Sea was higher and perched seasonal flood waters above the 2003 berm. *Atriplex lentiformis* (ATLE) also occurs infrequently.

- **Low-density vegetation adjacent to Bombay Beach Community**. Linear patches of ALOC occur adjacent to and east of the community of Bombay Beach. These features are relict from historic (2008 through 2014) shoreline elevations of the Salton Sea, when infrequent stormwater flows were retained by mounded barnacle bars deposited by wave action and wind. ATLE is found occasionally. Plant health is better than above the 2003 shoreline berm, likely reflecting the increased availability of surface water.

- **Moderate-density vegetation within northeastern portion of the plot study**. ALOC and *Suaeda nigra* (SUNI) dominate plant community composition. Both species are considered hydrophytic (water tolerant) species. Shallow excavations in this area indicate presence of an expansive, shallow sandstone hardpan (5-12 inches below ground surface elevation). The presence, persistence, and good condition of existing hydrophytic vegetation in this area likely reflects the ability of the hardpan to perch and retain ephemeral flood flows for extended periods of time. This hydrophytic community appears to be restricted to the region south of a breach in the 2003 shoreline berm.

Bunds will be used to mimic the surface water retention achieved by natural beach ridges and promote vegetation expansion into areas where natural beach ridges do not occur (Figure 2, Figure 8). Historic precipitation data in the Salton Sea basin shows that rains tend to occur late fall through early spring, with some storm events occurring late summer, ranging from 0.01 inches in June to 0.4 inches in October per year on average (CIMIS 1999-2022). When runoff is available, the bunds are expected to capture and retain the water making it available to reclaim and irrigate the soil, thus supporting the expansion and enhancement of existing vegetation. Vegetation recruitment will be accomplished through both managed seed distribution and naturally-occurring seed dispersal. If surface water runoff does not provide sufficient water for vegetation establishment, then groundwater resources may also be used.

Bunds will consist of semi-circular and trapezoidal shapes. There are two types of semi-circular bunds: Type A and Type B. Type A bunds are smaller (relative to Type B) in both diameter and berm height and are only intended to capture the rainwater that falls within their footprint. Type B bunds are larger (relative to Type A) in both their diameter and berm height and are intended to capture upslope runoff. Trapezoidal bunds are 3-sided features arranged in a staggered pattern such that the upper rows of bunds spill into the row below. Surface diversion swales will be installed as necessary to keep runoff within the bund array and to keep water from flowing into the Type A semi-circular bunds.

The bunds were designed for optimal performance in terms of flow rate capacity for a 10-year storm recurrence interval. Using the runoff volume from a 10-year storm event, the amount of water infiltrated into the bunds and the amount of water that will flow through the bunds and out of the array was estimated based on monitoring of shallow groundwater levels in the plot study and a range of assumed soil water holding capacities. This assumes that stormwater spreads within the area shown as habitat enhancement features in Figure 1. With the existing shallow groundwater at 5’ below ground surface (bgs) the amount of runoff from a 10-year storm is 60% of the flow that passes through the breach. The bunds are expected to be compromised from a berm integrity standpoint (i.e., potentially fail) for any storm in excess of a 25-year interval.

Vegetation monitoring conducted as a part of the SS AQMP indicates that vegetation (including ALOC) may experience negative health impacts due to root zone hypoxia caused by prolonged soil saturation. To minimize the potential for excessive accumulation of surface runoff, the bunds will be constructed to ensure that water can slowly infiltrate the deeper soil horizons. This slow infiltration is anticipated to retain adequate storm water in the upper soil profile for establishment of shallow-rooted seedlings, as well as aeration of more mature plants.

4.3 SAND FENCING

Sand fencing will be installed on the western and northern perimeter of the project site, with a dual purpose to 1) limit in the intrusion of moving sand from upwind sources areas outside of the project area, and 2) serve as a barrier to limit access to the site to non-project related vehicles. Sand fencing traps mobile soil particles behind individual barriers through increasing the threshold friction velocity required to move soil particles.

FIGURE 8. EXAMPLE OF RAINWATER HARVESTING BUNDS TO SUPPORT NATURAL VEGETATION ENHANCEMENT AND EXPANSION

5 DUST CONTROL IMPLEMENTATION

This section describes implementation of the dust control measures in the general order of operations.

5.1 VEGETATION ESTABLISHMENT

Vegetation establishment activities include earthworks, seeding, and the installation and operation of an irrigation system. Vegetation will be the ALOC Playa Mix. In this mix, ATLE is used as a nurse plant to protect the ALOC as it matures, however, this species' salinity tolerance is much less than ALOC and it eventually dies back.

5.1.1 SITE PREPARATION

Site preparation includes site staking, grubbing, construction of hedgerow seedbeds, and hedgerow seeding.

- Site staking is required to establish hedgerow locations as well as identify areas of existing vegetation to avoid when performing tractor work.
- Grubbing is required to remove debris that would interfere with construction. Typically, this includes removing trash left by playa users, legacy debris from Sea inundation, and dead plant material that would interfere with tractor operations.
- Hedgerows are planted on seedbeds and require multiple steps and pieces of equipment to complete. Following line-marking and grubbing, the initial step is to use a chisel plow for shallow sub-soiling. The width of chiseling and subsequent earthworks will not exceed 10 feet wide. Depending on the size of the clods brought up, a stubble disc (Figure 9) may be required to reduce their size. Following the initial earthworks, soil amendments including compost and fertilizer are applied along the seedbed. The amendments are incorporated with a smooth disc. Following discing a lister plow is used to raise the soil for use with a bed-shaper. The bed-shaper is then used to prepare the raised bed planting surface. Seeding is performed with a single-row seeder in two passes, one for each species. A total of 70,000 LF of seedbed will be prepared.

Site preparation is expected to take ten days and require a mini-excavator, light-duty tractor (50-100hp), three ATVs, and two light-duty (1/4-ton) pickups with trailers.

5.1.2 IRRIGATION SYSTEM

The groundwater wells will be configured to pump into a centralized water storage tank farm. The tank farm will be located coincident with one of the groundwater wells. The remaining wells will supply the tank farm by a buried pipeline. The length of pipeline will vary based on actual well locations. Approximately 650 LF to 3,250 LF of buried mainline are anticipated. The polyethylene water storage tanks will consist of three 5,000-gallon tanks per well (Figure 10). The solar power from the groundwater wells will be used to pump and convey the water to the tank farm. The larger (approximately 60' by 80') fenced compound installed during well commissioning will be used to contain the wellhead, pump solar arrays, and pump controllers, tank farm, connecting pipes, valves, booster pumps, filter station, and other equipment.

The hedgerows will be irrigated with a drip system which includes a booster pump, filter station (Figure 11), a flow meter, mainline, block control valves, submains, and driplines (Figure 12). Approximately 4,500 LF of mainline, 14,000 LF of sub-main, and 70,000 LF of drip lines will be installed. Lateral drip line runs range from 20 to 825LF.

A buried mainline will be used to convey water supply to the submains. The driplines will be installed both on the surface and subsurface. Typically, subsurface drip is installed with a shank. For areas with sub-surface irrigation a second, surface line is installed for reclamation and germination purposes. This surface line will be removed following reclamation and germination.

A solar powered booster pump will be used to supply pressure to the irrigation system. Ten to twelve solar panels will be installed adjacent to the booster pump and wired to a pump controller, breaker, and lightning arrestor.

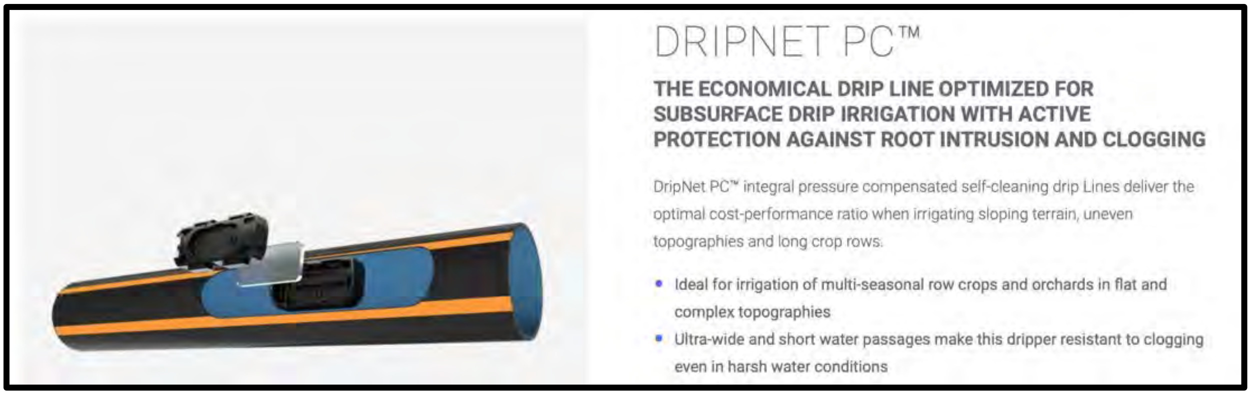
The installation activities of the buried mainline system will require light-duty (1/4-ton) pickups, mini-excavator, backhoe, bulldozer, and a motor-grader or other similar equipment as appropriate. The remaining irrigation system installation activities will require a light-duty tractor (50-100hp), three ATVs, and two light-duty (1/4-ton) pickups with trailers. This work will take approximately 30 days.

FIGURE 9. TYPICAL STUBBLE DISK

FIGURE 10. POLYETHYLENE WATER STORAGE TANK

FIGURE 11. EXAMPLE OF FILTRATION EQUIPMENT FOR DRIP IRRIGATION

FIGURE 12. EXAMPLE OF SURFACE OR SUB-SURFACE DRIPLINE



DRIPNET PC™

THE ECONOMICAL DRIP LINE OPTIMIZED FOR SUBSURFACE DRIP IRRIGATION WITH ACTIVE PROTECTION AGAINST ROOT INTRUSION AND CLOGGING

DripNet PC™ integral pressure compensated self-cleaning drip Lines deliver the optimal cost-performance ratio when irrigating sloping terrain, uneven topographies and long crop rows.

- Ideal for irrigation of multi-seasonal row crops and orchards in flat and complex topographies
- Ultra-wide and short water passages make this dripper resistant to clogging even in harsh water conditions

5.2 VEGETATION ENHANCEMENT WITH BUNDS

Bund construction will consist of staking, grubbing, excavation, compaction, and site restoration. All bund types utilize the same general construction methods. Site staking will consist of marking the locations of the bunds, adjacent borrow areas, and diversion swales. Bunds will be located to limit the disturbance of existing vegetation. The location of the tips of the trapezoidal bunds of type B semi-circular will be located such that they are at the same elevation to ensure that they spill water equally. Additionally, for trapezoidal bunds, the base of the trapezoid is to be installed along contour. Grubbing is required to remove debris that would interfere with construction. Typically, this includes removing trash left by playa users, legacy debris from Sea inundation, and dead plant material that would interfere with tractor operations.

Type A semi-circular bunds will have a radius of 20 feet, a top with and maximum height above existing grade of 1 foot, and side slopes of 1:1 (horizontal:vertical). Type B semi-circular bunds will have a radius of 65 feet, a top width of 1 foot, maximum height above existing grade of 2 feet, and side slopes of 3:1. Trapezoidal bunds are to have one side installed on contour (center bund) that is 130 LF, a top width and maximum height above existing grade of 2 feet and side slopes of 4:1. The remaining two sides of the trapezoidal bund (side bunds) are to be installed at an angle of 45 degrees upslope, referenced to the center bund, with a length of 184 LF.

All bund types will be constructed with native fill that is excavated immediately upslope of the bund. The tops of all bunds will be level such that the height above grade is reduced as the bund is constructed up slope playa. The volume of soil excavated will be roughly equivalent to the bund sizes described. The tips of semi-circular type B and trapezoidal bunds will be armored with rip-rap.

Diversion swales will be installed to divert surface flow to the bund arrays. The swales will be excavated with a depth of 9 inches, a bottom width of 2 feet and side slopes of 3:1. Swales will have a downslope berm with an equivalent geometry. The termination of the swale will be armored with rip rap and transitioned to a shallower and wider channel to ensure the water is dispersed as sheet or shallow concentrated flow.

The installation of the bunds is expected to take 30 days and will require a 130 hp excavator, 75 hp vibratory soil compactor, 125 hp dozer, a 75 hp skid steer, a water truck two ATVs, and two light-duty (1/4-ton) pickups with trailers. Following construction, all disturbed surfaces will be treated with stormwater erosion control features consisting of but not limited to, coconut mats and straw rolls.

5.3 SAND FENCING

Sand fencing will be UV resistant, have a height of 4’ and will be fastened to t-posts, driven into the ground, on a spacing of 6’. Fencing material will be fastened to the t-posts with UV resistant zip ties with a wooden dowl between the fence and t-post. Additionally, a single 12.5-gauge wire will be installed on the bottom of the fence to keep the fence taught at the ground surface. There will be 5,000 LF of sand fence. The installation of the sand fence is expected to take approximately 10 days and will require two ATVs, and two light-duty (1/4-ton) pickups with trailers.

6 OPERATIONS, MAINTENANCE, AND MONITORING

Operations and maintenance are primarily focused on irrigation; however, gap-filling with seed or transplants may be required. In addition, the plot study will be accessed periodically for monitoring project performance. A light-duty truck will be required for access.

6.1 OPERATIONS

Operations include seedbed reclamation and irrigation. Following reclamation, the managed irrigation system will be used to establish and maintain vegetation. The establishment period will last for 16 weeks, with every lateral irrigated every three days. After establishment, irrigation will revert to maintenance irrigation once per week for 20 weeks. Irrigation operations are implemented through cellular-based automation and staffed as necessary. Irrigation scheduling is dependent upon soil and vegetation monitoring, but it is anticipated to include the following:

- Reclamation – An irrigation event every three days for one month
- Establishment – An irrigation event every three days for 16 weeks
- Maturation – An irrigation event every seven days for 16 weeks

6.2 MONITORING

Plot study monitoring includes groundwater production and sampling, irrigation system performance, vegetation monitoring and sampling, and soil sampling. Sand motion monitoring will also be conducted to evaluate the dust control performance of the plot studies.

6.2.1 GROUNDWATER

During operations, groundwater elevation trends and quality will be monitored. Groundwater elevation trends will be evaluated using recorded pressure transducer data collected during periods of pumping and non-pumping. Results will be compared to the groundwater model to understand whether groundwater elevations are within the anticipated range. Groundwater quality monitoring will include quarterly assessments, including field measurements of conductivity and pH. Additional samples will be collected for lab analysis as needed.

6.2.2 IRRIGATION AND VEGETATION

As described in Section 6.1, irrigation will consist of surface and subsurface drip. Most of the site will be surface irrigated with the drip laterals placed on the surface, and a limited area will have the drip laterals shanked approximately one foot below the ground surface. Irrigation water will be applied, as required, to reclaim the soil, to establish the vegetation, and to meet the long-term evapotranspiration demand of the mature vegetation. The irrigation system and vegetation stand will be monitored during each irrigation event.

Vegetation performance monitoring is essential for ensuring dust control effectiveness over time. Visual, photographic, and remote-sensing-based monitoring of vegetation will be used to observe and quantify the density and size of vegetation. Visual monitoring will be used to observe the presence of vegetation and to direct any required maintenance efforts. Fixed location and random photographic monitoring will be used to sub-sample plant porosity. Fixed photographic locations will be coincident with ground-based sand motion monitoring. Light Detection and Ranging LiDAR-based imagery will be used to quantify the areal plant coverage. Plant porosity data will be used, along with sand motion monitoring data, to determine the effectiveness of the hedgerows in reducing PM_{10}.

6.2.3 SOILS

Monitoring soil quality, particularly soil salinity, is important for protecting vegetation. Soil samples, to a depth of two feet, were taken to establish a baseline soil salinity condition. After seeding, soil reclamation will be completed based on the baseline salinity analysis. During implementation, salinity monitoring will be done through periodic sampling to compare with baseline conditions. An additional metric for triggering the collection of salinity samples is the conductivity of water supply.

6.2.4 PERFORMANCE MONITORING

Development of performance monitoring techniques and appropriate maintenance criteria have been a focus of IID and ICAPCD collaborative efforts (IID 2020a). Results of performance monitoring on field-scale pilot studies have demonstrated that an effective performance monitoring program includes multiple lines of evidence to balance the strengths and weaknesses of individual dust control methodologies (IID 2020a). By pursuing multiple lines of evidence, a clear and readily interpretable assessment of dust control performance can be achieved. Performance monitoring is an important component of the plot studies because it will help determine the feasibility and applicability of implemented DCMs for additional areas around the Salton Sea. Performance monitoring is anticipated to include a combination of the following:

Visual Surveillance Network. Visual surveillance is an effective and intuitive method of performance monitoring, as it examines the presence/absence and intensity of dust plumes during hours with high wind speed. Although not a quantitative technique, this provides a straightforward method to assess whether a site might be emissive. IID’s visual surveillance network consists of four stationary cameras and one mobile Roundshot camera. The Bombay Beach Roundshot camera, located on a power pole on the SE corner of the town provides a full view of the site and will be used to monitor the site for dust plums, as well as potential human site disturbance (once fully built out).

Sand Flux Monitoring. Sand flux monitoring sensors are used to measure real-time horizontal sand fluxes for discrete locations. Two types of sand flux monitors may be deployed, either on a stand-alone or co-located basis. One option is a Cox Sand Catcher (CSC), consisting of a vertical tube that physically traps saltating particles at 6” above the soil surface. A CSC may also be deployed on a stand-alone basis, especially in areas where no to marginal sand motion is anticipated. In areas where sand motion is anticipated—for example, uncontrolled upwind locations—the CSC may be co-located with a device that would allow for distributing sand masses to estimate hourly fluxes, either a Sensit or SANTRI (“Standalone Aeolian Transport Real-time Instrument”). A Sensit is a piezoelectric sensor that registers saltating particles that strike the sensor at 15 cm above the soil surface. The Sensit can be connected directly to IID’s air quality monitoring network, or data can be downloaded manually in the field. Mass from the CSC can be time-resolved with the Sensit data to estimate an hourly sand flux. A SANTRI is a more recently developed instrument that has been shown to produce more reliable data than the Sensit. It is anticipated that predominantly CSC will be deployed at the plot study site as part of the monitoring network once the DCMs are in place, although Sensits of SANTRI units may also be deployed. The latter is to be determined. A detailed performance monitoring network layout has not been designed at this point in time, but will be developed closer to the implementation of the construction.

Upwind/Downwind PM_{10} Monitoring. Upwind/downwind PM_{10} monitors can be strategically positioned along transects crossing areas controlled for PM_{10} emissions. Currently available equipment includes BGIs (Model PQ200) and the DustTrak (Model DRX 8533), which measure PM_{10} concentrations on a 24-hour and real-time basis, respectively. In general, the difference in measured upwind and downwind PM_{10} concentrations provides an indicator of dust control performance in the intervening “controlled” area. If the difference is low (within the anticipated inherent concentration variability in a dust plume) or if the downwind monitor concentrations are substantially lower than those measured by the upwind monitor, then it is an indicator that the DCM is performing well. Specifically, the data indicate that the DCM is not generating additional airborne particulate matter. If the measured downwind monitoring concentrations are substantially higher than those from the upwind monitor, then it is an indicator that the DCM may be producing additional PM_{10}. At this juncture, PM_{10} monitoring is not planned for the site.

Saltation Flux Mapping. Saltation flux mapping is a landscape-based, data-driven process that uses fine-scale LiDAR remote-sensing mapping to quantify site-specific measurements describing soil surface conditions, surface roughness attributes, and vegetation characteristics to develop a saltation flux estimate relative to the original playa condition (uncontrolled) (IID 2020b). These landscape data and corresponding potential saltation flux estimates (developed using SWEEP) provide a quantitative basis to spatially assess dust control performance. Saltation flux maps provide a means to determine if portions, or all, of the area covered by a DCM is working, or if portions might have deteriorated or are nearing the end of the DCM’s effective life. Thus, these types of maps help to identify and delineate where DCM maintenance actions (augmentation, vegetation enhancement) might be needed. Saltation flux maps would be generated three times per year, consistent with the recommendations in the 2019/2020 PDCP (IID 2020b).

6.3 MAINTENANCE

Maintenance activities will include repairs to water supply and storage facilities as well as any needed repairs to drip laterals. Vegetation maintenance includes gap-filling and replanting of any dead or poorly performing plants. It is anticipated that all maintenance activities will be completed during an irrigation event. Maintenance of sand fence may include repair and replacement. Minor maintenance of the bunds to repair erosion associated with large storm flows may occur one to two times per year.

7 ENVIRONMENTAL COMPLIANCE AND PERMITTING

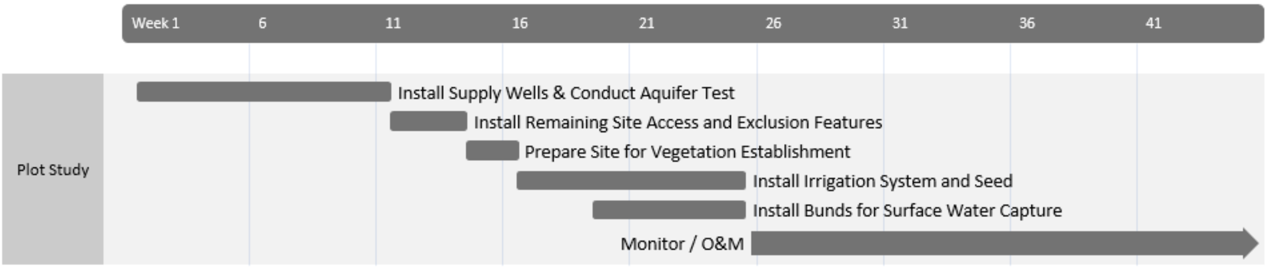
Environmental compliance and permitting will include the following:

- Preparation of an Addendum to the Water Transfer Project Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) under the California Environmental Quality Act (CEQA).
- Completion of the supply wells will follow the California State Well Standards and Imperial County ordinances. This includes California Department of Water Resources Bulletin 74-90 and Imperial County Ordinance No. 682.3, which regulates the Construction, Reconstruction, Abandonment, and Destruction of Wells.
- Issuance of a Building Permit and a Conditional Use Permit from Imperial County for the supply wells.
- Issuance of a Grading Permit from Imperial County for earthworks associated with implementation of the bunds, if determined necessary.
- Discharge of well development water, which will occur under State Water Resources Control Board Water Quality Order No. 2003-0003-DWQ – Statewide General Waste Discharge Requirements (WDRs) for Discharges to Land with a Low Threat to Water Quality.
- Preparation of an Aquatic Resources Delineation Report to identify resources under the jurisdiction of the United States Army Corps of Engineers (USACE). USACE concurrence will be obtained prior to implementation of the plot study.

8 SCHEDULE

A simple project schedule is shown in Figure 13. Installation timeframes will vary to ensure successful vegetation establishment (e.g., avoid initial establishment in late spring and summer). The simple project schedule reflects the main components described throughout Section 5.

FIGURE 13. SIMPLIFIED PROJECT SCHEDULE



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APPENDIX B

Air Quality and Greenhouse Gas Assessment

Air Quality and Greenhouse Gas Emissions Assessment
for the
Bombay Beach Vegetation Plots Project

County of Imperial, California

Prepared For:

Imperial Irrigation District

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November 2022

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LIST OF ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

°F	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per cubic meter; ppm = parts per million
1992 CO Plan	1992 Federal Attainment Plan for Carbon Monoxide
AB	Assembly Bill
AQMD	Air Quality Management District
AQTF	Air Quality Task Force
ATCM	Airborne toxics control measure
BAAQMD	Bay Area Air Quality Management District
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
County	Imperial County
DCMs	Dust Control Measures
DPM	Diesel particulate matter
EO	Executive Order
GHG	Greenhouse gas
GWP	Global warming potential
HRA	Health Risk Assessment
ICAPCD	Imperial County Air Pollution Control District
IID	Imperial Irrigation District
IPCC	Intergovernmental Panel on Climate Change
MDAQMD	Mojave Desert Air Quality Management District

LIST OF ACRONYMS AND ABBREVIATIONS

N_2O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NO_2	Nitrogen dioxide
NO_x	Nitric oxides
O_3	Ozone
PM	Particulate matter
PM_{10}	Coarse particulate matter
$PM_{2.5}$	Fine particulate matter
ppb	Parts per billion
Project	Bombay Beach Vegetation Plots Project
ROGs	Reactive organic gases
SB	Senate Bill
SCAQMD	South Coast Air Quality Management
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SO_x	Sulfur oxides
SR	State Route
SSAB	Salton Sea Air Basin
SSAQMP	Salton Sea Air Quality Mitigation Program
TACs	Toxic air contaminants
USEPA	U.S. Environmental Protection Agency
VOC	Volatile organic compound
VMT	Vehicle Miles Traveled

1.0 INTRODUCTION

This report documents the results of an assessment of both air quality and greenhouse gas (GHG) emissions completed for the Bombay Beach Vegetation Plots Project (Project), which includes the implementation of Bombay Beach Plot Study as a part of portion of the Salton Sea Air Quality Mitigation Program (SSAQMP) on approximately 149.2 acres of vacant land in Imperial County, California. This assessment was prepared using methodologies and assumptions recommended in the rules and regulations promulgated by the Imperial County Air Pollution Control District (ICAPCD). Regional and local existing conditions are presented, along with pertinent emissions standards and regulations.

1.1 Project Overview

The Project Site is currently vacant land located adjacent to the eastern edge of the town of Bombay Beach on the eastern playa of the Salton Sea in Imperial County (County). Water conservation and transfer programs have reduced the volume of agricultural return flow to the Salton Sea. As a result, the Salton Sea is shrinking in size. As the Sea dries up, it exposes dry lakebed (also called playa) which subject to wind erosion. The increase in the rate of playa exposure increases the potential for dust emissions that could affect communities near and around the Sea. The Project proposes to implement several surface treatments along the Salton Sea shoreline to provide dust control and habitat enhancements adjacent to the community of Bombay Beach, California. More specifically, the Project proposes to evaluate groundwater supply and quality, vegetation establishment in hedgerows, enhancement of existing vegetation through rainwater harvesting (bunds) techniques, and waterless dust control measures (DCMs) in the Project Area. The Proposed Project will be a crucial part of the SSAQMP.

The main elements of the proposed Project are as follows:

- Installation of site exclusion barriers to prevent vehicle disturbance on the Project Site;
- Installation of access routes totaling 5,250 linear feet;
- Construction and development of three wells and completion of aquifer testing;
- Placement and use of approximately nine 5,000-gallon water storage tanks;
- Installation of irrigation system from wells to storage tanks and from storage tanks to vegetation on the exposed playa;
- Enhancement of up to 53 acres of existing vegetation and establishment of 86.5 acres of vegetated hedgerows, including site preparation, seeding and transplanting, and installation of managed irrigation systems. Vegetation would be seeded or transplanted iodine bush.

The purpose of the Project is the development of sufficient groundwater (both quantity and quality) to establish and sustain vegetation cover and implementation of DCMs. The primary DCMs would include vegetation establishment using irrigation from groundwater wells and vegetation enhancement using bunds for surface water capture. Existing vegetation includes native species such as iodine bush (*Allenrolfea occidentalis* or ALOC), fourwing saltbush (*Atriplex canescens* or ATCA), big saltbush (*Atriplex lentiformis* or ATLE), and bush seepweed (*Suaeda nigra* or SUNI).

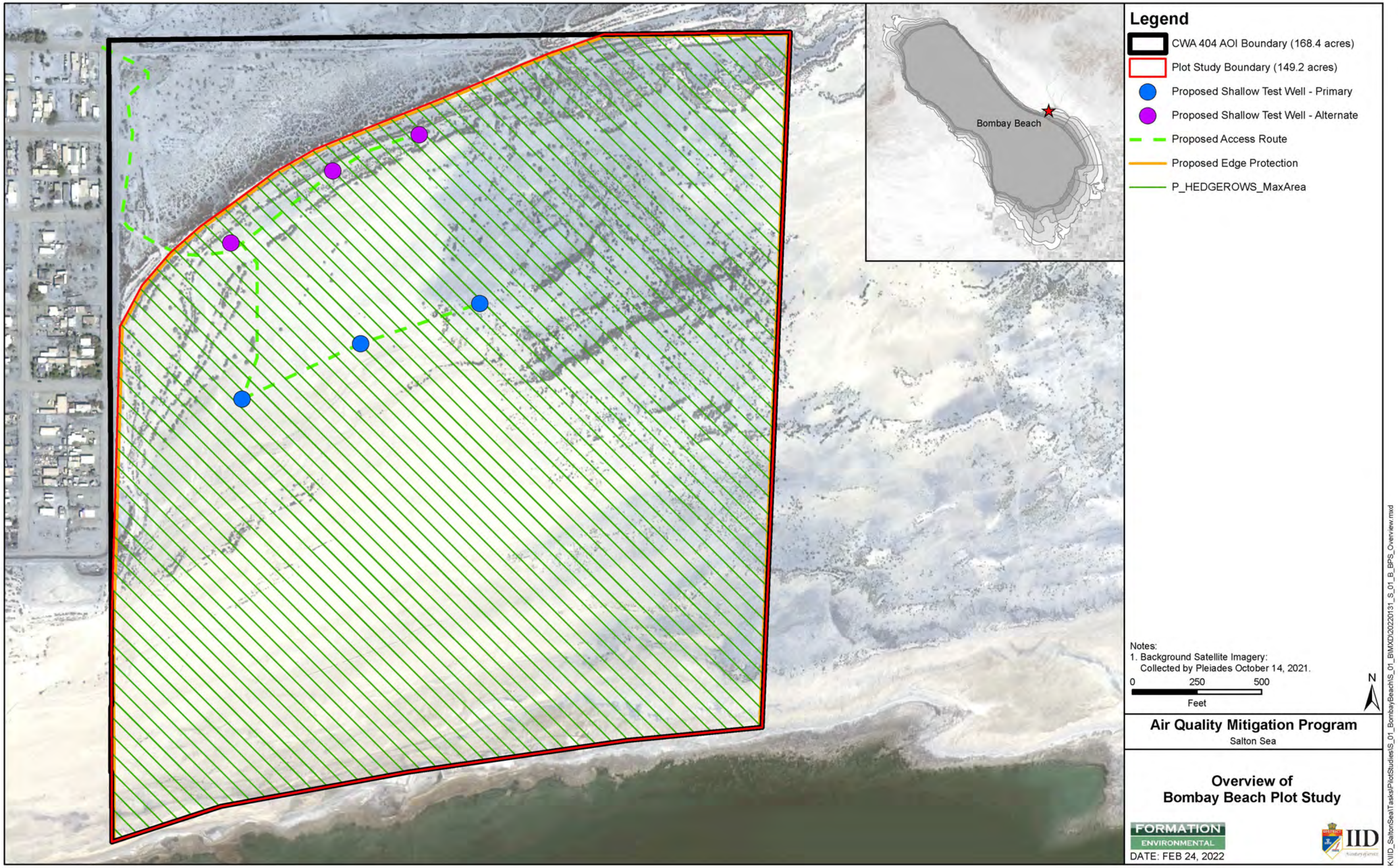
Vegetation establishment activities include earthworks, seeding, and the installation and operation of an irrigation system. The vegetated hedgerows would be planted with ALOC Playa Mix. Site preparation includes site staking, grubbing, construction of hedgerow seedbeds, and hedgerow seeding.

Bunds would be used to mimic the surface water retention achieved by natural beach ridges and promote vegetation expansion into areas were natural beach ridges to not occur. Bund construction is proposed to consist of staking, grubbing, excavation, compaction, and site restoration. Diversion swales would be installed to divert surface flow to the bund arrays.

Waterless DCMs include hay bales and sand fencing. Hay bales are proposed to be placed on the eastern and southern perimeter of the Project Area for site exclusion. Sand fencing would be installed on the western and northern perimeter of the Project Area for site exclusion and upwind control. A concrete barrier would also be placed along a portion of the western perimeter to prevent vehicle disturbance to the Project Site.

1.2 Project Location

The Project Area is directly adjacent to southeastern edge of the community of Bombay Beach, on the eastern edge of the Salton Sea. Site access would be available from State Highway 111 via Avenue A to the roads within the community of Bombay Beach. All access roads to the Project Site are paved.



Map Date: 11/08/2022
Photo (or Base) Source: Formation Environmental 2022

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ENVIRONMENTAL CONSULTANTS

Figure 1. Project Location

2022-061 Bombay Beach Vegetation Plots Project

2.0 AIR QUALITY

2.1 Air Quality Setting

Air quality in a region is determined by its topography, meteorology, and existing air pollutant sources. These factors are discussed below, along with the current regulatory structure that applies to the Salton Sea Air Basin (SSAB), which encompasses the Project Site, pursuant to the regulatory authority of the ICAPCD.

Ambient air quality is commonly characterized by climate conditions, the meteorological influences on air quality, and the quantity and type of pollutants released. The air basin is subject to a combination of topographical and climatic factors that reduce the potential for high levels of regional and local air pollutants. The following section describes the pertinent characteristics of the air basin and provides an overview of the physical conditions affecting pollutant dispersion in the Project Area.

2.1.1 Salton Sea Air Basin

The California Air Resources Board (CARB) divides the State into air basins that share similar meteorological and topographical features. Imperial County, which extends over 4,482 square miles in the southeastern corner of California, lies in the SSAB, which includes the Imperial Valley and the central part of Riverside County, including the Coachella Valley. The province is characterized by the large-scale sinking and warming of air within the semi-permanent subtropical high-pressure center over the Pacific Ocean. The elevation in Imperial County ranges from about 230 feet below sea level in the Salton Sea to more than 2,800 feet on the mountain summits to the east.

2.1.1.1 Temperature and Precipitation

The flat terrain near the Salton Sea, intense heat from the sun during the day, and strong radiational cooling at night create deep convective thermals during the daytime and equally strong surface-based temperature inversions at night. The temperature inversions and light nighttime winds trap any local air pollution emissions near the ground. The area is subject to frequent hazy conditions at sunrise, followed by rapid daytime dissipation as winds pick up and the temperature warms. The lack of clouds and atmospheric moisture creates strong diurnal and seasonal temperature variations ranging from an average summer maximum of 108 degrees Fahrenheit (° F) down to a winter morning minimum of 38° F. The most pleasant weather occurs from about mid-October to early May when daily highs are in the 70s and 80s with very infrequent cloudiness or rainfall. Imperial County experiences rainfall on an average of only four times per year (>0.10 inches in 24 hours). The local area usually has three days of rain in winter and one thunderstorm day in August. The annual rainfall in this region is less than three inches per year.

2.1.1.2 Wind

Winds in the area are driven by a complex pattern of local, regional and global forces, but primarily reflect the temperature difference between the cool ocean to the west and the heated interior of the entire desert southwest. For much of the year, winds flow predominantly from the west to the east. In summer, intense solar heating in the Imperial Valley creates a more localized wind pattern, as air comes up from the southeast via the Gulf of California. During periods of strong solar heating and intense convection, turbulent motion creates good mixing and low levels of air pollution. However, even strong turbulent mixing is insufficient to overcome the limited air pollution controls on sources in the Mexicali, Mexico area. Imperial County is predominately agricultural land. This is a factor in the cumulative air quality of the SSAB. The agricultural production generates dust and small particulate matter through the use of agricultural equipment on unpaved roads, land preparation, and harvest practices. The Imperial County experiences unhealthful air quality from photochemical smog and from dust due to extensive surface disturbance and the very arid climate.

2.1.1.3 Inversion

The entire county is affected by inversion layers, where warm air overlays cooler air. Inversion layers trap pollutants close to the ground. In the winter, these pollutant-trapping, ground-based inversions are formed during windless, clear-sky conditions, as cold air collects in low-lying areas such as valleys and canyons. Imperial County experiences surface inversions almost every day of the year. Due to strong surface heating, these inversions are usually broken allowing pollutants to be more easily dispersed (ICAPCD 2010).

2.1.2 Criteria Air Pollutants

Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health with a determined margin of safety. Ozone (O_3), coarse particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$) are generally considered to be regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) are considered to be local pollutants because they tend to accumulate in the air locally. PM is also considered a local pollutant. Health effects commonly associated with criteria pollutants are summarized in Table 2-1.

Table 2-1. Criteria Air Pollutants- Summary of Common Sources and Effects

Pollutant	Major Manmade Sources	Human Health & Welfare Effects
CO	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, effecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
NO_2	A reddish-brown gas formed during fuel combustion for motor vehicles, energy utilities and industrial sources.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Causes brown discoloration of the atmosphere.
O_3	Formed by a chemical reaction between reactive organic gases (ROGs) and nitrous oxides (N_2O) in the presence of sunlight. Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, solvents, paints and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield.
PM_{10} & $PM_{2.5}$	Power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles and others.	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
SO_2	A colorless, nonflammable gas formed when fuel containing sulfur is burned. Examples are refineries, cement manufacturing, and locomotives.	Respiratory irritant. Aggravates lung and heart problems. Can damage crops and natural vegetation. Impairs visibility.

Source: California Air Pollution Control Officers Association (CAPCOA 2013)

2.1.2.1 Carbon Monoxide

CO in the urban environment is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can cause headaches, aggravate cardiovascular disease and impair central nervous system functions. CO concentrations can vary greatly over comparatively short distances. Relatively high concentrations of CO are typically found near crowded intersections and along heavy roadways with slow moving traffic. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within relatively short distances of the source. Overall CO emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973. CO levels in the SSAB are in compliance with the state and federal one- and eight-hour standards.

2.1.2.2 Nitrogen Oxides

Nitrogen gas comprises about 80 percent of the air and is naturally occurring. At high temperatures and under certain conditions, nitrogen can combine with oxygen to form several different gaseous compounds collectively called nitric oxides (NO_x). Motor vehicle emissions are the main source of NO_x in urban areas. NO_x is very toxic to animals and humans because of its ability to form nitric acid with water in the eyes, lungs, mucus membrane, and skin. In animals, long-term exposure to NO_x increases susceptibility to respiratory infections, and lowering resistance to such diseases as pneumonia and influenza. Laboratory studies show that susceptible humans, such as asthmatics, who are exposed to high concentrations can suffer from lung irritation or possible lung damage. Precursors of NO_x, such as NO and NO_2, attribute to the formation of O_3 and $PM_{2.5}$. Epidemiological studies have also shown associations between NO_2 concentrations and daily mortality from respiratory and cardiovascular causes and with hospital admissions for respiratory conditions.

2.1.2.3 Ozone

O_3 is a secondary pollutant, meaning it is not directly emitted. It is formed when volatile organic compounds (VOCs) or ROGs and NO_x undergo photochemical reactions that occur only in the presence of sunlight. The primary source of ROG emissions is unburned hydrocarbons in motor vehicle and other internal combustion engine exhaust. NO_x forms as a result of the combustion process, most notably due to the operation of motor vehicles. Sunlight and hot weather cause ground-level O_3 to form. Ground-level O_3 is the primary constituent of smog. Because O_3 formation occurs over extended periods of time, both O_3 and its precursors are transported by wind and high O_3 concentrations can occur in areas well away from sources of its constituent pollutants.

People with lung disease, children, older adults, and people who are active can be affected when O_3 levels exceed ambient air quality standards. Numerous scientific studies have linked ground-level O_3 exposure to a variety of problems including lung irritation, difficult breathing, permanent lung damage to those with repeated exposure, and respiratory illnesses.

2.1.2.4 Particulate Matter

PM includes both aerosols and solid particulates of a wide range of sizes and composition. Of concern are those particles smaller than or equal to 10 microns in diameter size (PM_{10}) and small than or equal to 2.5 microns in diameter ($PM_{2.5}$). Smaller particulates are of greater concern because they can penetrate deeper into the lungs than larger particles. PM_{10} is generally emitted directly as a result of mechanical processes that crush or grind larger particles or form the resuspension of dust, typically through construction activities and vehicular travel. PM_{10} generally settles out of the atmosphere rapidly and is not readily transported over large distances. $PM_{2.5}$ is directly emitted in combustion exhaust and is formed in atmospheric reactions between various gaseous pollutants, including NO_x, sulfur oxides (SO_x) and VOCs. $PM_{2.5}$ can remain suspended in the atmosphere for days and/or weeks and can be transported long distances.

The principal health effects of airborne PM are on the respiratory system. Short-term exposure of high $PM_{2.5}$ and PM_{10} levels are associated with premature mortality and increased hospital admissions and emergency room visits. Long-term exposure is associated with premature mortality and chronic respiratory disease. According to the U.S. Environmental Protection Agency (USEPA), some people are much more sensitive than others to breathing PM_{10} and $PM_{2.5}$. People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worse illnesses; people with bronchitis can expect aggravated symptoms; and children may experience decline in lung function due to breathing in PM_{10} and $PM_{2.5}$. Other groups considered sensitive include smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive because many breathe through their mouths.

2.1.3 Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Additionally, diesel engines emit a complex mixture of air pollutants composed of gaseous and solid material. The solid emissions in diesel exhaust are known as diesel particulate matter (DPM). In 1998, California identified DPM as a TAC based on its potential to cause cancer, premature death, and other health problems (e.g., asthma attacks and other respiratory symptoms). Those most vulnerable are children (whose lungs are still developing) and the elderly (who may have other serious health problems). Overall, diesel engine emissions are responsible for the majority of California’s known cancer risk from outdoor air pollutants. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage, and death.

2.1.3.1 Diesel Exhaust

Most recently, CARB identified DPM as a TAC. 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 a complex mixture of particles and gases produced when an engine burns diesel fuel. DPM is a concern because it causes lung cancer; many compounds found in diesel exhaust are carcinogenic. DPM includes the particle-phase constituents in diesel exhaust. The chemical composition and particle sizes of DPM vary between different engine types (heavy-duty, light-duty), engine operating conditions (idle, accelerate, decelerate), fuel formulations (high/low sulfur fuel), and the year of the engine (USEPA 2002). Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation, and diesel exhaust can cause coughs, headaches, light-headedness, and nausea. DPM poses the greatest health risk among the TACs; due to their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

2.1.4 Ambient Air Quality

Ambient air quality at the Project Site can be inferred from ambient air quality measurements conducted at nearby air quality monitoring stations. CARB maintains more than 60 monitoring stations throughout California. O_3, PM_{10} and $PM_{2.5}$ are the pollutant species most potently affecting the Project region. As described in detail below, the Project region is designated as a nonattainment area for the federal O_3, PM_{10}, and $PM_{2.5}$ standards and is also a nonattainment area for the state standards for O_3 and PM_{10} (CARB 2019). The Niland-English Road air quality monitoring station (7711 English Road, Niland) is located approximately 10.6 miles southeast of the Project Site, monitors ambient concentrations of O_3 and PM_{10}. The Brawley-Main Street #2 air quality monitoring station (220 Main Street, Brawley), located 24.0 miles south of the Project Site, monitors ambient concentrations of $PM_{2.5}$. Ambient emission concentrations will vary due to localized variations in emission sources and climate and should be considered "generally" representative of ambient concentrations in the Project Area.

Table 2-2 summarizes the published data concerning O_3, $PM_{2.5}$ and PM_{10} from the Niland-English Road and Brawley-Main Street #2 monitoring stations for each year that the monitoring data is provided. O_3, PM_{10} and $PM_{2.5}$ are the pollutant species most potently affecting the Project region.

Table 2-2. Summary of Ambient Air Quality Data

Pollutant Standards	2019	2020	2021
O_3- Niland-English Road			
Max 1-hour concentration (ppm)	0.060	0.054	0.065
Max 8-hour concentration (ppm) (state/federal)	0.055 / 0.054	0.046 / 0.045	0.055 / 0.055
Number of days above 1-hour standard (state/federal)	0 / 0	0 / 0	0 / 0
Number of days above 8-hour standard (state/federal)	0 / 0	0 / 0	0 / 0
PM_{10}- Niland-English Road			
Max 24-hour concentration (µg/m^3) (state/federal)	156.3 / 155.7	241.3 / 239.8	218.2 / 211.2
Number of days above 24-hour standard (state/federal)	49.3 / 1.0	68.9 / 1.0	86.0 / 4.0
$PM_{2.5}$- Brawley-Main Street			
Max 24-hour concentration (µg/m^3) (state/federal)	28.9 / 28.9	23.7 / 23.7	24.4 / 24.4
Number of days above federal 24-hour standard	0	0	*

Source: CARB 2022
µg/m^3 = micrograms per cubic meter; ppm = parts per million
* = Insufficient data available

The USEPA and CARB designate air basins or portions of air basins and counties as being in "attainment" or "nonattainment" for each of the criteria pollutants. Areas that do not meet the standards are classified as nonattainment areas. The National Ambient Air Quality Standards (NAAQS) (other than O_3, PM_{10} and $PM_{2.5}$ and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. The NAAQS for O_3, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over one- to three-year periods, depending on the pollutant. The California Ambient Air Quality Standards (CAAQS) are not to be exceeded during a three-year period. The attainment status for the portion of the SSAB encompassing the Project Site is included in Table 2-3.

Table 2-3. Attainment Status of Criteria Pollutants in the Imperial County Portion of the SSAB

Pollutant	State Designation	Federal Designation
O_3	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Nonattainment
$PM_{2.5}$	Attainment	Nonattainment
CO	Attainment	Unclassified/Attainment
NO_2	Attainment	Unclassified/Attainment
SO_2	Attainment	Unclassified/Attainment

Source: CARB 2019

The determination of whether an area meets the state and federal standards is based on air quality monitoring data. Some areas are unclassified, which means there is insufficient monitoring data for determining attainment or nonattainment. Unclassified areas are typically treated as being in attainment. Because the attainment/nonattainment designation is pollutant-specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the state and federal standards differ, an area could be classified as attainment for the federal standards of a pollutant and as nonattainment for the state standards of the same pollutant. The region is designated as a nonattainment area for the federal O_3, $PM_{2.5}$, and PM_{10} standards and is also a nonattainment area for the state standards for O_3 and PM_{10} (CARB 2019).

2.1.5 Sensitive Receptors

Sensitive receptors are defined as facilities or land uses that include members of the population who are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. The nearest existing sensitive receptors to the Project Site are several single-family residences located on the road, Aisle of Palms, which is directly adjacent to the Project Site.

2.2 Regulatory Framework

2.2.1 Federal

2.2.1.1 Clean Air Act

The Clean Air Act (CAA) of 1970 and the CAA Amendments of 1971 required the USEPA to establish the NAAQS, with states retaining the option to adopt more stringent standards or to include other specific pollutants.

These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those "sensitive receptors" most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

The USEPA has classified air basins (or portions thereof) as being in attainment, nonattainment, or unclassified for each criteria air pollutant, based on whether or not the NAAQS have been achieved. If an area is designated unclassified, it is because inadequate air quality data were available as a basis for a nonattainment or attainment designation. Table 2-3 lists the federal attainment status of the SSAB for the criteria pollutants.

2.2.2 State

2.2.2.1 California Clean Air Act

The California Clean Air Act (CCAA) allows the state to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. 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, including setting the CAAQS. CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions 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 also has primary responsibility for the development of California's State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts.

2.2.2.2 California State Implementation Plan

The CCAA (and its subsequent amendments) requires the state to prepare an air quality control plan referred to as the SIP. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The USEPA has the responsibility to review all SIPs to determine if they conform to the requirements of the CAA. State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the USEPA for approval and publication in the Federal Register.

Local air districts, such as the ICAPCD, prepare air quality attainment plans or air quality management plans and submit them to CARB for review, approval, and incorporation into the applicable SIP. The air districts develop the strategies stated in the SIPs for achieving air quality standards on a regional basis.

For 8-Hour O_3, the ICAPCD adopted the 2017 8-hour Ozone State Implementation Plan in October 2018. The plan includes control measures which are an integral part of how the ICAPCD currently controls the ROG and NO_X emissions within the O_3 nonattainment areas. The overall strategy includes programs and control measures which represent the implementation of Reasonable Available Control Technology (40 CFR 51.912) and the assurance that stationary sources maintain a net decrease in emissions.

For PM_{10}, the ICAPCD adopted the PM_{10} State Implementation Plan in 2018, which maintained previously adopted fugitive dust control measures (Regulation VIII). The USEPA had previously approved Regulation VIII fugitive dust rules into the Imperial County portion of the California SIP in 2013.

For $PM_{2.5}$, the ICAPCD adopted the $PM_{2.5}$ SIP in April 2018. This SIP concluded that the majority of the $PM_{2.5}$ emissions resulted from transport in nearby Mexico. Specifically, the SIP demonstrates attainment of the 2006 $PM_{2.5}$ NAAQS "but for" transport of international emissions from Mexicali, Mexico. In accordance with the CCAA, the $PM_{2.5}$ SIP satisfies the attainment demonstration requirement satisfying the provisions of the CCAA.

The ICAPCD is working cooperatively with counterparts from Mexico to implement emissions reductions strategies and projects for air quality improvements at the border. The two countries strive to achieve these goals through local input from states, County governments, and citizens. Within the Mexicali and Imperial Valley area, the Air Quality Task Force (AQTF) has been organized to address those issues unique to the border region known as the Mexicali/Imperial air shed. The AQTF membership includes representatives from Federal, State, and local governments from both sides of the border, as well as representatives from academia, environmental organizations, and the general public. This group was created to promote regional efforts to improve the air quality monitoring network, emissions inventories, and air pollution transport modeling development, as well as the creation of programs and strategies to improve air quality.

2.2.2.3 Tanner Air Toxics Act & Air Toxics "Hot Spots" Information and Assessment Act

CARB's Statewide comprehensive air toxics program was established in 1983 with Assembly Bill (AB) 1807, the Toxic Air Contaminant Identification and Control Act (Tanner Air Toxics Act of 1983). AB 1807 created California's program to reduce exposure to air toxics and sets forth a formal procedure for CARB to designate substances as TACs. Once a TAC is identified, CARB adopts an airborne toxics control measure (ATCM) for sources that emit designated TACs. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology to minimize emissions.

CARB also administers the state's mobile source emissions control program and oversees air quality programs established by state statute, such as AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987. Under AB 2588, TAC emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High priority facilities are required to perform a health risk assessment (HRA) and, if specific thresholds are exceeded, required to communicate the results to the public in the form of notices and public meetings. In September 1992, the "Hot Spots" Act was amended by Senate Bill (SB) 1731, which required facilities that pose a significant health risk to the community to reduce their risk through a risk management plan.

2.2.3 Local

2.2.3.1 Imperial County Air Pollution Control District

The ICAPCD is the local air quality agency and shares responsibility with CARB for ensuring that state and federal ambient air quality standards are achieved and maintained in the SSAB. Furthermore, ICAPCD adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs and regulates agricultural burning. Other ICAPCD responsibilities include monitoring ambient air quality, preparing clean air plans, planning activities such as modeling and maintenance of the emission inventory, and responding to citizen air quality complaints.

To achieve and maintain ambient air quality standards, the ICAPCD has adopted various rules and regulations for the control of airborne pollutants. The ICAPCD Rules and Regulations that are applicable to the Proposed Project include, but are not limited to, ICAPCD Regulation VIII (Fugitive Dust Rules). The purpose of this regulation is to reduce the amount of PM_{10} entrained in the ambient air as a result of emissions generated from construction and other earthmoving activities by requiring actions to prevent, reduce, or mitigate PM_{10} emissions. Regulation VIII requires the Project to adopt best available control measures to minimize emissions from surface-disturbing activities. These measures include the following (ICAPCD 2017):

- All disturbed areas, including bulk material storage which is not being actively utilized, shall be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by using water, chemical stabilizers, dust suppressants, tarps, or other suitable material such as vegetative ground cover.
- All on-site and off-site unpaved roads will be effectively stabilized, and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, or dust suppressants.
- All unpaved traffic areas of 1 acre or more with 75 or more average vehicle trips per day will be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, dust suppressants, and/or watering.
- The transport of bulk materials shall be completely covered unless 6 inches of freeboard space from the top of the container is maintained with no spillage and loss of bulk material. In addition, the cargo compartment of all haul trucks is to be cleaned and/or washed at the delivery site after removal of bulk material.
- All track-out or carry-out will be cleaned at the end of each workday or immediately when mud or dirt extends a cumulative distance of 50 linear feet or more onto a paved road within an urban area.
- Bulk material handling or transfer shall be stabilized prior to handling or at points of transfer with application of sufficient water, chemical stabilizers, or by sheltering or enclosing the operation and transfer line.

- The construction of any new unpaved road is prohibited within any area with a population of 500 or more unless the road meets the definition of a temporary unpaved road. Any temporary unpaved road shall be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emission by paving, chemical stabilizers, dust suppressants and/or watering.

In addition, there are other ICAPCD rules and regulations, not detailed here, which may apply to the Proposed Project, but are administrative or descriptive in nature. These include rules associated with fees, enforcement and penalty actions, and variance procedures.

2.3 Air Quality Emissions Impact Assessment

2.3.1 Thresholds of Significance

The impact analysis provided below is based on the following California Environmental Quality Act (CEQA) Guidelines Appendix G thresholds of significance. The Project would result in a significant impact to air quality if it would do any of the following:

1. Conflict with or obstruct implementation of any applicable air quality plan.
2. Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).
3. Expose sensitive receptors to substantial pollutant concentrations.
4. Result in other emissions (such as those leading to odors adversely affecting a substantial number of people).

2.3.1.1 Imperial County Air Pollution Control District Thresholds

The significance criteria established by the applicable air quality management or air pollution control district (ICAPCD) may be relied upon to make the above determinations. The ICAPCD has identified significance thresholds for use in evaluating project impacts under CEQA. Accordingly, the ICAPCD-recommended thresholds of significance are used to determine whether implementation of the proposed Project would result in a significant air quality impact. Significance thresholds for evaluation construction air quality impacts are listed in Table 2-4.

Table 2-4. ICAPCD Significance Thresholds for Construction

Criteria Pollutant and Precursors	Construction Activities
	Average Daily Emissions (lbs/day)
ROG	75
NO_x	100
PM_{10}	150
$PM_{2.5}$	N/A
CO	550
SO_2	N/A

Source: ICAPCD 2017

By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's individual emissions exceed its identified significance thresholds, the project would be cumulatively considerable. Projects that do not exceed significance thresholds would not be considered cumulative considerable.

2.3.2 Methodology

Air quality impacts were assessed in accordance with methodologies recommended by the ICAPCD. Where criteria air pollutant quantification was required, emissions were modeled using the California Emissions Estimator Model (CalEEMod), version 2020.4.0. CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with construction from a variety of land use projects. Project construction-generated worker and vendor trip lengths were calculated using CalEEMod model defaults for Imperial County. More specifically, the model assumes that the average trip length for a worker to commute to the Project Site would be approximately 10.2 miles and the trip length for a vendor to be approximately 11.9 miles. As previously described, site access would be available from State Highway 111 via Avenue A to the roads within the community of Bombay Beach. All access roads to the Project Site are paved. For instance, Highway 111, which is the sole roadway providing access to Bombay Beach and the Project Site, is 100 percent paved, as is Avenue A and all of the roadway facilities within the community of Bombay Beach. CalEEMod model defaults account for all roadways in Imperial County to be 50 percent unpaved; therefore, this default value was adjusted to reflect the reality that 100 percent of all of the roadway facilities that can be used to access the Project Site are paved. This adjustment allows CalEEMod to more accurately predict roadway dust particle re-entrainment and accompanying PM emissions generated by Project construction traffic. The duration of Project construction and the specific construction equipment that would be employed are derived from the Project Dust Control Plan for Bombay Beach Plot Study (Imperial Irrigation District [IID] 2022).

The operational phase of this Project would be limited to maintenance and monitoring, which would pose a negligible impact from emissions and therefore is addressed qualitatively.

2.3.3 Impact Analysis

2.3.3.1 Project Construction-Generated Criteria Air Quality Emissions

Emissions associated with Project implementation would be temporary and short-term but have the potential to represent a significant air quality impact. Construction activities such as excavation and grading operations, construction vehicle traffic, and wind blowing over exposed soils would generate exhaust emissions and fugitive PM emissions that affect local air quality at various times during construction. Effects would be variable depending on the weather, soil conditions, the amount of activity taking place, and the nature of dust control efforts. The dry climate of the area during the summer months creates a high potential for dust generation. Construction activities would be subject to ICAPCD Regulation VIII which, as previously described, requires taking reasonable precautions to reduce the amount of PM_{10} entrained in the ambient air as a result of emissions generated from construction and other earthmoving activities by requiring actions to prevent, reduce, or mitigate PM_{10} emissions. Regulation VIII requires the Project to adopt best available control measures to minimize emissions from surface-disturbing activities to comply with ICAPCD Regulation VIII (Fugitive Dust Rules).

Emissions associated with Project off-road equipment, worker commute trips, and ground disturbance were calculated using the CARB-approved CalEEMod computer program, which is designed to model emissions for land use development projects, based on typical construction requirements. See Attachment A for more information regarding the construction assumptions, including types of construction equipment used and Project duration used in this analysis.

Predicted maximum daily emissions attributable to Project construction are summarized in Table 2-5. Such emissions are short-term and of temporary duration, lasting only as long as Project construction activities occur, but would be considered a significant air quality impact if the volume of pollutants generated exceeds the ICAPCD thresholds of significance.

Table 2-5. Project Construction-Generated Emissions

Construction Phase	Maximum Pollutant (pounds per day)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Vegetation Management (Year 1)	16.74	63.28	124.17	0.51	32.80	9.70
Well and Irrigation Installation (Year 1)	5.09	36.05	32.97	0.13	9.22	4.94
Total	**21.83**	**99.33**	**157.14**	**0.64**	**42.02**	**14.64**
ICAPCD Significance Threshold	*75*	*100*	*550*	*N/A*	*150*	*N/A*
Exceed ICAPCD Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod version 2020.4.0. Refer to Attachment A for Model Data Outputs.
Notes: Pounds per day taken from the season with the highest output.

As shown in Table 2-5, emissions generated during Project construction would not exceed the ICAPCD significance threshold. Therefore, criteria pollutant emissions generated during Project construction would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard.

2.3.3.2 Operational Criteria Air Quality Emissions

Operational emissions impacts are long-term air emissions impacts that are associated with any changes in the permanent use of the Project Site by onsite stationary sources and offsite mobile sources that substantially increase emissions. Once construction is complete, no regular additional daily vehicle trips or personnel would be added to operate or maintain the Project Site. No major diesel-powered equipment would be required as part of ongoing Project operations. Thus, the Proposed Project would not include the provision of new permanent stationary or mobile sources of criteria air pollutant emissions. The operations of the Project focus on maintenance and monitoring of the irrigation system. Implementation of the Project would result in negligible long-term operational emissions of criteria air pollutants.

2.3.3.3 Conflict with an Applicable Air Quality Management Plan

As previously described, the Project region is classified as nonattainment for federal O_3, PM_{10}, and $PM_{2.5}$ standards (CARB 2019). The USEPA, under the provisions of the CAA, requires each state with regions that have not attained the federal air quality standards to prepare a SIP, detailing how these standards are to be met in each local area. The SIP is a legal agreement between each state and the federal government to commit resources to improving air quality. It serves as the template for conducting regional and project-level air quality analysis. CARB is the lead agency for developing the SIP in California. Local air districts, such as the ICAPCD, prepare air quality attainment plans or air quality management plans and submit them to CARB for review, approval, and incorporation into the applicable SIP. The air districts develop the strategies stated in the SIPs for achieving air quality standards on a regional basis.

The region's SIP is constituted of the ICAPCD air quality plans: 2018 PM_{10} SIP, the 2018 Annual $PM_{2.5}$ SIP, and the 2017 8-Hour Ozone SIP. Project compliance with all of the ICAPCD rules and regulations results in conformance with the ICAPCD air quality plans. These air quality attainment plans are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls describing how the state will attain ambient air quality standards. These SIP plans and associated control measures are based on information derived from projected growth in Imperial County in order to project future emissions and then determine strategies and regulatory controls for the reduction of emissions. Growth projections are based on the general plans developed by Imperial County and the incorporated cities in the county.

As previously described, the Project proposes to implement several surface treatments to provide dust control and habitat enhancements adjacent to the community of Bombay Beach on approximately 149.2 acres of vacant land. The Project would not result in population growth and would not cause an increase in currently established population projections. The Project does not include residential development or large local or regional employment centers, and thus would not result in significant population or employment growth. Once construction is complete, no regular additional daily vehicle trips or personnel would be added to operate or maintain the Project Site. No major diesel-powered equipment would be required as part of ongoing Project operations. Thus, the Proposed Project would not include the provision of new permanent stationary or mobile sources of criteria air pollutant emissions. Project operations would include maintenance and monitoring of the irrigation system. This poses a negligible impact and would not conflict with any local or regional plan.

2.3.3.4 Exposure of Sensitive Receptors to Toxic Air Contaminants

As previously described, sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over age 65, children under age 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis The nearest existing sensitive receptors to the Project Site are several single-family residences located on the road, Aisle of Palms, which is directly adjacent to the Project Site.

Construction-Generated Air Contaminants

Construction of the Project would result in temporary, short-term proposed Project-generated emissions of diesel particulate matter (DPM), ROG, NOx, CO, and PM_{10} from the exhaust of off-road, heavy-duty diesel equipment for Project construction; soil hauling truck traffic; paving; and other miscellaneous activities. The portion of the SSAB which encompasses the Project Area is designated as a nonattainment area for federal O_3 and $PM_{2.5}$ standards and is also a nonattainment area for the state standards for O_3 and PM_{10} (CARB 2019). Thus, existing O_3 and PM_{10} levels in the SSAB are at unhealthy levels during certain periods. However, as shown in Table 2-5, the Project would not exceed the ICAPCD significance thresholds for construction emissions.

The health effects associated with O_3 are generally associated with reduced lung function. Because the Project would not involve construction activities that would result in O_3 precursor emissions (ROG or NO_x)

in excess of the ICAPCD thresholds, the Project is not anticipated to substantially contribute to regional O_3 concentrations and the associated health impacts.

CO tends to be a localized impact associated with congested intersections. In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions. The Project would not involve activities that would result in CO emissions in excess of the ICAPCD thresholds. Thus, the Project's CO emissions would not contribute to the health effects associated with this pollutant.

Particulate matter (PM_{10} and $PM_{2.5}$) contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Particulate matter exposure has been linked to a variety of problems, including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms such as irritation of the airways, coughing, or difficulty breathing. For construction-type activity, DPM is the primary TAC of concern. PM_{10} exhaust is considered a surrogate for DPM as all diesel exhaust is considered to be DPM. Most PM_{10} exhaust derives from combustion, such as use of gasoline and diesel fuels by motor vehicles. As with O_3 and NOx, the Project would not generate emissions of PM_{10} or $PM_{2.5}$ that would exceed the ICAPCD's thresholds. Accordingly, the Project's PM_{10} and $PM_{2.5}$ emissions are not expected to cause any increase in related regional health effects for these pollutants.

In summary, Project construction would not result in a potentially significant contribution to regional concentrations of nonattainment pollutants and would not result in a significant contribution to the adverse health impacts associated with those pollutants.

Operational Air Contaminants

Operation of the Proposed Project would not result in the development of any substantial sources of air toxics. There would be no stationary sources associated Project operations; nor would the Project attract additional mobile sources that spend long periods queuing and idling at the site. Onsite Project emissions would not result in significant concentrations of pollutants at the nearby sensitive receptor as the predominant operational emissions associated with the Proposed Project would be routine maintenance work, water deliveries, and site security. Therefore, the Project would not be a substantial source of TACs. The Project will not result in a high carcinogenic or non-carcinogenic risk during operation.

Carbon Monoxide Hot Spots

It has long been recognized that CO exceedances are caused by vehicular emissions, primarily when idling at intersections. Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Under certain meteorological conditions, CO concentrations close to congested intersections that experience high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Given the high traffic volume potential, areas of high CO concentrations, or "hot spots," are typically associated with intersections that are projected to operate at unacceptable levels of service during the peak commute hours. It has long been recognized that CO hotspots are caused by vehicular emissions, primarily when idling at congested intersections. However, transport of this criteria pollutant is extremely limited, and CO disperses rapidly with distance from the source under normal meteorological conditions. Furthermore, vehicle emissions standards have become increasingly more stringent in the last 20 years. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams/mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration in the SSAB is designated as in attainment. Detailed modeling of Project-specific CO "hot spots" is not necessary and thus this potential impact is addressed qualitatively.

A CO "hot spot" would occur if an exceedance of the state one-hour standard of 20 parts per million (ppm) or the eight-hour standard of 9 ppm were to occur. The analysis prepared for CO attainment in the South Coast Air Quality Management District's (SCAQMD's) *1992 Federal Attainment Plan for Carbon Monoxide* in Los Angeles County and a Modeling and Attainment Demonstration prepared by the SCAQMD as part of the 2003 Air Quality Management Plan can be used to demonstrate the potential for CO exceedances of these standards. The SCAQMD is the air pollution control officer for much of southern California. The SCAQMD conducted a CO hot spot analysis as part of the 1992 CO Federal Attainment Plan at four busy intersections in Los Angeles County during the peak morning and afternoon time periods. The intersections evaluated included Long Beach Boulevard and Imperial Highway (Lynwood), Wilshire Boulevard and Veteran Avenue (Westwood), Sunset Boulevard and Highland Avenue (Hollywood), and La Cienega Boulevard and Century Boulevard (Inglewood). The busiest intersection evaluated was at Wilshire Boulevard and Veteran Avenue, which has a traffic volume of approximately 100,000 vehicles per day. Despite this level of traffic, the CO analysis concluded that there was no violation of CO standards (SCAQMD 1992). In order to establish a more accurate record of baseline CO concentrations affecting the Los Angeles, a CO "hot spot" analysis was conducted in 2003 at the same four busy intersections in Los Angeles at the peak morning and afternoon time periods. This "hot spot" analysis did not predict any violation of CO standards. The highest one-hour concentration was measured at 4.6 ppm at Wilshire Boulevard and Veteran Avenue and the highest eight-hour concentration was measured at 8.4 ppm at Long Beach Boulevard and Imperial Highway. Thus, there was no violation of CO standards.

Similar considerations are also employed by other Air Districts when evaluating potential CO concentration impacts. More specifically, the Bay Area Air Quality Management District (BAAQMD), the air pollution control officer for the San Francisco Bay Area, concludes that under existing and future vehicle emission rates, a given project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact.

The Proposed Project would not generate traffic volumes at any intersection of more than 100,000 vehicles per day (or 44,000 vehicles per day) and there is no likelihood of the Project traffic exceeding CO values. Furthermore, as shown in Table 2-5, Project construction would result in the emission of CO below the ICAPCD significance threshold, which is a health-based threshold intended to reduce the health deleterious effects of air pollution.

2.3.3.5 Odors

Typically, odors are 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).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

During construction, the Proposed Project presents the potential for generation of objectionable odors in the form of diesel exhaust in the immediate vicinity of the site. However, these emissions are short-term in nature and will rapidly dissipate and be diluted by the atmosphere downwind of the emission sources. Additionally, odors would be localized and generally confined to the Project Area, which is generally devoid of surrounding receptors. Therefore, odors generated during Project construction would not adversely affect a substantial number of people to odor emissions.

Land uses commonly considered to be potential sources of obnoxious odorous emissions include agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding. The Proposed Project does not include any uses identified as being associated with odors.

3.0 GREENHOUSE GAS EMISSIONS

3.1 Greenhouse Gas Setting

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. Because the earth has a much lower temperature than the sun, it emits lower-frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead trapped, resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, the earth would not be able to support life as we know it.

Prominent GHGs contributing to the greenhouse effect are CO_2, methane (CH_4), and N_2O. Fluorinated gases also make up a small fraction of the GHGs that contribute to climate change. Fluorinated gases include chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride; however, it is noted that these gases are not associated with typical land use development. Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. 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 GHG concentrations and other anthropogenic factors together (Intergovernmental Panel on Climate Change [IPCC] 2014).

Table 3-1 describes the primary GHGs attributed to global climate change, including their physical properties, primary sources, and contributions to the greenhouse effect.

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH_4 traps over 25 times more heat per molecule than CO_2, and N_2O absorbs 298 times more heat per molecule than CO_2 (IPCC 2014). Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e), which weight each gas by its global warming potential. Expressing GHG emissions in CO_2e takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, or other forms. Of the total annual human-caused CO_2 emissions, approximately 55 percent is sequestered through ocean and land uptakes every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO_2 emissions remains stored in the atmosphere (IPCC 2013).

Table 3-1. Greenhouse Gases

Greenhouse Gas	Description
CO_2	Carbon dioxide is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere.[1]
CH_4	Methane is a colorless, odorless gas and is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (intestinal fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of CH_4 to the atmosphere. Natural sources of CH_4 include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. The atmospheric lifetime of CH_4 is about12 years.[2]
N_2O	Nitrous oxide is a clear, colorless gas with a slightly sweet odor. Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years.[3]

Sources: [1]USEPA 2016a, [2] USEPA 2016b, [3] USEPA 2016c

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; it is sufficient to say the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature or to global, local, or microclimates. From the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

3.1.1 Sources of Greenhouse Gas Emissions

In 2021, CARB released the 2021 edition of the California GHG inventory covering calendar year 2019 emissions. In 2019, California emitted 418.2 million gross metric tons of CO_2e including from imported electricity. Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2019, accounting for approximately 40 percent of total GHG emissions in the State. When emissions from extracting, refining and moving transportation fuels in California are included, transportation is responsible for over 50 percent of statewide emissions in 2019. Continuing the downward trend from 2018, transportation emissions decreased 3.5 million metric tons of CO_2e in 2019, only being outpaced by electricity, which reduced emissions by 4.3 million metric tons of CO_2e in 2019. Emissions from the electricity sector account for 14 percent of the inventory and have shown a substantial decrease in 2019 due to increases in renewables. California's industrial sector accounts for the second largest source of the State's GHG emissions in 2019, accounting for 21 percent (CARB 2021).

3.2 Regulatory Framework

3.2.1 State

3.2.1.1 Executive Order S-3-05

Executive Order (EO) S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the EO established total GHG emission targets for the state. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

3.2.1.2 Assembly Bill 32 Climate Change Scoping Plan and Updates

In 2006, the California legislature passed Assembly Bill (AB) 32 (Health and Safety Code § 38500 et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 required CARB to design and implement feasible and cost-effective emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions). Pursuant to AB 32, CARB adopted a Scoping Plan in December 2008, which outlined measures to meet the 2020 GHG reduction goals. California exceeded the target of reducing GHG emissions to 1990 levels by the year 2017.

The Scoping Plan is required by AB 32 to be updated at least every five years. The latest update, the 2017 Scoping Plan Update, addresses the 2030 target established by Senate Bill (SB) 32 as discussed below and establishes a proposed framework of action for California to meet a 40 percent reduction in GHG emissions by 2030 compared to 1990 levels. The key programs that the Scoping Plan Update builds on include increasing the use of renewable energy in the State, the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, and reduction of methane emissions from agricultural and other wastes.

3.2.1.3 Senate Bill 32 and Assembly Bill 197 of 2016

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include § 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030.

3.2.1.4 Senate Bill 100 of 2018

In 2018, SB 100 was signed by Governor Brown, codifying a goal of 60 percent renewable procurement by 2030 and 100 percent by 2045 Renewables Portfolio Standard.

3.3 Greenhouse Gas Emissions Impact Assessment

3.3.1 Thresholds of Significance

The impact analysis provided below is based on the following CEQA Guidelines Appendix G thresholds of significance. The Project would result in a significant impact to GHG emissions if it would:

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

The Appendix G thresholds for GHG's do not prescribe specific methodologies for performing an assessment, do not establish specific thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA. With respect to GHG emissions, the CEQA Guidelines § 15064.4(a) states that lead agencies "shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions resulting from a project. The CEQA Guidelines note that an agency has the discretion to either quantify a project's GHG emissions or rely on a "qualitative analysis or other performance-based standards." (14 California Code of Regulations [CCR] 15064.4(b)). A lead agency may use a "model or methodology" to estimate GHG emissions and has the discretion to select the model or methodology it considers "most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change." (14 CCR 15064.4(c)). Section 15064.4(b) provides that the lead agency should consider the following when determining the significance of impacts from GHG emissions on the environment:

1. The extent a project may increase or reduce GHG emissions as compared to the existing environmental setting.
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
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 GHG emissions (14 CCR 15064.4(b)).

In addition, Section 15064.7(c) of the CEQA Guidelines specifies that "[w]hen adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence" (14 CCR 15064.7(c)). The CEQA Guidelines also clarify that the effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis (see CEQA Guidelines § 15130(f)). As a note, the CEQA Guidelines were amended in response to SB 97. In particular, the CEQA Guidelines were amended to specify that compliance with a GHG emissions reduction plan renders a cumulative impact insignificant.

Per CEQA Guidelines § 15064(h)(3), a project's incremental contribution to a cumulative impact can be found not cumulatively considerable if the project would comply with an approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the cumulative problem within the geographic area of the project. To qualify, such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency. Examples of such programs include a "water quality control plan, air quality attainment or maintenance plan, integrated waste management plan, habitat conservation plan, natural community conservation plans [and] plans or regulations for the reduction of greenhouse gas emissions." Put another way, CEQA Guidelines § 15064(h)(3) allows a lead agency to make a finding of less than significant for GHG emissions if a project complies with adopted programs, plans, policies and/or other regulatory strategies to reduce GHG emissions.

The significance of the Project's GHG emissions is evaluated consistent with CEQA Guidelines § 15064.4(b)(2) by considering whether the Project complies with applicable plans, policies, regulations and requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. The ICAPCD has not adopted a GHG significance threshold yet recommends the 100,000-metric ton of CO_2e threshold established by the Mojave Desert Air Quality Management District (MDAQMD). As previously described, Section 15064.7(c) of the CEQA Guidelines specifies that "[w]hen adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence" (14 CCR 15064.7(c)). This ICAPCD-recommended threshold is appropriate as the MDAQMD GHG thresholds were formulated based on similar geography and climate patterns as found in Imperial County. Therefore, the 100,000-metric ton of CO_2e threshold is appropriate for this analysis.

In *Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal. 4th 2014, 213, 221, 227, following its review of various potential GHG thresholds proposed in an academic study [Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203], the California Supreme Court identified the use of numeric bright-line thresholds as a potential pathway for compliance with CEQA GHG requirements. The study found numeric bright line thresholds designed to determine when small projects were so small as to not cause a cumulatively considerable impact on global climate change was consistent with CEQA. Specifically, Public Resources Code section 21003(f) provides it is a policy of the state that "[a]ll persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment." The Supreme Court-reviewed study noted, "[s]ubjecting the smallest projects to the full panoply of CEQA requirements, even though the public benefit would be minimal, would not be consistent with implementing the statute in the most efficient, expeditious manner. Nor would it be consistent with applying lead agencies' scarce resources toward mitigating actual significant climate change impacts." (Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203, 221, 227.)

3.3.2 Methodology

Where GHG emission quantification was required, emissions were modeled using CalEEMod, version 2020.4.0. CalEEMod is a statewide land use emissions computer model designed to quantify potential GHG emissions associated with both construction and operations from a variety of land use projects. Project construction generated GHG emissions were calculated using CalEEMod model defaults for Imperial County. The duration of Project construction and the specific construction equipment that would be employed are derived from the Project Dust Control Plan for Bombay Beach Plot Study (Imperial Irrigation District [IID] 2022). The operational phase of this Project would be limited to maintenance and monitoring, which would pose a negligible impact associated with GHG emissions and therefore is addressed qualitatively.

3.3.3 Impact Analysis

3.3.3.1 Generation of GHG Emissions

<u>Project Construction</u>

Construction-related activities that would generate GHG emissions include worker commute trips, haul trucks carrying supplies and materials to and from the Project Site, and off-road construction equipment (e.g., dozers, loaders, excavators). Table 3-2 illustrates the specific construction generated GHG emissions that would result from construction of the Project. Once construction is complete, the generation of these GHG emissions would cease.

Table 3-2. Construction-Related Greenhouse Gas Emissions

Emissions by Phase	CO_2e (Metric Tons/Year)
Vegetation Management (Year 1)	1,041
Well and Irrigation Installation (Year 1)	216
Total	**1,257**
Significance Threshold	*100,000*
Exceed Significance Threshold?	**No**

Source: CalEEMod version 2020.4.0. Refer to Attachment A for Model Data Outputs.

As shown in Table 3-2, Project would result in the total generation of approximately 1,257 metric tons of CO_2e in the construction phase. Therefore, Project GHG emissions would not exceed the significance threshold.

<u>Operations</u>

Operations of the Project, which include the maintenance and monitoring of the irrigation system, would result in negligible amounts of long-term GHG emissions. Operational emissions impacts are long-term impacts that are associated with any changes in the permanent use of the Project Site by sources that substantially increase emissions. Once construction is complete, no regular additional daily vehicle trips or personnel would be added to operate or maintain the Project Site. No major diesel-powered equipment would be required as part of ongoing Project operations. The operations of the Project focus on maintenance and monitoring of the irrigation system. Thus, the Proposed Project would not include the provision of major sources of GHG emissions and implementation of the Project would result in negligible long-term operational GHG emissions.

3.3.3.2 Conflict with any Applicable Plan, Policy, or Regulation of an Agency Adopted for the Purpose of Reducing the Emissions of Greenhouse Gases

The Project would not conflict with any adopted plans, policies, or regulations adopted for the purpose of reducing GHG emissions. The Proposed Project is subject to compliance with SB 32. As discussed previously, the Proposed Project-generated GHG emissions would not surpass either the ICAPCD-recommended GHG significance threshold, which was prepared with the purpose of complying with statewide GHG-reduction efforts.

4.0 REFERENCES

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LIST OF ATTACHMENTS

- Attachment A – CalEEMod Output Files Criteria Air Pollutants
- Attachment B – CalEEMod Output Files Greenhouse Gas Emissions

ATTACHMENT A

CalEEMod Output Files Criteria Air Pollutant Emissions

CALEEMOD OUTPUTS: VEGETATION PLOTS, SURFACE ROUGHENING, ACCESS ROADS

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Vegetation Plots, Surface Roughening, Access Roads

Imperial County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	143.50	Acre	143.50	6,250,860.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2024
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 143.5 acres accounts for 53 acres for enhancement of existing vegetation, 86.5 acres of vegetated hedgerows, and 4 acres of perimeter sand fencing.

Construction Phase - Total days updated to match PD and accounting for 8 hour work days

Off-road Equipment - Equipment updated to match PD. Other Construction Equipment includes light-duty trucks, ATVs, and water trucks

Off-road Equipment - Equipment updated to match PD. Other construction equipment includes ATVs, and light-duty pickups with trailers

Off-road Equipment - Equipment updated to match PD. Other Construction Equipment includes light-duty trucks, ATVs, and water trucks

Off-road Equipment - Equipment updated to match PD. Other construction equipment is light-duty pickups with trailers and ATVs

Off-road Equipment - Equipment updated to match PD. Other construction equipment includes a water truck, ATVs, and light-duty pickups with trailers

Trips and VMT -

On-road Fugitive Dust - According to the default CalEEMod trip length for workers (10.2 miles) and vendors (11.9 miles) the roads to access the Project Site are 100% paved. These roads are Highway 111, Grapefruit Boulevard, Avenue A, and 1st Street.

Grading -

Construction Off-road Equipment Mitigation - Vehicle speed limited to 5 mph on unpaved roadways, as specified by PD

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	5
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
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
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	3,100.00	30.00
tblConstructionPhase	NumDays	3,100.00	10.00
tblConstructionPhase	NumDays	310.00	5.00
tblConstructionPhase	NumDays	120.00	10.00
tblConstructionPhase	NumDays	120.00	10.00
tblOffRoadEquipment	HorsePower	158.00	130.00
tblOffRoadEquipment	HorsePower	8.00	75.00
tblOffRoadEquipment	HorsePower	247.00	125.00
tblOffRoadEquipment	HorsePower	65.00	75.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

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					
2023	16.7433	63.2784	124.1712	0.5115	31.6818	1.4810	32.7956	8.6591	1.3625	9.7024	0.0000	53,123.7718	53,123.7718	1.5341	4.9913	54,642.2349
Maximum	**16.7433**	**63.2784**	**124.1712**	**0.5115**	**31.6818**	**1.4810**	**32.7956**	**8.6591**	**1.3625**	**9.7024**	**0.0000**	**53,123.7718**	**53,123.7718**	**1.5341**	**4.9913**	**54,642.2349**

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					
2023	15.9336	54.3097	125.9435	0.5115	31.6818	0.6317	32.3135	8.6591	0.6018	9.2610	0.0000	53,123.7718	53,123.7718	1.5341	4.9913	54,642.2349
Maximum	**15.9336**	**54.3097**	**125.9435**	**0.5115**	**31.6818**	**0.6317**	**32.3135**	**8.6591**	**0.6018**	**9.2610**	**0.0000**	**53,123.7718**	**53,123.7718**	**1.5341**	**4.9913**	**54,642.2349**

	ROG	**NOx**	**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	**4.84**	**14.17**	**-1.43**	**0.00**	**0.00**	**57.34**	**1.47**	**0.00**	**55.83**	**4.55**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9298	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335
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	0.0000	0.0000	0.0000	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	**2.9298**	**1.3000e-004**	**0.0146**	**0.0000**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**5.0000e-005**		**0.0314**	**0.0314**	**8.0000e-005**	**0.0000**	**0.0335**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9298	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335
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	0.0000	0.0000	0.0000	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	**2.9298**	**1.3000e-004**	**0.0146**	**0.0000**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**5.0000e-005**		**0.0314**	**0.0314**	**8.0000e-005**	**0.0000**	**0.0335**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	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	Site Exclusion	Site Preparation	3/1/2023	3/14/2023	5	10	
2	Access Road Installation	Grading	3/15/2023	3/21/2023	5	5	
3	Site Preparation	Site Preparation	3/22/2023	4/4/2023	5	10	
4	Vegetation Enhancement	Building Construction	4/5/2023	5/16/2023	5	30	
5	Sand Fencing	Building Construction	5/17/2023	5/30/2023	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 143.5

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Exclusion	Forklifts	2	8.00	89	0.20
Site Exclusion	Other Construction Equipment	5	8.00	172	0.42
Site Exclusion	Skid Steer Loaders	2	8.00	65	0.37
Site Exclusion	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Excavators	1	8.00	158	0.38
Site Preparation	Other Construction Equipment	3	8.00	172	0.42

Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Access Road Installation	Graders	2	8.00	187	0.41
Access Road Installation	Other Construction Equipment	3	8.00	172	0.42
Access Road Installation	Rubber Tired Dozers	2	8.00	247	0.40
Vegetation Enhancement	Excavators	1	8.00	130	0.38
Vegetation Enhancement	Other Construction Equipment	3	2.00	172	0.42
Vegetation Enhancement	Plate Compactors	3	8.00	75	0.43
Vegetation Enhancement	Rubber Tired Dozers	1	8.00	125	0.40
Vegetation Enhancement	Skid Steer Loaders	1	8.00	75	0.37
Sand Fencing	Other Construction Equipment	3	7.00	172	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Exclusion	11	28.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	5	13.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Access Road Installation	7	18.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Vegetation Enhancement	9	2,625.00	1,025.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Sand Fencing	3	2,625.00	1,025.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Exclusion - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.3801	23.9090	29.5360	0.0443		1.2236	1.2236		1.1257	1.1257		4,291.4954	4,291.4954	1.3880		4,326.1944
Total	**2.3801**	**23.9090**	**29.5360**	**0.0443**	**0.0000**	**1.2236**	**1.2236**	**0.0000**	**1.1257**	**1.1257**		**4,291.4954**	**4,291.4954**	**1.3880**		**4,326.1944**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1403	0.0649	0.9818	2.0200e-003	0.2173	1.0800e-003	0.2183	0.0576	1.0000e-003	0.0586		206.5686	206.5686	6.4600e-003	6.0000e-003	208.5193
Total	**0.1403**	**0.0649**	**0.9818**	**2.0200e-003**	**0.2173**	**1.0800e-003**	**0.2183**	**0.0576**	**1.0000e-003**	**0.0586**		**206.5686**	**206.5686**	**6.4600e-003**	**6.0000e-003**	**208.5193**

3.2 Site Exclusion - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day							lb/day			
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5977	4.4732	33.7169	0.0443		0.0729	0.0729		0.0729	0.0729	0.0000	4,291.4954	4,291.4954	1.3880		4,326.1943
Total	**0.5977**	**4.4732**	**33.7169**	**0.0443**	**0.0000**	**0.0729**	**0.0729**	**0.0000**	**0.0729**	**0.0729**	**0.0000**	**4,291.4954**	**4,291.4954**	**1.3880**		**4,326.1943**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day							lb/day			
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1403	0.0649	0.9818	2.0200e-003	0.2173	1.0800e-003	0.2183	0.0576	1.0000e-003	0.0586		206.5686	206.5686	6.4600e-003	6.0000e-003	208.5193
Total	**0.1403**	**0.0649**	**0.9818**	**2.0200e-003**	**0.2173**	**1.0800e-003**	**0.2183**	**0.0576**	**1.0000e-003**	**0.0586**		**206.5686**	**206.5686**	**6.4600e-003**	**6.0000e-003**	**208.5193**

3.3 Access Road Installation - 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					14.1652	0.0000	14.1652	6.8495	0.0000	6.8495			0.0000			0.0000
Off-Road	3.1815	33.8737	21.6057	0.0488		1.4803	1.4803		1.3618	1.3618		4,730.4967	4,730.4967	1.5299		4,768.7452
Total	**3.1815**	**33.8737**	**21.6057**	**0.0488**	**14.1652**	**1.4803**	**15.6454**	**6.8495**	**1.3618**	**8.2113**		**4,730.4967**	**4,730.4967**	**1.5299**		**4,768.7452**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0902	0.0417	0.6311	1.3000e-003	0.1397	6.9000e-004	0.1404	0.0371	6.4000e-004	0.0377		132.7941	132.7941	4.1500e-003	3.8600e-003	134.0481
Total	**0.0902**	**0.0417**	**0.6311**	**1.3000e-003**	**0.1397**	**6.9000e-004**	**0.1404**	**0.0371**	**6.4000e-004**	**0.0377**		**132.7941**	**132.7941**	**4.1500e-003**	**3.8600e-003**	**134.0481**

3.3 Access Road Installation - 2023

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					14.1652	0.0000	14.1652	6.8495	0.0000	6.8495			0.0000			0.0000
Off-Road	0.6007	2.6031	27.7594	0.0488		0.0801	0.0801		0.0801	0.0801	0.0000	4,730.4967	4,730.4967	1.5299		4,768.7452
Total	**0.6007**	**2.6031**	**27.7594**	**0.0488**	**14.1652**	**0.0801**	**14.2453**	**6.8495**	**0.0801**	**6.9296**	**0.0000**	**4,730.4967**	**4,730.4967**	**1.5299**		**4,768.7452**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0902	0.0417	0.6311	1.3000e-003	0.1397	6.9000e-004	0.1404	0.0371	6.4000e-004	0.0377		132.7941	132.7941	4.1500e-003	3.8600e-003	134.0481
Total	**0.0902**	**0.0417**	**0.6311**	**1.3000e-003**	**0.1397**	**6.9000e-004**	**0.1404**	**0.0371**	**6.4000e-004**	**0.0377**		**132.7941**	**132.7941**	**4.1500e-003**	**3.8600e-003**	**134.0481**

3.4 Site Preparation - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.3853	13.3976	17.4969	0.0268		0.6885	0.6885		0.6334	0.6334		2,596.4671	2,596.4671	0.8398		2,617.4609
Total	**1.3853**	**13.3976**	**17.4969**	**0.0268**	**0.0000**	**0.6885**	**0.6885**	**0.0000**	**0.6334**	**0.6334**		**2,596.4671**	**2,596.4671**	**0.8398**		**2,617.4609**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0651	0.0302	0.4558	9.4000e-004	0.1009	5.0000e-004	0.1014	0.0268	4.6000e-004	0.0272		95.9068	95.9068	3.0000e-003	2.7900e-003	96.8125
Total	**0.0651**	**0.0302**	**0.4558**	**9.4000e-004**	**0.1009**	**5.0000e-004**	**0.1014**	**0.0268**	**4.6000e-004**	**0.0272**		**95.9068**	**95.9068**	**3.0000e-003**	**2.7900e-003**	**96.8125**

3.4 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3309	1.4337	20.4026	0.0268		0.0441	0.0441		0.0441	0.0441	0.0000	2,596.4671	2,596.4671	0.8398		2,617.4609
Total	**0.3309**	**1.4337**	**20.4026**	**0.0268**	**0.0000**	**0.0441**	**0.0441**	**0.0000**	**0.0441**	**0.0441**	**0.0000**	**2,596.4671**	**2,596.4671**	**0.8398**		**2,617.4609**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0651	0.0302	0.4558	9.4000e-004	0.1009	5.0000e-004	0.1014	0.0268	4.6000e-004	0.0272		95.9068	95.9068	3.0000e-003	2.7900e-003	96.8125
Total	**0.0651**	**0.0302**	**0.4558**	**9.4000e-004**	**0.1009**	**5.0000e-004**	**0.1014**	**0.0268**	**4.6000e-004**	**0.0272**		**95.9068**	**95.9068**	**3.0000e-003**	**2.7900e-003**	**96.8125**

3.5 Vegetation Enhancement - 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					
Off-Road	1.0104	9.8383	10.6023	0.0156		0.5089	0.5089		0.4682	0.4682		1,509.4149	1,509.4149	0.4882		1,521.6193
Total	**1.0104**	**9.8383**	**10.6023**	**0.0156**		**0.5089**	**0.5089**		**0.4682**	**0.4682**		**1,509.4149**	**1,509.4149**	**0.4882**		**1,521.6193**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5804	47.3526	21.5296	0.3060	11.3146	0.5037	11.8182	3.2566	0.4818	3.7384		32,187.5325	32,187.5325	0.1286	4.4284	33,510.4172
Worker	13.1525	6.0875	92.0393	0.1892	20.3672	0.1013	20.4685	5.4025	0.0933	5.4958		19,365.8024	19,365.8024	0.6053	0.5629	19,548.6830
Total	**15.7329**	**53.4401**	**113.5689**	**0.4952**	**31.6818**	**0.6050**	**32.2867**	**8.6591**	**0.5751**	**9.2342**		**51,553.3349**	**51,553.3349**	**0.7339**	**4.9913**	**53,059.1002**

3.5 Vegetation Enhancement - 2023

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	0.1919	0.8315	11.8330	0.0156		0.0256	0.0256		0.0256	0.0256	0.0000	1,509.4149	1,509.4149	0.4882		1,521.6193
Total	**0.1919**	**0.8315**	**11.8330**	**0.0156**		**0.0256**	**0.0256**		**0.0256**	**0.0256**	**0.0000**	**1,509.4149**	**1,509.4149**	**0.4882**		**1,521.6193**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5804	47.3526	21.5296	0.3060	11.3146	0.5037	11.8182	3.2566	0.4818	3.7384		32,187.5325	32,187.5325	0.1286	4.4284	33,510.4172
Worker	13.1525	6.0875	92.0393	0.1892	20.3672	0.1013	20.4685	5.4025	0.0933	5.4958		19,365.8024	19,365.8024	0.6053	0.5629	19,548.6830
Total	**15.7329**	**53.4401**	**113.5689**	**0.4952**	**31.6818**	**0.6050**	**32.2867**	**8.6591**	**0.5751**	**9.2342**		**51,553.3349**	**51,553.3349**	**0.7339**	**4.9913**	**53,059.1002**

3.6 Sand Fencing - 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					
Off-Road	0.9146	9.0242	10.5068	0.0162		0.4698	0.4698		0.4322	0.4322		1,570.4369	1,570.4369	0.5079		1,583.1347
Total	**0.9146**	**9.0242**	**10.5068**	**0.0162**		**0.4698**	**0.4698**		**0.4322**	**0.4322**		**1,570.4369**	**1,570.4369**	**0.5079**		**1,583.1347**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5804	47.3526	21.5296	0.3060	11.3146	0.5037	11.8182	3.2566	0.4818	3.7384		32,187.5325	32,187.5325	0.1286	4.4284	33,510.4172
Worker	13.1525	6.0875	92.0393	0.1892	20.3672	0.1013	20.4685	5.4025	0.0933	5.4958		19,365.8024	19,365.8024	0.6053	0.5629	19,548.6830
Total	**15.7329**	**53.4401**	**113.5689**	**0.4952**	**31.6818**	**0.6050**	**32.2867**	**8.6591**	**0.5751**	**9.2342**		**51,553.3349**	**51,553.3349**	**0.7339**	**4.9913**	**53,059.1002**

3.6 Sand Fencing - 2023

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	0.2007	0.8696	12.3747	0.0162		0.0268	0.0268		0.0268	0.0268	0.0000	1,570.4369	1,570.4369	0.5079		1,583.1347
Total	**0.2007**	**0.8696**	**12.3747**	**0.0162**		**0.0268**	**0.0268**		**0.0268**	**0.0268**	**0.0000**	**1,570.4369**	**1,570.4369**	**0.5079**		**1,583.1347**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5804	47.3526	21.5296	0.3060	11.3146	0.5037	11.8182	3.2566	0.4818	3.7384		32,187.5325	32,187.5325	0.1286	4.4284	33,510.4172
Worker	13.1525	6.0875	92.0393	0.1892	20.3672	0.1013	20.4685	5.4025	0.0933	5.4958		19,365.8024	19,365.8024	0.6053	0.5629	19,548.6830
Total	**15.7329**	**53.4401**	**113.5689**	**0.4952**	**31.6818**	**0.6050**	**32.2867**	**8.6591**	**0.5751**	**9.2342**		**51,553.3349**	**51,553.3349**	**0.7339**	**4.9913**	**53,059.1002**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
Other Non-Asphalt Surfaces	16.40	9.50	11.90	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
Other Non-Asphalt Surfaces	0.526464	0.059349	0.179786	0.147621	0.026929	0.006851	0.008316	0.016412	0.000925	0.000120	0.022958	0.000766	0.003504

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					
Other Non-Asphalt Surfaces	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**

5.2 Energy by Land Use - NaturalGas

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					
Other Non-Asphalt Surfaces	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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.9298	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335
Unmitigated	2.9298	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335

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	0.7144					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.2141					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3500e-003	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335
Total	**2.9298**	**1.3000e-004**	**0.0146**	**0.0000**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**		**0.0314**	**0.0314**	**8.0000e-005**		**0.0335**

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	0.7144					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.2141					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3500e-003	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335
Total	**2.9298**	**1.3000e-004**	**0.0146**	**0.0000**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**		**0.0314**	**0.0314**	**8.0000e-005**		**0.0335**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Vegetation Plots, Surface Roughening, Access Roads

Imperial County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	143.50	Acre	143.50	6,250,860.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2024
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 143.5 acres accounts for 53 acres for enhancement of existing vegetation, 86.5 acres of vegetated hedgerows, and 4 acres of perimeter sand fencing.

Construction Phase - Total days updated to match PD and accounting for 8 hour work days

Off-road Equipment - Equipment updated to match PD. Other Construction Equipment includes light-duty trucks, ATVs, and water trucks

Off-road Equipment - Equipment updated to match PD. Other construction equipment includes ATVs, and light-duty pickups with trailers

Off-road Equipment - Equipment updated to match PD. Other Construction Equipment includes light-duty trucks, ATVs, and water trucks

Off-road Equipment - Equipment updated to match PD. Other construction equipment is light-duty pickups with trailers and ATVs

Off-road Equipment - Equipment updated to match PD. Other construction equipment includes a water truck, ATVs, and light-duty pickups with trailers

Trips and VMT -

On-road Fugitive Dust - According to the default CalEEMod trip length for workers (10.2 miles) and vendors (11.9 miles) the roads to access the Project Site are 100% paved. These roads are Highway 111, Grapefruit Boulevard, Avenue A, and 1st Street.

Grading -

Construction Off-road Equipment Mitigation - Vehicle speed limited to 5 mph on unpaved roadways, as specified by PD

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	5
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
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
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	3,100.00	30.00
tblConstructionPhase	NumDays	3,100.00	10.00
tblConstructionPhase	NumDays	310.00	5.00
tblConstructionPhase	NumDays	120.00	10.00
tblConstructionPhase	NumDays	120.00	10.00
tblOffRoadEquipment	HorsePower	158.00	130.00
tblOffRoadEquipment	HorsePower	8.00	75.00
tblOffRoadEquipment	HorsePower	247.00	125.00
tblOffRoadEquipment	HorsePower	65.00	75.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

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					
2023	13.3422	68.5096	98.5722	0.4836	31.6818	1.4810	32.7970	8.6591	1.3625	9.7037	0.0000	50,274.4969	50,274.4969	1.5341	5.0257	51,803.1944
Maximum	**13.3422**	**68.5096**	**98.5722**	**0.4836**	**31.6818**	**1.4810**	**32.7970**	**8.6591**	**1.3625**	**9.7037**	**0.0000**	**50,274.4969**	**50,274.4969**	**1.5341**	**5.0257**	**51,803.1944**

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					
2023	12.5325	59.5409	100.3445	0.4836	31.6818	0.6331	32.3149	8.6591	0.6032	9.2623	0.0000	50,274.4969	50,274.4969	1.5341	5.0257	51,803.1944
Maximum	**12.5325**	**59.5409**	**100.3445**	**0.4836**	**31.6818**	**0.6331**	**32.3149**	**8.6591**	**0.6032**	**9.2623**	**0.0000**	**50,274.4969**	**50,274.4969**	**1.5341**	**5.0257**	**51,803.1944**

	ROG	**NOx**	**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	**6.07**	**13.09**	**-1.80**	**0.00**	**0.00**	**57.25**	**1.47**	**0.00**	**55.73**	**4.55**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9298	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335
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	0.0000	0.0000	0.0000	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	**2.9298**	**1.3000e-004**	**0.0146**	**0.0000**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**5.0000e-005**		**0.0314**	**0.0314**	**8.0000e-005**	**0.0000**	**0.0335**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.9298	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335
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	0.0000	0.0000	0.0000	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	**2.9298**	**1.3000e-004**	**0.0146**	**0.0000**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**5.0000e-005**		**0.0314**	**0.0314**	**8.0000e-005**	**0.0000**	**0.0335**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	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	Site Exclusion	Site Preparation	3/1/2023	3/14/2023	5	10	
2	Access Road Installation	Grading	3/15/2023	3/21/2023	5	5	
3	Site Preparation	Site Preparation	3/22/2023	4/4/2023	5	10	
4	Vegetation Enhancement	Building Construction	4/5/2023	5/16/2023	5	30	
5	Sand Fencing	Building Construction	5/17/2023	5/30/2023	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 143.5

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Exclusion	Forklifts	2	8.00	89	0.20
Site Exclusion	Other Construction Equipment	5	8.00	172	0.42
Site Exclusion	Skid Steer Loaders	2	8.00	65	0.37
Site Exclusion	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Excavators	1	8.00	158	0.38
Site Preparation	Other Construction Equipment	3	8.00	172	0.42

Site Preparation	Tractors/Loaders/Backhoes		1	8.00	97	0.37
Access Road Installation	Graders		2	8.00	187	0.41
Access Road Installation	Other Construction Equipment		3	8.00	172	0.42
Access Road Installation	Rubber Tired Dozers		2	8.00	247	0.40
Vegetation Enhancement	Excavators		1	8.00	130	0.38
Vegetation Enhancement	Other Construction Equipment		3	2.00	172	0.42
Vegetation Enhancement	Plate Compactors		3	8.00	75	0.43
Vegetation Enhancement	Rubber Tired Dozers		1	8.00	125	0.40
Vegetation Enhancement	Skid Steer Loaders		1	8.00	75	0.37
Sand Fencing	Other Construction Equipment		3	7.00	172	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Exclusion	11	28.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	5	13.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Access Road Installation	7	18.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Vegetation Enhancement	9	2,625.00	1,025.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Sand Fencing	3	2,625.00	1,025.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Exclusion - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	2.3801	23.9090	29.5360	0.0443		1.2236	1.2236		1.1257	1.1257		4,291.4954	4,291.4954	1.3880		4,326.1944
Total	**2.3801**	**23.9090**	**29.5360**	**0.0443**	**0.0000**	**1.2236**	**1.2236**	**0.0000**	**1.1257**	**1.1257**		**4,291.4954**	**4,291.4954**	**1.3880**		**4,326.1944**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1054	0.0679	0.7022	1.7200e-003	0.2173	1.0800e-003	0.2183	0.0576	1.0000e-003	0.0586		175.5816	175.5816	6.5100e-003	6.1400e-003	177.5755
Total	**0.1054**	**0.0679**	**0.7022**	**1.7200e-003**	**0.2173**	**1.0800e-003**	**0.2183**	**0.0576**	**1.0000e-003**	**0.0586**		**175.5816**	**175.5816**	**6.5100e-003**	**6.1400e-003**	**177.5755**

3.2 Site Exclusion - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5977	4.4732	33.7169	0.0443		0.0729	0.0729		0.0729	0.0729	0.0000	4,291.4954	4,291.4954	1.3880		4,326.1943
Total	**0.5977**	**4.4732**	**33.7169**	**0.0443**	**0.0000**	**0.0729**	**0.0729**	**0.0000**	**0.0729**	**0.0729**	**0.0000**	**4,291.4954**	**4,291.4954**	**1.3880**		**4,326.1943**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.1054	0.0679	0.7022	1.7200e-003	0.2173	1.0800e-003	0.2183	0.0576	1.0000e-003	0.0586		175.5816	175.5816	6.5100e-003	6.1400e-003	177.5755
Total	**0.1054**	**0.0679**	**0.7022**	**1.7200e-003**	**0.2173**	**1.0800e-003**	**0.2183**	**0.0576**	**1.0000e-003**	**0.0586**		**175.5816**	**175.5816**	**6.5100e-003**	**6.1400e-003**	**177.5755**

3.3 Access Road Installation - 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					14.1652	0.0000	14.1652	6.8495	0.0000	6.8495			0.0000			0.0000
Off-Road	3.1815	33.8737	21.6057	0.0488		1.4803	1.4803		1.3618	1.3618		4,730.4967	4,730.4967	1.5299		4,768.7452
Total	**3.1815**	**33.8737**	**21.6057**	**0.0488**	**14.1652**	**1.4803**	**15.6454**	**6.8495**	**1.3618**	**8.2113**		**4,730.4967**	**4,730.4967**	**1.5299**		**4,768.7452**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0678	0.0437	0.4514	1.1000e-003	0.1397	6.9000e-004	0.1404	0.0371	6.4000e-004	0.0377		112.8739	112.8739	4.1900e-003	3.9500e-003	114.1557
Total	**0.0678**	**0.0437**	**0.4514**	**1.1000e-003**	**0.1397**	**6.9000e-004**	**0.1404**	**0.0371**	**6.4000e-004**	**0.0377**		**112.8739**	**112.8739**	**4.1900e-003**	**3.9500e-003**	**114.1557**

3.3 Access Road Installation - 2023

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					14.1652	0.0000	14.1652	6.8495	0.0000	6.8495			0.0000			0.0000
Off-Road	0.6007	2.6031	27.7594	0.0488		0.0801	0.0801		0.0801	0.0801	0.0000	4,730.4967	4,730.4967	1.5299		4,768.7452
Total	**0.6007**	**2.6031**	**27.7594**	**0.0488**	**14.1652**	**0.0801**	**14.2453**	**6.8495**	**0.0801**	**6.9296**	**0.0000**	**4,730.4967**	**4,730.4967**	**1.5299**		**4,768.7452**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0678	0.0437	0.4514	1.1000e-003	0.1397	6.9000e-004	0.1404	0.0371	6.4000e-004	0.0377		112.8739	112.8739	4.1900e-003	3.9500e-003	114.1557
Total	**0.0678**	**0.0437**	**0.4514**	**1.1000e-003**	**0.1397**	**6.9000e-004**	**0.1404**	**0.0371**	**6.4000e-004**	**0.0377**		**112.8739**	**112.8739**	**4.1900e-003**	**3.9500e-003**	**114.1557**

3.4 Site Preparation - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.3853	13.3976	17.4969	0.0268		0.6885	0.6885		0.6334	0.6334		2,596.4671	2,596.4671	0.8398		2,617.4609
Total	**1.3853**	**13.3976**	**17.4969**	**0.0268**	**0.0000**	**0.6885**	**0.6885**	**0.0000**	**0.6334**	**0.6334**		**2,596.4671**	**2,596.4671**	**0.8398**		**2,617.4609**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0489	0.0315	0.3260	8.0000e-004	0.1009	5.0000e-004	0.1014	0.0268	4.6000e-004	0.0272		81.5200	81.5200	3.0200e-003	2.8500e-003	82.4458
Total	**0.0489**	**0.0315**	**0.3260**	**8.0000e-004**	**0.1009**	**5.0000e-004**	**0.1014**	**0.0268**	**4.6000e-004**	**0.0272**		**81.5200**	**81.5200**	**3.0200e-003**	**2.8500e-003**	**82.4458**

3.4 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.3309	1.4337	20.4026	0.0268		0.0441	0.0441		0.0441	0.0441	0.0000	2,596.4671	2,596.4671	0.8398		2,617.4609
Total	**0.3309**	**1.4337**	**20.4026**	**0.0268**	**0.0000**	**0.0441**	**0.0441**	**0.0000**	**0.0441**	**0.0441**	**0.0000**	**2,596.4671**	**2,596.4671**	**0.8398**		**2,617.4609**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0489	0.0315	0.3260	8.0000e-004	0.1009	5.0000e-004	0.1014	0.0268	4.6000e-004	0.0272		81.5200	81.5200	3.0200e-003	2.8500e-003	82.4458
Total	**0.0489**	**0.0315**	**0.3260**	**8.0000e-004**	**0.1009**	**5.0000e-004**	**0.1014**	**0.0268**	**4.6000e-004**	**0.0272**		**81.5200**	**81.5200**	**3.0200e-003**	**2.8500e-003**	**82.4458**

3.5 Vegetation Enhancement - 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					
Off-Road	1.0104	9.8383	10.6023	0.0156		0.5089	0.5089		0.4682	0.4682		1,509.4149	1,509.4149	0.4882		1,521.6193
Total	**1.0104**	**9.8383**	**10.6023**	**0.0156**		**0.5089**	**0.5089**		**0.4682**	**0.4682**		**1,509.4149**	**1,509.4149**	**0.4882**		**1,521.6193**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4522	52.3046	22.1407	0.3065	11.3146	0.5051	11.8196	3.2566	0.4831	3.7397		32,243.2901	32,243.2901	0.1238	4.4496	33,572.3588
Worker	9.8796	6.3667	65.8292	0.1608	20.3672	0.1013	20.4685	5.4025	0.0933	5.4958		16,460.7700	16,460.7700	0.6103	0.5761	16,647.7009
Total	**12.3318**	**58.6713**	**87.9699**	**0.4674**	**31.6818**	**0.6064**	**32.2881**	**8.6591**	**0.5764**	**9.2356**		**48,704.0601**	**48,704.0601**	**0.7341**	**5.0257**	**50,220.0598**

3.5 Vegetation Enhancement - 2023

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	0.1919	0.8315	11.8330	0.0156		0.0256	0.0256		0.0256	0.0256	0.0000	1,509.4149	1,509.4149	0.4882		1,521.6193
Total	**0.1919**	**0.8315**	**11.8330**	**0.0156**		**0.0256**	**0.0256**		**0.0256**	**0.0256**	**0.0000**	**1,509.4149**	**1,509.4149**	**0.4882**		**1,521.6193**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4522	52.3046	22.1407	0.3065	11.3146	0.5051	11.8196	3.2566	0.4831	3.7397		32,243.2901	32,243.2901	0.1238	4.4496	33,572.3588
Worker	9.8796	6.3667	65.8292	0.1608	20.3672	0.1013	20.4685	5.4025	0.0933	5.4958		16,460.7700	16,460.7700	0.6103	0.5761	16,647.7009
Total	**12.3318**	**58.6713**	**87.9699**	**0.4674**	**31.6818**	**0.6064**	**32.2881**	**8.6591**	**0.5764**	**9.2356**		**48,704.0601**	**48,704.0601**	**0.7341**	**5.0257**	**50,220.0598**

3.6 Sand Fencing - 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					
Off-Road	0.9146	9.0242	10.5068	0.0162		0.4698	0.4698		0.4322	0.4322		1,570.4369	1,570.4369	0.5079		1,583.1347
Total	**0.9146**	**9.0242**	**10.5068**	**0.0162**		**0.4698**	**0.4698**		**0.4322**	**0.4322**		**1,570.4369**	**1,570.4369**	**0.5079**		**1,583.1347**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4522	52.3046	22.1407	0.3065	11.3146	0.5051	11.8196	3.2566	0.4831	3.7397		32,243.2901	32,243.2901	0.1238	4.4496	33,572.3588
Worker	9.8796	6.3667	65.8292	0.1608	20.3672	0.1013	20.4685	5.4025	0.0933	5.4958		16,460.7700	16,460.7700	0.6103	0.5761	16,647.7009
Total	**12.3318**	**58.6713**	**87.9699**	**0.4674**	**31.6818**	**0.6064**	**32.2881**	**8.6591**	**0.5764**	**9.2356**		**48,704.0601**	**48,704.0601**	**0.7341**	**5.0257**	**50,220.0598**

3.6 Sand Fencing - 2023

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	0.2007	0.8696	12.3747	0.0162		0.0268	0.0268		0.0268	0.0268	0.0000	1,570.4369	1,570.4369	0.5079		1,583.1347
Total	**0.2007**	**0.8696**	**12.3747**	**0.0162**		**0.0268**	**0.0268**		**0.0268**	**0.0268**	**0.0000**	**1,570.4369**	**1,570.4369**	**0.5079**		**1,583.1347**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4522	52.3046	22.1407	0.3065	11.3146	0.5051	11.8196	3.2566	0.4831	3.7397		32,243.2901	32,243.2901	0.1238	4.4496	33,572.3588
Worker	9.8796	6.3667	65.8292	0.1608	20.3672	0.1013	20.4685	5.4025	0.0933	5.4958		16,460.7700	16,460.7700	0.6103	0.5761	16,647.7009
Total	**12.3318**	**58.6713**	**87.9699**	**0.4674**	**31.6818**	**0.6064**	**32.2881**	**8.6591**	**0.5764**	**9.2356**		**48,704.0601**	**48,704.0601**	**0.7341**	**5.0257**	**50,220.0598**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
Other Non-Asphalt Surfaces	16.40	9.50	11.90	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
Other Non-Asphalt Surfaces	0.526464	0.059349	0.179786	0.147621	0.026929	0.006851	0.008316	0.016412	0.000925	0.000120	0.022958	0.000766	0.003504

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					
Other Non-Asphalt Surfaces	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**

5.2 Energy by Land Use - NaturalGas

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					
Other Non-Asphalt Surfaces	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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.9298	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335
Unmitigated	2.9298	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335

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	0.7144					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.2141					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3500e-003	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335
Total	**2.9298**	**1.3000e-004**	**0.0146**	**0.0000**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**		**0.0314**	**0.0314**	**8.0000e-005**		**0.0335**

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	0.7144					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.2141					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3500e-003	1.3000e-004	0.0146	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005		0.0314	0.0314	8.0000e-005		0.0335
Total	**2.9298**	**1.3000e-004**	**0.0146**	**0.0000**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**		**0.0314**	**0.0314**	**8.0000e-005**		**0.0335**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CALEEMOD OUTPUTS: WELL DEVELOPMENT, IRRIGATION SYSTEM INSTALLATION, TESTING

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Well Development, Irrigation System Installation, Testing

Imperial County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	5.70	Acre	5.70	248,292.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2024
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 5.7 acres of well installation and irrigation pipelines

Construction Phase - Total days updated to match PD and accounting for 8 hour work days

Off-road Equipment - Equipment updated to match PD

Off-road Equipment - Equipment updated to match PD. Off highway trucks include heavy-duty and light-duty trucks

Off-road Equipment - Equipment updated to match PD. Other construction equipment include light-duty trucks and ATVs

Off-road Equipment - Equipment updated to match PD. Off highway trucks include heavy-duty and light-duty trucks

Trips and VMT -

On-road Fugitive Dust - According to the default CalEEMod trip length for workers (10.2 miles) and vendors (11.9 miles) the roads to access the Project Site are 100% paved. These roads are Highway 111, Grapefruit Boulevard, Avenue A, and 1st Street.

Grading -

Construction Off-road Equipment Mitigation - Vehicle speed limited to 5 mph on unpaved roadways, as specified by PD

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	5
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	230.00	30.00
tblConstructionPhase	NumDays	230.00	30.00
tblConstructionPhase	PhaseEndDate	12/8/2023	2/17/2023
tblConstructionPhase	PhaseEndDate	10/25/2024	5/16/2023
tblConstructionPhase	PhaseStartDate	1/21/2023	1/9/2023
tblConstructionPhase	PhaseStartDate	12/9/2023	4/5/2023
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00

tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

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					
2023	5.0894	36.0525	32.9706	0.1301	7.9127	1.4107	9.2192	3.7385	1.2986	4.9412	0.0000	12,737.8608	12,737.8608	3.4562	0.2022	12,884.5303
Maximum	**5.0894**	**36.0525**	**32.9706**	**0.1301**	**7.9127**	**1.4107**	**9.2192**	**3.7385**	**1.2986**	**4.9412**	**0.0000**	**12,737.8608**	**12,737.8608**	**3.4562**	**0.2022**	**12,884.5303**

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					
2023	2.0279	7.9654	54.0398	0.1301	7.9127	0.2031	8.1158	3.7385	0.2019	3.9404	0.0000	12,737.8608	12,737.8608	3.4562	0.2022	12,884.5303
Maximum	**2.0279**	**7.9654**	**54.0398**	**0.1301**	**7.9127**	**0.2031**	**8.1158**	**3.7385**	**0.2019**	**3.9404**	**0.0000**	**12,737.8608**	**12,737.8608**	**3.4562**	**0.2022**	**12,884.5303**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	60.15	77.91	-63.90	0.00	0.00	85.60	11.97	0.00	84.45	20.25	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	0.1164	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003
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	0.0000	0.0000	0.0000	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	**0.1164**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.2500e-003**	**1.2500e-003**	**0.0000**	**0.0000**	**1.3300e-003**

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	0.1164	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003
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	0.0000	0.0000	0.0000	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	**0.1164**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.2500e-003**	**1.2500e-003**	**0.0000**	**0.0000**	**1.3300e-003**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	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	Aquifer Testing and Site Restoration	Site Preparation	1/9/2023	1/20/2023	5	10	
2	Well Construction and Development	Building Construction	1/9/2023	2/17/2023	5	30	
3	Irrigation System	Building Construction	4/5/2023	5/16/2023	5	30	

Acres of Grading (Site Preparation Phase): 5

Acres of Grading (Grading Phase): 0

Acres of Paving: 5.7

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Well Construction and Development	Bore/Drill Rigs	1	7.00	221	0.50
Well Construction and Development	Off-Highway Trucks	3	8.00	402	0.38
Aquifer Testing and Site Restoration	Off-Highway Trucks	4	8.00	402	0.38
Aquifer Testing and Site Restoration	Rubber Tired Dozers	1	8.00	247	0.40
Irrigation System	Excavators	2	7.00	158	0.38
Irrigation System	Graders	1	8.00	187	0.41
Irrigation System	Other Construction Equipment	4	8.00	172	0.42
Irrigation System	Rubber Tired Dozers	1	8.00	247	0.40

Irrigation System	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Well Construction and Development	4	104.00	41.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Aquifer Testing and Site Restoration	5	13.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Irrigation System	9	104.00	41.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Reduce Vehicle Speed on Unpaved Roads

3.2 Aquifer Testing and Site Restoration - 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					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.7001	21.3987	16.2603	0.0614		0.8370	0.8370		0.7700	0.7700		5,946.5547	5,946.5547	1.9232		5,994.6356
Total	**2.7001**	**21.3987**	**16.2603**	**0.0614**	**6.5523**	**0.8370**	**7.3893**	**3.3675**	**0.7700**	**4.1375**		**5,946.5547**	**5,946.5547**	**1.9232**		**5,994.6356**

3.2 Aquifer Testing and Site Restoration - 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	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0651	0.0302	0.4558	9.4000e-004	0.1009	5.0000e-004	0.1014	0.0268	4.6000e-004	0.0272		95.9068	95.9068	3.0000e-003	2.7900e-003	96.8125
Total	**0.0651**	**0.0302**	**0.4558**	**9.4000e-004**	**0.1009**	**5.0000e-004**	**0.1014**	**0.0268**	**4.6000e-004**	**0.0272**		**95.9068**	**95.9068**	**3.0000e-003**	**2.7900e-003**	**96.8125**

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					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	0.7512	3.2551	27.5428	0.0614		0.1002	0.1002		0.1002	0.1002	0.0000	5,946.5547	5,946.5547	1.9232		5,994.6356
Total	**0.7512**	**3.2551**	**27.5428**	**0.0614**	**6.5523**	**0.1002**	**6.6525**	**3.3675**	**0.1002**	**3.4676**	**0.0000**	**5,946.5547**	**5,946.5547**	**1.9232**		**5,994.6356**

3.2 Aquifer Testing and Site Restoration - 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	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0651	0.0302	0.4558	9.4000e-004	0.1009	5.0000e-004	0.1014	0.0268	4.6000e-004	0.0272		95.9068	95.9068	3.0000e-003	2.7900e-003	96.8125
Total	**0.0651**	**0.0302**	**0.4558**	**9.4000e-004**	**0.1009**	**5.0000e-004**	**0.1014**	**0.0268**	**4.6000e-004**	**0.0272**		**95.9068**	**95.9068**	**3.0000e-003**	**2.7900e-003**	**96.8125**

3.3 Well Construction and Development - 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					
Off-Road	1.6998	12.4883	11.6442	0.0480		0.4448	0.4448		0.4092	0.4092		4,640.6434	4,640.6434	1.5009		4,678.1653
Total	**1.6998**	**12.4883**	**11.6442**	**0.0480**		**0.4448**	**0.4448**		**0.4092**	**0.4092**		**4,640.6434**	**4,640.6434**	**1.5009**		**4,678.1653**

3.3 Well Construction and Development - 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	0.0000
Vendor	0.1032	1.8941	0.8612	0.0122	0.4526	0.0202	0.4727	0.1303	0.0193	0.1495		1,287.5013	1,287.5013	5.1400e-003	0.1771	1,340.4167
Worker	0.5211	0.2412	3.6465	7.5000e-003	0.8069	4.0100e-003	0.8109	0.2140	3.7000e-003	0.2177		767.2547	767.2547	0.0240	0.0223	774.5002
Total	**0.6243**	**2.1353**	**4.5077**	**0.0197**	**1.2595**	**0.0242**	**1.2837**	**0.3443**	**0.0230**	**0.3673**		**2,054.7560**	**2,054.7560**	**0.0291**	**0.1994**	**2,114.9169**

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	0.5873	2.5449	21.5335	0.0480		0.0783	0.0783		0.0783	0.0783	0.0000	4,640.6434	4,640.6434	1.5009		4,678.1653
Total	**0.5873**	**2.5449**	**21.5335**	**0.0480**		**0.0783**	**0.0783**		**0.0783**	**0.0783**	**0.0000**	**4,640.6434**	**4,640.6434**	**1.5009**		**4,678.1653**

3.3 Well Construction and Development - 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	0.0000
Vendor	0.1032	1.8941	0.8612	0.0122	0.4526	0.0202	0.4727	0.1303	0.0193	0.1495		1,287.5013	1,287.5013	5.1400e-003	0.1771	1,340.4167
Worker	0.5211	0.2412	3.6465	7.5000e-003	0.8069	4.0100e-003	0.8109	0.2140	3.7000e-003	0.2177		767.2547	767.2547	0.0240	0.0223	774.5002
Total	**0.6243**	**2.1353**	**4.5077**	**0.0197**	**1.2595**	**0.0242**	**1.2837**	**0.3443**	**0.0230**	**0.3673**		**2,054.7560**	**2,054.7560**	**0.0291**	**0.1994**	**2,114.9169**

3.4 Irrigation System - 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					
Off-Road	2.9245	29.5851	28.4629	0.0516		1.3865	1.3865		1.2756	1.2756		4,999.9668	4,999.9668	1.6171		5,040.3941
Total	**2.9245**	**29.5851**	**28.4629**	**0.0516**		**1.3865**	**1.3865**		**1.2756**	**1.2756**		**4,999.9668**	**4,999.9668**	**1.6171**		**5,040.3941**

3.4 Irrigation System - 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	0.0000
Vendor	0.1032	1.8941	0.8612	0.0122	0.4526	0.0202	0.4727	0.1303	0.0193	0.1495		1,287.5013	1,287.5013	5.1400e-003	0.1771	1,340.4167
Worker	0.5211	0.2412	3.6465	7.5000e-003	0.8069	4.0100e-003	0.8109	0.2140	3.7000e-003	0.2177		767.2547	767.2547	0.0240	0.0223	774.5002
Total	**0.6243**	**2.1353**	**4.5077**	**0.0197**	**1.2595**	**0.0242**	**1.2837**	**0.3443**	**0.0230**	**0.3673**		**2,054.7560**	**2,054.7560**	**0.0291**	**0.1994**	**2,114.9169**

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	0.6359	2.7555	34.5709	0.0516		0.0848	0.0848		0.0848	0.0848	0.0000	4,999.9668	4,999.9668	1.6171		5,040.3941
Total	**0.6359**	**2.7555**	**34.5709**	**0.0516**		**0.0848**	**0.0848**		**0.0848**	**0.0848**	**0.0000**	**4,999.9668**	**4,999.9668**	**1.6171**		**5,040.3941**

3.4 Irrigation System - 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	0.0000
Vendor	0.1032	1.8941	0.8612	0.0122	0.4526	0.0202	0.4727	0.1303	0.0193	0.1495		1,287.5013	1,287.5013	5.1400e-003	0.1771	1,340.4167
Worker	0.5211	0.2412	3.6465	7.5000e-003	0.8069	4.0100e-003	0.8109	0.2140	3.7000e-003	0.2177		767.2547	767.2547	0.0240	0.0223	774.5002
Total	**0.6243**	**2.1353**	**4.5077**	**0.0197**	**1.2595**	**0.0242**	**1.2837**	**0.3443**	**0.0230**	**0.3673**		**2,054.7560**	**2,054.7560**	**0.0291**	**0.1994**	**2,114.9169**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
Other Non-Asphalt Surfaces	16.40	9.50	11.90	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
Other Non-Asphalt Surfaces	0.526464	0.059349	0.179786	0.147621	0.026929	0.006851	0.008316	0.016412	0.000925	0.000120	0.022958	0.000766	0.003504

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					
Other Non-Asphalt Surfaces	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**

5.2 Energy by Land Use - NaturalGas

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					
Other Non-Asphalt Surfaces	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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	0.1164	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003
Unmitigated	0.1164	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0284					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0880					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-005	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003
Total	**0.1164**	**1.0000e-005**	**5.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.2500e-003**	**1.2500e-003**	**0.0000**		**1.3300e-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	lb/day										lb/day					
Architectural Coating	0.0284					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0880					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-005	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003
Total	**0.1164**	**1.0000e-005**	**5.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.2500e-003**	**1.2500e-003**	**0.0000**		**1.3300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Well Development, Irrigation System Installation, Testing

Imperial County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	5.70	Acre	5.70	248,292.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2024
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 5.7 acres of well installation and irrigation pipelines

Construction Phase - Total days updated to match PD and accounting for 8 hour work days

Off-road Equipment - Equipment updated to match PD

Off-road Equipment - Equipment updated to match PD. Off highway trucks include heavy-duty and light-duty trucks

Off-road Equipment - Equipment updated to match PD. Other construction equipment include light-duty trucks and ATVs

Off-road Equipment - Equipment updated to match PD. Off highway trucks include heavy-duty and light-duty trucks

Trips and VMT -

On-road Fugitive Dust - According to the default CalEEMod trip length for workers (10.2 miles) and vendors (11.9 miles) the roads to access the Project Site are 100% paved. These roads are Highway 111, Grapefruit Boulevard, Avenue A, and 1st Street.

Grading -

Construction Off-road Equipment Mitigation - Vehicle speed limited to 5 mph on unpaved roadways, as specified by PD

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	5
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	230.00	30.00
tblConstructionPhase	NumDays	230.00	30.00
tblConstructionPhase	PhaseEndDate	12/8/2023	2/17/2023
tblConstructionPhase	PhaseEndDate	10/25/2024	5/16/2023
tblConstructionPhase	PhaseStartDate	1/21/2023	1/9/2023
tblConstructionPhase	PhaseStartDate	12/9/2023	4/5/2023
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00

tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

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					
2023	4.9384	36.2630	31.9566	0.1288	7.9127	1.4108	9.2192	3.7385	1.2986	4.9413	0.0000	12,610.6097	12,610.6097	3.4563	0.2037	12,757.7071
Maximum	**4.9384**	**36.2630**	**31.9566**	**0.1288**	**7.9127**	**1.4108**	**9.2192**	**3.7385**	**1.2986**	**4.9413**	**0.0000**	**12,610.6097**	**12,610.6097**	**3.4563**	**0.2037**	**12,757.7071**

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					
2023	1.8769	8.1759	52.8960	0.1288	7.9127	0.2032	8.1159	3.7385	0.2019	3.9405	0.0000	12,610.6097	12,610.6097	3.4563	0.2037	12,757.7071
Maximum	**1.8769**	**8.1759**	**52.8960**	**0.1288**	**7.9127**	**0.2032**	**8.1159**	**3.7385**	**0.2019**	**3.9405**	**0.0000**	**12,610.6097**	**12,610.6097**	**3.4563**	**0.2037**	**12,757.7071**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	61.99	77.45	-65.52	0.00	0.00	85.60	11.97	0.00	84.45	20.25	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	0.1164	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003
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	0.0000	0.0000	0.0000	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	**0.1164**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.2500e-003**	**1.2500e-003**	**0.0000**	**0.0000**	**1.3300e-003**

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	0.1164	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003
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	0.0000	0.0000	0.0000	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	**0.1164**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**1.2500e-003**	**1.2500e-003**	**0.0000**	**0.0000**	**1.3300e-003**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	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	Aquifer Testing and Site Restoration	Site Preparation	1/9/2023	1/20/2023	5	10	
2	Well Construction and Development	Building Construction	1/9/2023	2/17/2023	5	30	
3	Irrigation System	Building Construction	4/5/2023	5/16/2023	5	30	

Acres of Grading (Site Preparation Phase): 5

Acres of Grading (Grading Phase): 0

Acres of Paving: 5.7

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Well Construction and Development	Bore/Drill Rigs	1	7.00	221	0.50
Well Construction and Development	Off-Highway Trucks	3	8.00	402	0.38
Aquifer Testing and Site Restoration	Off-Highway Trucks	4	8.00	402	0.38
Aquifer Testing and Site Restoration	Rubber Tired Dozers	1	8.00	247	0.40
Irrigation System	Excavators	2	7.00	158	0.38
Irrigation System	Graders	1	8.00	187	0.41
Irrigation System	Other Construction Equipment	4	8.00	172	0.42
Irrigation System	Rubber Tired Dozers	1	8.00	247	0.40

Irrigation System	Tractors/Loaders/Backhoes		1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Well Construction and Development	4	104.00	41.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Aquifer Testing and Site Restoration	5	13.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Irrigation System	9	104.00	41.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Reduce Vehicle Speed on Unpaved Roads

3.2 Aquifer Testing and Site Restoration - 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					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	2.7001	21.3987	16.2603	0.0614		0.8370	0.8370		0.7700	0.7700		5,946.5547	5,946.5547	1.9232		5,994.6356
Total	**2.7001**	**21.3987**	**16.2603**	**0.0614**	**6.5523**	**0.8370**	**7.3893**	**3.3675**	**0.7700**	**4.1375**		**5,946.5547**	**5,946.5547**	**1.9232**		**5,994.6356**

3.2 Aquifer Testing and Site Restoration - 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	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0489	0.0315	0.3260	8.0000e-004	0.1009	5.0000e-004	0.1014	0.0268	4.6000e-004	0.0272		81.5200	81.5200	3.0200e-003	2.8500e-003	82.4458
Total	**0.0489**	**0.0315**	**0.3260**	**8.0000e-004**	**0.1009**	**5.0000e-004**	**0.1014**	**0.0268**	**4.6000e-004**	**0.0272**		**81.5200**	**81.5200**	**3.0200e-003**	**2.8500e-003**	**82.4458**

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					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	0.7512	3.2551	27.5428	0.0614		0.1002	0.1002		0.1002	0.1002	0.0000	5,946.5547	5,946.5547	1.9232		5,994.6356
Total	**0.7512**	**3.2551**	**27.5428**	**0.0614**	**6.5523**	**0.1002**	**6.6525**	**3.3675**	**0.1002**	**3.4676**	**0.0000**	**5,946.5547**	**5,946.5547**	**1.9232**		**5,994.6356**

3.2 Aquifer Testing and Site Restoration - 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	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0489	0.0315	0.3260	8.0000e-004	0.1009	5.0000e-004	0.1014	0.0268	4.6000e-004	0.0272		81.5200	81.5200	3.0200e-003	2.8500e-003	82.4458
Total	**0.0489**	**0.0315**	**0.3260**	**8.0000e-004**	**0.1009**	**5.0000e-004**	**0.1014**	**0.0268**	**4.6000e-004**	**0.0272**		**81.5200**	**81.5200**	**3.0200e-003**	**2.8500e-003**	**82.4458**

3.3 Well Construction and Development - 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					
Off-Road	1.6998	12.4883	11.6442	0.0480		0.4448	0.4448		0.4092	0.4092		4,640.6434	4,640.6434	1.5009		4,678.1653
Total	**1.6998**	**12.4883**	**11.6442**	**0.0480**		**0.4448**	**0.4448**		**0.4092**	**0.4092**		**4,640.6434**	**4,640.6434**	**1.5009**		**4,678.1653**

3.3 Well Construction and Development - 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	0.0000
Vendor	0.0981	2.0922	0.8856	0.0123	0.4526	0.0202	0.4728	0.1303	0.0193	0.1496		1,289.7316	1,289.7316	4.9500e-003	0.1780	1,342.8944
Worker	0.3914	0.2522	2.6081	6.3700e-003	0.8069	4.0100e-003	0.8109	0.2140	3.7000e-003	0.2177		652.1600	652.1600	0.0242	0.0228	659.5661
Total	**0.4895**	**2.3444**	**3.4937**	**0.0186**	**1.2595**	**0.0242**	**1.2837**	**0.3443**	**0.0230**	**0.3673**		**1,941.8916**	**1,941.8916**	**0.0291**	**0.2008**	**2,002.4604**

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	0.5873	2.5449	21.5335	0.0480		0.0783	0.0783		0.0783	0.0783	0.0000	4,640.6434	4,640.6434	1.5009		4,678.1653
Total	**0.5873**	**2.5449**	**21.5335**	**0.0480**		**0.0783**	**0.0783**		**0.0783**	**0.0783**	**0.0000**	**4,640.6434**	**4,640.6434**	**1.5009**		**4,678.1653**

3.3 Well Construction and Development - 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	0.0000
Vendor	0.0981	2.0922	0.8856	0.0123	0.4526	0.0202	0.4728	0.1303	0.0193	0.1496		1,289.7316	1,289.7316	4.9500e-003	0.1780	1,342.8944
Worker	0.3914	0.2522	2.6081	6.3700e-003	0.8069	4.0100e-003	0.8109	0.2140	3.7000e-003	0.2177		652.1600	652.1600	0.0242	0.0228	659.5661
Total	**0.4895**	**2.3444**	**3.4937**	**0.0186**	**1.2595**	**0.0242**	**1.2837**	**0.3443**	**0.0230**	**0.3673**		**1,941.8916**	**1,941.8916**	**0.0291**	**0.2008**	**2,002.4604**

3.4 Irrigation System - 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					
Off-Road	2.9245	29.5851	28.4629	0.0516		1.3865	1.3865		1.2756	1.2756		4,999.9668	4,999.9668	1.6171		5,040.3941
Total	**2.9245**	**29.5851**	**28.4629**	**0.0516**		**1.3865**	**1.3865**		**1.2756**	**1.2756**		**4,999.9668**	**4,999.9668**	**1.6171**		**5,040.3941**

3.4 Irrigation System - 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	0.0000
Vendor	0.0981	2.0922	0.8856	0.0123	0.4526	0.0202	0.4728	0.1303	0.0193	0.1496		1,289.7316	1,289.7316	4.9500e-003	0.1780	1,342.8944
Worker	0.3914	0.2522	2.6081	6.3700e-003	0.8069	4.0100e-003	0.8109	0.2140	3.7000e-003	0.2177		652.1600	652.1600	0.0242	0.0228	659.5661
Total	**0.4895**	**2.3444**	**3.4937**	**0.0186**	**1.2595**	**0.0242**	**1.2837**	**0.3443**	**0.0230**	**0.3673**		**1,941.8916**	**1,941.8916**	**0.0291**	**0.2008**	**2,002.4604**

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	0.6359	2.7555	34.5709	0.0516		0.0848	0.0848		0.0848	0.0848	0.0000	4,999.9668	4,999.9668	1.6171		5,040.3941
Total	**0.6359**	**2.7555**	**34.5709**	**0.0516**		**0.0848**	**0.0848**		**0.0848**	**0.0848**	**0.0000**	**4,999.9668**	**4,999.9668**	**1.6171**		**5,040.3941**

3.4 Irrigation System - 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	0.0000
Vendor	0.0981	2.0922	0.8856	0.0123	0.4526	0.0202	0.4728	0.1303	0.0193	0.1496		1,289.7316	1,289.7316	4.9500e-003	0.1780	1,342.8944
Worker	0.3914	0.2522	2.6081	6.3700e-003	0.8069	4.0100e-003	0.8109	0.2140	3.7000e-003	0.2177		652.1600	652.1600	0.0242	0.0228	659.5661
Total	**0.4895**	**2.3444**	**3.4937**	**0.0186**	**1.2595**	**0.0242**	**1.2837**	**0.3443**	**0.0230**	**0.3673**		**1,941.8916**	**1,941.8916**	**0.0291**	**0.2008**	**2,002.4604**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
Other Non-Asphalt Surfaces	16.40	9.50	11.90	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
Other Non-Asphalt Surfaces	0.526464	0.059349	0.179786	0.147621	0.026929	0.006851	0.008316	0.016412	0.000925	0.000120	0.022958	0.000766	0.003504

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					
Other Non-Asphalt Surfaces	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**

5.2 Energy by Land Use - NaturalGas

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					
Other Non-Asphalt Surfaces	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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	0.1164	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003
Unmitigated	0.1164	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0284					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0880					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-005	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003
Total	**0.1164**	**1.0000e-005**	**5.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.2500e-003**	**1.2500e-003**	**0.0000**		**1.3300e-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	lb/day										lb/day					
Architectural Coating	0.0284					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0880					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.0000e-005	1.0000e-005	5.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		1.2500e-003	1.2500e-003	0.0000		1.3300e-003
Total	**0.1164**	**1.0000e-005**	**5.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.2500e-003**	**1.2500e-003**	**0.0000**		**1.3300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

ATTACHMENT B

CalEEMod Output Files Greenhouse Gas Emissions

CALEEMOD OUTPUTS: VEGETATION PLOTS, SURFACE ROUGHENING, ACCESS ROADS

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Vegetation Plots, Surface Roughening, Access Roads

Imperial County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	143.50	Acre	143.50	6,250,860.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2024
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 143.5 acres accounts for 53 acres for enhancement of existing vegetation, 86.5 acres of vegetated hedgerows, and 4 acres of perimeter sand fencing.

Construction Phase - Total days updated to match PD and accounting for 8 hour work days

Off-road Equipment - Equipment updated to match PD. Other Construction Equipment includes light-duty trucks, ATVs, and water trucks

Off-road Equipment - Equipment updated to match PD. Other construction equipment includes ATVs, and light-duty pickups with trailers

Off-road Equipment - Equipment updated to match PD. Other Construction Equipment includes light-duty trucks, ATVs, and water trucks

Off-road Equipment - Equipment updated to match PD. Other construction equipment is light-duty pickups with trailers and ATVs

Off-road Equipment - Equipment updated to match PD. Other construction equipment includes a water truck, ATVs, and light-duty pickups with trailers

Trips and VMT -

On-road Fugitive Dust - According to the default CalEEMod trip length for workers (10.2 miles) and vendors (11.9 miles) the roads to access the Project Site are 100% paved. These roads are Highway 111, Grapefruit Boulevard, Avenue A, and 1st Street.

Grading -

Construction Off-road Equipment Mitigation - Vehicle speed limited to 5 mph on unpaved roadways, as specified by PD

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	5
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
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
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	3,100.00	30.00
tblConstructionPhase	NumDays	3,100.00	10.00
tblConstructionPhase	NumDays	310.00	15.00
tblConstructionPhase	NumDays	120.00	15.00
tblConstructionPhase	NumDays	120.00	10.00
tblOffRoadEquipment	HorsePower	158.00	130.00
tblOffRoadEquipment	HorsePower	8.00	75.00
tblOffRoadEquipment	HorsePower	247.00	125.00
tblOffRoadEquipment	HorsePower	65.00	75.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

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					
2023	0.3346	1.8666	2.6399	0.0108	0.7391	0.0470	0.7861	0.2244	0.0436	0.2680	0.0000	1,012.3392	1,012.3392	0.0470	0.0910	1,040.6255
Maximum	**0.3346**	**1.8666**	**2.6399**	**0.0108**	**0.7391**	**0.0470**	**0.7861**	**0.2244**	**0.0436**	**0.2680**	**0.0000**	**1,012.3392**	**1,012.3392**	**0.0470**	**0.0910**	**1,040.6255**

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					
2023	0.2790	1.2300	2.7614	0.0108	0.7391	0.0141	0.7532	0.2244	0.0135	0.2379	0.0000	1,012.3390	1,012.3390	0.0470	0.0910	1,040.6254
Maximum	**0.2790**	**1.2300**	**2.7614**	**0.0108**	**0.7391**	**0.0141**	**0.7532**	**0.2244**	**0.0135**	**0.2379**	**0.0000**	**1,012.3390**	**1,012.3390**	**0.0470**	**0.0910**	**1,040.6254**

	ROG	**NOx**	**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	**16.60**	**34.10**	**-4.60**	**0.00**	**0.00**	**70.00**	**4.18**	**0.00**	**69.05**	**11.23**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
1	**3-1-2023**	**5-31-2023**	2.1730	1.4809
		Highest	2.1730	1.4809

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	0.5346	1.0000e-005	1.3200e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5600e-003	2.5600e-003	1.0000e-005	0.0000	2.7300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.5346**	**1.0000e-005**	**1.3200e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5600e-003**	**2.5600e-003**	**1.0000e-005**	**0.0000**	**2.7300e-003**

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	0.5346	1.0000e-005	1.3200e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5600e-003	2.5600e-003	1.0000e-005	0.0000	2.7300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.5346**	**1.0000e-005**	**1.3200e-003**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5600e-003**	**2.5600e-003**	**1.0000e-005**	**0.0000**	**2.7300e-003**

	ROG	**NOx**	**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	Site Exclusion	Site Preparation	3/1/2023	3/21/2023	5	15	
2	Access Road Installation	Grading	3/1/2023	3/21/2023	5	15	
3	Site Preparation	Site Preparation	3/22/2023	4/4/2023	5	10	

4	Vegetation Enhancement	Building Construction	4/5/2023	5/16/2023	5	30	
5	Sand Fencing	Building Construction	4/5/2023	4/18/2023	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 30

Acres of Paving: 143.5

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Exclusion	Forklifts	2	8.00	89	0.20
Site Exclusion	Other Construction Equipment	5	8.00	172	0.42
Site Exclusion	Skid Steer Loaders	2	8.00	65	0.37
Site Exclusion	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Excavators	1	8.00	158	0.38
Site Preparation	Other Construction Equipment	3	8.00	172	0.42
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Access Road Installation	Graders	2	8.00	187	0.41
Access Road Installation	Other Construction Equipment	3	8.00	172	0.42
Access Road Installation	Rubber Tired Dozers	2	8.00	247	0.40
Access Road Installation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Vegetation Enhancement	Excavators	1	8.00	130	0.38
Vegetation Enhancement	Other Construction Equipment	3	2.00	172	0.42
Vegetation Enhancement	Plate Compactors	3	8.00	75	0.43
Vegetation Enhancement	Rubber Tired Dozers	1	8.00	125	0.40
Vegetation Enhancement	Skid Steer Loaders	1	8.00	75	0.37
Sand Fencing	Other Construction Equipment	3	7.00	172	0.42

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Exclusion	11	28.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	5	13.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Access Road Installation	9	23.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Vegetation Enhancement	9	2,625.00	1,025.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Sand Fencing	3	2,625.00	1,025.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Exclusion - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0179	0.1793	0.2215	3.3000e-004		9.1800e-003	9.1800e-003		8.4400e-003	8.4400e-003	0.0000	29.1988	29.1988	9.4400e-003	0.0000	29.4349
Total	**0.0179**	**0.1793**	**0.2215**	**3.3000e-004**	**0.0000**	**9.1800e-003**	**9.1800e-003**	**0.0000**	**8.4400e-003**	**8.4400e-003**	**0.0000**	**29.1988**	**29.1988**	**9.4400e-003**	**0.0000**	**29.4349**

3.2 Site Exclusion - 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	8.5000e-004	5.0000e-004	5.9000e-003	1.0000e-005	1.6200e-003	1.0000e-005	1.6300e-003	4.3000e-004	1.0000e-005	4.4000e-004	0.0000	1.2810	1.2810	4.0000e-005	4.0000e-005	1.2944
Total	**8.5000e-004**	**5.0000e-004**	**5.9000e-003**	**1.0000e-005**	**1.6200e-003**	**1.0000e-005**	**1.6300e-003**	**4.3000e-004**	**1.0000e-005**	**4.4000e-004**	**0.0000**	**1.2810**	**1.2810**	**4.0000e-005**	**4.0000e-005**	**1.2944**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4800e-003	0.0336	0.2529	3.3000e-004		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	29.1988	29.1988	9.4400e-003	0.0000	29.4349
Total	**4.4800e-003**	**0.0336**	**0.2529**	**3.3000e-004**	**0.0000**	**5.5000e-004**	**5.5000e-004**	**0.0000**	**5.5000e-004**	**5.5000e-004**	**0.0000**	**29.1988**	**29.1988**	**9.4400e-003**	**0.0000**	**29.4349**

3.2 Site Exclusion - 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	8.5000e-004	5.0000e-004	5.9000e-003	1.0000e-005	1.6200e-003	1.0000e-005	1.6300e-003	4.3000e-004	1.0000e-005	4.4000e-004	0.0000	1.2810	1.2810	4.0000e-005	4.0000e-005	1.2944
Total	**8.5000e-004**	**5.0000e-004**	**5.9000e-003**	**1.0000e-005**	**1.6200e-003**	**1.0000e-005**	**1.6300e-003**	**4.3000e-004**	**1.0000e-005**	**4.4000e-004**	**0.0000**	**1.2810**	**1.2810**	**4.0000e-005**	**4.0000e-005**	**1.2944**

3.3 Access Road Installation - 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					0.1062	0.0000	0.1062	0.0514	0.0000	0.0514	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0261	0.2771	0.1955	4.1000e-004		0.0122	0.0122		0.0113	0.0113	0.0000	36.2895	36.2895	0.0117	0.0000	36.5830
Total	**0.0261**	**0.2771**	**0.1955**	**4.1000e-004**	**0.1062**	**0.0122**	**0.1185**	**0.0514**	**0.0113**	**0.0626**	**0.0000**	**36.2895**	**36.2895**	**0.0117**	**0.0000**	**36.5830**

3.3 Access Road Installation - 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	7.0000e-004	4.1000e-004	4.8500e-003	1.0000e-005	1.3300e-003	1.0000e-005	1.3400e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.0523	1.0523	3.0000e-005	3.0000e-005	1.0632
Total	**7.0000e-004**	**4.1000e-004**	**4.8500e-003**	**1.0000e-005**	**1.3300e-003**	**1.0000e-005**	**1.3400e-003**	**3.5000e-004**	**1.0000e-005**	**3.6000e-004**	**0.0000**	**1.0523**	**1.0523**	**3.0000e-005**	**3.0000e-005**	**1.0632**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1062	0.0000	0.1062	0.0514	0.0000	0.0514	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.0700e-003	0.0220	0.2433	4.1000e-004		6.8000e-004	6.8000e-004		6.8000e-004	6.8000e-004	0.0000	36.2895	36.2895	0.0117	0.0000	36.5829
Total	**5.0700e-003**	**0.0220**	**0.2433**	**4.1000e-004**	**0.1062**	**6.8000e-004**	**0.1069**	**0.0514**	**6.8000e-004**	**0.0521**	**0.0000**	**36.2895**	**36.2895**	**0.0117**	**0.0000**	**36.5829**

3.3 Access Road Installation - 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	7.0000e-004	4.1000e-004	4.8500e-003	1.0000e-005	1.3300e-003	1.0000e-005	1.3400e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.0523	1.0523	3.0000e-005	3.0000e-005	1.0632
Total	**7.0000e-004**	**4.1000e-004**	**4.8500e-003**	**1.0000e-005**	**1.3300e-003**	**1.0000e-005**	**1.3400e-003**	**3.5000e-004**	**1.0000e-005**	**3.6000e-004**	**0.0000**	**1.0523**	**1.0523**	**3.0000e-005**	**3.0000e-005**	**1.0632**

3.4 Site Preparation - 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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.9300e-003	0.0670	0.0875	1.3000e-004		3.4400e-003	3.4400e-003		3.1700e-003	3.1700e-003	0.0000	11.7774	11.7774	3.8100e-003	0.0000	11.8726
Total	**6.9300e-003**	**0.0670**	**0.0875**	**1.3000e-004**	**0.0000**	**3.4400e-003**	**3.4400e-003**	**0.0000**	**3.1700e-003**	**3.1700e-003**	**0.0000**	**11.7774**	**11.7774**	**3.8100e-003**	**0.0000**	**11.8726**

3.4 Site Preparation - 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	2.6000e-004	1.5000e-004	1.8300e-003	0.0000	5.0000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.3965	0.3965	1.0000e-005	1.0000e-005	0.4006
Total	**2.6000e-004**	**1.5000e-004**	**1.8300e-003**	**0.0000**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.3965**	**0.3965**	**1.0000e-005**	**1.0000e-005**	**0.4006**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6500e-003	7.1700e-003	0.1020	1.3000e-004		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004	0.0000	11.7774	11.7774	3.8100e-003	0.0000	11.8726
Total	**1.6500e-003**	**7.1700e-003**	**0.1020**	**1.3000e-004**	**0.0000**	**2.2000e-004**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**2.2000e-004**	**0.0000**	**11.7774**	**11.7774**	**3.8100e-003**	**0.0000**	**11.8726**

3.4 Site Preparation - 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	2.6000e-004	1.5000e-004	1.8300e-003	0.0000	5.0000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.3965	0.3965	1.0000e-005	1.0000e-005	0.4006
Total	**2.6000e-004**	**1.5000e-004**	**1.8300e-003**	**0.0000**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.3965**	**0.3965**	**1.0000e-005**	**1.0000e-005**	**0.4006**

3.5 Vegetation Enhancement - 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					
Off-Road	0.0152	0.1476	0.1590	2.3000e-004		7.6300e-003	7.6300e-003		7.0200e-003	7.0200e-003	0.0000	20.5398	20.5398	6.6400e-003	0.0000	20.7059
Total	**0.0152**	**0.1476**	**0.1590**	**2.3000e-004**		**7.6300e-003**	**7.6300e-003**		**7.0200e-003**	**7.0200e-003**	**0.0000**	**20.5398**	**20.5398**	**6.6400e-003**	**0.0000**	**20.7059**

3.5 Vegetation Enhancement - 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	0.0370	0.7685	0.3266	4.5900e-003	0.1687	7.5600e-003	0.1763	0.0486	7.2400e-003	0.0558	0.0000	438.3190	438.3190	1.7200e-003	0.0604	456.3716
Worker	0.1596	0.0936	1.1068	2.5900e-003	0.3033	1.5200e-003	0.3049	0.0805	1.4000e-003	0.0819	0.0000	240.1913	240.1913	7.9800e-003	7.7400e-003	242.6959
Total	**0.1966**	**0.8621**	**1.4334**	**7.1800e-003**	**0.4721**	**9.0800e-003**	**0.4811**	**0.1291**	**8.6400e-003**	**0.1377**	**0.0000**	**678.5103**	**678.5103**	**9.7000e-003**	**0.0682**	**699.0675**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8800e-003	0.0125	0.1775	2.3000e-004		3.8000e-004	3.8000e-004		3.8000e-004	3.8000e-004	0.0000	20.5398	20.5398	6.6400e-003	0.0000	20.7058
Total	**2.8800e-003**	**0.0125**	**0.1775**	**2.3000e-004**		**3.8000e-004**	**3.8000e-004**		**3.8000e-004**	**3.8000e-004**	**0.0000**	**20.5398**	**20.5398**	**6.6400e-003**	**0.0000**	**20.7058**

3.5 Vegetation Enhancement - 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	0.0370	0.7685	0.3266	4.5900e-003	0.1687	7.5600e-003	0.1763	0.0486	7.2400e-003	0.0558	0.0000	438.3190	438.3190	1.7200e-003	0.0604	456.3716
Worker	0.1596	0.0936	1.1068	2.5900e-003	0.3033	1.5200e-003	0.3049	0.0805	1.4000e-003	0.0819	0.0000	240.1913	240.1913	7.9800e-003	7.7400e-003	242.6959
Total	**0.1966**	**0.8621**	**1.4334**	**7.1800e-003**	**0.4721**	**9.0800e-003**	**0.4811**	**0.1291**	**8.6400e-003**	**0.1377**	**0.0000**	**678.5103**	**678.5103**	**9.7000e-003**	**0.0682**	**699.0675**

3.6 Sand Fencing - 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					
Off-Road	4.5700e-003	0.0451	0.0525	8.0000e-005		2.3500e-003	2.3500e-003		2.1600e-003	2.1600e-003	0.0000	7.1234	7.1234	2.3000e-003	0.0000	7.1810
Total	**4.5700e-003**	**0.0451**	**0.0525**	**8.0000e-005**		**2.3500e-003**	**2.3500e-003**		**2.1600e-003**	**2.1600e-003**	**0.0000**	**7.1234**	**7.1234**	**2.3000e-003**	**0.0000**	**7.1810**

3.6 Sand Fencing - 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	0.0124	0.2562	0.1089	1.5300e-003	0.0562	2.5200e-003	0.0588	0.0162	2.4100e-003	0.0186	0.0000	146.1063	146.1063	5.7000e-004	0.0201	152.1239
Worker	0.0532	0.0312	0.3689	8.6000e-004	0.1011	5.1000e-004	0.1016	0.0268	4.7000e-004	0.0273	0.0000	80.0638	80.0638	2.6600e-003	2.5800e-003	80.8986
Total	**0.0655**	**0.2874**	**0.4778**	**2.3900e-003**	**0.1574**	**3.0300e-003**	**0.1604**	**0.0430**	**2.8800e-003**	**0.0459**	**0.0000**	**226.1701**	**226.1701**	**3.2300e-003**	**0.0227**	**233.0225**

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	1.0000e-003	4.3500e-003	0.0619	8.0000e-005		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	7.1234	7.1234	2.3000e-003	0.0000	7.1810
Total	**1.0000e-003**	**4.3500e-003**	**0.0619**	**8.0000e-005**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**	**0.0000**	**7.1234**	**7.1234**	**2.3000e-003**	**0.0000**	**7.1810**

3.6 Sand Fencing - 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	0.0124	0.2562	0.1089	1.5300e-003	0.0562	2.5200e-003	0.0588	0.0162	2.4100e-003	0.0186	0.0000	146.1063	146.1063	5.7000e-004	0.0201	152.1239
Worker	0.0532	0.0312	0.3689	8.6000e-004	0.1011	5.1000e-004	0.1016	0.0268	4.7000e-004	0.0273	0.0000	80.0638	80.0638	2.6600e-003	2.5800e-003	80.8986
Total	**0.0655**	**0.2874**	**0.4778**	**2.3900e-003**	**0.1574**	**3.0300e-003**	**0.1604**	**0.0430**	**2.8800e-003**	**0.0459**	**0.0000**	**226.1701**	**226.1701**	**3.2300e-003**	**0.0227**	**233.0225**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
Other Non-Asphalt Surfaces	16.40	9.50	11.90	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
Other Non-Asphalt Surfaces	0.526464	0.059349	0.179786	0.147621	0.026929	0.006851	0.008316	0.016412	0.000925	0.000120	0.022958	0.000766	0.003504

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	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	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	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	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	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
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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					
Other Non-Asphalt Surfaces	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
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive 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	0.5346	1.0000e-005	1.3200e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5600e-003	2.5600e-003	1.0000e-005	0.0000	2.7300e-003
Unmitigated	0.5346	1.0000e-005	1.3200e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5600e-003	2.5600e-003	1.0000e-005	0.0000	2.7300e-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	0.1304					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4041					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2000e-004	1.0000e-005	1.3200e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5600e-003	2.5600e-003	1.0000e-005	0.0000	2.7300e-003
Total	**0.5346**	**1.0000e-005**	**1.3200e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5600e-003**	**2.5600e-003**	**1.0000e-005**	**0.0000**	**2.7300e-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	0.1304					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4041					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2000e-004	1.0000e-005	1.3200e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5600e-003	2.5600e-003	1.0000e-005	0.0000	2.7300e-003
Total	**0.5346**	**1.0000e-005**	**1.3200e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5600e-003**	**2.5600e-003**	**1.0000e-005**	**0.0000**	**2.7300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

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

CALEEMOD OUTPUTS: WELL DEVELOPMENT, IRRIGATION SYSTEM INSTALLATION, TESTING

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Well Development, Irrigation System Installation, Testing

Imperial County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	5.70	Acre	5.70	248,292.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2024
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 5.7 acres of well installation and irrigation pipelines

Construction Phase - Total days updated to match PD and accounting for 8 hour work days

Off-road Equipment - Equipment updated to match PD

Off-road Equipment - Equipment updated to match PD. Off highway trucks include heavy-duty and light-duty trucks

Off-road Equipment - Equipment updated to match PD. Other construction equipment include light-duty trucks and ATVs

Off-road Equipment - Equipment updated to match PD. Off highway trucks include heavy-duty and light-duty trucks

Trips and VMT -

On-road Fugitive Dust - According to the default CalEEMod trip length for workers (10.2 miles) and vendors (11.9 miles) the roads to access the Project Site are 100% paved. These roads are Highway 111, Grapefruit Boulevard, Avenue A, and 1st Street.

Grading -

Construction Off-road Equipment Mitigation - Vehicle speed limited to 5 mph on unpaved roadways, as specified by PD

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	5
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	230.00	30.00
tblConstructionPhase	NumDays	230.00	30.00
tblConstructionPhase	PhaseEndDate	12/8/2023	2/17/2023
tblConstructionPhase	PhaseEndDate	10/25/2024	5/16/2023
tblConstructionPhase	PhaseStartDate	1/21/2023	1/9/2023
tblConstructionPhase	PhaseStartDate	12/9/2023	4/5/2023
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00

tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

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					
2023	0.0987	0.8071	0.7986	2.3800e-003	0.0708	0.0324	0.1032	0.0272	0.0298	0.0571	0.0000	212.6547	212.6547	0.0519	5.4600e-003	215.5803
Maximum	**0.0987**	**0.8071**	**0.7986**	**2.3800e-003**	**0.0708**	**0.0324**	**0.1032**	**0.0272**	**0.0298**	**0.0571**	**0.0000**	**212.6547**	**212.6547**	**0.0519**	**5.4600e-003**	**215.5803**

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					
2023	0.0380	0.1648	1.0949	2.3800e-003	0.0708	3.6800e-003	0.0745	0.0272	3.6400e-003	0.0309	0.0000	212.6545	212.6545	0.0519	5.4600e-003	215.5801
Maximum	**0.0380**	**0.1648**	**1.0949**	**2.3800e-003**	**0.0708**	**3.6800e-003**	**0.0745**	**0.0272**	**3.6400e-003**	**0.0309**	**0.0000**	**212.6545**	**212.6545**	**0.0519**	**5.4600e-003**	**215.5801**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**61.54**	**79.58**	**-37.11**	**0.00**	**0.00**	**88.63**	**27.83**	**0.00**	**87.79**	**45.87**	**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	**1-9-2023**	**4-8-2023**	0.3972	0.1115
2	**4-9-2023**	**7-8-2023**	0.4787	0.0835
		Highest	0.4787	0.1115

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	0.0212	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0212**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.0000**	**1.1000e-004**

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	0.0212	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0212**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.0000**	**1.1000e-004**

	ROG	**NOx**	**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	Aquifer Testing and Site Restoration	Site Preparation	1/9/2023	1/20/2023	5	10	
2	Well Construction and Development	Building Construction	1/9/2023	2/17/2023	5	30	
3	Irrigation System	Building Construction	4/5/2023	5/16/2023	5	30	

Acres of Grading (Site Preparation Phase): 5

Acres of Grading (Grading Phase): 0

Acres of Paving: 5.7

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Well Construction and Development	Bore/Drill Rigs	1	7.00	221	0.50
Well Construction and Development	Off-Highway Trucks	3	8.00	402	0.38
Aquifer Testing and Site Restoration	Off-Highway Trucks	4	8.00	402	0.38
Aquifer Testing and Site Restoration	Rubber Tired Dozers	1	8.00	247	0.40
Irrigation System	Excavators	2	7.00	158	0.38
Irrigation System	Graders	1	8.00	187	0.41
Irrigation System	Other Construction Equipment	4	8.00	172	0.42
Irrigation System	Rubber Tired Dozers	1	8.00	247	0.40
Irrigation System	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Well Construction and Development	4	104.00	41.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Aquifer Testing and Site Restoration	5	13.00	0.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT
Irrigation System	9	104.00	41.00	0.00	10.20	11.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Reduce Vehicle Speed on Unpaved Roads

3.2 Aquifer Testing and Site Restoration - 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					0.0328	0.0000	0.0328	0.0168	0.0000	0.0168	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0135	0.1070	0.0813	3.1000e-004		4.1800e-003	4.1800e-003		3.8500e-003	3.8500e-003	0.0000	26.9731	26.9731	8.7200e-003	0.0000	27.1912
Total	**0.0135**	**0.1070**	**0.0813**	**3.1000e-004**	**0.0328**	**4.1800e-003**	**0.0369**	**0.0168**	**3.8500e-003**	**0.0207**	**0.0000**	**26.9731**	**26.9731**	**8.7200e-003**	**0.0000**	**27.1912**

3.2 Aquifer Testing and Site Restoration - 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	2.6000e-004	1.5000e-004	1.8300e-003	0.0000	5.0000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.3965	0.3965	1.0000e-005	1.0000e-005	0.4006
Total	**2.6000e-004**	**1.5000e-004**	**1.8300e-003**	**0.0000**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.3965**	**0.3965**	**1.0000e-005**	**1.0000e-005**	**0.4006**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0328	0.0000	0.0328	0.0168	0.0000	0.0168	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.7600e-003	0.0163	0.1377	3.1000e-004		5.0000e-004	5.0000e-004		5.0000e-004	5.0000e-004	0.0000	26.9731	26.9731	8.7200e-003	0.0000	27.1912
Total	**3.7600e-003**	**0.0163**	**0.1377**	**3.1000e-004**	**0.0328**	**5.0000e-004**	**0.0333**	**0.0168**	**5.0000e-004**	**0.0173**	**0.0000**	**26.9731**	**26.9731**	**8.7200e-003**	**0.0000**	**27.1912**

3.2 Aquifer Testing and Site Restoration - 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	2.6000e-004	1.5000e-004	1.8300e-003	0.0000	5.0000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.3965	0.3965	1.0000e-005	1.0000e-005	0.4006
Total	**2.6000e-004**	**1.5000e-004**	**1.8300e-003**	**0.0000**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.3965**	**0.3965**	**1.0000e-005**	**1.0000e-005**	**0.4006**

3.3 Well Construction and Development - 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					
Off-Road	0.0255	0.1873	0.1747	7.2000e-004		6.6700e-003	6.6700e-003		6.1400e-003	6.1400e-003	0.0000	63.1488	63.1488	0.0204	0.0000	63.6594
Total	**0.0255**	**0.1873**	**0.1747**	**7.2000e-004**		**6.6700e-003**	**6.6700e-003**		**6.1400e-003**	**6.1400e-003**	**0.0000**	**63.1488**	**63.1488**	**0.0204**	**0.0000**	**63.6594**

3.3 Well Construction and Development - 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	1.4800e-003	0.0307	0.0131	1.8000e-004	6.7500e-003	3.0000e-004	7.0500e-003	1.9400e-003	2.9000e-004	2.2300e-003	0.0000	17.5328	17.5328	7.0000e-005	2.4200e-003	18.2549
Worker	6.3200e-003	3.7100e-003	0.0439	1.0000e-004	0.0120	6.0000e-005	0.0121	3.1900e-003	6.0000e-005	3.2400e-003	0.0000	9.5162	9.5162	3.2000e-004	3.1000e-004	9.6154
Total	**7.8000e-003**	**0.0345**	**0.0569**	**2.8000e-004**	**0.0188**	**3.6000e-004**	**0.0191**	**5.1300e-003**	**3.5000e-004**	**5.4700e-003**	**0.0000**	**27.0489**	**27.0489**	**3.9000e-004**	**2.7300e-003**	**27.8702**

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	8.8100e-003	0.0382	0.3230	7.2000e-004		1.1700e-003	1.1700e-003		1.1700e-003	1.1700e-003	0.0000	63.1487	63.1487	0.0204	0.0000	63.6593
Total	**8.8100e-003**	**0.0382**	**0.3230**	**7.2000e-004**		**1.1700e-003**	**1.1700e-003**		**1.1700e-003**	**1.1700e-003**	**0.0000**	**63.1487**	**63.1487**	**0.0204**	**0.0000**	**63.6593**

3.3 Well Construction and Development - 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	1.4800e-003	0.0307	0.0131	1.8000e-004	6.7500e-003	3.0000e-004	7.0500e-003	1.9400e-003	2.9000e-004	2.2300e-003	0.0000	17.5328	17.5328	7.0000e-005	2.4200e-003	18.2549
Worker	6.3200e-003	3.7100e-003	0.0439	1.0000e-004	0.0120	6.0000e-005	0.0121	3.1900e-003	6.0000e-005	3.2400e-003	0.0000	9.5162	9.5162	3.2000e-004	3.1000e-004	9.6154
Total	**7.8000e-003**	**0.0345**	**0.0569**	**2.8000e-004**	**0.0188**	**3.6000e-004**	**0.0191**	**5.1300e-003**	**3.5000e-004**	**5.4700e-003**	**0.0000**	**27.0489**	**27.0489**	**3.9000e-004**	**2.7300e-003**	**27.8702**

3.4 Irrigation System - 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					
Off-Road	0.0439	0.4438	0.4269	7.7000e-004		0.0208	0.0208		0.0191	0.0191	0.0000	68.0384	68.0384	0.0220	0.0000	68.5885
Total	**0.0439**	**0.4438**	**0.4269**	**7.7000e-004**		**0.0208**	**0.0208**		**0.0191**	**0.0191**	**0.0000**	**68.0384**	**68.0384**	**0.0220**	**0.0000**	**68.5885**

3.4 Irrigation System - 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	1.4800e-003	0.0307	0.0131	1.8000e-004	6.7500e-003	3.0000e-004	7.0500e-003	1.9400e-003	2.9000e-004	2.2300e-003	0.0000	17.5328	17.5328	7.0000e-005	2.4200e-003	18.2549
Worker	6.3200e-003	3.7100e-003	0.0439	1.0000e-004	0.0120	6.0000e-005	0.0121	3.1900e-003	6.0000e-005	3.2400e-003	0.0000	9.5162	9.5162	3.2000e-004	3.1000e-004	9.6154
Total	**7.8000e-003**	**0.0345**	**0.0569**	**2.8000e-004**	**0.0188**	**3.6000e-004**	**0.0191**	**5.1300e-003**	**3.5000e-004**	**5.4700e-003**	**0.0000**	**27.0489**	**27.0489**	**3.9000e-004**	**2.7300e-003**	**27.8702**

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	9.5400e-003	0.0413	0.5186	7.7000e-004		1.2700e-003	1.2700e-003		1.2700e-003	1.2700e-003	0.0000	68.0383	68.0383	0.0220	0.0000	68.5885
Total	**9.5400e-003**	**0.0413**	**0.5186**	**7.7000e-004**		**1.2700e-003**	**1.2700e-003**		**1.2700e-003**	**1.2700e-003**	**0.0000**	**68.0383**	**68.0383**	**0.0220**	**0.0000**	**68.5885**

3.4 Irrigation System - 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	1.4800e-003	0.0307	0.0131	1.8000e-004	6.7500e-003	3.0000e-004	7.0500e-003	1.9400e-003	2.9000e-004	2.2300e-003	0.0000	17.5328	17.5328	7.0000e-005	2.4200e-003	18.2549
Worker	6.3200e-003	3.7100e-003	0.0439	1.0000e-004	0.0120	6.0000e-005	0.0121	3.1900e-003	6.0000e-005	3.2400e-003	0.0000	9.5162	9.5162	3.2000e-004	3.1000e-004	9.6154
Total	**7.8000e-003**	**0.0345**	**0.0569**	**2.8000e-004**	**0.0188**	**3.6000e-004**	**0.0191**	**5.1300e-003**	**3.5000e-004**	**5.4700e-003**	**0.0000**	**27.0489**	**27.0489**	**3.9000e-004**	**2.7300e-003**	**27.8702**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
Other Non-Asphalt Surfaces	16.40	9.50	11.90	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
Other Non-Asphalt Surfaces	0.526464	0.059349	0.179786	0.147621	0.026929	0.006851	0.008316	0.016412	0.000925	0.000120	0.022958	0.000766	0.003504

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	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	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	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	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	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
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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					
Other Non-Asphalt Surfaces	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
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive 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	0.0212	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004
Unmitigated	0.0212	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004

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	5.1800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0161					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004
Total	**0.0212**	**0.0000**	**5.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.0000**	**1.1000e-004**

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	5.1800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0161					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004
Total	**0.0212**	**0.0000**	**5.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.0000**	**1.1000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

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 Assessment

Biological Resources Assessment for the Bombay Beach Vegetation Plot Project

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Imperial County, California

Prepared For:

Imperial Irrigation District

Prepared By:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
2525 Warren Drive
Rocklin, California 95677

December 12, 2022

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Description
Act	Rivers and Harbors Act
AMM	Avoidance and Minimization Measure
BBVP	Bombay Beach Vegetation Plot
BCC	Birds of Conservation Concern
BRA	Biological Resources Assessment
bsl	Below Sea Level
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	Clean Water Act
ESA	Endangered Species Act
HCP	Habitat Conservation Plan
IID	Imperial Irrigation District
MBTA	Migratory Bird Treaty Act
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
Project	Bombay Beach Vegetation Plot
RWQCB	Regional Water Quality Control Board
SSC	Species of Special Concern
AOI	Area of Interest
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBWG	Western Bat Working Group

1.0 INTRODUCTION

On behalf of the Imperial Irrigation District (IID), ECORP Consulting, Inc. conducted a Biological Resources Assessment (BRA) for the IID Bombay Beach Vegetation Plots Project (Project) located in Imperial County, California. The purpose of the assessment was to collect information on the biological resources present or with the potential to occur in the Project Area of Interest (AOI), assess the extent of potential impacts, and identify potential avoidance, minimization, or mitigation measures to inform California Environmental Quality Act (CEQA) documentation for biological resources.

1.1 Area Of Interest Location

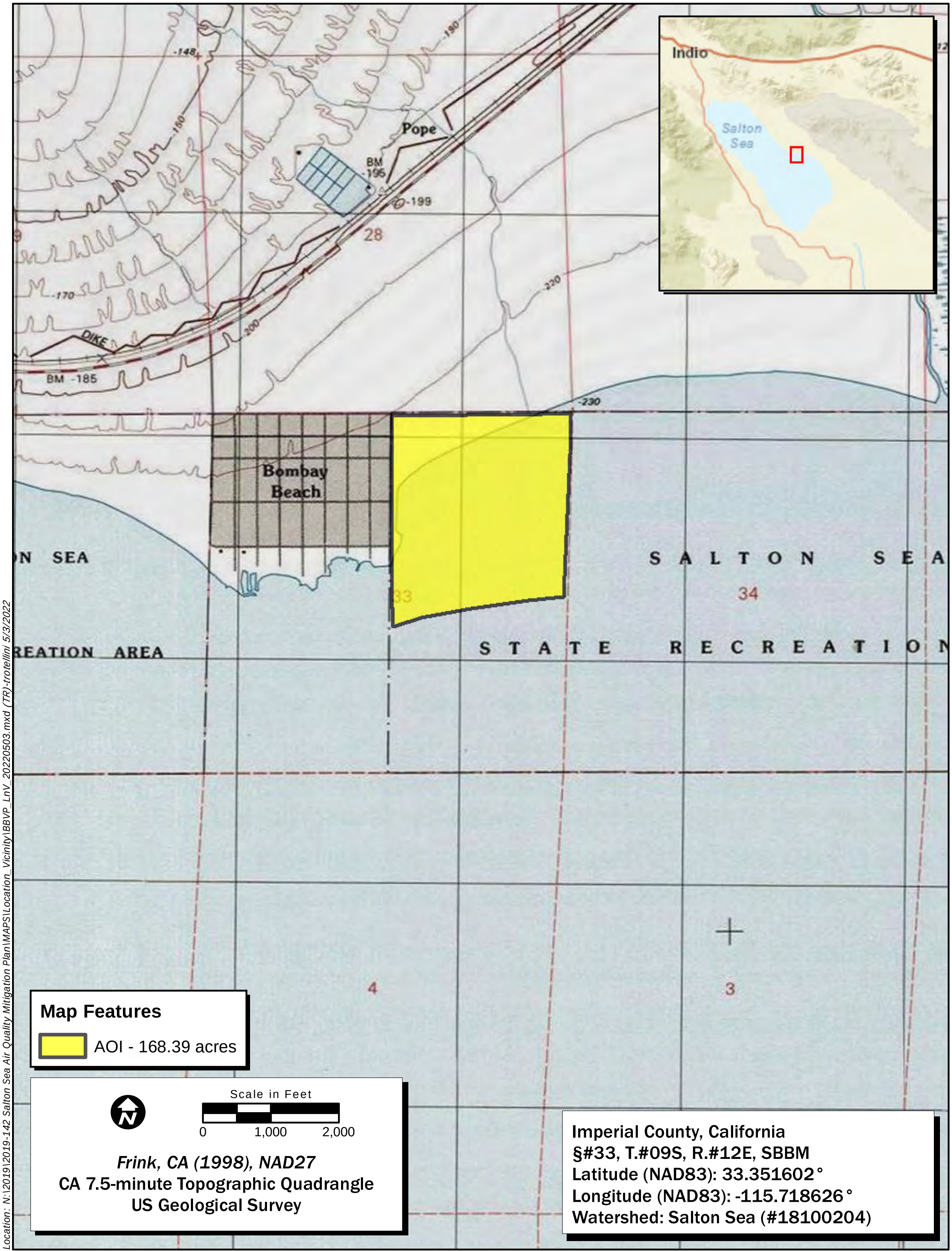
The approximately 168.39-acre AOI (i.e., Study Area) is located along the eastern margin of the Salton Sea in Imperial County, California (Figure 1). The AOI corresponds to Section 33 of Township 9 South and Range 12 East (San Bernardino Base and Meridian) of the “Frink, California” 7.5-minute Topographic Quadrangles (U.S. Geological Survey [USGS] 1998). The approximate center of the AOI is located at 33.351602° and -115.718626° within the Salton Sea Watershed (Hydrologic Unit Code #18100204, Natural Resources Conservation Service [NRCS] et al. 2016).

1.2 Project Description

IID is proposing a plot study to inform dust control at Bombay Beach originating from the Salton Sea playa (exposed seabed). The purpose of the plot study (i.e., this Project) is to investigate the effectiveness of various dust control and irrigation approaches to inform larger-scale implementation to restore habitat and reduce particulate matter air pollution (e.g., $PM_{2.5}$ and PM_{10}). Specifically, the plot study will evaluate groundwater supply and quality, vegetation establishment in hedgerows, enhancement of existing vegetation through rainwater harvesting (bunds) techniques, and waterless dust control measures. Additionally, physical barriers (e.g., hay bales) will be installed to prevent vehicle disturbance to the plot study within the AOI. A brief description of each Project component is provided below.

1.2.1 Groundwater Well Installation.

Well installation will occur in non-wetland habitat within the AOI. Three primary locations and three alternative locations have been identified (Appendix A). Groundwater supply and quality will be evaluated to ascertain whether it is suitable for irrigation. Then, up to three shallow, groundwater wells will be installed to provide irrigation needed to support vegetation establishment and enhancement. Work limits for equipment will be established within three, 50-foot by 100-foot areas where bore drilling will be conducted. Drilling will require the use of a drill rig and heavy and light duty trucks, followed by installation of a well, pump, and in some locations a water storage tank, if conditions are appropriate. Restoration of the work areas will include removal of all materials and re-leveling of access routes to approximate pre-Project conditions.



Map Features

🟨 AOI - 168.39 acres

Frink, CA (1998), NAD27
CA 7.5-minute Topographic Quadrangle
US Geological Survey

Imperial County, California
§#33, T.#09S, R.#12E, SBBM
Latitude (NAD83): 33.351602°
Longitude (NAD83): -115.718626°
Watershed: Salton Sea (#18100204)

Location: N:\2019\2019-142 Salton Sea Air Quality Mitigation Plan\MAPS\Location_Vicinity\BBVP_LnV_20220503.mxd (TR)-trotellini 5/3/2022

Map Date: 5/3/2022

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community, Copyright:© 2013 National Geographic Society, i-cubed

Figure 1. AOI Location and Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2022-061 Bombay Beach Vegetation Plots

1.2.2 Vegetation Establishment/Hedgerow Construction

Vegetation establishment activities will be conducted within approximately 86 acres of non-wetland habitat within the AOI (Appendix A). This Project component will include the construction of vegetated "hedgerows" oriented to provide protection against wind erosion, helping to decrease dust and increase persistence of vegetative growth. Construction of hedgerows will include grubbing and earthwork in preparation of the hedgerow seedbeds. The hedgerow seedbeds will be irrigated via placement of buried pipeline from the location of the wells/storage tanks, seeded with a native seed mix (ALOC [iodine bush] Playa Mix) and soil amendments added.

1.2.3 Waterless Dust Control

Waterless dust control methods will include installation of approximately 5,000 feet (with a footprint of approximately 4 acres) of perimeter sand-fencing. This fencing will protect vegetation during establishment from moving (eroding) sand entering the site. The fencing will be installed along the western and northern AOI boundaries (Appendix A).

1.2.4 Habitat Enhancement

Habitat enhancement and enhancement of existing vegetation will occur within approximately 53 acres of wetland habitat within the AOI (Appendix A). This Project component will include the construction of bunds built to mimic the surface water retention achieved by natural beach ridges. Diversion swales 24" wide will be excavated, and the terminus armored with rip rap, to divert surface flow to the bund arrays. These features are designed to promote vegetation expansion within the existing wetland by retaining storm water in the upper soil profile for establishment of shallow-rooted seedlings and aeration of mature plants.

IID is preparing a CEQA addendum to the IID Water Conservation and Transfer Final Environmental Impact Report and Environmental Impact Statement to evaluate the impacts associated with implementation of the Project. The addendum will discuss and analyze the impacts associated with implementation of the proposed Project, which is identified as part of IID's 2019/2020 Proactive Dust Control Plan under the Salton Sea Air Quality Mitigation Program.

1.3 Purpose of this Biological Resources Assessment

The purpose of this BRA is to assess the potential for occurrence of special-status plant and animal species or their habitat, and sensitive habitats such as wetlands within the AOI. This assessment does not include determinate field surveys conducted according to agency-promulgated protocols. The conclusions and recommendations presented in this report are based upon a review of the available literature and site reconnaissance.

1.4 Definition of Special-Status Species

For the purposes of this assessment, special-status species are defined as plants or animals that:

- are listed, proposed for listing, or candidates for future listing as threatened or endangered under the federal Endangered Species Act (ESA);
- are listed or candidates for future listing as threatened or endangered under the California ESA;
- meet the definitions of endangered or rare under Section 15380 of CEQA Guidelines;
- are identified as a Species of Special Concern (SSC) by the California Department of Fish and Wildlife (CDFW);
- are birds identified as Birds of Conservation Concern (BCC) by the U.S. Fish and Wildlife Service (USFWS);
- are plants considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1 and 2);
- are plants listed by CNPS as species about which more information is needed to determine their status (CRPR 3), and plants of limited distribution (CRPR 4);
- are plants listed as rare under the California Native Plant Protection Act (NPPA, California Fish and Game Code, Section 1900 et seq.); or
- are fully protected in California in accordance with the California Fish and Game Code, Sections 3511 (birds), 4700 (mammals), 5050 (amphibians and reptiles), and 5515 (fishes).

Only species that fall into one of the above-listed groups were considered for this assessment. Other species without special status that are sometimes found in database or literature searches were not included within this analysis.

2.0 REGULATORY SETTING

2.1 Federal Regulations

2.1.1 Federal Endangered Species Act

The federal ESA protects plants and animals that are listed as endangered or threatened by the USFWS and the National Marine Fisheries Service. Section 9 of ESA prohibits the taking of listed wildlife, where take is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct” (50 Code of Federal Regulations [CFR] 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 U.S. Code [USC] 1538). Under Section 7 of ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion, the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of ESA provides for issuance of incidental take permits where no other federal actions are necessary provided a Habitat Conservation Plan (HCP) is developed.

2.1.1.1 Critical Habitat

Critical Habitat is defined in Section 3 of the ESA as (1) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features essential to the conservation of the species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. For inclusion in a Critical Habitat designation, habitat within the geographical area occupied by the species at the time it was listed must first have features that are essential to the conservation of the species. Critical Habitat designations identify, to the extent known and using the best scientific data available, habitat areas that provide essential life cycle needs of the species.

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the U.S. and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR part 13 General Permit Procedures and 50 CFR part 21 Migratory Bird Permits. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code.

2.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (as amended) provides for the protection of bald eagle and golden eagle by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit [16 USC 668(a); 50 CFR 22]. USFWS may authorize take of bald eagles and golden eagles for activities where the take is associated with, but not the purpose of, the activity and cannot practicably be avoided (50 CFR 22.26).

2.1.4 Federal Clean Water Act

The purpose of the federal Clean Water Act (CWA) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "Waters of the U.S." without a permit from the U.S. Army Corps of Engineers (USACE). "Discharges of fill material" is defined as the addition of fill material into Waters of the U.S., including, but not limited to, the following: placement of fill necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes, and subaqueous utility lines" (33 CFR Section 328.2(f)). In addition, Section 401 of the CWA (33 USC 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Substantial impacts to wetlands (over 0.5 acre of impact) may require an individual permit. Projects that only minimally affect wetlands (less than 0.5 acre of impact) may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the Regional Water Quality Control Board (RWQCB).

2.1.5 Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 (Act) requires authorization from the Secretary of the Army, acting through the USACE, for the construction of any structure in or over any navigable Waters of the U.S. Structures or work outside the limits defined for navigable Waters of the U.S. require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the U.S., and applies to all structures, from the smallest floating dock to the largest commercial undertaking. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction. The alteration of a USACE federally authorized civil works project requires a permit pursuant to Section 14 of the Act, as amended and codified in 33 USC 408. Projects with minimal impacts require approval by the USACE Sacramento District Construction Operations Group; however, projects with more substantial impacts may require USACE Headquarters review. Coordination with the Central Valley Flood Protection Board, who serve as the Non-Federal Sponsor, is required as a part of the process of obtaining a Section 408 permit.

2.2 State Regulations

2.2.1 California Fish and Game Code

2.2.1.1 California Endangered Species Act

The California ESA (California Fish and Game Code Sections 2050-2116) generally parallels the main provisions of the ESA, but unlike its federal counterpart, the California ESA applies the take prohibitions to species proposed for listing (called *candidates* by the State). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section

86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California ESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered, threatened or candidate species or result in destruction or adverse modification of essential habitat.

2.2.1.2 Fully Protected Species

The State of California first began to designate species as "fully protected" prior to the creation of the federal and California ESAs. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction and included fish, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under the federal and/or California ESAs. The regulations that implement the Fully Protected Species Statute (California Fish and Game Code Section 4700 for mammals, Section 3511 for birds, Section 5050 for reptiles and amphibians, and Section 5515 for fish) provide that fully protected species may not be taken or possessed at any time. Furthermore, the CDFW prohibits any State agency from issuing incidental take permits for fully protected species. The CDFW will issue licenses or permits for take of these species for necessary scientific research or live capture and relocation pursuant to the permit.

2.2.1.3 Native Plant Protection Act

The NPPA of 1977 was created with the intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA is administered by CDFW and provided in California Fish and Game Code Sections 1900-1913. The Fish and Wildlife Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. The California ESA of 1984 (California Fish and Game Code Section 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

2.2.1.4 Nesting Birds

Section 3503 of the California Fish and Game Code prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Sections 3800, 3513, and 3503 of the California Fish and Game Code specifically protect birds of prey. Section 3800 states that it is unlawful to take nongame birds, such as those occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds, except when in accordance with regulations of the commission or a mitigation plan approved by CDFW for mining operations. Section 3513 specifically prohibits the take or possession of any migratory nongame bird as designated in the MBTA. These provisions, along with the federal MBTA, serve to protect nesting native birds.

2.2.2 Species of Special Concern

SSC are defined by CDFW as a species, subspecies, or distinct population of an animal native to California that are not legally protected under the ESA, California ESA, or California Fish and Game Code, but currently satisfy one or more of the following criteria:

- The species has been completely extirpated from the state or, as in the case of birds, it has been extirpated from its primary seasonal or breeding role.
- The species is listed as federally (but not State) threatened or endangered, or meets the State definition of threatened or endangered but has not formally been listed.
- The species has or is experiencing serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status.
- The species has naturally small populations that exhibit high susceptibility to risk from any factor that if realized, could lead to declines that would qualify it for State threatened or endangered status.

SSC are typically associated with habitats that are threatened. Project-related impacts to SSC, State-threatened, or endangered species are considered "significant" under CEQA.

2.2.3 California Rare Plant Ranks

The CNPS maintains the Inventory of Rare and Endangered Plants of California (CNPS 2022), which provides a list of plant species native to California that are threatened with extinction, have limited distributions, and/or low populations. Plant species meeting one of these criteria are assigned to one of six CRPRs. The rank system was developed in collaboration with government, academia, non-governmental organizations, and private sector botanists, and is jointly managed by CDFW and CNPS. The CRPRs are currently recognized in the California Natural Diversity Database (CNDDB). The following are definitions of the CNPS CRPRs:

- Rare Plant Rank 1A – presumed extirpated in California and either rare or extinct elsewhere
- Rare Plant Rank 1B – rare, threatened, or endangered in California and elsewhere
- Rare Plant Rank 2A – presumed extirpated in California, but more common elsewhere
- Rare Plant Rank 2B – rare, threatened, or endangered in California but more common elsewhere
- Rare Plant Rank 3 – a review list of plants about which more information is needed
- Rare Plant Rank 4 – a watch list of plants of limited distribution

Additionally, the CNPS has defined Threat Ranks that are added to the CRPR as an extension. Threat Ranks designate the level of threat on a scale of 1 through 3, with 1 being the most threatened and 3 being the least threatened. Threat Ranks are generally present for all plants ranked 1B, 2B, or 4, and for the majority of plants ranked 3. Plant species ranked 1A and 2A (presumed extirpated in California), and some species ranked 3, which lack threat information, do not typically have a Threat Rank extension. The following are definitions of the CNPS Threat Ranks:

- Threat Rank 0.1 – Seriously threatened in California (more than 80 percent of occurrences threatened/high degree and immediacy of threat)
- Threat Rank 0.2 – Moderately threatened in California (20 to 80 percent occurrences threatened/moderate degree and immediacy of threat)
- Threat Rank 0.3 – Not very threatened in California (less than 20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known)

Factors such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Rank; and differences in Threat Ranks do not constitute additional or different protection (CNPS 2020). Depending on the policy of the lead agency, substantial impacts to plants ranked 1A, 1B, or 2 are typically considered significant under CEQA Guidelines Section 15380. Significance under CEQA is typically evaluated on a case-by-case basis for plants ranked 3 or 4.

2.2.4 Porter-Cologne Water Quality Act

The RWQCB implements water quality regulations under the federal CWA and the Porter-Cologne Water Quality Act. These regulations require compliance with the National Pollutant Discharge Elimination System (NPDES), including compliance with the California Storm Water NPDES General Construction Permit for discharges of stormwater runoff associated with construction activities. General Construction Permits for projects that disturb one or more acres of land require development and implementation of a Storm Water Pollution Prevention Plan. Under the Porter-Cologne Water Quality Act, the RWQCB regulates actions that would involve “discharging waste, or proposing to discharge waste, with any region that could affect the water of the state” (Water Code 13260(a)). Waters of the State are defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (Water Code 13050 (e)). The RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into Waters of the State, that are not regulated by USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of a Waste Discharge Requirement for these activities.

2.2.5 California Environmental Quality Act

In accordance with CEQA Guidelines Section 15380, a species not protected on a federal or State list may be considered rare or endangered if the species meets certain specified criteria. These criteria follow the definitions in the ESA, California ESA, and Sections 1900-1913 of the California Fish and Game Code, which deal with rare or endangered plants or animals. Section 15380 was included in the CEQA Guidelines primarily to deal with situations where a project under review may have a significant effect on a species that has not yet been listed by either USFWS or CDFW.

2.2.5.1 California Environmental Quality Act Significance Criteria

Sections 15063-15065 of the CEQA Guidelines address how an impact is identified as significant and are particularly relevant to SSC. Generally, impacts to rare, threatened, or endangered species are considered significant, requiring thorough analysis in a CEQA document and often requiring mitigation to avoid or minimize potential impacts. Assessment of "impact significance" to populations of non-listed species (e.g., SSC) usually considers the proportion of the species' range that will be affected by a project, impacts to habitat, and the regional and population level effects.

Specifically, Section 15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds that the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the expanded Initial Study checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if a project would:

- 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 CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;
- 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;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional, or State HCP.

An evaluation of whether or not an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, State, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish or result in the permanent loss of an important resource on a population- or region-wide basis.

3.0 METHODS

3.1 Literature Review

The following resources were reviewed to determine the special-status species that have been documented within or near the AOI. Results of the species searches are included as Appendix B.

- CDFW CNDDB data for the "Frink, California" 7.5-minute quadrangle as well as the eight surrounding USGS quadrangles (CDFW 2022a);
- USFWS Information, Planning, and Consultation System Resource Report List for the AOI (USFWS 2022a);
- CNPS' Rare Plant Inventory was queried for the "Frink, California" 7.5-minute quadrangle and the nine surrounding quadrangles (CNPS 2022).

Additional background information was reviewed regarding the documented or potential occurrence of special-status species within or near the AOI from the following sources:

- The Status of Rare, Threatened, and Endangered Plants and Animals of California 2000-2004 (California Department of Fish and Game 2005);
- Special Animals List (CDFW 2022b);
- Bird Species of Conservation Concern (USFWS 2021);
- Amphibian and Reptile Species of Special Concern in California (Thompson et al.2016);
- Mammalian Species of Special Concern in California (Williams 1986);
- California's Wildlife, Volumes I-III (Zeiner et al. 1988, 1990a, 1990b);
- A Guide to Wildlife Habitats of California (Mayer and Laudenslayer Jr., eds. 1988);
- USFWS Online Critical Habitat Mapper (USFWS 2022b); and
- NRCS Web Soil Survey (NRCS 2022).

3.2 Site Surveys

3.2.1 Reconnaissance Site Survey

ECORP Biologists Jeff Tupen, Emily Mecke, Alexandra Dorough, Chelsie Brown and Christina Torres conducted the site reconnaissance visit on April 5, 2022 and May 10, 2022. The AOI was systematically surveyed on foot using an EOS Arrow Global Positioning System unit with sub-meter accuracy, topographic maps, and aerial imagery to ensure total site coverage. Special attention was given to identifying those portions of the AOI with the potential to support special-status species and sensitive habitats. During the field survey, biological communities occurring onsite were characterized and the following biological resource information was collected:

- Potential aquatic resources
- Vegetation communities
- Plant and animal species directly observed
- Animal evidence (e.g., scat, tracks)
- Existing active bird nest locations
- Burrows and any other special habitat features
- Representative AOI photographs (Appendix C)

3.2.2 Aquatic Resources Delineation

An aquatic resources delineation of the AOI was completed on April 5 and May 10, 2022 by ECORP biologists (ECORP 2022). The delineation was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Region Supplement) (USACE 2008). Results of the aquatic resources delineation have been incorporated into this BRA.

3.2.3 Special-Status Plant Survey

A special-status plant survey was conducted by ECORP biologists within the AOI on May 10, 2022. Survey methods were devised with consideration of the following resources: 1) Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants (USFWS 2000), 2) Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW 2018), and 3) CNPS Botanical Survey Guidelines (CNPS 2001).

3.3 Special-Status Species Considered for the Project

Based on species occurrence information from the literature review and observations in the field, a list of special-status plant and animal species that have the potential to occur within the AOI was generated. Only special-status species as defined in Section 1.4 were included in this analysis. Each of these species' potential to occur within the AOI was assessed based on the following criteria:

- **Present** - Species was observed during the site visit or is known to occur within the AOI based on documented occurrences within the CNDDB or other literature.
- **Potential to Occur** - Habitat (including soils and elevation requirements) for the species occurs within the AOI.

- **Low Potential to Occur** - Marginal or limited amounts of habitat occurs and/or the species is not known to occur within the vicinity of the AOI based on CNDDB records and other available documentation.
- **Absent** - No suitable habitat (including soils and elevation requirements) present at the AOI and/or the species is not known to occur within the vicinity of the AOI based on CNDDB records and other documentation.

4.0 RESULTS

4.1 Site Characteristics and Topography

The AOI is primarily located within the exposed former bed of the Salton Sea (also referred to as the Salton Sea playa or playa), which has been exposed over the last 16 years as a result of seawater evaporation and decreased agricultural inflows. Slopes on the playa within the AOI are very flat, ranging from 1 to 3 inches of vertical drop every 100 feet, generally grading from northwest to south-southeast. Exposed elevations within the AOI range from approximately -221 feet below sea level (bsl) at the northwest AOI corner, to approximately -230 feet bsl North American Vertical Datum 1988 (NAVD88) at the Salton Sea margin.

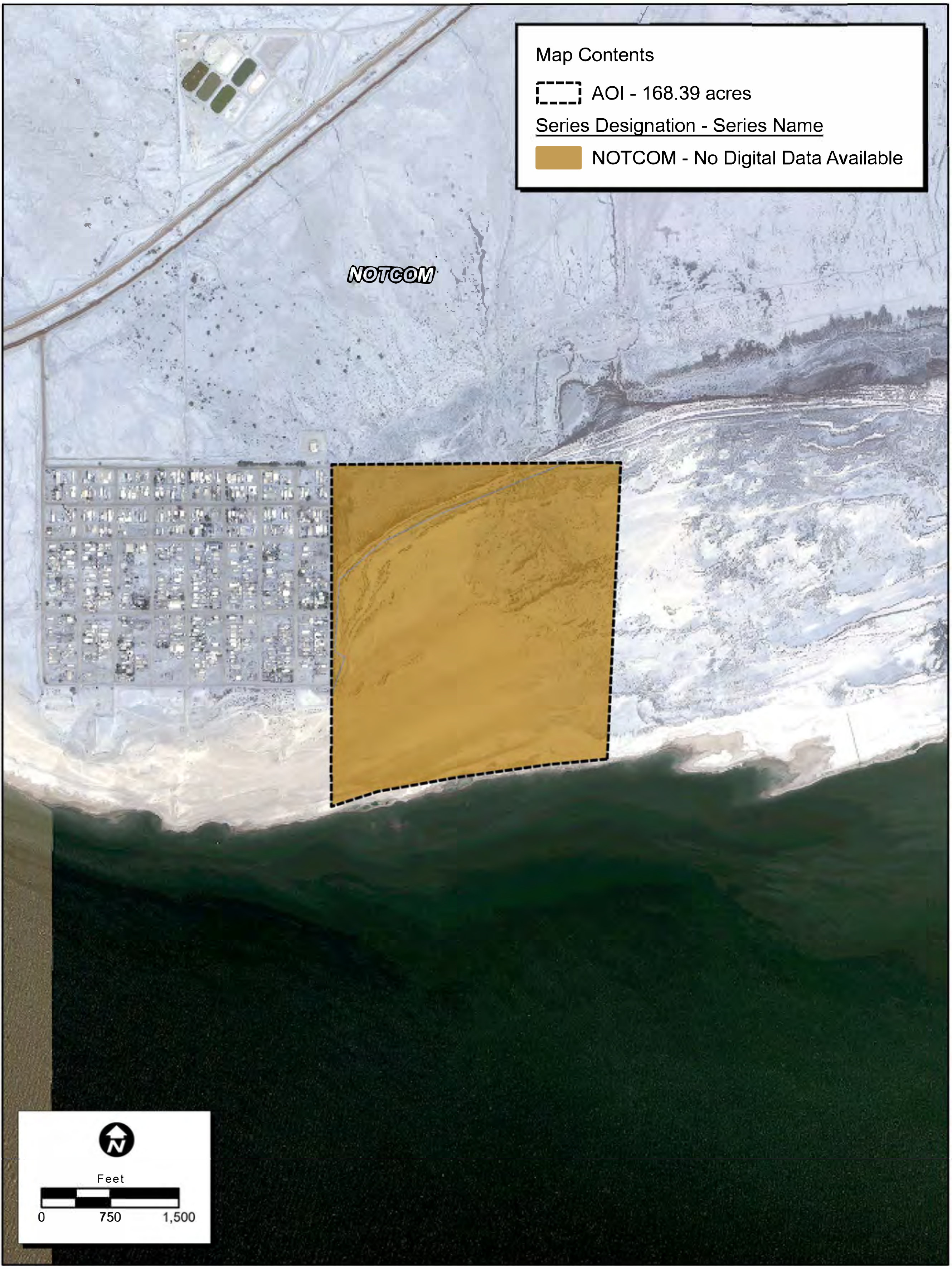
The site is characterized by expansive bare playa areas interspersed with patches of very-low density to moderate-density halophytic (salt loving) vegetation. No perennial surface water resources occur at the AOI. Rather, one prominent ephemeral wash originating from the Chocolate Mountains (to the north) enters the northeastern corner of the site. This ephemeral wash does not appear to reach the Salton Sea with any regular frequency. The recurrence interval of flood flows entering the AOI through this wash is uncertain but appears to be very infrequent based on the number and size of plants growing in the washes. Plant condition (apparent health and vigor) appears to vary within the AOI, likely reflecting the scarcity and sources of irrigation water over time.

4.2 Soils

Soils within the AOI have not been mapped by the NRCS (shown as NOTCOM) because this area was inundated by the Salton Sea until very recently (NRCS 2022; Figure 2).

4.3 Habitat and Land Cover Types

The AOI is characterized by four coarse habitat types. These are upland iodine bush scrub, upland Chenopod scrub, upland bare salt pan, and wetland iodine/bush seepweed scrub (Figure 3). Descriptions of the habitat and land cover types present within the AOI are provided below.



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Map Date:
Photo Source: Pleiades - Captured 04/28/2022

Figure 2. Natural Resources Conservation Service Soil Types

2019-142 Salton Sea Air Quality Mitigation Plan - Bombay Beach Vegetation Plot

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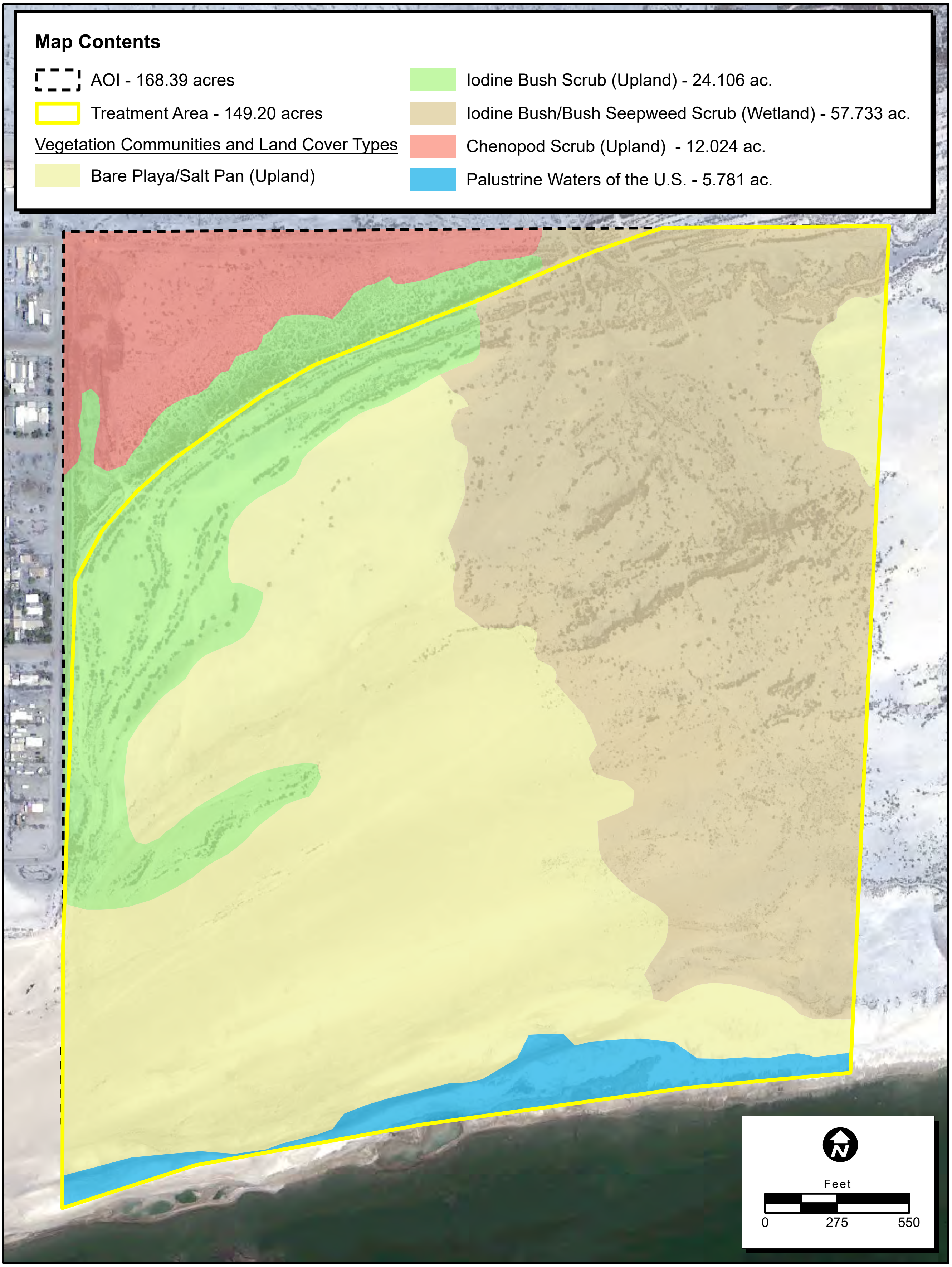

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Map Date: 12/8/2022
Photo Source: Pleiades - Captured 04/28/2022

Figure 3. Vegetation Communities and Land Cover Types

2019-142 Salton Sea Air Quality Mitigation Plan

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At the Salton Sea, iodine bush (*Allenrolfea occidentalis*) occupies both water-dependent and xeric niches. Like most plants, iodine bush requires surface water to recruit to a location and like most hydrophytes, iodine bush requires considerable and consistent water supplies to become established through the recruitment event. Unlike most hydrophytes, however, iodine bush does not require consistent and persistent root-zone saturation to persist over time. Large areas of the Salton Sea playa are dominated by iodine bush scrub communities that are not exposed to soil saturation beyond a rainfall event and perhaps days thereafter. In this BRA, ECORP therefore distinguishes upland iodine bush scrub from wetland iodine bush scrub communities; however, both occur within the AOI.

Plant species richness within the AOI is extremely low due to the selective influences of exceptionally high soil alkalinity, and the scarcity of broadly available water resources (both surface and shallow groundwater). Floristic rare-plant surveys completed in May 2022 identified only seven species occurring in the AOI (Appendix A). Four of these species are within the family Chenopodiaceae. Chenopods are characterized in large part by their ability to recruit and persist in high alkalinity environments. As such, Chenopods are common and abundant near the Salton Sea. Two of the other seven plant species identified in the AOI are also salt-tolerant shrubs.

4.3.1 Iodine Bush Scrub (Upland)

Iodine bush scrub habitat type is characterized by scattered to moderately abundant iodine bush, a halophyte, within those portions of the AOI not historically inundated by the Salton Sea. Iodine bush also occupy older salt pan areas where "barnacle bars" have accumulated in drift lines, forming higher elevation substrates for vegetation to recruit and persist. High soil salinities within iodine bush scrub habitat is still a limiting factor for plant recruitment, persistence, and condition, though not as significant of a stressor as within salt pan areas.

Iodine bush scrub dominates plant composition within the AOI, both with respect to relative frequency of occurrence and relative cover. Linear patches of iodine bush occur adjacent to and east of the community of Bombay Beach (Figure 3). These features are relict from historic (2008 through 2014) shoreline elevations of the Salton Sea when infrequent stormwater flows were again perched against and retained by the mounded barnacle bars deposited by wave action and winds. Quail bush (*Atriplex lentiformis*) is found occasionally in this community. Plant condition at this location is better than above the 2002 shoreline berm, likely reflecting the increased availability of irrigation water. Iodine bush scrub may provide habitat for several species of small mammals, reptiles, and nesting birds.

4.3.2 Chenopod Scrub (Upland)

Chenopod scrub is characterized by a mix of dense iodine bush alkali goldenbush (*Isocoma acradenia*), and four-wing saltbush (*Atriplex canescens*). Chenopod scrub dominates the northwestern corner of the AOI, above the historic 2002 shoreline elevation of the Salton Sea. Iodine bush at this location was generally in very poor condition and appeared water-stressed. Chenopod scrub may provide habitat for several species of small mammals, reptiles, and nesting birds.

4.3.3 Bare Playa/Salt Pan (Upland)

This habitat type is found within those portions of the AOI that were, until fairly recently (2004 to 2014), inundated by the Salton Sea. Salt pan areas typically support little to no vegetation and are characterized by a salt crust at the soil surface. Barnacle tests, relics from past inundation, commonly litter the surface of salt pan areas of the Salton Sea. Salt pans provide very little habitat value for plant or animal species due to highly saline (and alkaline) soils. Birds will on occasion establish ground nests within salt pan habitats.

4.3.4 Iodine Bush/Bush Seepweed Scrub (Wetland)

Iodine bush/bush seepweed scrub wetland is present throughout much of the eastern and central portion of the AOI. Within the central portion of the AOI, iodine bush and bush seepweed (*Suaeda nigra*) dominate plant community composition. Both species are considered hydrophytic (water loving) species, though Iodine bush can establish and persist with or without perennial water. Inspection of shallow excavations in this area revealed the presence of an expansive, shallow (5 to 12 inches below ground surface elevation) sandstone hardpan. The presence, persistence, and good condition of hydrophytic vegetation in this area likely reflects the ability of the hardpan to perch and retain ephemeral flood flows for extended periods of time. This hydrophytic community appears to be restricted to the region south of the ephemeral drainage inlet described previously. Iodine bush/bush seepweed scrub may provide important nesting and foraging habitat for birds.

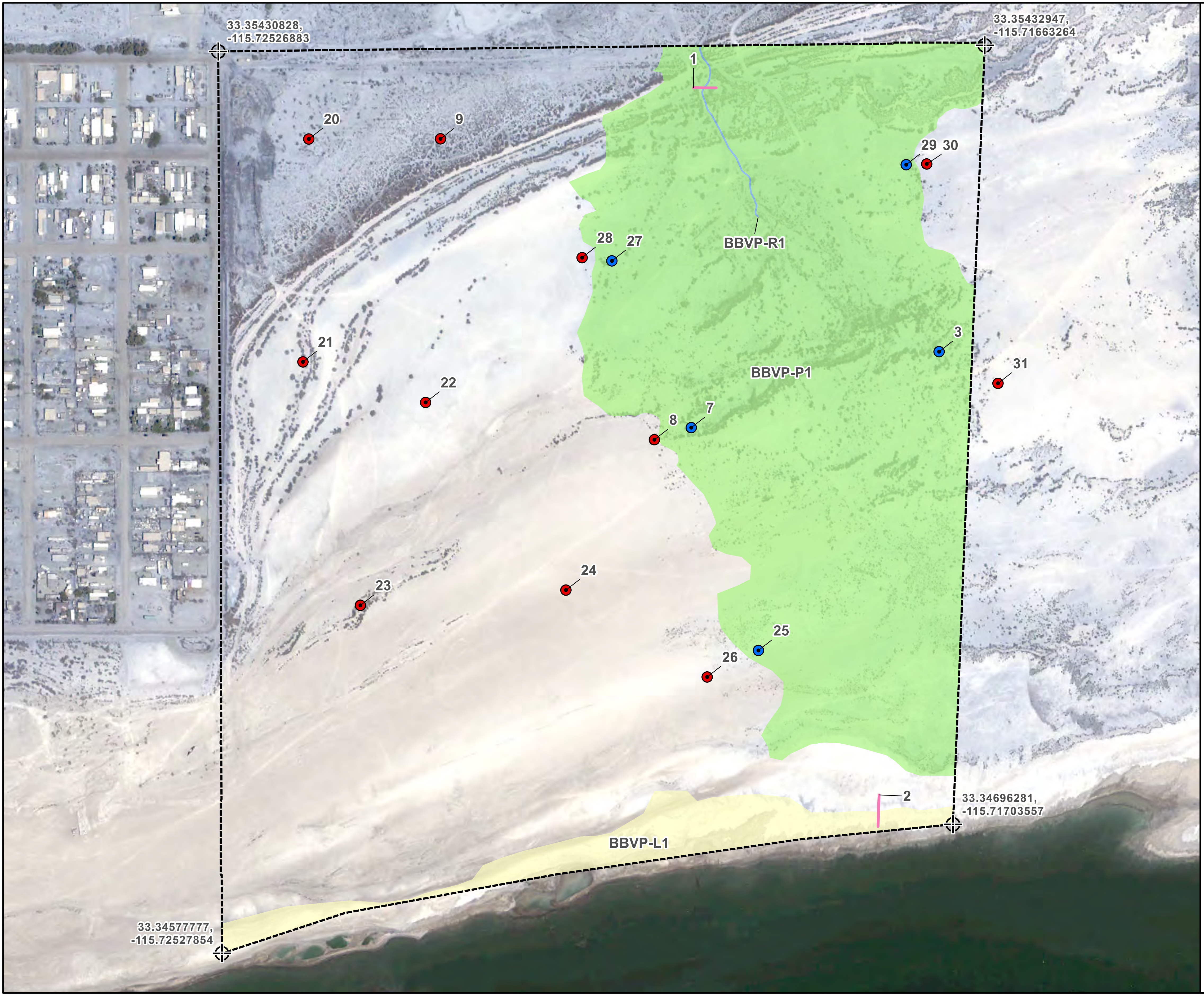
4.4 Aquatic Resources

A total of 63.433 acres of aquatic resources have been mapped within the AOI (Figure 4). Aquatic resources within the AOI include Palustrine (57.619 acres) corresponding to the iodine bush/bush seepweed scrub, Riverine (0.091 acre) corresponding to a small seasonal wash, and Lacustrine (5.723 acres) corresponding to the Salton Sea (ECORP 2022).

4.5 Evaluation of Species Identified in the Literature Search

A list of all of the special-status plant and wildlife species identified in the literature search as potentially occurring within the AOI is provided in Table 1. This table includes the listing status for each species, a brief habitat description, and a determination on the potential to occur in or near the AOI. Following the table is a brief description of each species with high potential to occur, or that is known to occur within the AOI.

Several species and sensitive habitat types that came up in the database and literature searches have been formally delisted, are tracked by the CNDDB but possess no special status, or are identified as sensitive habitats but not located within the AOI. These species and habitat types were not included in Table 1 and are not discussed further in this report.



Map Features

▭ Bombay Beach Vegetation Plot AOI - 168.39 acres

⌖ Reference Coordinate (NAD83)

— OHWM Transect

Sample Point Type

● Upland

● Waters

Aquatic Resources[1]*

🟨 Lacustrine (non-wetland waters) - 5.723 acres

🟩 Palustrine (wetland waters) - 57.619 acres

🟦 Riverine (non-wetland waters) - 0.091 acres

Feature Type	**Total Acres**
Lacustrine (non-wetland waters)	5.723
Palustrine (wetland waters)	57.619
Riverine (non-wetland waters)	0.091
Upland	105.046
Grand Total	**168.479**

Photo Source: Pleiades - Captured 04/28/2022
Boundary Source: Formation Environmental
Delineator(s): Jeff Tupen, Emily Mecke, Alexandra Dorough, Christina Torres
Coordinate System: NAD 1983 State Plane California VI FIPS 0406 Feet

Service Layer Credits: USGSTopo: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed June, 2022.

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Los Angeles District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.
* The acreage value for each feature has been rounded to the nearest 1/1000 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.

ECORP: N:\2019\2019-142 Salton Sea Air Quality Mitigation Plan\MAPS\Jurisdictional_Delineation\BBVP_ARD_20220524.aprx ()-trotellini 11/21/2022

Map Date: 11/21/2022

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Scale in Feet
0 350

Figure 4. Aquatic Resource Delineation

2019-142 Salton Sea Air Quality Mitigation Plan - Bombay Beach Vegetation Plot

Table 1. Potential for Special-Status Species to Occur

Common Name (*Scientific Name*)	**Status**			**Habitat and Species Description**	**Potential to Occur in AOI**
	FESA	**CESA**	**Other**		
Plants					
Chaparral sand-verbena (*Abronia villosa* var. *aurita*)	–	–	CRPR 1B.1	Annual herb found in sandy soils in chaparral, coastal scrub, and desert dunes at elevations of 250–5300 ft. Blooms March-Sept.	**Absent.** Not observed during focused surveys completed on May 10, 2022. No CNDDB occurrences within 5 miles of the AOI. One CNDDB occurrence in 1949 near Salton Beach along Hwy 111.
Salton milk-vetch *(Astragalus crotalariae)*	-	-	CRPR 4.3	Perennial herb found in Sonoran desert scrub at elevations of -200-800 ft. Blooms Jan-April.	**Absent.** No *Astragalus* sp. of any kind observed during focused surveys completed on May 10, 2022. Found on occasion on exposed playa areas of the Salton Sea. Detected by IID in 2021 on exposed playa near San Felipe Creek. No CNDDB occurrences within 5 miles of the AOI.
Harwood's milk-vetch *(Astragalus insularis* var. *harwoodii)*	-	-	CRPR 2B.2	Annual herb found in desert dunes and Mojavean desert scrub at elevations of -150 – 2300 ft. Blooms Jan-May.	**Absent.** No *Astragalus* sp. of any kind observed during focused surveys completed on May 10, 2022. No CNDDB occurrences within 5 miles of the AOI. One CNDDB occurrence in 2005 east of Wister along the Coachella Canal. Second CNDDB occurrence (undated) near Kane Spring.
Gravel milk-vetch *(Astragalus sabulonum)*	-	-	CRPR 2B.2	Annual/perennial herb found in desert dunes, Mojavean desert scrub, and Sonoran desert scrub at elevations of -200-3000 ft. Blooms Feb-June.	**Absent.** No *Astragalus* sp. of any kind observed during focused surveys completed on May 10, 2022. No CNDDB occurrences within 5 miles of the AOI. Two CNDDB occurrences: one in 1962 near San Felipe Creek at the junction of Hwy 86 and Hwy 78, and one in 1906 near Niland.

Table 1. Potential for Special-Status Species to Occur

Common Name (*Scientific Name*)	**Status**			**Habitat and Species Description**	**Potential to Occur in AOI**
	FESA	**CESA**	**Other**		
Triple-ribbed milk-vetch *(Astragalus tricarinatus)*	FE	-	CRPR 1B.2	Perennial herb found in in sandy or gravelly soils of Joshua tree woodlands and Sonoran desert scrub at elevations of 1500-3900 ft. Blooms Feb-May. Known from fewer than 20 occurrences.	**Absent.** No *Astragalus* sp. of any kind observed during focused surveys completed on May 10, 2022. No CNDDB occurrences within 5 miles of the AOI. One CNDDB occurrence in 2016 in the Orocopia Mountains.
California sawgrass (*Cladium californicum*)	–	–	CRPR 2B.2	Perennial rhizomatous herb found in alkaline or freshwater meadows, seeps, marshes, and swamps at elevations of 200–5200 ft. Blooms June-Sept.	**Absent**. No suitable habitat in AOI.
Ribbed cryptantha *(Johnstonella costata)*	-	-	CRPR 4.3	Annual herb found in desert dunes, Mojavean desert scrub, and Sonoran desert scrub at elevations of -200-1600 ft. Blooms Feb-May.	**Absent.** Not observed during focused surveys completed on May 10, 2022. No CNDDB occurrences within 5 miles of the AOI.
Cooper's rush (*Juncus cooperi*)	-	-	CRPR 4.3	Perennial herb found in meadows and seeps at elevations of -855 to 5805 ft. Blooms April – May (Aug)	**Absent**. No suitable habitat in AOI.
Narrow-leaf sandpaper-plant (*Petalonyx linearis*)	–	–	CRPR 2B.3	Perennial shrub found in sandy or rocky canyons of Mojavean desert scrub and Sonoran desert scrub at elevations of -80–3700 ft. Blooms March-May.	**Absent.** Not observed during focused surveys completed on May 10, 2022. One dated (1949) CNDDB occurrence reported approximately 4.5 miles from the AOI, near a hot spring at the base of the Chocolate Mountains.

Table 1. Potential for Special-Status Species to Occur					
Common Name (*Scientific Name*)	**Status**			**Habitat and Species Description**	**Potential to Occur in AOI**
	FESA	**CESA**	**Other**		
Orocopia sage (*Salvia greatae*)	-	-	CRPR 1B.3	Perennial evergreen shrub found on alluvial slopes, floodplains, and edges of washes in Sonoran creosote scrub at elevations of 1001500 ft. Blooms March-April.	**Absent.** Not observed during focused surveys completed on May 10, 2022. There are 11 historic regional CNDDB occurrences, with two of these occurrences located within 5 miles of the AOI: one occurrence 1.7 mi NW of Bombay Beach and north of Hwy 111 in 1980, and one 1990 occurrence along the Coachella Canal near Siphon 17 (approximately 3 miles from AOI).
Chocolate Mountains tiquilia (*Tiquilia canescens* var. *pulchella*)	–	–	CRPR 3.2	Perennial shrub found on slopes, ridges, or washes in Sonoran desert scrub at elevations of 800–2300 ft. Blooms Feb-May.	**Absent.** Not observed during focused surveys completed on May 10, 2022. No CNDDB occurrences within 5 miles of the AOI.
Invertebrates					
Monarch butterfly (*Danaus plexippus*)	FC	-	-	Adult monarchs west of the Rocky Mountains typically overwinter in sheltered wooded groves of Monterey pine, Monterey cypress, and gum eucalyptus along coastal California, then disperse in spring throughout California, Nevada, Arizona, and parts of Oregon and Washington. Adults require milkweed and additional nectar sources during the breeding season. Larval caterpillars feed exclusively on milkweed.	**Absent**. No suitable habitat in AOI.

Table 1. Potential for Special-Status Species to Occur

Common Name (*Scientific Name*)	**Status**			**Habitat and Species Description**	**Potential to Occur in AOI**
	FESA	**CESA**	**Other**		
Fish					
Desert pupfish (*Cyprinodon macularius*)	FE	CE	-	Shallow and slow-moving water features with sand or silt bottoms and aquatic plants. May include desert springs, marshes, lakes, and saline or stream pools. Extant within Salton Sea agricultural drains and natural drainages like San Felipe Creek. Historically present in the Salton Sea.	**Absent**. No suitable habitat in AOI.
Razorback sucker (*Xyrauchen texanus*)	FE	CE	CFP	Rivers and lakes in the southwestern United States. Extant but declining in the Colorado River. Detected on occasion within the All-American Canal.	**Absent**. No suitable habitat in AOI.
Amphibians					
Sonoran Desert toad (*Incilius alvarius*)	-	-	SSC	Breeds in temporary pools and irrigation ditches along the Colorado River and southern Imperial Valley. Habitat includes in artificial flowing waters, aquatic wetlands, and desert washes.	**Low Potential to Occur** in seasonal drainages within AOI. No CNDDB occurrences within 5 miles of the AOI. There is single CNDDB occurrence in 1916 near Niland, with the species thought to be extirpated at this location.
Lowland leopard frog (*Lithobates yavapaiensis*)	-	-	SSC	Slack water habitats dominated by bulrushes, cattails, and riparian grasses where there's an overstory of Fremont's cottonwoods and willows.	**Absent**. No suitable habitat in AOI.
Couch's spadefoot (*Scaphiopus couchii*)	-	-	SSC	Habitats with an insect food base (especially termites). Temporary desert rain pools that last at least 7 days, with water temps > 15 C, and with subterranean refuge sites close by.	**Low Potential to Occur** in seasonal drainages within the AOI. No CNDDB occurrences within 5 miles of the AOI. There is only one CNDDB occurrence (of one individual) in the region from 2007 east of the railway right-of-way near Niland.

Table 1. Potential for Special-Status Species to Occur

Common Name (*Scientific Name*)	**Status**			**Habitat and Species Description**	**Potential to Occur in AOI**
	FESA	**CESA**	**Other**		
Reptiles					
Flat-tailed horned lizard (*Phrynosoma mcallii*)	-	-	SSC	Desert scrub on sandy flats and valleys with little or no windblown sand, salt flats, and areas with gravelly soils. There are three regional populations of flat-tailed horned lizard in California; two of these (representing the majority of the range in the State) occur in Imperial County. These are on the west side of the Salton Sea/Imperial Valley and on the east side of the Imperial Valley.	**Low Potential to Occur.** Focused habitat surveys completed by BBS (2021) east of and adjacent to the BBVP site concluded no flat-tailed horned lizard habitat. There are four CNDDB occurrences within 5 miles of the AOI, none of which occurred in association with the exposed playa of the Salton Sea. Most were detected east of or near Highway 111.
Desert tortoise (*Gopherus agassizii*)	FT	CT	-	Desert scrub, desert wash, and Joshua tree habitats; creosote bush habitat with large annual wildflower blooms preferred. Occurs in almost every desert habitat. Friable soils are required for burrowing and nest construction.	**Absent**. No suitable habitat in AOI.
Birds					
California black rail (*Laterallus jamaicensis coturniculus*)	-	CT	CFP	Salt marsh, shallow freshwater marsh, wet meadows, and flooded grassy vegetation. In California, primarily found in coastal and Bay-Delta communities, but also in Sierran foothills. Nests March-Sept.	**Absent**. No suitable habitat in AOI.

Table 1. Potential for Special-Status Species to Occur

Common Name (*Scientific Name*)	**Status**			**Habitat and Species Description**	**Potential to Occur in AOI**
	FESA	**CESA**	**Other**		
Ridgway's rail (Yuma Ridgway's rail) *(Rallus obsoletus yumanensis)*	FE	CT	CFP	Found in the south end of Salton Sea, lower Colorado River; in marshes dominated by emergent plants such as cattail (*Typha* spp.), bull whip bulrush (*Juncus californicus*), three-squared bulrush (*Scirpus olneyi*), and sedges (Cyperaceae). Nests March-Aug.	**Absent**. No suitable habitat in AOI.
Mountain plover (*Charadrius montanus*)	-	-	SSC	Breeds in the Great Plains/Midwestern US; winters in California, Arizona, Texas, and Mexico; wintering habitat in California includes tilled fields, heavily grazed open grassland, burned fields, and alfalfa fields. Winters Sept-March.	**Absent**. There is no suitable wintering habitat in the AOI.
Western snowy plover (Interior population) *(Charadrius nivosus nivosus)*	-	-	SSC	Nests on the ground, on open sandy, barrens shores of inland saline lakes (e.g. Salton Sea), on river bars, and man-made ponds such as wastewater ponds, dredge spoils, and salt evaporation ponds. Nests March-Sept.	**High Potential to Occur**. Observed on playa near shoreline pools at Bombay Beach Wetlands (east of and adjacent to AOI) in July 2021. There are several CNDDB occurrences within the vicinity of the AOI between Bombay Beach and the Alamo River. May nest in the AOI.
Gull-billed tern *(Gelochelidon nilotica)*	-	-	SSC	Salt marshes, estuaries, coastlines, and plowed fields. Nests on beaches, sandy shores of salt marshes, and sandy barrier islands. Nests April-July.	**High Potential to Occur**. Suitable nesting habitat is present in the AOI. No CNDDB occurrences within 5 miles of the AOI.

Table 1. Potential for Special-Status Species to Occur

Common Name (*Scientific Name*)	Status			Habitat and Species Description	Potential to Occur in AOI
	FESA	CESA	Other		
Black skimmer *(Rynchops niger)*	-	-	SSC	Nests on open sandy areas or sparsely vegetated gravel or shell bars or broad mats of sea wrack on salt marsh. Nests May-Sept.	**High Potential to Occur**. Suitable nesting habitat is present in the AOI. No CNDDB occurrences within 5 miles of the AOI.
California brown pelican *(Pelecanus occidentalis californicus)*	DL	DL	CFP	Nests on rocky offshore islands along Pacific Coast of California south to Baja California. Winters throughout coastal California. Nests Jan-Sept and winters Sept-April.	**High Potential to Occur**. May forage within the AOI but there is no suitable nesting habitat in the AOI. One CNDDB occurrence reported within 5 miles of the AOI.
Burrowing owl *(Athene cunicularia)*	-	-	SSC	Nests in burrows or burrow surrogates in open, treeless, areas within grassland, steppe, and desert biomes. Often with other burrowing mammals (e.g. prairie dogs, California ground squirrels). May also use human-made habitat such as agricultural fields, golf courses, cemeteries, roadside, airports, vacant urban lots, and fairgrounds. Nests Feb-Aug.	Absent. There is no suitable habitat present with the AOI. No burrows or ground squirrels were observed during site surveys in April and May 2022. No foraging habitat (agricultural fields) within the vicinity of the AOI.
Gila woodpecker *(Melanerpes uropygialis)*	-	CE		Year-round resident of southeastern California (Imperial Valley and lower Colorado River valley), southern Nevada, Arizona, and New Mexico. Nesting habitat includes large cacti and trees within saguaro desert, riparian woodland and residential areas. Nests April-Aug.	**Absent**. No suitable habitat in the AOI.

Table 1. Potential for Special-Status Species to Occur

Common Name (*Scientific Name*)	**Status**			**Habitat and Species Description**	**Potential to Occur in AOI**
	FESA	**CESA**	**Other**		
Southwestern willow flycatcher *(Empidonax traillii extimus)*	FE	CE	-	Found in southern California, Arizona, New Mexico, southern Utah and Nevada, and possibly southwestern Colorado. Nesting habitat includes moist, shrubby riparian willow thickets, often with standing or running water. Winters in Central and South America. Nests May-Aug.	**Absent**. No suitable habitat in the AOI.
Crissal thrasher (*Toxostoma crissale*)	-	-	SSC	Desert scrub and riparian brush with dense mesquite thickets often near streams or washes. Nests Jan-Aug.	**Absent**. No suitable habitat in the AOI.
LeConte's thrasher (*Toxostoma lecontei*)	-	-	SSC	Desert flats, dunes, and scrub with sparse saltbush and sometimes creosote bush. Nests Feb-June.	**Low Potential to Occur**. Suitable low-value nesting habitat is present in the AOI. No CNDDB occurrences within 5 miles of the AOI.
Yellow-breasted chat (*Icteria virens*)	-	-	SSC	In California, breeds in Klamath Mountains, inner Northern Coast Range south to San Francisco Bay, locally distributed from Santa Clara County south to San Diego County Sacramento and San Joaquin valleys, along west slope of Sierra Nevada from the Feather River to Kern River, Mono and Inyo counties. In the west, nesting habitat includes dense riparian and shrubby. Nests May-Aug.	**Absent**. No suitable habitat in the AOI.

Table 1. Potential for Special-Status Species to Occur

Common Name (*Scientific Name*)	**Status**			**Habitat and Species Description**	**Potential to Occur in AOI**
	FESA	**CESA**	**Other**		
Yellow warbler (*Setophaga petechia*)	-	-	SSC	Breeding range includes most of California, except Central Valley (isolated breeding locales on Valley floor, Stanislaus, Colusa, and Butte Counties), Sierra Nevada range above tree line, and southeastern deserts. Nesting habitat includes riparian vegetation near streams and meadows. Winters in Mexico south to South America. Nests May-Aug.	**Absent**. No suitable habitat in the AOI.
Mammals					
Palm Springs little pocket mouse (*Perognathus longimembris bangsi*)	-	-	SSC	Occurs in flat or gently sloping habitats of loose or sandy soils, with relatively sparse vegetation, with suitable habitat characteristics similar to flat-tailed horned lizard. Known from the Palm Spring and Borrego Springs regions.	**Low Potential to Occur**. Highly alkaline soils within the portion of the AOI below the 2002 shoreline berm not expected to support this species. Above the 2002 berm, vegetation may be too dense to support this species. No CNDDB occurrences within 5 miles of the AOI.
Pallid bat (*Antrozous pallidus*)	-	-	SSC	Crevices in rocky outcrops and cliffs, caves, mines, trees (e.g. basal hollows of redwoods, cavities of oaks, exfoliating pine and oak bark, deciduous trees in riparian areas, and fruit trees in orchards). Also roosts in various human structures such as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings (Western Bat Working Group [WBWG] 2017). Maternity period April-Sept.	**Absent**. No suitable habitat in the AOI.

Table 1. Potential for Special-Status Species to Occur

Common Name (*Scientific Name*)	**Status**			**Habitat and Species Description**	**Potential to Occur in AOI**
	FESA	**CESA**	**Other**		
Western yellow bat (*Lasiurus xanthinus*)	-	-	SSC	Roosts in trees, especially in fan palms with dead fronds. Found in riparian woodlands in arid regions, oak or pinyon-juniper woodlands, and human developed areas. Maternity period April-Sept.	**Absent**. No suitable habitat in the AOI.
Western mastiff bat (*Eumops perotis californicus*)	-	-	SSC	Primarily a cliff-dwelling species, found in similar crevices in large boulders and buildings (WBWG 2017). Maternity period April-Sept.	**Absent**. No suitable habitat in the AOI.
Yuma hispid cotton rat (*Sigmodon hispidus* ssp. *eremicus*)	-	-	SSC	Inhabits a variety of habitats, but generally associated with drainage ditches, canals, and seeps vegetated with plants such as arrow weed, saltgrass, common reed, cattails, sedges, tamarisk, heliotrope, and annual grasses. They utilize runways through dense herbaceous growth and nests are built of woven grass. Noted presence in moist agricultural fields.	**Absent**. No suitable habitat in the AOI.
American badger *(Taxidea taxus)*	-	-	SSC	Drier open stages of most shrub, forest, and herbaceous habitats with friable soils.	**Absent**. No suitable habitat in the AOI.

Table 1. Potential for Special-Status Species to Occur

Common Name (*Scientific Name*)	Status			Habitat and Species Description	Potential to Occur in AOI
	FESA	CESA	Other		
Desert bighorn sheep (*Ovis canadensis nelsoni*)	-	-	CFP	Open, rocky, steep areas with available water and herbaceous forage. Habitats include alpine, chaparral, chenopod scrub, pinon and juniper woodlands, riparian woodlands, and Sonoran desert scrub communities.	**Absent**. No suitable habitat in the AOI.

Status Codes NOTE:

FESA	Federal Endangered Species Act
CESA	California Endangered Species Act
FE	FESA listed, Endangered.
FT	FESA listed, Threatened.
FC	Candidate for FESA listing as Threatened or Endangered
DL	FESA delisted
CT	CESA- or NPPA-listed, Threatened.
CE	CESA or NPPA listed, Endangered.
CFP	California Fish and Game Code Fully Protected Species (Section 3511-birds, Section4700-mammals, Section5 050-reptiles/amphibians).
SSC	CDFW Species of Special Concern (CDFW, updated July 2022).
1B	California Rare Plant Rank (CRPR) Rare or Endangered in California and elsewhere.
2B	CRPR Rare, threatened, or endangered in California but more common elsewhere.
3	CRPR Plants for which more Information is Needed – A Review List
4	CRPR Plants of Limited Distribution – A Watch List.
0.1	Threat Rank/Seriously threatened in California (over 80% occurrences threatened / high degree and immediacy of threat)
0.2	Threat Rank/Moderately threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat)
0.3	Threat Rank/Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

4.5.1 Plants

Eleven special-status plant species were identified historically in the vicinity of the AOI based on the literature review (Table 1). Upon further analysis and after the special-status plant survey conducted in May 2022 (Section 4.2.3), all 11 species were determined to not occur within the AOI. No further discussion of these species is provided in this analysis.

4.5.2 Fish

Two special-status fish species were identified as having the potential to occur within AOI based on the literature review (Table 1). Upon further analysis and after the reconnaissance site visit (Section 4.2.1), both species were determined to not have potential to occur within the AOI due to the absence of suitable habitat. No further discussion of these species is provided in this analysis.

4.5.3 Invertebrates

One special-status invertebrate species was identified as having the potential to occur within AOI based on the literature review Table 1). Upon further analysis and after the reconnaissance site visit, this species was determined to not have potential to occur within the AOI due to the absence of suitable habitat. No further discussion of the species is provided in this analysis.

4.5.4 Amphibians

Three special-status amphibian species were identified as having the potential to occur within AOI based on the literature review (Table 1). Upon further analysis and after the reconnaissance site visit, one species was determined to not have potential to occur within the AOI due to the absence of suitable habitat. The remaining two species have low potential to occur. No further discussion of these species is provided in this analysis.

4.5.5 Reptiles

Two special-status reptile species were identified as having the potential to occur within AOI based on the literature review (Table 1). Upon further analysis and after the reconnaissance site visit, one species was determined to not have potential to occur within the AOI due to the absence of suitable habitat. The remaining species has only low potential to occur. No further discussion of these species is provided in this analysis.

4.5.6 Birds

Fourteen special-status bird species were identified as having the potential to occur within the AOI based on the literature review (Table 1). Upon further analysis and after the reconnaissance site visit, nine species were determined to not occur within the AOI due to the absence of suitable habitat. An additional species has only low potential to occur. No further discussion of these species is provided in this analysis. Brief descriptions of the remaining four species that have high potential to occur within the AOI are presented below.

Western Snowy Plover

Two distinct populations of western snowy plover occur in California. Along the Pacific Coast, snowy plovers breed from southern Washington to Baja Sur, Mexico south to coastal Ecuador and Chile (Page et al. 2020). The Pacific Coast snowy plover is described by USFWS as a distinct population segment that occurs within 50 miles of the coast and is listed as threatened pursuant to the federal ESA (USFWS 2007). In California, inland breeding occurs locally in the San Joaquin Valley, the Salton Sea, and eastern California (Shuford and Gardali 2008). The “interior” population, which includes snowy plovers at the Salton Sea (and therefore considered within this analysis), resides in California and is a year-round resident at the Salton Sea. Western snowy plovers at the Salton Sea are a CDFW SSC (CDFW 2022b). Ground nests are established on barren to sparsely vegetated sand beaches, dry salt flats, dredge spoils deposited on beach or dune habitat, levees and flats at salt-evaporation ponds, and sand/cobble river bars (Page et al. 2020). Breeding/nesting occurs from March through September.

There are several CNDDB occurrences with non-specific locations within the vicinity of the AOI between Bombay Beach and the Alamo River (CDFW 2022a). Additionally, the species was observed on the playa near shoreline pools at Bombay Beach Wetlands (east of and adjacent to AOI) in July 2021. Suitable nesting habitat occurs within open areas of sandy playa onsite. Western snowy plover has high potential to occur onsite.

Black Skimmer

The black skimmer (*Rynchops niger*) is not listed pursuant to either the federal or California ESAs; however, it is designated as a BCC by the USFWS and a SSC by the CDFW. In California, black skimmers breed inland at the Salton Sea and coastal San Diego and Orange counties (Gochfeld et al. 2020). They prefer to nest on open sandy areas or sparsely vegetated gravel or shell bars or broad mats of sea wrack on salt marsh (Gochfeld et al. 2020). Nesting occurs during May through September.

There are no CNDDB records within five miles of the AOI (CDFW 2022a); however, the open playa may provide suitable nesting habitat onsite. Black skimmer has potential to occur onsite.

Gull-billed Tern

The gull-billed tern (*Gelochelidon nilotica*) is not listed pursuant to either the California or federal ESAs; however, it is designated as a BCC by the USFWS and a SSC by the CDFW. In western North America, their breeding range includes the southernmost portion of California along the coast into western Mexico. In California, breeding colonies are restricted to San Diego Bay and the Salton Sea (Unitt 2004 and Molina and Erwin 2006 in Molina et al. 2020). The Salton Sea population nests on eroded earthen levees and gravel and barnacle islets or on constructed islets in shallow, brackish impoundments (Molina et al. 2020). Other gull-billed tern colonies are found on sparsely vegetated exposed mudflats, shell bars, or dredged spoil islands in impoundments (Molina et al. 2020). Nesting occurs from late April through July.

There are no CNDDB records within five miles of the AOI (CDFW 2022a); however, suitable nesting habitat occurs onsite in the open areas of the playa. Gull-billed tern has potential to occur onsite.

California Brown Pelican

California brown pelican (*Pelecanus occidentalis californicus*) was formerly listed but is now delisted under both the federal and California ESAs. In addition, it is fully protected pursuant to California Fish and Game Code Section 3511 and is a Bureau of Land Management species. In western North America, brown pelicans nest from southern California (Channel Islands) to central Mexico (including Gulf of California) and the Salton Sea (Sturm 1988). The brown pelicans nesting in California nest mainly on the ground (Shields 2020). Nesting occurs during December through August.

There is one CNDDB record within five miles of the AOI (CDFW 2022a). Suitable foraging habitat occurs at the Salton Sea but no suitable nesting habitat occurs in the AOI. California brown pelican has potential to occur onsite.

4.5.7 Mammals

Seven special-status mammal species were identified as having the potential to occur within AOI based on the literature review (Table 1). Upon further analysis and after the reconnaissance site visit, six species were determined to not have potential to occur within the AOI due to the absence of suitable habitat. The remaining species has only low potential to occur. No further discussion of these species is provided in this analysis.

4.6 Critical Habitat

The AOI does not coincide with designated Critical Habitat for any federally listed species (USFWS 2022b).

5.0 IMPACT ANALYSIS

5.1 Impacts Overview

The Project is comprised of multiple components that will occur in different portions of the AOI, and result in different impacts. The Project components are as follows: groundwater well installation, vegetation enhancement/hedgerow construction, waterless dust control measures and habitat enhancement activities. Groundwater well installation, vegetation enhancement/hedgerow construction, and waterless dust control measures will occur in non-wetland area within the AOI. Habitat enhancement activities will occur within wetlands (Appendix A). See Section 1.2 for a description of each Project component.

- *Groundwater Well Installation*. Impacts associated with this Project component include temporary ground disturbance and equipment use within three, 50-foot by 100-foot work areas. Restoration of the work areas will include removal of all materials and re-leveling of access routes to approximate pre-Project conditions. No impacts to aquatic features will occur.
- *Vegetation Establishment/Hedgerow Construction*. Impacts associated with this Project component include temporary ground disturbance and reduction in vegetation to construct hedgerows. However, impacts to vegetation will be temporal in nature as the purpose of the activity is to enhance and provide resilience to vegetative growth within this area of the AOI. No impacts to aquatic features will occur.
- *Waterless Dust Control*. Due to the location of the AOI and species anticipated to occur, fencing installation is not anticipated to adversely affect species movements. Additionally, placement of fence is aimed at reducing erosion due to wind to protect the existing habitat. There are no impacts anticipated for this Project component.

- *Habitat Enhancement*. Impacts associated with this Project component include temporary disturbance to existing wetland habitat to create bunds and diversion swale features, resulting in a temporal loss. However, these restoration activities are anticipated to result in a net increase in wetland habitat, including native vegetation and wetland acreage.

5.2 Impacts to Special Status Birds

The AOI provides suitable nesting and foraging habitat for special-status birds and birds protected by the MBTA and Fish and Game Code. Nesting and/or foraging birds have potential to be adversely impacted by Project activities (all components) if present within and adjacent to the AOI during implementation of the Project. Implementation of Avoidance and Minimization Measure (AMM) BIRD-1 and AMM BIRD-2 described in Section 6.0 would avoid or minimize potential impacts to special-status birds and birds protected by the MBTA and Fish and Game Code.

5.3 Aquatic Resources, Including Waters the U.S. and State

A total of 63.433 acres of aquatic resources have been mapped within the AOI (Figure 4). The AOI supports aquatic resources that are potential Waters of the U.S. and Waters of the State, subject to verification by the USACE and RWQCB, respectively. The following regulatory authorizations pertain to the Project component that will occur within the wetland habitat onsite: habitat enhancement activities, including construction of bunds and diversion swales (see Appendix A).

The habitat enhancement activities, including construction of bunds and diversion swales will result in ground disturbance within wetlands. While ground disturbance will occur, the Project is designed to enhance and expand the existing wetland. Therefore, no net loss of aquatic resources is anticipated to occur.

Permit authorizations to impact wetlands or Waters of the U.S. under Section 404 of the federal CWA (Section 404 Permit) will be required from the USACE. The Project will also be required to obtain a permit authorization from the RWQCB pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Act for discharge to Waters of the U.S./State. Lastly, aquatic resources within the AOI are also subject to regulation under Section 1600 of the Fish and Game Code (impacts to the bed, channel, or bank of any river, stream, or lake). The Project will be required to obtain a Streambed Alteration Agreement from CDFW pursuant to Section 1602 of the California Fish and Game Code.

6.0 RECOMMENDATIONS

This section summarizes recommended avoidance and minimization measures to avoid, minimize, or compensate for potential impacts to biological resources from the proposed Project.

6.1 Special-Status Birds and Migratory Bird Treaty Act-Protected Birds (Including Nesting Raptors)

To ensure Project implementation would not disturb nesting birds, the following measures are recommended for all Project components within the AOI:

AMM BIRD-1: Complete all Project activities outside of the bird nesting season to avoid impacts to nesting birds. The nesting season for birds that could potentially establish ground nests at the Salton Sea is March 1 through October 31.

AMM BIRD-2: If it is not feasible to comply with AMM-BIRD-1, a qualified biologist shall survey all areas to be disturbed within 7 days in advance of the start of ground-disturbing activities. Active bird nests identified during the survey effort shall be avoided until such time that the qualified biologist has determined that the nest(s) is/are vacant or is/are otherwise not active. Depending on the location of the active nest(s) the qualified biologist may establish a no-work buffer around an active nest(s). Work may resume within the active nest buffer only with the approval of the qualified biologist.

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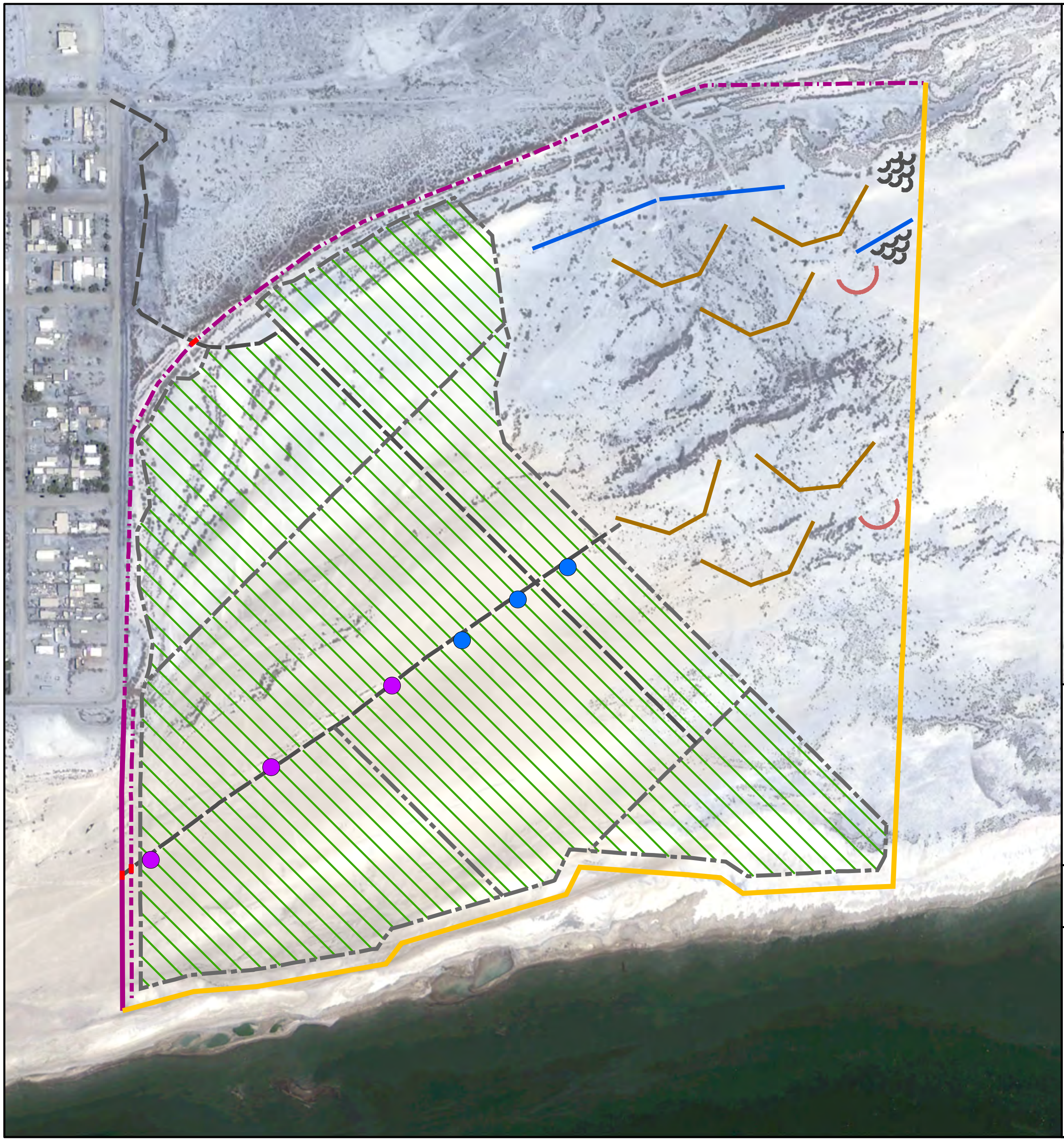
LIST OF APPENDICES

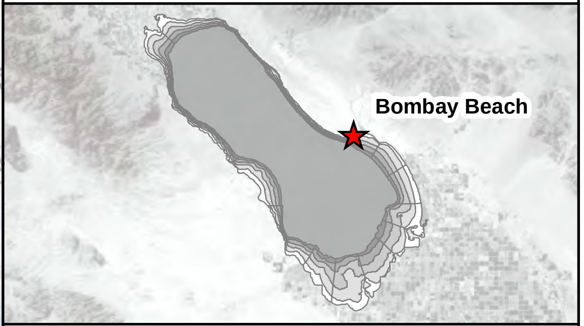
APPENDIX A

Project Components



Legend

- ▬ ▬ Access Route
- ▬ · ▬ Maintenance Access
- ▬ PM 10 Gate
- ▬ Concrete Barrier – Site Exclusion
- ▬ · ▬ Sand Fence – Site Exclusion and Upwind Control
- ▬ Haybales – Site Exclusion
- ● Well – Primary
- ● Well – Alternate
- ▬ Hedgerows
- ▬ Trapezoidal Bund
- ▬ Semi-Circular Bund – Type A
- ▬ Semi-Circular Bund – Type B
- ▬ Diversion Swale



Notes:
1. The access routes are to be 15 feet wide.
2. Maintenance paths are to be 8 feet wide.
3. Background Imagery Source: Pleiades © 2020, Distribution Airbus DS, April 28, 2022.

0 500 1,000
Feet

N

Air Quality Mitigation Program

Salton Sea

Figure 2. Bombay Beach Plot Study Site Features

FORMATION ENVIRONMENTAL

DATE: AUG 02, 2022

IID

K:\IID_SaltonSea\Tasks\PilotStudies\S_01_BombayBeach\S_01_B\MXD\DustControlPlan\Figure2_BombayBeachPlotStudySiteFeatures_V3.mxd

APPENDIX B

Special-Status Species Search Results

Selected Elements by Element Code

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Kane Spring NE (3311527) OR Durmid (3311547) OR Durmid SE (3311537) OR Frink (3311536) OR Frink NE (3311545) OR Frink NW (3311546) OR Niland (3311525) OR Obsidian Butte (3311526) OR Wister (3311535))

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAABB01010	***Incilius alvarius*** Sonoran Desert toad	None	None	G5	SH	SSC
AAABF01020	***Scaphiopus couchii*** Couch's spadefoot	None	None	G5	S2	SSC
AAABH01250	***Lithobates yavapaiensis*** lowland leopard frog	None	None	G4	SX	SSC
ABNFC01021	***Pelecanus occidentalis californicus*** California brown pelican	Delisted	Delisted	G4T3T4	S3	FP
ABNGE02020	***Plegadis chihi*** white-faced ibis	None	None	G5	S3S4	WL
ABNKD06030	***Falco columbarius*** merlin	None	None	G5	S3S4	WL
ABNME03041	***Laterallus jamaicensis coturniculus*** California black rail	None	Threatened	G3T1	S1	FP
ABNME0501A	***Rallus obsoletus yumanensis*** Yuma Ridgway's rail	Endangered	Threatened	G3T3	S1S2	FP
ABNNB03031	***Charadrius nivosus nivosus*** western snowy plover	Threatened	None	G3T3	S2	SSC
ABNNB03100	***Charadrius montanus*** mountain plover	None	None	G3	S2S3	SSC
ABNNM03110	***Larus californicus*** California gull	None	None	G5	S4	WL
ABNNM08010	***Gelochelidon nilotica*** gull-billed tern	None	None	G5	S1	SSC
ABNNM08020	***Hydroprogne caspia*** Caspian tern	None	None	G5	S4	
ABNNM14010	***Rynchops niger*** black skimmer	None	None	G5	S2	SSC
ABNSB10010	***Athene cunicularia*** burrowing owl	None	None	G4	S3	SSC
ABNYF04150	***Melanerpes uropygialis*** Gila woodpecker	None	Endangered	G5	S1	
ABPAE33043	***Empidonax traillii extimus*** southwestern willow flycatcher	Endangered	Endangered	G5T2	S1	
ABPBJ08030	***Polioptila melanura*** black-tailed gnatcatcher	None	None	G5	S3S4	WL
ABPBK06090	***Toxostoma crissale*** Crissal thrasher	None	None	G5	S3	SSC

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
ABPBK06100	***Toxostoma lecontei*** Le Conte's thrasher	None	None	G4	S3	SSC
ABPBX03010	***Setophaga petechia*** yellow warbler	None	None	G5	S3S4	SSC
ABPBX24010	***Icteria virens*** yellow-breasted chat	None	None	G5	S3	SSC
AFCJC11010	***Xyrauchen texanus*** razorback sucker	Endangered	Endangered	G1	S1S2	FP
AFCNB02060	***Cyprinodon macularius*** desert pupfish	Endangered	Endangered	G1	S1	
AMACC05070	***Lasiurus xanthinus*** western yellow bat	None	None	G4G5	S3	SSC
AMACC10010	***Antrozous pallidus*** pallid bat	None	None	G4	S3	SSC
AMACD02011	***Eumops perotis californicus*** western mastiff bat	None	None	G4G5T4	S3S4	SSC
AMAFD01043	***Perognathus longimembris bangsi*** Palm Springs pocket mouse	None	None	G5T2	S1	SSC
AMAFF07013	***Sigmodon hispidus eremicus*** Yuma hispid cotton rat	None	None	G5T2T3	S2	SSC
AMAJF04010	***Taxidea taxus*** American badger	None	None	G5	S3	SSC
AMALE04013	***Ovis canadensis nelsoni*** desert bighorn sheep	None	None	G4T4	S3	FP
ARAAF01012	***Gopherus agassizii*** desert tortoise	Threatened	Threatened	G3	S2S3	
ARACF12040	***Phrynosoma mcallii*** flat-tailed horned lizard	None	None	G3	S2	SSC
CTT22100CA	***Active Desert Dunes*** Active Desert Dunes	None	None	G4	S2.2	
CTT22200CA	***Stabilized and Partially Stabilized Desert Dunes*** Stabilized and Partially Stabilized Desert Dunes	None	None	G4	S3.2	
CTT62300CA	***Desert Fan Palm Oasis Woodland*** Desert Fan Palm Oasis Woodland	None	None	G3	S3.2	
PDFAB0F491	***Astragalus insularis var. harwoodii*** Harwood's milk-vetch	None	None	G5T4	S2	2B.2
PDFAB0F7R0	***Astragalus sabulonum*** gravel milk-vetch	None	None	G4G5	S2	2B.2
PDFAB0F920	***Astragalus tricarinatus*** triple-ribbed milk-vetch	Endangered	None	G2	S2	1B.2
PDLAM1S0P0	***Salvia greatae*** Orocopia sage	None	None	G2G3	S2S3	1B.3

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
PDLOA04010	***Petalonyx linearis*** narrow-leaf sandpaper-plant	None	None	G4	S3?	2B.3
PDNYC010P1	***Abronia villosa var. aurita*** chaparral sand-verbena	None	None	G5T2?	S2	1B.1
PMCYP04010	***Cladium californicum*** California saw-grass	None	None	G4	S2	2B.2

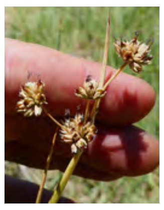
Record Count: 43

CNPS Rare Plant Inventory

Search Results

11 matches found. Click on scientific name for details

Search Criteria: 9-Quad include [3311547:3311537:3311527:3311526:3311536:3311545:3311546:3311535:3311525]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	PHOTO
Abronia villosa var. *aurita*	chaparral sand-verbena	Nyctaginaceae	annual herb	(Jan)Mar-Sep	None	None	G5T2?	S2	1B.1	 © 2011 Aaron E. Sims
Astragalus crotalariae	Salton milk-vetch	Fabaceae	perennial herb	Jan-Apr	None	None	G4G5	S4	4.3	No Photo Available
Astragalus insularis var. *harwoodii*	Harwood's milk-vetch	Fabaceae	annual herb	Jan-May	None	None	G5T4	S2	2B.2	No Photo Available
Astragalus sabulonum	gravel milk-vetch	Fabaceae	annual/perennial herb	Feb-Jun	None	None	G4G5	S2	2B.2	No Photo Available
Astragalus tricarinatus	triple-ribbed milk-vetch	Fabaceae	perennial herb	Feb-May	FE	None	G2	S2	1B.2	No Photo Available
Cladium californicum	California saw-grass	Cyperaceae	perennial rhizomatous herb	Jun-Sep	None	None	G4	S2	2B.2	No Photo Available
Johnstonella costata	ribbed cryptantha	Boraginaceae	annual herb	Feb-May	None	None	G4G5	S4	4.3	No Photo Available
Juncus cooperi	Cooper's rush	Juncaceae	perennial herb	Apr-May(Aug)	None	None	G4	S3	4.3	 © 2018 Neal Kramer
Petalonyx linearis	narrow-leaf sandpaper-plant	Loasaceae	perennial shrub	(Jan-Feb)Mar-May(Jun-Dec)	None	None	G4	S3?	2B.3	No Photo Available
Salvia greatae	Orocopia sage	Lamiaceae	perennial evergreen shrub	Mar-Apr	None	None	G2G3	S2S3	1B.3	No Photo Available
Tiquilia canescens var. *pulchella*	Chocolate Mountains tiquilia	Ehretiaceae	perennial shrub	Feb-May	None	None	G5T3T4	S3	3.2	No Photo Available

Showing 1 to 11 of 11 entries

Suggested Citation:

California Native Plant Society, Rare Plant Program. 2022. Rare Plant Inventory (online edition, v9-01 1.5). Website https://www.rareplants.cnps.org [accessed 14 September 2022].

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
Phone: (760) 431-9440 Fax: (760) 431-5901

In Reply Refer To:
Project Code: 2022-0085305
Project Name: Bombay Beach Vegetation Plot Study

September 14, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A biological assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a biological assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a biological assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found at the Fish and Wildlife Service's Endangered Species Consultation website at:

https://www.fws.gov/endangered/what-we-do/faq.html

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
(760) 431-9440

Project Summary

Project Code:	2022-0085305
Project Name:	Bombay Beach Vegetation Plot Study
Project Type:	Restoration / Enhancement of Waterbody
Project Description:	~168 acres.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@33.35020215,-115.72084790375408,14z

Counties: Imperial County, California

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yuma Ridgway"s Rail *Rallus obsoletus yumanensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3505	Endangered

Fishes

NAME	STATUS
Desert Pupfish *Cyprinodon macularius* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7003	Endangered
Razorback Sucker *Xyrauchen texanus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/530	Endangered

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency:	ECORP Consulting, Inc.
Name:	Angela Haas
Address:	2525 Warren Drive
City:	Rocklin
State:	CA
Zip:	95677
Email	ahaas@ecorpconsulting.com
Phone:	9167829100

APPENDIX C

Representative Site Photographs

Photo 1. BBVP-P1 Suaeda wetland

Photo 2. BBVP-P1 depressional area

Photo 3. BBVP-R1 beneath RR and Hwy 111

Photo 4. BBVP-R1 entering AOI

Photo 5. BBVP-R1 deeper in AOI

Photo 6. BBVP-L1 SS OHWM Wrack line

Photo 7. Upland Suaeda iodine atriplex mix

Photo 8. Upland water stressed iodine above 2002 berm

APPENDIX D

Groundwater Resources Impact Assessment

FORMATION
ENVIRONMENTAL

TECHNICAL MEMORANDUM

GROUNDWATER RESOURCES IMPACT ASSESSMENT, BOMBAY BEACH PLOT STUDY AREA, IMPERIAL COUNTY, CALIFORNIA

PREPARED FOR: Imperial Irrigation District

PREPARED BY: Mike Tietze, PG, CHG, CEG, Formation Environmental, LLC
Nat Beal, PG, Formation Environmental, LLC

DATE: January 2023

Mike Tietze

MICHAEL TIETZE
No. HG 63
Exp. 04/30/23
CERTIFIED HYDROGEOLOGIST

This technical memorandum presents the methods and results of a Groundwater Resources Impact Assessment (GRIA) to evaluate the potential groundwater-related impacts associated with the installation of three test wells, and their conversion to supply wells to support vegetation enhancement at the Bombay Beach Plot Study Area (Plot Study Area). The Plot Study Area is located along the eastern shore of the Salton Sea, in Imperial County, California. Vegetation enhancement, which includes expansion and maintenance of existing vegetation, is planned as part of several plot studies in the Imperial Irrigation District's (IID) Salton Sea Air Quality Mitigation Program (SS AQM Program). This GRIA provides an assessment of the potential groundwater resource-related environmental impacts associated with groundwater extraction by the proposed wells at the Plot Study Area and will be used to support preparation of an environmental document for the Bombay Beach Plot Study under the California Environmental Quality Act (CEQA).

1 BACKGROUND

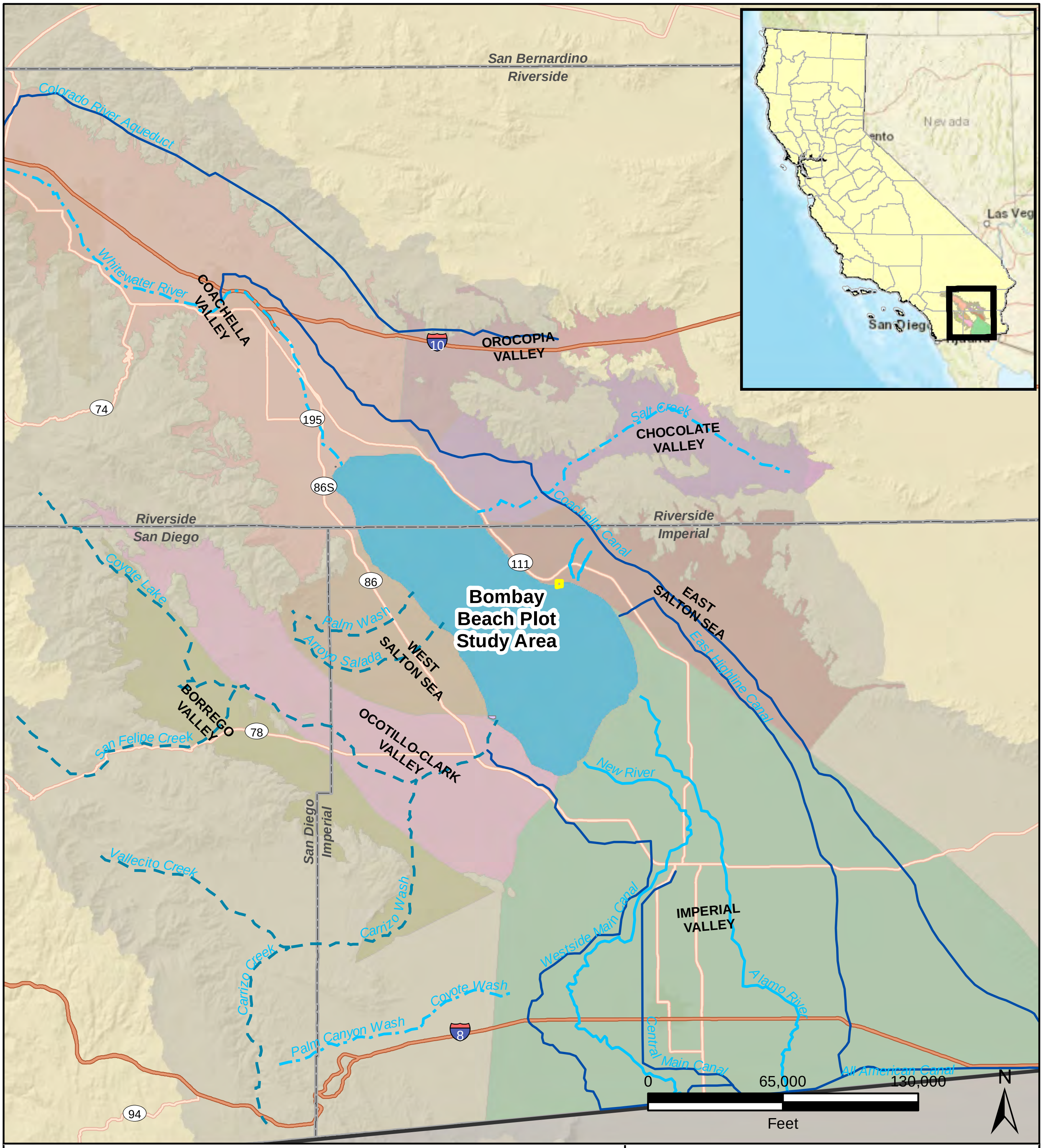
Irrigation water supply development is necessary to support the Bombay Beach Plot Study. Water supplies are limited in this area, with no agricultural drains or other currently developed sources readily available for irrigation use. Potential water sources that are currently feasible to support the Bombay Beach Plot Study are limited to retention of storm water runoff and groundwater. Stormwater availability is not sufficient to meet the plot study objectives. Available data suggest that groundwater underlying the Plot Study Area could potentially be developed as a water supply source for irrigation. Review of lithologic data indicates that the sediments in the Plot Study Area are comprised of lacustrine deposits including water-bearing sandy zones interbedded with finer-grained silts and clays that appear to contain brackish groundwater that is likely suitable for irrigation of salt-tolerant vegetation. The purpose of the water supply test wells is to further investigate the groundwater conditions in the Plot Study Area. If groundwater conditions are found to be adequate for development of a long-term irrigation water supply for vegetation-based dust control in terms of the available quality and quantity, the test wells will be converted to long-term supply wells. The converted supply wells will provide an irrigation water supply for vegetation enhancement in the Plot Study Area and potentially, in the future, the surrounding playa area. The long-term supply wells will be permitted under a Conditional Use Permit (CUP) from Imperial County.

2 PROJECT DESCRIPTION

The Bombay Beach Plot Study Area is located on the east side of the Salton Sea (Figure 1) west of Highway 111, and is immediately east of the community of Bombay Beach, California (Figure 2). The Plot Study Area is located on IID-owned land on Assessor's Parcel Number 002-640-002, and is surrounded by private land on the north, the community of Bombay Beach to the west, land owned by the Bureau of Reclamation (BOR) and leased to State Parks on the east, and the Salton Sea to the south (Figure 2). The locations of the proposed test wells are shown in Figure 2.

The Bombay Beach Plot Study will include groundwater supply development, establishment of new vegetation, maintenance of existing vegetation, stormwater retention and spreading features (bunds), and waterless dust control measures (DCMs). Specifically, the study will gather data to inform water supply development and planning for expanded future vegetation-based dust control on the east side of the Salton Sea. Test wells will be developed, tested, and if feasible, operated as supply wells; new vegetation will be established in hedgerows, irrigated, and monitored; and existing vegetation will be monitored and irrigated as needed to maintain plant vigor and prevent loss of existing vegetation cover.

Vegetation will be established by planting the *Allenrolfea occidentalis* (ALOC) Playa Seed Mix developed for use around the Salton Sea in hedgerows to augment existing drought-resistant and salt-tolerant vegetation in the area. Initially, planting will take place on about 85 acres within the Plot Study Area shown in Figure 3. In the future, this area will be expanded, and existing vegetation may be irrigated if it becomes stressed and requires additional water to survive. Established and existing vegetation will be monitored and irrigated as needed to maintain plant vigor and prevent loss of existing and new vegetation cover.



Legend

Groundwater Basins

- 🟩 Borrego Valley
- 🟪 Chocolate Valley
- 🟥 Coachella Valley
- 🟥 East Salton Sea
- 🟩 Imperial Valley
- 🟪 Ocotillo-Clark Valley
- 🟪 Orocopia Valley
- 🟫 West Salton Sea
- 🟨 Plot Study Area
- ⬜ Salton Sea Watershed
- ☐ State Boundary
- ☐ Counties
- Stream; Braided Stream
- Ephemeral Stream
- Stream Intermittent
- Canal; Aqueduct; Intracoastal Waterway

BOMBAY BEACH STUDY AREA

SALTON SEA

FIGURE 1

STUDY AREA AND REGIONAL GROUNDWATER BASINS

DATE: SEP 27, 2022

BY: DKG

FOR: NBB

FORMATION ENVIRONMENTAL

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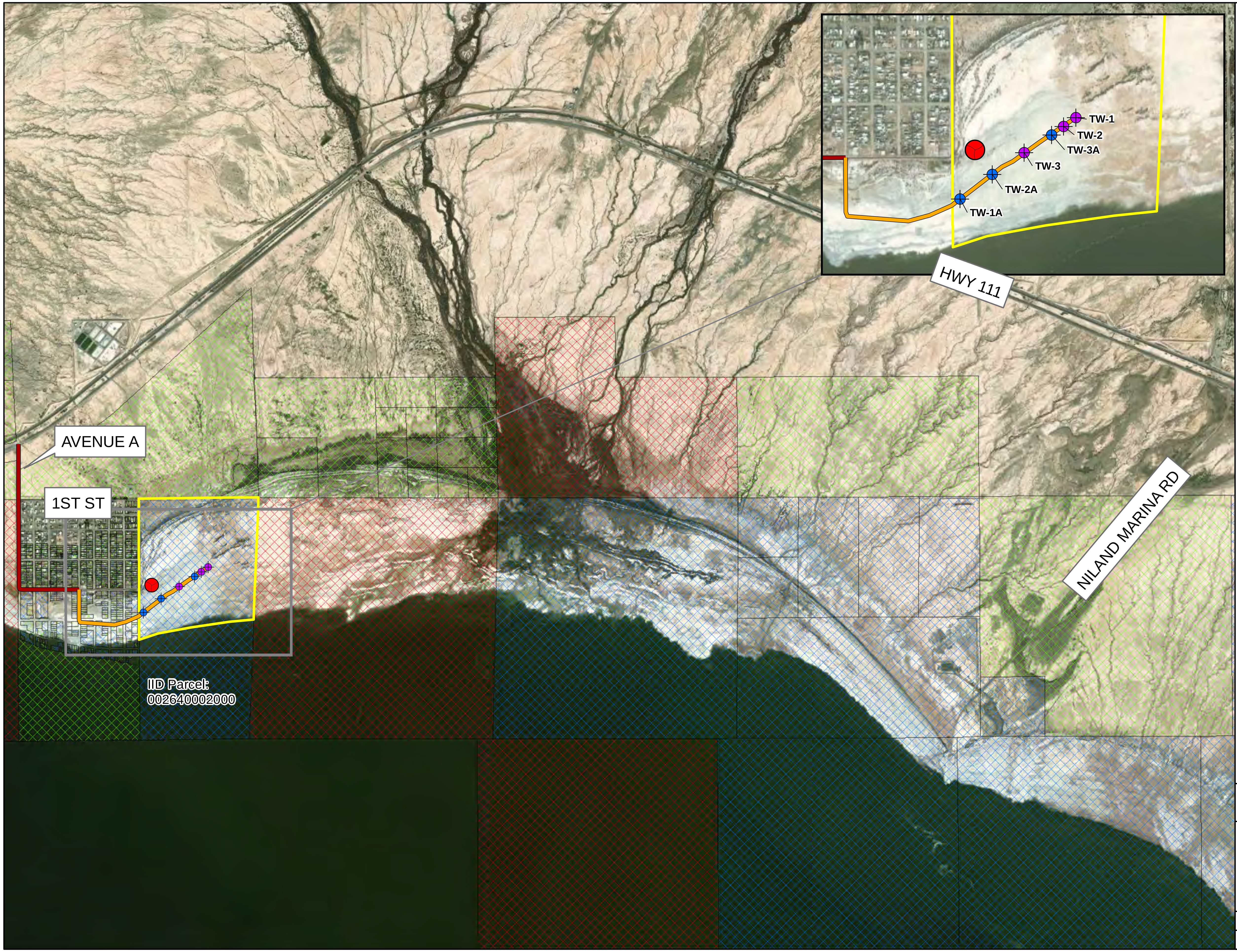

BOMBAY BEACH STUDY AREA

SALTON SEA

FIGURE 2

SITE VICINITY MAP

DATE: SEP 27, 2022

BY: DKG

FOR: BAL

FORMATION ENVIRONMENTAL

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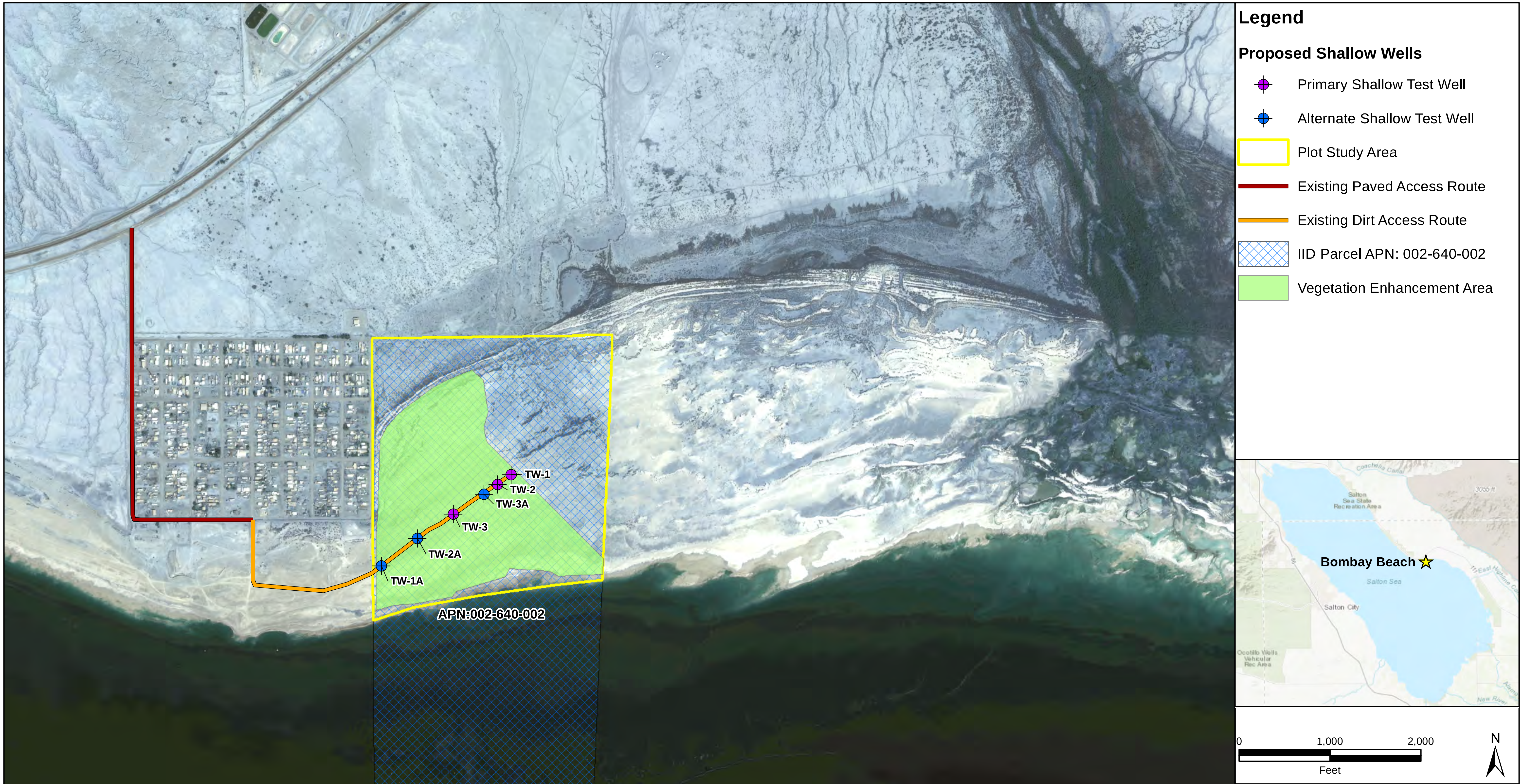


BOMBAY BEACH STUDY AREA

SALTON SEA

FIGURE 3

SITE LAYOUT & PARCELS TO BE SERVED BY PROPOSED WELLS

DATE: SEP 09, 2022

BY:

FOR:

K:\IID_SaltonSeaTasks\WaterSupply\Geodatabase\GIS\MXD\2021_BB_GRIA_Drawdown_Analysis\BB_Fig03_SiteLayoutParcels.mxd

The average annual groundwater irrigation demand to establish and maintain new vegetation as part of the plot study is summarized in Table 1. The calculated demand assumes that ALOC Playa Seed Mix is planted in hedgerows that provide approximately 8 percent ground cover in the designated planting area. The irrigation water demand is proposed to be met by extracting groundwater (Table 1).

As noted in Table 1, based on the information available to date, the wells will likely provide excess pumping capacity above the demand of the new vegetation in the Plot Study Area. Excess water may be used to irrigate a greater area or density of vegetation hedgerows, maintain existing drought-resistant and salt-tolerant vegetation in the surrounding portions of the Plot Study Area and surrounding IID-owned land, and/or to help facilitate natural recruitment of additional vegetation in micro-catchments designed to retain storm water runoff. In some of these areas, existing ALOC, *Atriplex canescens* (ATCA), and *Sueda nigra* (SUNI) may be dependent on the regional groundwater table and could experience long-term stress due to ongoing groundwater level declines associated with receding water levels in the Salton Sea (Section 3.2). In other areas, ALOC, ATCA, and SUNI appear to use groundwater that temporarily perches on a shallow clay layer following significant rain events (Section 3.2). This shallow clay is relatively widespread beneath the playa east of Bombay Beach and is believed to be associated with deposition of lakebed sediments in ancient Lake Cahuilla (Section 3.3). The objective of this portion of the Bombay Beach Plot Study is to augment the water supply for existing and naturally recruited vegetation as needed, using an adaptive management approach.

Groundwater extraction will occur from three wells using solar-powered pumps, and irrigation water will only be pumped during daylight hours; however, the pumping rates summarized in Table 1 are presented as daily and long-term annual average rates. During vegetation establishment, it is assumed for this analysis that the average daily extraction rate over a 24-hour period from each of the shallow groundwater wells will be 3.75 gallons per minute (gpm) per well (Table 1), which is equivalent to pumping at 10 gpm for nine hours (maximum instantaneous pumping rate during daylight hours). It is assumed that the long-term average annual rate will be 18 acre-feet/year per well (afy).

TABLE 1. AVERAGE ANNUAL WATER DEMAND AND GROUNDWATER SUPPLY

Water Balance Component	Average Annual Water Demand and Supply		
	gallons/day	**acre-feet/year**	**gallons/minute**
Irrigation Water Demand – 85 acres, up to 8% cover, within a 149-acre Plot Study Area			
Year 1 (1.8 feet/year for planted area, including soil reclamation (salt flushing) and establishment of seedlings)	11,120	12.5	7.7
Years 2 through 4 (1.8 feet/year to establish juvenile plants in planted area)	11,120	12.5	7.7
Long-Term (10 inches/year for planted area)	5,148	5.8	3.6
Groundwater Supply to Meet Irrigation Water Demand			
Shallow Zone Groundwater Pumping Capacity (assumes pumping for 24 hrs/day)	16,200 (5,400 per well)	18 (6 per well)	11.25 (3.75 per well)

Notes: Surplus groundwater will be used to irrigate existing vegetation in the plot study and surrounding IID-owned land within the area potentially affected by project drawdown, and potentially to supply future vegetation-based dust control measures.

Up to three shallow supply test wells will be constructed and operated. It is anticipated that the target groundwater production zone will be between approximately 40 and 100 feet bgs, based on the available lithologic and water quality data. The target production zone is based on a test boring and a geophysical investigation that were completed at the Plot Study Area to support this GRIA. The results of the test boring are included in Attachment A. The results of the geophysical investigation are included in Attachment B.

Based on the findings of the test well investigation, pumping rates greater than those assumed in Table 1, may be feasible. As discussed in Section 4.1, the GRIA model simulations will be updated with site-specific data and higher pumping rates may be simulated, if warranted. The results of the updated GRIA will be used to support the CUP application for the project, as well as an updated CEQA analysis, if determined necessary.

As discussed in Section 3.3, the San Andreas fault has been interpreted to extend beneath the playa in the vicinity of the proposed test wells. The precise location and hydraulic properties of the fault are not known, but faults often act as hydraulic barriers. The primary (TW-1 through TW-3) and alternative (TW-1A through TW-3A) test well locations shown in Figure 3 are located on either side of the mapped fault trace, to maximize the possibility of completing wells on either side of the fault and investigate the fault properties. Depending on the groundwater conditions encountered during drilling of pilot borings for these wells, one or more of the shallow test wells may be completed at the alternative locations shown in Figure 3. As described in Section 4, pumping from wells located on either side of the fault, to the east of the fault, and to the west of the fault was simulated to evaluate the long-term effects of the various well location options.

The shallow groundwater supply test wells will be constructed as follows:

1) Access to each drill site will occur via an existing dirt access route on the playa. At each location, a temporary drilling site will be established in a temporary fenced compound measuring approximately 50 feet by 100 feet.

2) A pilot boring will be drilled at each well location to a depth of approximately 100 feet using a truck mounted Rotosonic drilling rig to characterize subsurface conditions, sample water quality, and collect data necessary for design of the test well. Equipment used typically includes the drilling rig, a support truck, and crew trucks. No drilling additives will be used, and native soil cuttings will be spread on the ground surface in the work area.

3) Each test well will be constructed using 6-inch-diameter polyvinyl chloride (PVC) casing and screen. A grout annular seal will be placed to a depth of approximately 50 feet and a filter pack will be placed in the anulus opposite the screen. Equipment used during well construction will include the drilling rig, delivery trucks, and crew trucks.

4) Each well will be developed by mechanical methods, including surging, bailing, and pumping, as needed. Groundwater removed during development will be dispersed on the playa using a high-capacity sprinkler under a Low Threat Discharge Permit obtained from the Regional Water Quality Control Board (RWQCB). Equipment used during well development will include a development truck and crew trucks.

5) A pumping test will be conducted using one of the test wells. The pumping test will include a step-drawdown test and a 24-hour constant discharge test with water level measurements in the pumping well and the other test wells during pumping and recovery. Groundwater removed during pump testing will be dispersed on the playa using a high-capacity sprinkler under the Low Threat Discharge Permit obtained from the RWQCB. Equipment will include a development truck and crew trucks.

6) At each well head, a solar-powered pump will be installed and well surface equipment, piping, and solar panels will be secured in a fenced compound.

7) A larger central fenced compound measuring 60 by 70 feet will be constructed at one of the well head locations to secure the above-ground storage tanks used to supply the irrigation system. A smaller fenced compound measuring approximately 40 by 40 feet will be constructed at the other well locations.

The test wells will be constructed and tested over a period of approximately two months. After completion and initial pump testing and surface completions of the wells, a long-term pumping test (up to approximately one month) will be conducted to assess long-term performance of the test wells, water quality, and water level response during diurnal solar pumping. During this test period, groundwater may be used to reclaim soil salinity in the Plot Study Area prior to establishing vegetation.

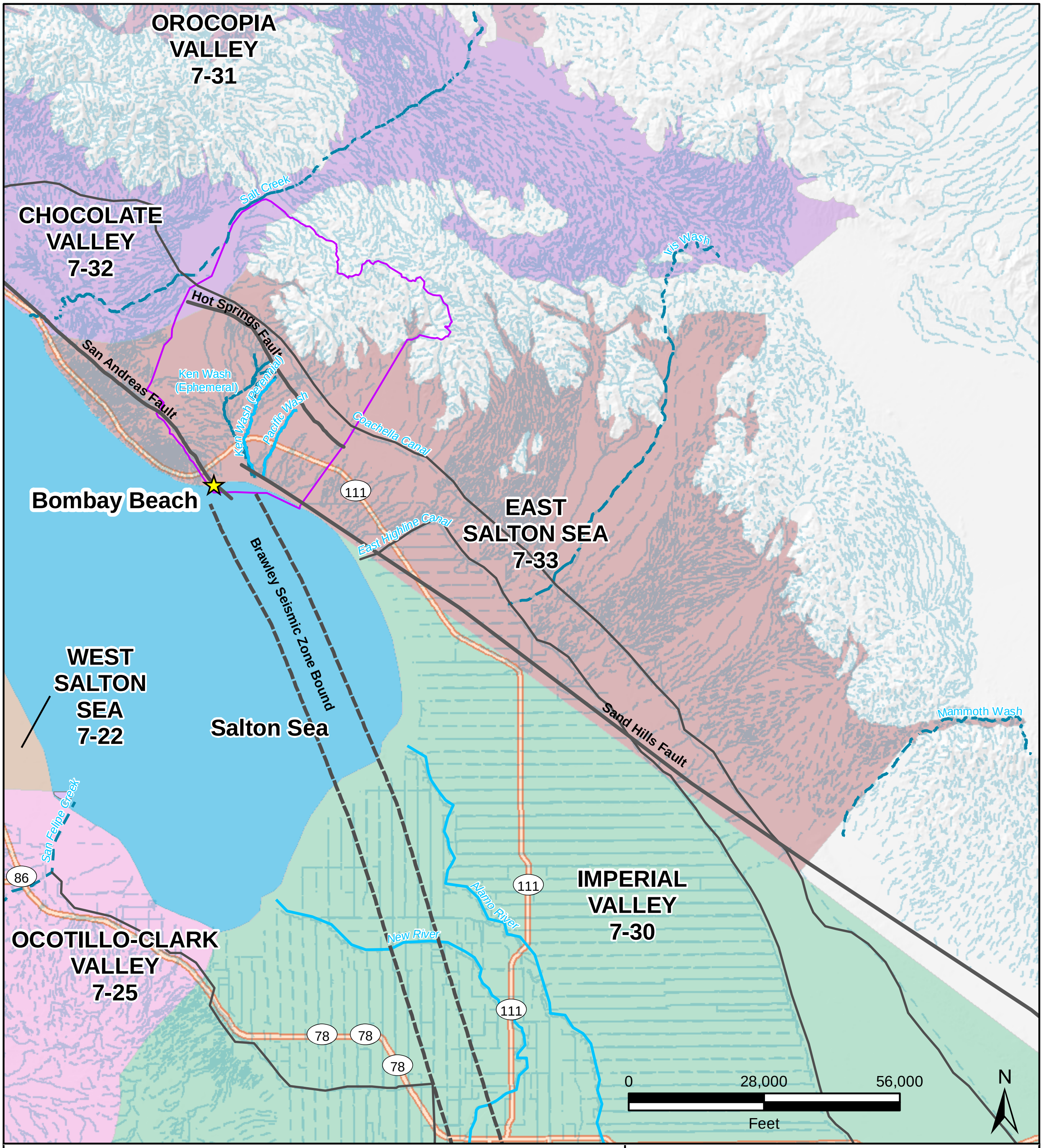
3 PROJECT SETTING

3.1 SURFACE HYDROLOGY

The watershed surrounding the Plot Study Area is shown in Figure 4. The East Salton Sea Groundwater Basin is drained by Mammoth Wash and Iris Wash in the eastern portion and by Ken Wash and Pacific Wash in the western portion (Figure 4). Ken and Pacific Washes drain into the Bombay Beach Wetland, east of the Plot Study Area, which drains directly into the Salton Sea (Figure 5). The Salton Sea is a terminal or closed basin with no outlets. Pacific wash receives perennial flow from the Fountain of Youth resort community and its wastewater treatment plant in the Hot Mineral Spa area. Ken Wash has an east and a west channel (Figure 5). The west channel is ephemeral while the east channel receives perennial flow from Pacific Aqua Farms and two RV resort communities in the Hot Mineral Spa area (Bashford’s Hot Mineral Spa), and an additional wastewater treatment plant. As discussed in Section 3.2, a relatively impermeable clay layer associated with deposits from ancient Lake Cahuilla is present in the shallow subsurface beneath these washes, keeping discharge from seeping into the subsurface and maintaining the flow in the washes. These washes converge at the Bombay Beach wetland, which is located approximately 1 mile east of the proposed test wells (Figure 5) and is maintained by their flow.

The Coachella Canal is located approximately 5 miles northeast of the Plot Study Area, at the foot of the Chocolate Mountains. This canal runs from the southeast to northwest and is lined (Figure 5). As discussed in Section 3.2, there is evidence that leakage from the canal contributes to surface water discharge upslope from the Hot Mineral Spa area, and may contribute to perennial flow in Pacific Wash and the eastern branch of Ken Wash.

Several small wastewater treatment ponds operated by the Bombay Beach Community Services District are located to the northeast and northwest of the Study Area (Figure 5). No apparent surface water discharge occurs from these ponds.



Legend

Groundwater Basins

- 🟪 Chocolate Valley
- 🟫 East Salton Sea
- 🟩 Imperial Valley
- 🟪 Ocotillo-Clark Valley
- 🟪 Orocopia Valley
- 🟫 West Salton Sea

- Brawley Seismic Zone
- Faults Near Study
- Stream; Braided Stream
- Ephemeral Stream
- Canal; Aqueduct; Intracoastal Waterway
- ☐ Approximate Watershed Bombay Beach Area

BOMBAY BEACH STUDY AREA

SALTON SEA

FIGURE 4

HYDROGEOLOGIC SETTING

DATE: SEP 09, 2022

BY: DKG

FOR: BAL

FORMATION ENVIRONMENTAL

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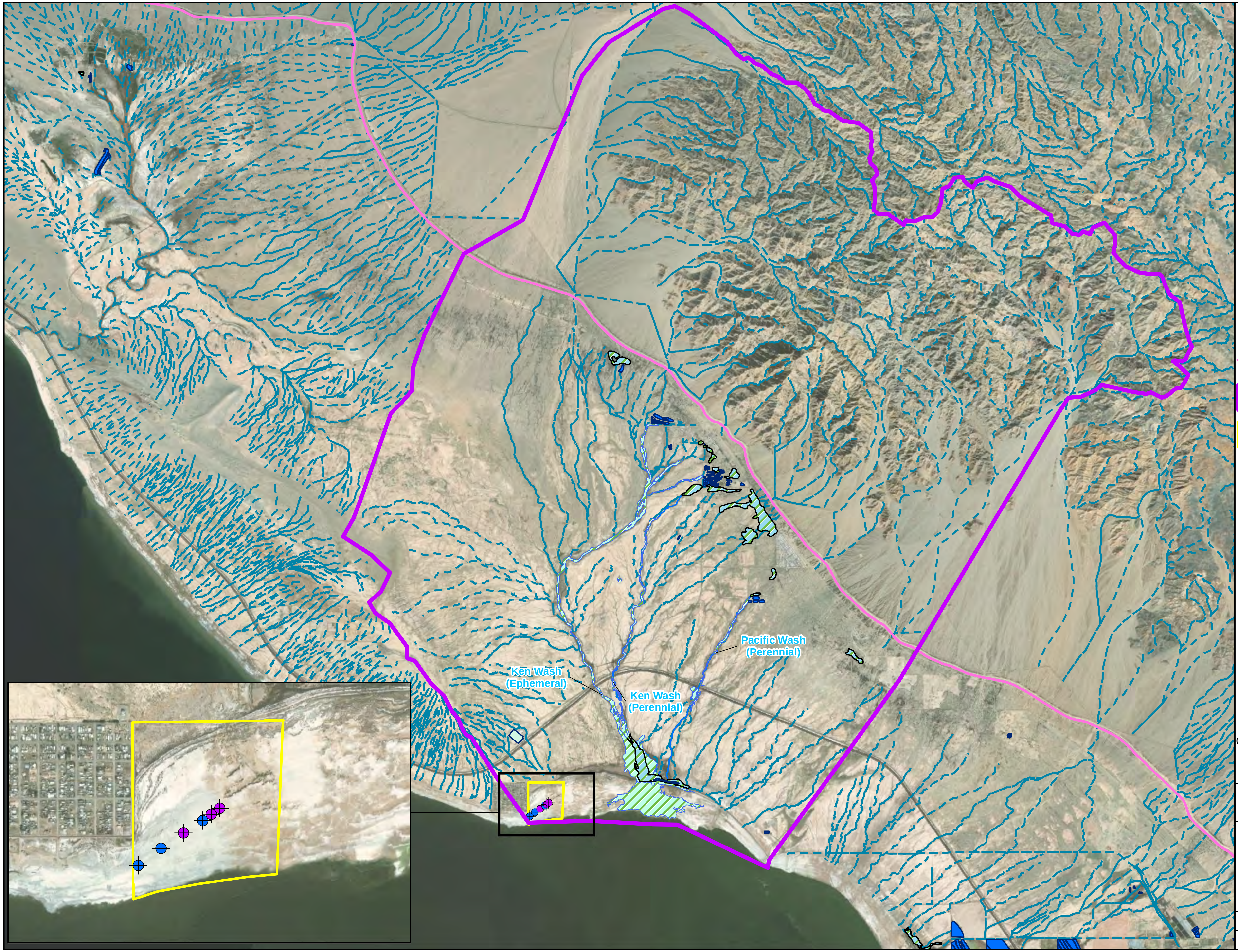

Legend

Proposed Shallow Wells

- ⊕ Primary Shallow Test Well
- ⊕ Alternate Shallow Test Well
- ■ Lake / Pond
- □ Reservoir
- ▨ Swamp or Marsh (NHD)
- ▨ Wetlands (ECORP and Formation Environmental)
- - - Ephemeral Streams
- — Perennial Streams
- — Coachella Canal
- □ Approx Bombay Beach Area Watershed
- □ Plot Study Area

BOMBAY BEACH STUDY AREA

SALTON SEA

FIGURE 5

SURFACE HYDROLOGY IN STUDY AREA VICINITY

DATE: SEP 09, 2022

BY: DKG FOR: BAL

FORMATION ENVIRONMENTAL

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3.2 POTENTIAL GROUNDWATER-DEPENDENT VEGETATION

Potential groundwater dependent ecosystems (GDEs) near the Plot Study Area are shown in Figure 6. These potential GDEs were identified using the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset developed for the DWR by The Nature Conservancy (TNC) in cooperation with the California Department of Fish and Wildlife. Data were downloaded from the GDE Pulse website (TNC 2021). The mapped GDEs include the Bombay Beach wetland, aquatic and emergent wetland vegetation along Pacific and Ken Washes, and several areas of mapped alkali shrub wetland located north of the Salton Sea 2002 shoreline berm and near the Hot Mineral Spa and Frink areas. Additionally, recent vegetation mapping conducted by Formation in December 2021, identified local occurrences of ALOC and SUNI, which are classified as obligate phreatophyte species, at elevations below -201 feet above mean sea level (amsl) in the vicinity of the Plot Study Area (Figure 6). Other potentially groundwater-dependent vegetation, including ATCA and *Atriplex lentiformis* (ATLE), were also found below this elevation. Finally, tamarisk (*Tamarix sp.*), a highly invasive phreatophyte species that utilizes large quantities of groundwater, is evident along Ken and Pacific Wash and in the upslope portions of the Bombay Beach wetland.

Our observations indicate that in some of the areas, the plant species described above may be dependent on the regional shallow groundwater table. The depth to the regional groundwater table increases with distance from the Salton Sea, which may explain the observed general limitation of these species below certain elevations. In these areas, this elevation line may be expected to shift seaward as the Salton Sea shoreline recedes and shallow groundwater levels fall.

Evidence of groundwater perching on a widespread shallow clay layer believed to be associated with sediments deposited in ancient Lake Cahuilla has been observed in many areas east and northeast of Bombay Beach. Near the Bombay Beach wetland and the perennial washes, this perched water appears to occur perennially, whereas, further to the east and west, perching of shallow groundwater appears to occur only after significant precipitation events. Phreatophyte vegetation dependent on perched groundwater would not be expected to be affected by decreases of shallow groundwater levels.

In the Durmid Hill area, described in Section 3.3.3 and located north and northwest of the community of Bombay Beach, the depth to groundwater is inferred to be greater than 20 feet bgs and there are no continuous clay layers that perch water. Thus, no GDEs are expected to occur in this area.

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c)

Legend

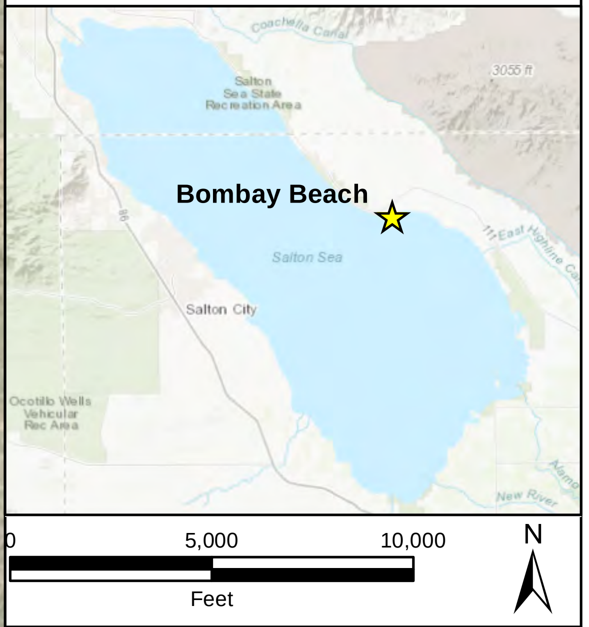
Proposed Shallow Wells

●	Primary Shallow Test Well
●	Alternate Shallow Test Well

GDE Vegetation

🟩	Alkali Desert Scrub
- - -	ALOC and SUNI, -201ft amsl
🟦	Lake / Pond
☐	Reservoir
▨	Swamp or Marsh (NHD)
▨	Wetland (ECORP and FE)
☐	Plot Study Area

Notes:
1. GDE Vegetation from NCCAG Vegetation data set (DWR, CDFW, and the Nature Conservancy).
2. Wetlands are a combination of the USGS National Hydrography Dataset (NHD) and Formation Environmental LLC observations.



BOMBAY BEACH STUDY AREA

SALTON SEA

FIGURE 6

GDE VEGETATION NEAR STUDY AREA

DATE: SEP 09, 2022
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3.3 HYDROGEOLOGY

3.3.1 HYDROGEOLOGIC SETTING

The Bombay Beach Plot Study Area is located in the East Salton Sea Groundwater Basin (DWR Basin No. 7-33) (Figure 4). The East Salton Sea Groundwater Basin is bounded by rocks of the Chocolate Mountains on the north and east, by the San Andreas Fault on the south and west, and by the Sand Hills Fault on the south (Figure 4). The basin is 306 square miles in area (196,000 acres) (DWR 2004). A summary regarding the East Salton Sea Groundwater Basin is provided in Table 2. According to the California Department of Water Resources (DWR 2004, Sims 2017), the storage capacity is estimated to be approximately 360,000 acre-feet; however, the actual amount of groundwater in storage is qualified as unknown. Groundwater in the area generally moves in a southwesterly direction and presumably discharges to the Salton Sea or as evapotranspiration from the surrounding playa. Annual recharge to the basin is stated as being about 200 AFY but is also qualified as uncertain. The California Statewide Groundwater Elevation Monitoring (CADGEM) program designates the basin as a "very low" priority (DWR 2019). There are no CASGEM monitoring wells in the basin. The basin is not listed as being in critical overdraft (DWR 2016). According to the DWR (1999), water level measurements collected between 1963 and 2000 indicate that a steady decline has occurred; however, the location of these measurements is not indicated. A more detailed analysis of recent local groundwater level trends is presented in Section 3.3.4.

TABLE 2. SUMMARY OF EAST SALTON SEA GROUNDWATER BASIN

DWR Groundwater Basin Number	Approximate Area	CASGEM Priority	Critical Overdraft
7-33	196,000 acres	Very Low	No
Sources: DWR 2004, DWR 2016, DWR 2019			

Groundwater resources in the East Salton Sea Groundwater Basin are very sparsely developed. No evidence of current groundwater use has been observed or reported in the area within about 5 miles of the Plot Study Area. According to the "Groundwater Exchange" website,[1] there are no drinking water supply wells in the basin. Several low-temperature shallow geothermal wells are located approximately 5 to 5.5 miles to the north of the Plot Study Area in the Hot Mineral Spa geothermal area, which is further described in Section 3.3.3. These wells supply geothermal groundwater to the Fountain of Youth Spa, Bashford's Hot Mineral Spa, and Lark Spa, and to the Pacific Aquafarms fish farm. Discharges from these facilities provide perennial flow to Pacific Wash and the eastern branch of Ken Wash and represent a source of recharge to the perched aquifers that underly the lower portions of these watersheds, as discussed in Section 3.3.4.

---

[1] https://groundwaterexchange.org/basin/east-salton-sea-7-033

The groundwater quality in the basin is reported as not being suitable for domestic, municipal, or agricultural purposes (DWR 2004).

3.3.2 GEOLOGIC SETTING

The East Salton Sea Groundwater Basin is located within the Salton Trough, which is the northern extension of the Gulf of California tectonic zone and is the result of active rifting of the continental crust (Barker 2001). The Salton trough consists of a series of deep, complex pull-apart structures that formed as a result of strike-slip motion between the Pacific and North-American plates, after the Farallon plate subduction ceased. The San Andreas Fault system developed during the Miocene Epoch.

Pull-apart basins formed at step-overs along the strike-slip faults of the San Andreas Fault system, resulting in the actively subsiding Brawley Seismic Zone in Imperial Valley and beneath the southern portion of the Salton Sea. In the Gulf of California, the pull-apart basins evolved into short seafloor spreading segments (Ikediobi 2013).

In the vicinity of the Plot Study Area, a transpressional ridge underlies Durmid Hill north of the community of Bombay Beach, where the southernmost San Andreas Fault zone changes gradually along the strike into the transtensional Brawley seismic zone (Figure 7) (Janecke et al. 2018). The active East Shoreline fault zone extends along the southwest side of the Durmid Hill area, whereas the San Andreas Fault is located to the northeast. In this area, Pliocene to modern sediments have been strongly folded and faulted by hundreds of faults that form the “Durmid ladder structure.” This area is being uplifted, and the land surface consists of a wave-cut platform eroded during the most recent high water-level stand of Lake Cahuilla. Further to the east and southeast of Bombay Beach, gravity data indicate that the land is subsiding and is underlain by an accumulation of lacustrine and alluvial basin-fill sediments.

The portion of the Salton Trough in which the Salton Sea is located has been filled predominantly with continental sediments derived from the Colorado River delta from the north and by sediment from the adjacent Peninsular and Transverse Ranges from the west and northwest (Barker 2001). The oldest basin fill rock is the upper Miocene to Pliocene Imperial Formation, which is composed of marine sediments deposited in shallow water resulting from a transgression of the Gulf of California. Fluvial and deltaic sediments deposited by the Colorado River cut the Salton Sea area of the Salton Trough off from the Gulf of Mexico between 5.5 and 4.0 million years before present (Ma) and are represented by the Diablo Formation and transitional sediments attributed to the Palm Springs Group (Kirby et al. 2007, Belgarde 2007). The Borrego Formation was deposited in a mud-dominated perennial lake in the Pliocene and early Pleistocene, and consists primarily of mudstone and claystone, with minor amounts of sandstone derived from the Colorado River (Kirby et al. 2007).

Beginning approximately 1.1 Ma, lacustrine and alluvial sediments of the Brawley and Ocotillo Formations prograded abruptly over the Borrego Formation. These consist of fluvial-deltaic sands and silts of Colorado River origin; lacustrine clays, silts, and fine sands of Colorado River or local origin; mudstones with common sand-filled desiccation cracks; occasional eolian sands; and occasional evaporites of the Brawley Formation. Near the margins of the basin, these are interbedded with and grade into the Ocotillo

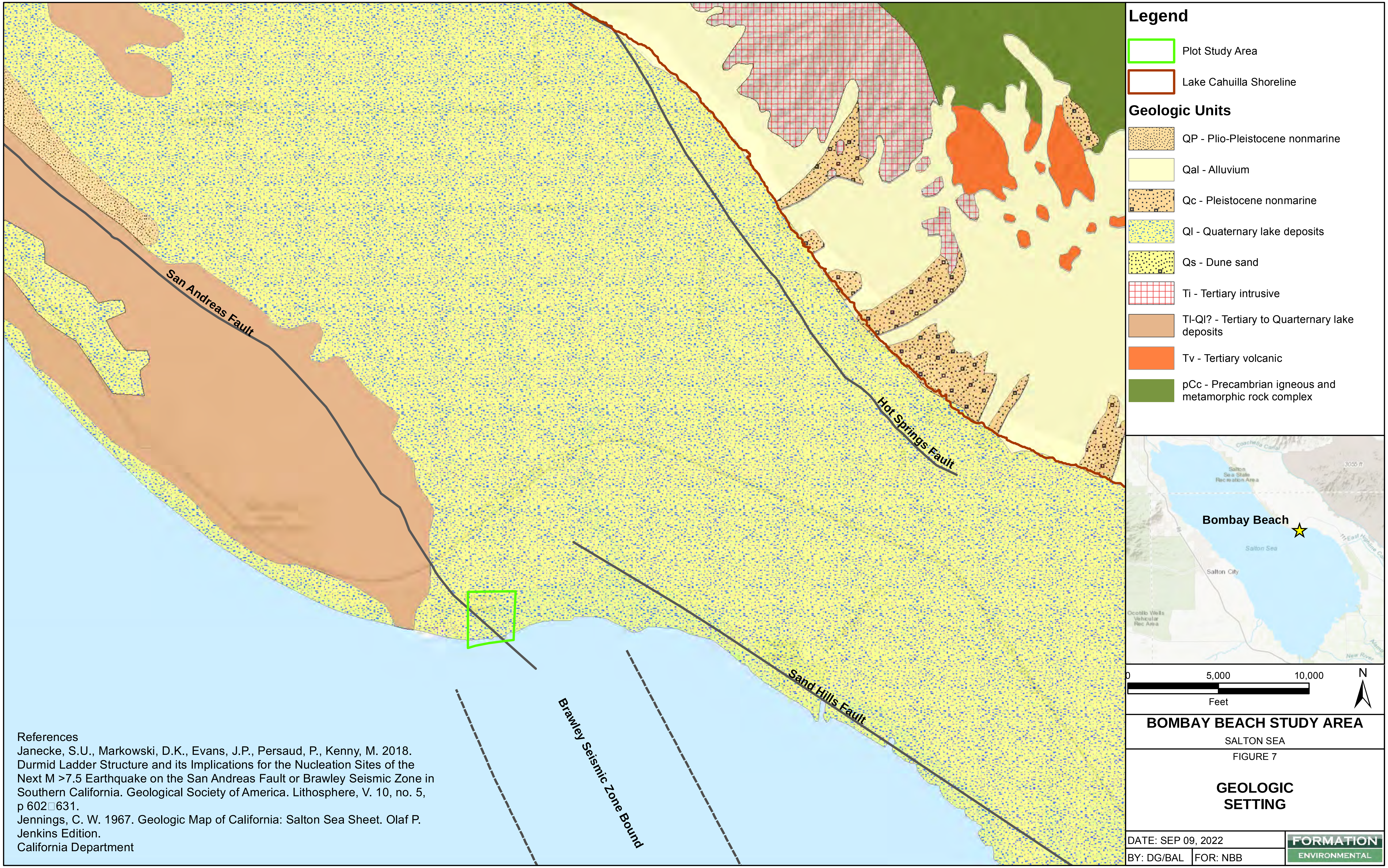
Formation, which consists of locally derived sands, pebbly sands and conglomerates of alluvial fan origin, and sands of local fluvial origin (Kirby et al. 2007). These sediments reflect repeated cycles of Colorado River inflow, lake formation, drying and subaerial exposure, and the influence of continued local sediment influx and alluvial fan progradation.

Holocene and Recent processes have deposited sedimentary sequences as a result of repeated filling of the ancient Lake Cahuilla basin when avulsions of the Colorado River caused it to flow northward into the basin instead of southward into the Gulf of Mexico. When the Colorado River flowed southward into the Gulf of Mexico, ancient Lake Cahuilla dried and subaerial exposure occurred. During these periods, sediments were derived primarily from local sources. At least four cycles of lake inundation and drying were inferred by Waters (1983) in the last 2,000 years, but other works have inferred additional inundation cycles related to Colorado River influx and climatic variability from the late Pleistocene to the present (Demere and Ekdale 2011). Reported sediment thicknesses range from less than 1 foot (deposited on a wave-cut surface, Hudnut 1989) to approximately 22 feet (Waters 1983); however, the timing and duration of inundation periods and the thickness of the accumulated sediments is an area of active research.

The groundwater-bearing sediments in the vicinity of the Plot Study Area primarily consist of Holocene lacustrine and alluvial deposits overlying older Pleistocene to Pliocene lacustrine deposits of the Brawley Formation (Figure 7), and were deposited in ancient Lake Cahuilla, as described above. The lacustrine deposits are comprised of silts and clays with interbedded sandy zones. The layered packages of silts, clays, and interbedded fine sands are likely thicker toward the center of the basin and become thinner towards the mountain front where the topography slopes above the basin floor. This depositional process created lacustrine packages with laterally extensive confining units near the Plot Study Area, resulting in the shallow and deep groundwater zones described in Section 3.3.3. Along the mountain front, coarser sand and gravel alluvial deposits are present, with less fines. According to the DWR (2004), recharge to the basin is thought to be primarily from infiltration through these mountain front alluvial deposits.

Figure 7, based on Janecke and others (2018) and Jennings (1967), shows the mapped faults, along with the mapped geology, in the vicinity of the Plot Study Area. The DWR (2004) described the San Andreas Fault as a potentially restrictive structure that may be an impedance to groundwater flow. The Hot Springs fault is also likely an impedance to groundwater flow. Finally, the Sand Hills fault is also potentially a restrictive structure. As described in Section 4.1, the hydraulic conductance terms across these faults were varied in the model simulations, to evaluate the potential effects of the faults.

The nearest reported subsidence monitoring station is the GPS monitoring station P505 (Imperial SpCS2006) NAM14 operated by UNAVCO. It is located approximately 6 miles north of the Plot Study Area (UNAVCO 2022). No subsidence has been reported at this station since recording began in 2006.



References
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Jennings, C. W. 1967. Geologic Map of California: Salton Sea Sheet. Olaf P. Jenkins Edition.
California Department

BOMBAY BEACH STUDY AREA
SALTON SEA

FIGURE 7

GEOLOGIC SETTING

DATE: SEP 09, 2022
BY: DG/BAL
FOR: NBB

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3.3.3 HYDROSTRATIGRAPHIC UNITS

Figure 8 illustrates the hydrogeologic conceptual understanding of the area surrounding the Plot Study Area, including the inferred extent of the major conceptual hydrostratigraphic units found in the upper 100 feet of strata. The aerial extent of these units is interpreted from the mapped geologic structures and geologic contacts between alluvial and lacustrine sediments. These hydrostratigraphic units define the groundwater systems found in the vicinity of the Plot Study Area and represent the upper 100 feet of stratigraphy in the basin. Deeper hydrostratigraphic units are not described herein, because they are below the target groundwater production zone for the Bombay Beach Plot Study.

The major hydrostratigraphic units in the vicinity of the Plot Study Area are described below:

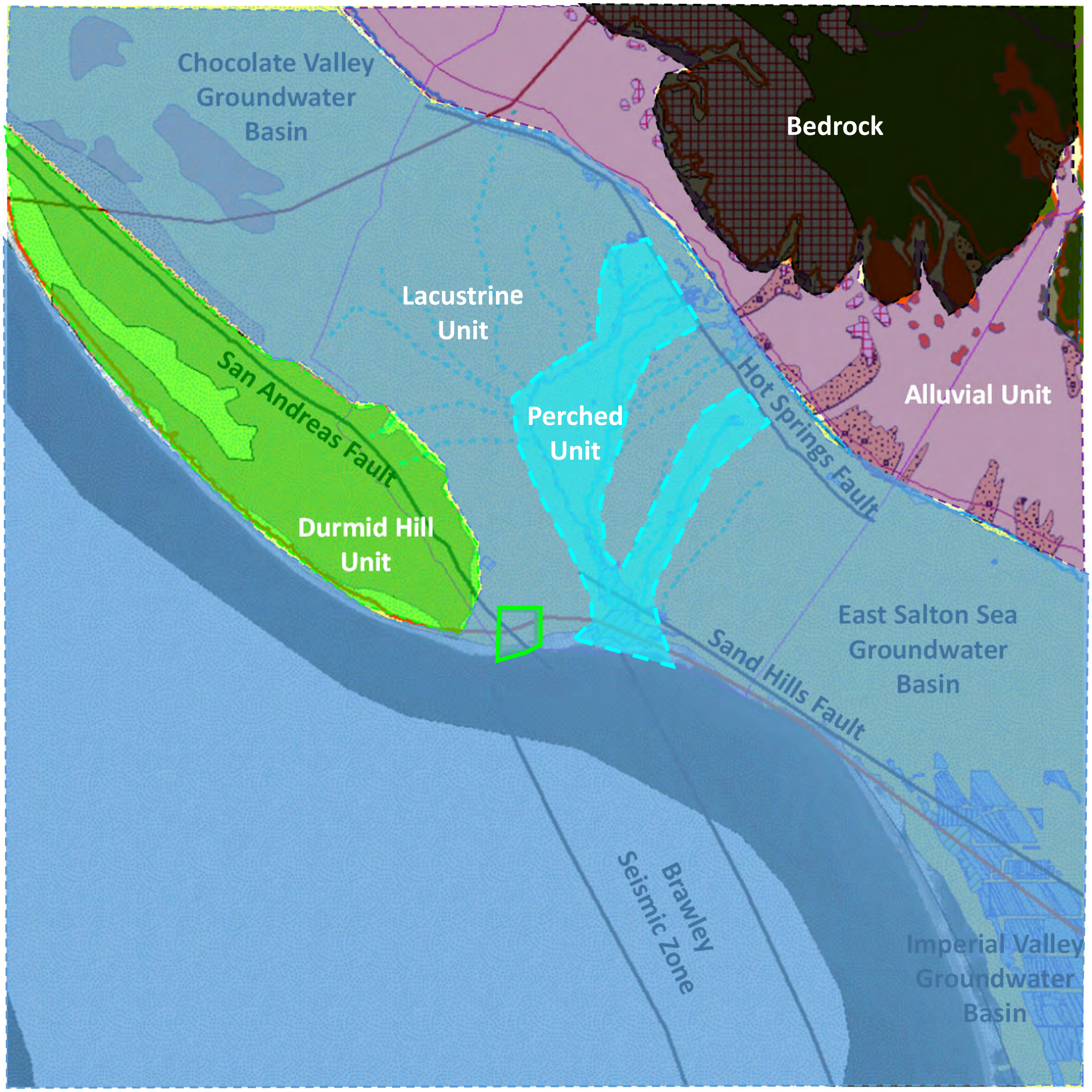
- **Lacustrine Unit:** The proposed test wells described in Section 2 will be completed within the lacustrine unit, which is characterized by Pleistocene to Recent lacustrine sediments consisting of sandy groundwater-producing zones interbedded with regionally extensive lacustrine silts and clays that act as aquitards. Toward the mountain front, these sediments may be increasingly interbedded with alluvium that is locally derived from the Chocolate Mountains. The alluvial hydrostratigraphic unit borders the lacustrine unit to the north and is characterized by the alluvial deposits found along the mountain front, as described below.

- **Alluvial Unit:** The alluvial unit borders the lacustrine unit to the north and northeast, and is characterized by the coarser-grained sands and gravels that are proximal to the mountain front. The materials were derived from the Chocolate Mountains and deposited in alluvial fans along the mountain front, mostly uphill from the Hot Springs Fault.

- **Durmid Hill Unit:** The Durmid Hill unit borders the lacustrine unit to the west, in the area of the Durmid ladder structure. This unit is characterized by highly deformed, predominantly fine-grained lacustrine sediments of the Brawley Formation associated with the San Andreas Fault zone, described previously.

- **Perched Unit:** A perennial perched groundwater system, extending from the Bombay Beach wetland along Ken and Pacific washes, is comprised of sandy alluvial and aeolian water-bearing materials perched on top of fine-grained lacustrine sediments deposited during the latest incursion of ancient Lake Cahuilla, which hydraulically separates the perched horizon from the underlying lacustrine unit. Groundwater may also temporality perch elsewhere in the Plot Study Area, following significant precipitation events, where the lacustrine perching unit(s) are present.

Major structural features important to our conceptual hydrogeologic understanding of the area include the Hot Springs and San Andreas Fault Zones, which likely act as restrictive structures to groundwater flow, the contact between permeable alluvial sediments and crystalline bedrock of the Chocolate Mountains along the northeast side of the basin, and the contact between highly deformed, relatively low permeability rocks underlying the Durmid Hill area with the more permeable and horizontally extensive lacustrine basin fill sediments to the south and southeast.



Legend

Perched Unit Extent

Alluvial Unit Extent

Lacustrine Unit Extent

Durmid Hill Unit Extent

Bedrock (no flow)

Plot Study Area 🟩

Bombay Beach Study Area

Salton Sea

FIGURE 8

Hydrogeologic Conceptual Model

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BY: NBB

FOR: MT

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3.3.4 AQUIFER PROPERTIES

Aquifer properties have been reported for a range of fine-grained (e.g., silts, silty clays, and clays) and coarse-grained (e.g., gravelly sands, sands, and silty sands) materials found in the southern region of the Salton Sea Basin, including the East Salton Sea Groundwater Basin, West Salton Sea Groundwater Basin, Ocotillo-Clark Valley Groundwater Basin, and Imperial Valley Groundwater Basin (basins are shown in Figure 1). Estimates pertinent to the hydrostratigraphic units in the vicinity of the Plot Study Area are summarized in Table 3.

TABLE 3. SUMMARY OF PUBLISHED HYDRAULIC CONDUCTIVITY ESTIMATES FOR THE REGION

Author	Fine-Grained (ft/day)	Coarse-Grained (ft/day)
Lawrence Livermore National Laboratory (LLNL) (2008)	0.6	100
Davids Engineering (2007)	0.26 to 0.65	22 to 25
GEI Consultants (2012)	--	13 to 71
Tetra Tech (1999)	--	36 to 428
Montgomery Watson (1995)	0.67 to 0.94	97 to 401

GEI (2012) estimated that storativity values in the Salton Sea basin range from 0.01 to 0.0001.

3.3.4.1 LACUSTRINE UNIT

The lacustrine unit is generally comprised of lacustrine sediments consisting of interbedded clay, silt, silty sand, and fine sand. The uppermost portion of the lacustrine unit contains a thin sequence of sandy deposits. Lithologic and geophysical logging of a test boring at Bombay Beach (included as Attachment A) in October 2020, and a subsequent geophysical investigation using towed time-domain electromagnetics (tTEM) and single site TEM (WalkTEM) methods (Ramboll 2022, included as Attachment B) indicates that the upper 100 to 150 feet of sediments may be generally divided into an upper and lower groundwater zone, separated by a confining unit.

Based on interpretation of available groundwater-level data, groundwater in the lacustrine unit generally flows to the south, away from the mountain front, in the direction of the Salton Sea shoreline (Figure 8).

Upper Groundwater Zone

The upper groundwater zone consists of the unconfined water table aquifer, and it occurs from approximately 5 to 20 feet bgs (Figure 9). On the Salton Sea playa, the upper zone generally has poor, highly saline groundwater quality. Groundwater quality in the upper zone has been monitored by

Formation in access tubes,[2] which have been installed in the Plot Study Area since 2015. Groundwater samples collected from the access tubes show Total Dissolved Solids (TDS) concentrations ranging from approximately 40,000 to 50,000 milligrams per liter (mg/L).

Groundwater-level data have been collected from the access tubes since 2016 by periodic manual measurements and routine measurements from pressure transducers equipped with data loggers. The access tubes were installed on the playa in a transect oriented perpendicular to the shoreline of the Salton Sea. Recent groundwater-level measurements indicate that the depth to groundwater becomes shallower down-transect, in the direction of the shoreline, ranging from approximately 3.5 feet bgs near the current shoreline to approximately 9 feet bgs 2,000 feet upslope from the shoreline, at the most distal access tube.

Figure C-1 in Attachment C shows the hydrographs for the access tubes installed in the Plot Study Area. These data show an overall groundwater elevation trend that is declining, with intermittent groundwater elevation spikes following seasonal recharge events. Groundwater elevations appear to be declining at a long-term rate of approximately 0.5 feet per year. These data suggest that groundwater levels in the uppermost groundwater-bearing zone beneath the playa are declining as water levels in the Salton Sea recede. Further declines are expected as the Salton Sea continues to recede.

The upper groundwater zone is comprised of fine sands between 5 and 20 feet bgs, with little to no fines (Attachment A). Laboratory grain-size analyses were conducted on a representative sample collected from the upper sand stratum. The grain-size distribution was used to estimate the hydraulic conductivity of these strata using the methods described by Devlin (2015). The calculated hydraulic conductivity was estimated at approximately 19 feet per day (ft/day), which is the lower end of the range for coarse-grained materials reported in Table 3, above.

Lower Groundwater Zone

The lower groundwater zone occurs below a depth of 40 feet bgs and is overlain by a clayey sequence from approximately 20 to 40 feet bgs (Figure 9) that produces confined to semi-confined conditions. Based on the geophysical boring log and the findings of the geophysical investigation, water quality improves considerably below the clayey confining unit. Preliminary groundwater quality measurements collected from the exploratory borehole suggest that TDS values range from approximately 10,000 to 12,000 mg/L (based on electrical conductivity measurements) in the lower zone. These results are consistent with the zone of “fresher” groundwater quality described by the geophysical investigation results presented in Attachment B. Upgradient, approximately 4.5 miles to the northeast of the Plot Study Area, several groundwater monitoring wells have been installed in the lower groundwater zone to investigate the groundwater conditions underlying the Hot Spa Solid Waste Site. Groundwater samples collected from these monitoring wells between 2005 and 2015 indicate that TDS values range from approximately 7,000 to 14,000 mg/L. Figure C-2 in Attachment C shows TDS concentration trends for these monitoring wells.

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[2] Access tubes are temporary groundwater monitoring locations completed within first-encountered groundwater at depths ranging from approximately 5 to 13 feet bgs.

This groundwater is too saline for agricultural use, and State Water Resources Control Board Resolution 88-63 states that water containing TDS concentrations over 3,000 mg/L would not be considered suitable as a source of municipal or domestic supply.

Figure C-2 in Attachment C shows the groundwater level hydrographs for monitoring wells installed at the Hot Spa Solid Waste Site. Routine groundwater-level measurements were collected from 2005 to 2019. The most recent depth-to-water measurements ranged from approximately 85 to 97 feet bgs. The hydrographs show a steadily declining groundwater-level trend, at a rate of approximately 0.25 feet per year.

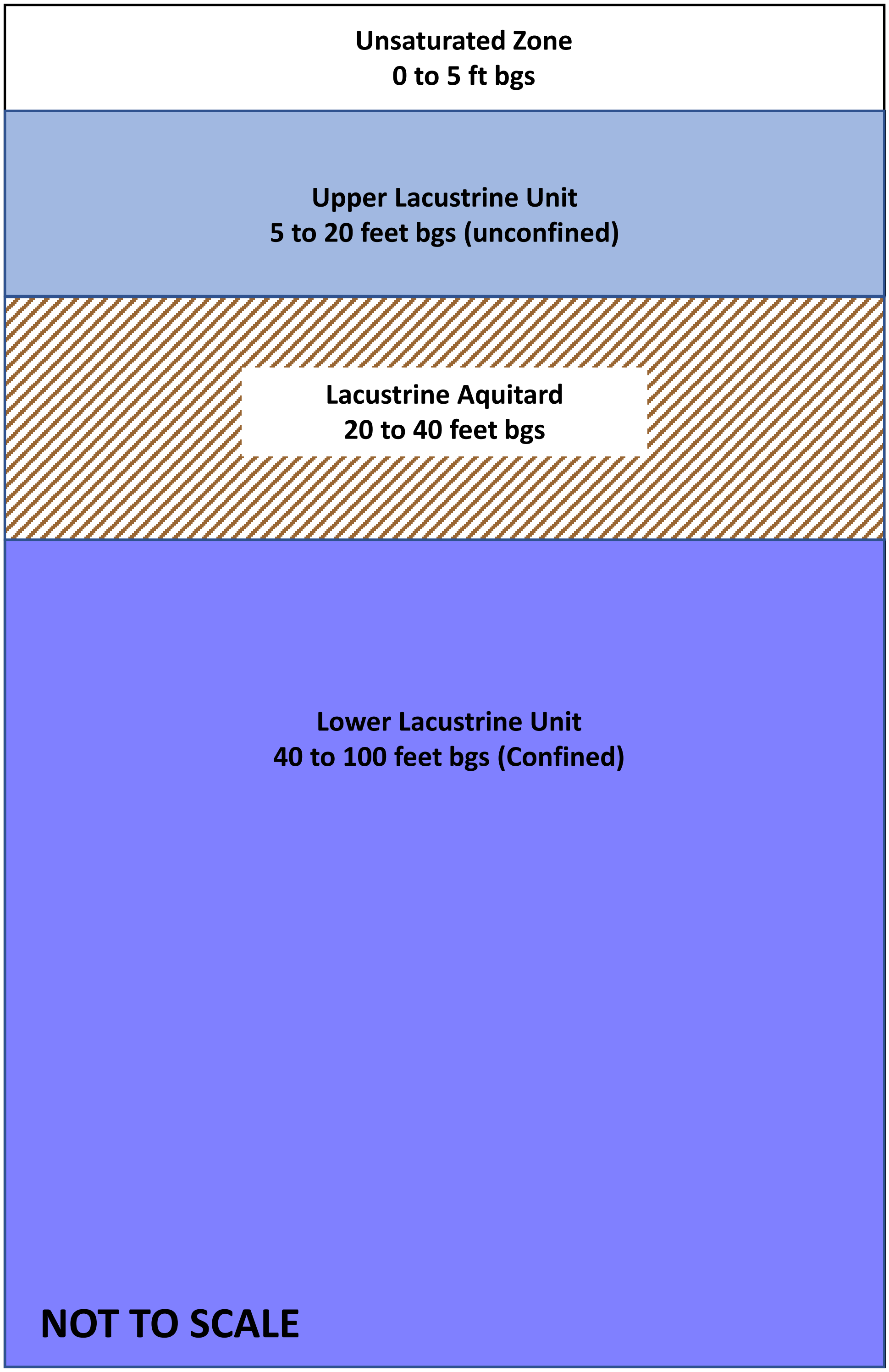
Based on the lithologic data and the preliminary groundwater quality results described above, the target groundwater production zone for the test wells appears to be the lower zone, extending from approximately 40 to 100 feet bgs. The lower zone is comprised of fine sands, silty sands, and clayey sands with interbeds of clays up to 5 feet thick between 40 and 100 feet bgs (Attachment A). Laboratory grain-size analyses were conducted on representative samples collected from the fine sand and silty sand stratum. The grain-size distribution was used to estimate the hydraulic conductivity of these strata using the methods described by Devlin (2015). The calculated hydraulic conductivity was estimated at approximately 20 ft/day for coarser sands, 4 ft/day for fine sands, and approximately 2 ft/day for the silty sands. Based on the thicknesses of each of these lithologies, the estimated composite hydraulic conductivity is approximately 5 ft/day for the lower zone.

3.3.4.2 PERCHED UNIT

The perched unit is comprised of alluvial materials deposited along the Ken and Pacific washes and modern sandy alluvial and aeolian sediments deposited on shallow lacustrine clays beneath the Salton Sea playa. In March 2020, Formation investigated the perched groundwater system on the east and west side of the Bombay Beach wetland. The perched system appears to be perennially mounded on top of a competent and laterally extensive clay perching unit. The saturated thickness of the perched unit is greatest in the center and thins on the edges. Thus, the perennial system has a limited lateral extent, and primarily underlies the washes and wetland. An approximately 5-foot thick unsaturated zone was observed below the perched confining unit at the investigation locations. The perched zone is believed to extend upgradient (north) from the wetland along the Ken and Pacific washes, to the mountain front (Figure 8). Groundwater may also temporality perch elsewhere in the Plot Study Area, following significant precipitation events, where the lacustrine perching unit(s) are present.

Recharge to the perched system is likely from the surface waters found in the Ken and Pacific washes. Groundwater in the perched zone has TDS values of 60,000 mg/L, near the western edge of the Bombay Beach wetland. The TDS of the wetland ranges from approximately 5,000 to 16,000 mg/L, suggesting that perched water beneath the wetland may contain lower TDS concentrations.

Groundwater in the perched unit generally flows to the south, away from the mountain front, in the direction of the Salton Sea shoreline (Figure 8).



Notes:

1. bgs = below ground surface
2. Generalized hydrostratigraphy based on exploratory boring in Attachment A.

Bombay Beach Study Area
Salton Sea

FIGURE 9

Lacustrine Unit Hydrostratigraphy

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3.3.4.3 ALLUVIAL UNIT

The alluvial unit is comprised of alluvial materials deposited proximal to the mountain front, upslope of the contact with the mapped ancient Lake Cahuilla shoreline. Limited information is available for the alluvial unit, which is located to the north of the Plot Study Area (Figure 8). Based on the available information, the thickness of the alluvial unit is estimated at 50 to 100 feet. The alluvial unit transitions into the Hot Springs Aquifer with depth, as described below. The hydraulic conductivity of the Alluvial Unit is estimated at approximately 20 ft/day based on the material properties evident in the available boring logs in the area and the published values summarized in Table 3.

Regional circulation of geothermal waters occurs along the northern margin of the Salton Trough on the northeastern (upgradient) side of the Hot Springs Fault shown in Figure 7. According to Hunter (1992), the geothermal waters are predominantly confined to an approximately 130-foot-thick body of Holocene alluvial sand and gravel, encountered by several flowing artesian hot spring wells completed at depths ranging from 65 to 420 feet. This coarse-grained deposit is absent in the wells to the south and west of the Hot Springs Fault where a 4,000-foot-thick sequence of clay, mudstone, and siltstone are present (Hunter 1992). Thus, the fault appears to define the southwestern boundary of the Hot Springs Aquifer. Holocene clay and mudstone lake deposits serve at the upper confining unit for the geothermal waters (Hunter 1992).

The water quality of the Hot Springs Aquifer has TDS values ranging from approximately 2,100 to 3,800 mg/L (Hunter 1992). Production rates from wells tapping the aquifer are reported to range from 150 gallons per minute (gpm) via pumping (Coachella Valley Pump and Supply, Inc. 1972) to 900 gpm artesianally (Hardt and French 1976). Youngs (1994) reported a flow rate of 400 gpm for wells at the Hot Mineral Spa geothermal area. Sims (2017) reported that an artesian well continuously discharges 510 gpm at Pacific Aquafarms. Thompson et al. (2008) identified a well in this area as producing 600 to 2,700 gpm. As of 1998, 23 wells were reported to be drilled into the producing zone in the Hot Mineral Spa area, of which 14 were used for aquaculture and/or recreation (Hunter 1992). The aquifer was reported to produce a combined flow of approximately 4,000 acre-feet of thermal water per year (Hunter 1992).

Water that is not consumptively used in this area is discharged to Pacific Wash and the eastern branch of Ken Wash. Deep percolation of discharge from the recreational facilities, fish farm, and wastewater treatment plants, coupled with seepage across the Hot Springs Fault, leakage from the Coachella Canal, and mountain front recharge, is a likely recharge source to the Perched and Lacustrine Units.

Groundwater in the alluvial aquifer generally flows to the south-southwest, away from the mountain front, in the direction of the Salton Sea shoreline (Figure 8).

3.3.4.4 DURMID HILL UNIT

The Durmid Hill unit is comprised of highly deformed and faulted lacustrine sediments of the Brawley Formation. These generally fine-grained and highly deformed sediments, described previously, likely would not yield significant volumes of water to wells because of the discontinuity between the water-bearing zones from the folding and faulting in the area.

Limited information is available for the Durmid Hill unit. A well records search in the area shows several wells completed in this area to depths ranging from 160 to 800 feet bgs. The well yield and groundwater quality in these wells are not reported, and no wells are reported to currently be pumping. In general, fine-grained lacustrine sediments that are highly deformed would not be expected to have significant permeability or lateral continuity. It is assumed that the hydraulic conductivity of these materials is approximately 1 ft/day.

Groundwater in the Durmid Hill unit is assumed to generally flow to the south-southwest in the direction of the Salton Sea shoreline (Figure 8). The depth to groundwater in this unit is assumed to be greater than 20 feet bgs based on the hydrogeologic setting.

4 EFFECTS ANALYSIS

4.1 CONCEPTUAL APPROACH

As described in Section 2, up to three shallow supply test wells are proposed to be installed and operated at the Bombay Beach Study Area. The data to characterize the aquifer system in the East Salton Sea Groundwater Basin is limited, and groundwater resources in the target groundwater supply zone are not currently being used, so use of an analytical element model with conservative simplifying assumptions is appropriate to evaluate the potential effects of operating the wells.

To simulate drawdown, a multi-layered modeling approach was implemented using the AnAqSim modeling code (Fitts Geosolutions 2020), which is a three-dimensional (multi-layer) analytical element modeling code capable of simulating groundwater flow to wells under confined, unconfined, or semiconfined aquifer conditions. AnAqSim can simulate a variety of boundary conditions (e.g., no-flow, constant flux, variable flux, general head, and constant head), line or area sources and sinks (e.g., rivers and recharge), and flow barriers (e.g., faults). AnAqSim can be used to simulate transient conditions as a result of pumping from single or multiple wells at constant or varying rates and calculates the head and discharge as functions of location and time across a designated model grid or at designated points.

The model boundary conditions and inputs are illustrated in Figure 10. A head-dependent normal flux boundary was modeled to the east, west, and south of the Plot Study Area. A constant head boundary was modeled north of the Plot Study Area to represent the Alluvial Unit, along the mountain front, which appears to maintain relatively stable groundwater levels. The model domain measures approximately 8 miles from west to east and 12 miles from north to south so that boundaries are located remote from the pumping wells in order to help minimize unintended boundary effects.

A leaky barrier line boundary was used to simulate the faults in the model domain. These faults include the San Andreas Fault, Sand Hills Fault, and Hot Springs Fault (Figure 10). An interdomain boundary was used on the north side of the Hot Springs fault to simulate the transition to the alluvial aquifer, represented by a single layer to simulate the coarser grained sediments (refer to cross-section A-A’ in Figure 10). A second interdomain boundary was used to simulate the transition to the Durmid Hill Unit, an area characterized by highly deformed sediments associated with the San Andreas Fault zone. The

Durmid Hill Unit is represented by three layers, with identical input values, meant to simulate a single unit (refer to cross-section B-B′ in Figure 10). The multi-layer design was needed to compute drawdown in each layer for comparison to the three-layer hydrostratigraphic system in the vicinity of the Plot Study Area described below.

The area that is represented in the model as a multi-later (unit) system includes the following (Figure 10):

- **Layer 1** represents a relatively thin (15 feet) unconfined upper groundwater zone occurring from approximately 5 to 20 feet bgs, comprised of sandy sediments. This layer has poor water quality and is in potential communication with GDEs.
- **Layer 2** extends from approximately 20 to 40 feet bgs; however, this unit is represented as a continuous 10-foot-thick clay unit because of the interbedded nature of the silts and sands in this zone. This layer represents the confining unit separating the upper and lower groundwater zones.
- **Layer 3** represents the production aquifer extending from approximately 40 to 100 feet bgs. This 60-foot-thick layer is confined to semi-confined and is comprised of interbedded fine sand, silty sand, clayey sand, and clay. Based on available data, the water quality improves considerably in Layer 3, as compared to Layer 1.

The following additional assumptions are incorporated into the model:

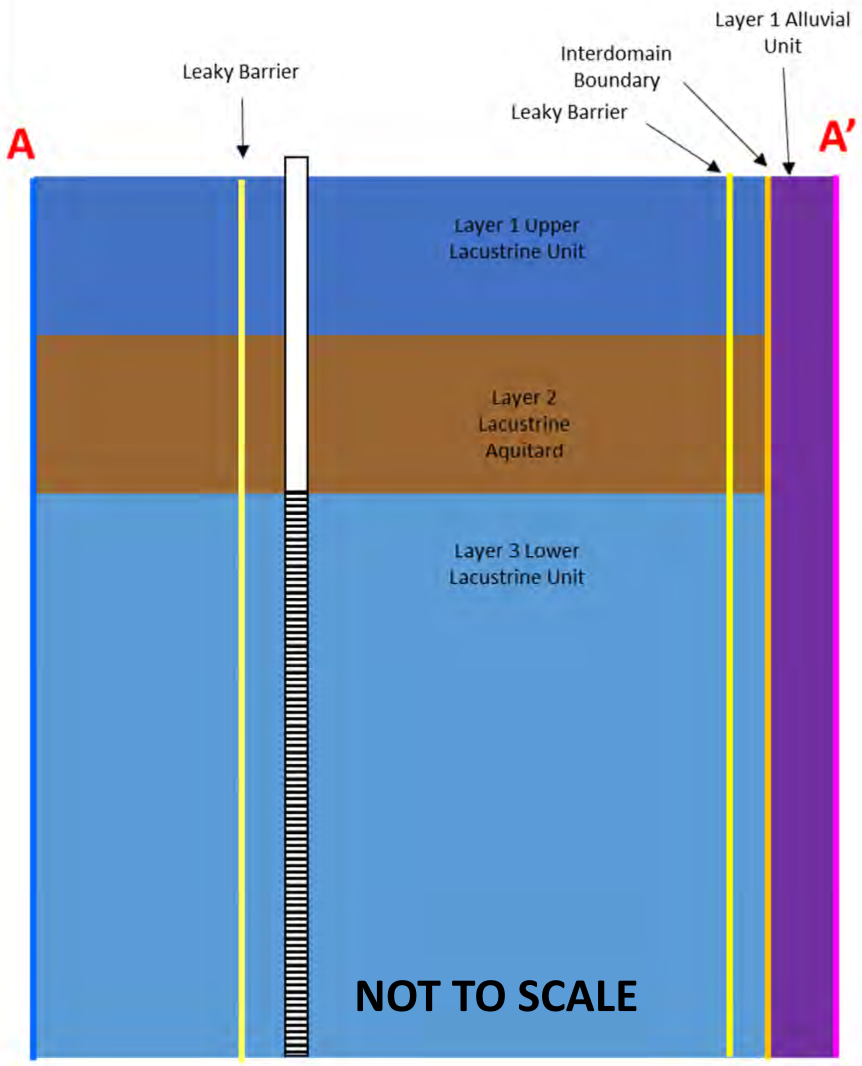
- The pumped layer (Layer 3) is homogeneous. This is a common simplifying assumption.
- The layers are uniform in thickness. This is a common simplifying assumption.
- The groundwater surface is flat in all layers. This is a common simplifying assumption used in “superposition” or “impact modeling,” and is an appropriate assumption when the drawdown effects of project pumping are isolated by subtracting them from a baseline condition, and exact groundwater elevations or flow rates do not need to be known.
- Predicted drawdown is measured from the initial heads, which are set at zero feet in all layers at time zero; this is appropriate when using a superposition or impact modeling approach.
- The model receives no recharge, and all flow from the pumping wells comes from storage. This simplifying assumption tends to produce a conservative result that over-predicts drawdown.
- The well pumping rates in the producing zone are constant and simulated as long-term averages. This is a reasonable assumption for a non-seasonal water supply project, especially when examining drawdown effects at a distance from the pumping wells.
- The narrow-perched hydrostratigraphic unit described in Section 3 overlies Layer 1 and is hydraulically separated from Layer 1 by a lacustrine clay aquitard. Therefore, the perched unit is not simulated in the model.

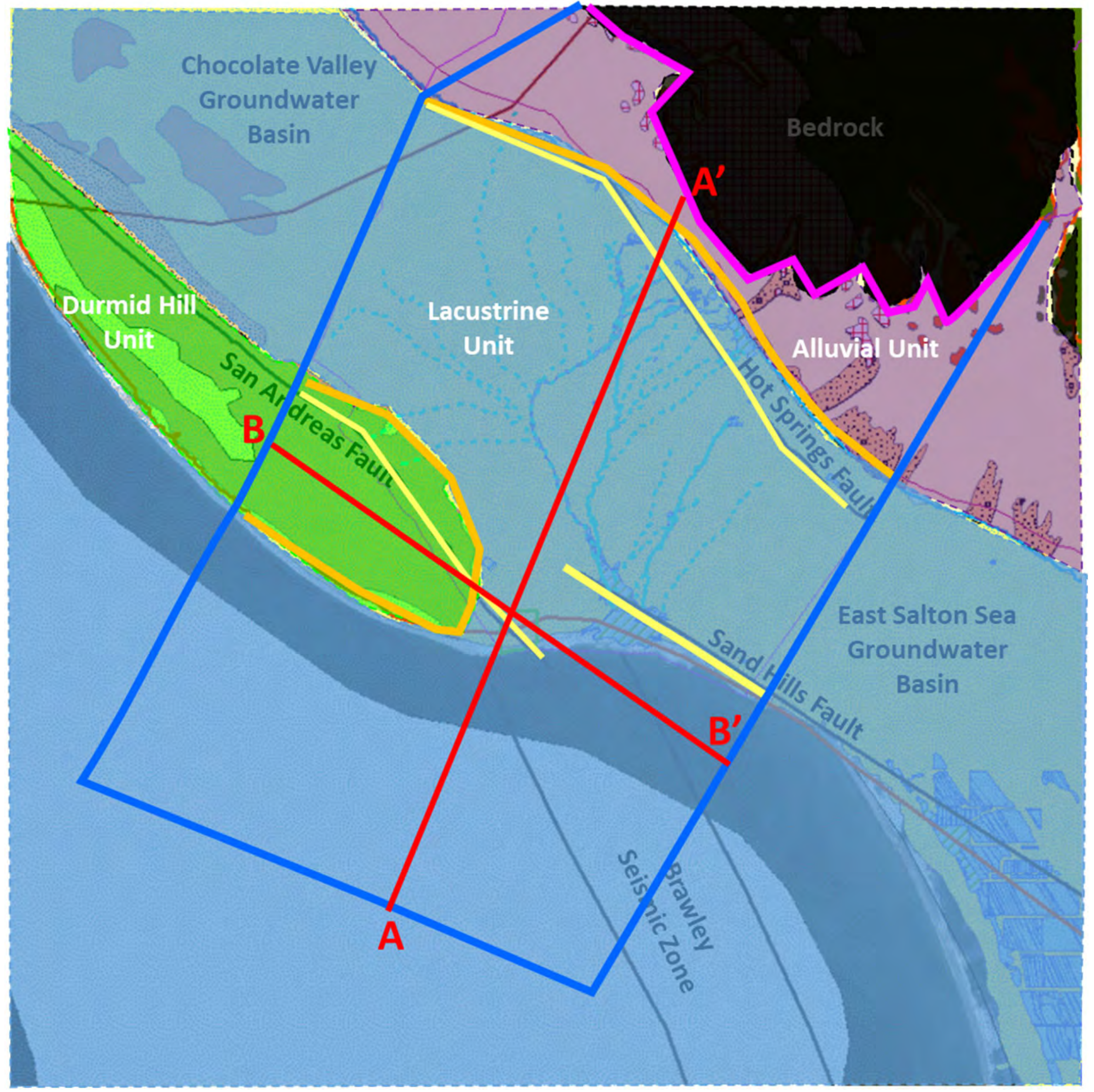
- To address uncertainty in the hydraulic properties of the faults in the model domain, the unitless conductance term for the faults was varied from $1\text{x}10^{-6}$ to $1\text{x}10^{-2}$. A sensitivity analysis was conducted to simulate the effects of varying fault conductance, and the low and high conductance terms were derived from this analysis. The conductance of the San Andreas fault, the nearest fault to the pumping wells, will be investigated during the pump testing planned for the test wells.

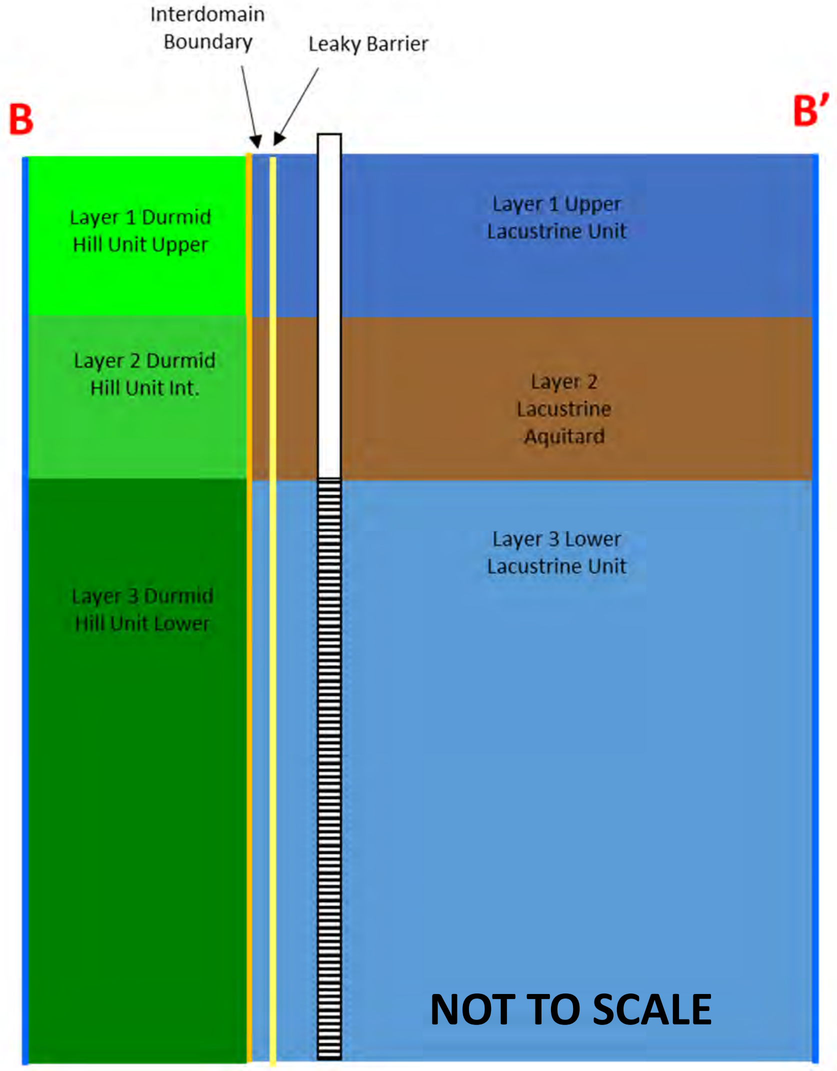
- The aquitard represented by Layer 2 is assumed to have a uniform thickness of 10 feet. While this unit is approximately 20-feet-thick near the proposed test well locations, the aquitard is represented as a continuous 10-foot-thick clay unit across the model domain because of the interbedded nature of the silts and sands in this zone, which are described in the boring log included in Attachment A. In addition, according to Waters (1983), fine-grained lacustrine units reportedly thin to the east of the Plot Study Area in the direction of the shoreline for paleo Lake Cahuilla, further supporting modeling a thinner aquitard thickness.

- Pumping was simulated for a period up to 20 years, after which drawdown is assumed to reach relatively stable conditions.

Western Interdomain Layer Description	Model Input Values						Central Domain Layer Description	Model Input Values						Northern Interdomain Layer Description	Model Input Values					
	Thickness (feet)	K_h (feet/day)	Kh/Kv	Kv (feet/day)	S_y	S		Thickness (feet)	K_h (feet/day)	Kh/Kv	K_v (feet/day)	S_y	S		Thickness (feet)	K_h (feet/day)	Kh/Kv	Kv (feet/day)	S_y	S
Layer 1 - Durmid Hill Unit	85	1	1/1000	0.001	0.1	0.001	Layer 1 - Upper Lacustrine Unit	15	10	1/20	0.5	0.1	0.1	Layer 1 - Alluvial Unit	85	20	1/20	1	0.1	0.1
							Layer 2 - Lacustrine Aquitard	10	0.005	1/10	0.0005	0.01	0.001							
							Layer 3 - Lower Lacustrine Unit	60	5	1/100	0.05	0.1	0.001							







LEGEND:

▤ Well Screen Interval

Head-Dependent Normal Flux Boundary (3rd type)

Leaky Barrier

Interdomain Boundary

Head Specified Boundary (Constant Head)

NOTES:

1. Kh = horizontal hydraulic conductivity
2. Kv = vertical hydraulic conductivity
3. Sy = specific yield
4. S = Storativity

Bombay Beach Study Area
Salton Sea

FIGURE 10

Model Domain and Inputs

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4.2 METHODS

The model inputs for the layers described in Section 4.1 are summarized in Figure 10. The lateral hydraulic conductivity (K_h) values for Layers 1 and 3 were estimated based on calculated values from lithologic data available for the exploratory borehole drilled in the Plot Study Area (Attachment A), as described in Section 3.3.4. The published hydraulic conductivity values summarized in Table 3 for the region were also considered.

In Layer 1, one-half of the estimated hydraulic conductivity was simulated to represent a reasonable lower bound of hydraulic conductivity. This assumption is conservative and will likely lead to over-estimation of drawdown at the water table beneath the playa.

In Layer 2, the hydraulic conductivity value of 0.005 ft/day was estimated based on the sand clay and clay intervals described between 20 and 40 feet bgs on the boring log included in Attachment A. This value is slightly higher than the upper bound of 0.0003 ft/day described by Fetter (2001), and the higher value accounts for the silt and sand fractions found across the aquitard interval (Attachment A).

The properties for Layer 3 were based on the exploratory boring log included in Attachment A. As shown on this boring log, the percentage of fine- and coarse-grained materials by thickness is approximately 48% and 42%, respectively. Thus, nearly half of this zone is comprised of fine-grained materials. This ratio was taken into consideration when the hydraulic conductivity value of 5 ft/day was estimated for this layer (Figure 10).

Vertical hydraulic conductivity values (K_v) for Layers 2 and 3 were assumed to be 1/100th of the horizontal hydraulic conductivity values, while the K_v for Layer 1 was 1/20th. These ratios were based on observed stratification in the formation (Attachment A).

Hydraulic conductivity values for the boundary domain areas of the model were assigned based on the range of values summarized in Table 3. A lower hydraulic conductivity value was assigned for the Durmid Hill Unit because the extensive folding and faulting impedes the hydraulic conductivity. The K_v of the Durmid Hill Unit was assumed to be 1/1000th of the horizonal hydraulic conductivity, because of the degree of deformation. A higher hydraulic conductivity value was estimated for the alluvial unit because of the coarser grained materials found along the mountain front.

Specific yield values (Sy) were estimated based on reasonable values for the sands encountered in groundwater-bearing Layers 1 and 3 (Fetter 2001). Storativity (S) values were based on professional judgment, assigning a reasonable value for unconfined aquifers for Layer 1, confined units for Layer 2, and unconfined to semi-confined aquifers for Layer 3. The range of storativity values published by GEI (2012) were also considered.

The simulated pumping rate for the shallow test wells simulated in Layer 3 is summarized in Table 4. As described in Section 2, irrigation water will only be pumped during daylight hours; however, the pumping rates summarized below are long-term averages and assume a constant rate of 3.75 gpm over a 24-hour period to simplify the modeling scenarios, which is equivalent to a pumping rate of 10 gpm for 9 hours. Actual pumping rates may vary based on the findings of the test well investigation.

TABLE 4. PUMPING INPUTS

Pumping	Input Value (24 hours/day constant rate)	Source	Additional Comments
Lower Lacustrine Unit	3.75 gpm/well	Irrigation Design	Pumping per well (three wells simulated for a combined daily average discharge rate of 11.25 gpm)

The various modeling scenarios are summarized in Table 5. All model input parameters remained constant, except the conductance of the faults and the locations of wells. All scenarios simulated the effects of pumping for 20 years, which is the expected operational life of the project.

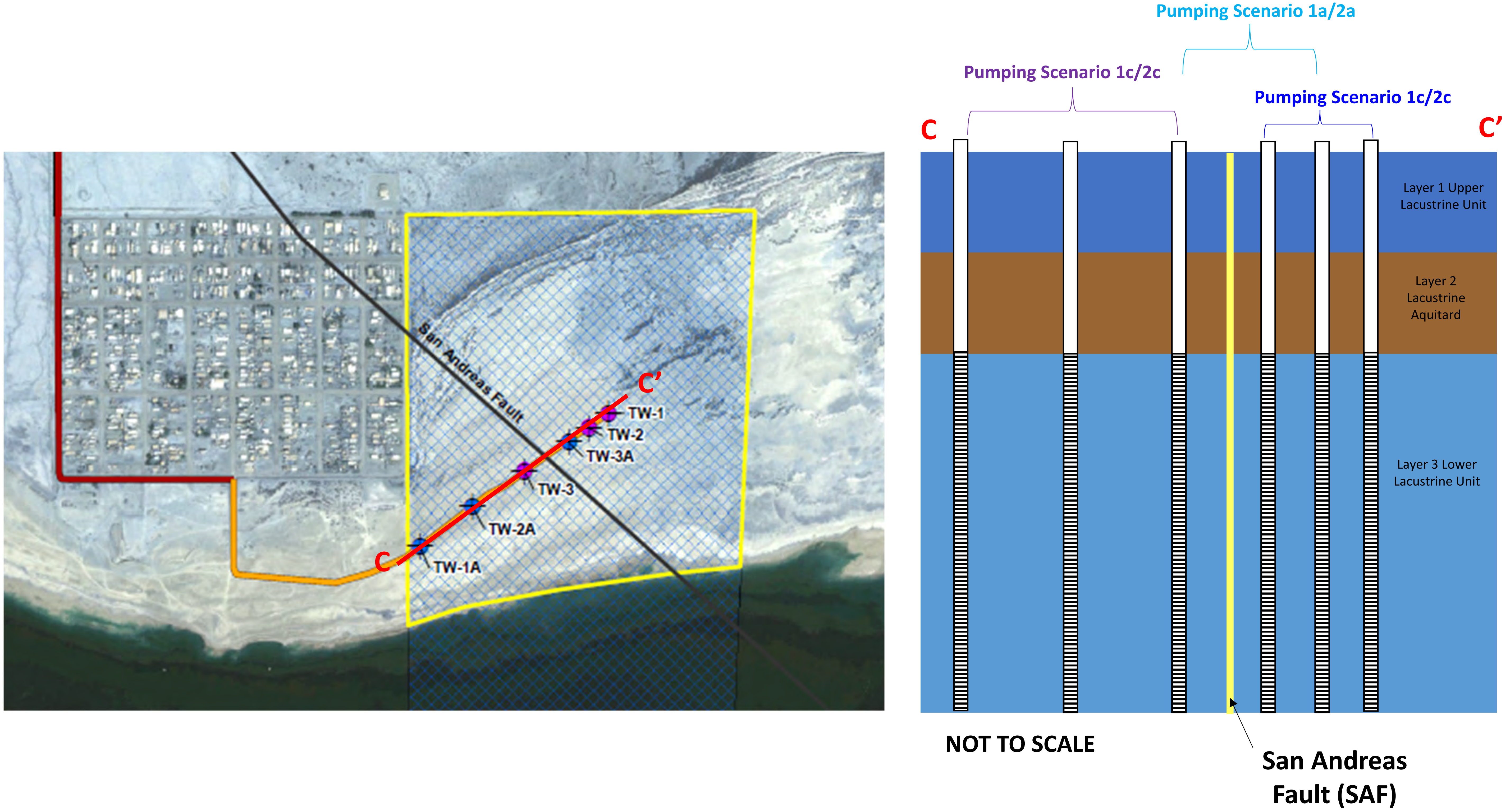
Scenario 1 simulated the lower bound fault conductance and the effects of pumping for 20 years from wells on either side of the San Andreas Fault (1a), wells on the eastside of the fault (1b), and wells on the westside of the fault (1c) (see Figure 11). Scenario 2 simulated the upper bound fault conductance and the effects of pumping for 20 years from wells on either side of the San Andreas fault (2a), wells on the eastside of the fault (2b), and wells on the westside of the fault (2c) (see Figure 11). As described in Section 4.3, the fault conductance term and the location of the pumping wells had a strong effect on the magnitude and distribution of drawdown.

All scenarios simulated the effects of pumping from Layer 3. Layer 1 represents the overlying groundwater bearing zone, which may be hydraulically connected to the potential GDEs described in Section 5.

TABLE 5. MODELING SCENARIOS

Scenario	Well Locations	Shallow Groundwater Zone		
		Combined Average Daily Discharge Rate (gpm)	Fault Conductance	Other Parameters
1a	One well west of SAF and two wells east of SAF	11.25	Low	Constant (Figure 10)
1b	Three wells east of SAF	11.25	Low	Constant (Figure 10)
1c	Three wells west of SAF	11.25	Low	Constant (Figure 10)
2a	One well west of SAF and two wells east of SAF	11.25	High	Constant (Figure 10)
2b	Three wells east of SAF	11.25	High	Constant (Figure 10)
2c	Three wells west of SAF	11.25	High	Constant (Figure 10)

Note: SAF = San Andreas Fault



LEGEND:

▤	Well Screen Interval
▮	Fault Boundary

NOTES:

1. Pumping Scenario 1a/2a – one well west of SAF and two wells east of SAF.
2. Pumping Scenario 1b/2b – three wells east of SAF.
3. Pumping Scenario 1c/2c – three wells west of SAF.

Bombay Beach Study Area
Salton Sea

FIGURE 11

Wellfield Simulation Scenarios

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4.3 RESULTS

The predicted drawdown associated with pumping of the proposed test wells, for the scenarios described in Section 4.2, is summarized in Table 6. Figure 11 illustrates the various pumping location scenarios.

Figure 12 illustrates the distribution and magnitude of the simulated drawdown in Model Layers 1 (water table) and 3 (pumped aquifer) for Scenarios 1a, 1b, and 1c. The results for Scenario 1 are described below.

- In Model Layer 1 (the water-table zone that is potentially connected to GDEs), drawdowns up to approximately 2 feet are predicted during Scenario 1 after 20 years of pumping, which used the low end of the reasonable fault conductance (Table 6). The maximum drawdown is predicted for Scenarios 1b and c, which simulated pumping from three wells on the east side and west side of the San Andreas Fault, respectively. Lesser drawdowns are predicted when simulated pumping straddles the fault (Scenario 1a). The maximum predicted drawdown in Layer 1 at the IID property line is approximately 1.9 feet, under Scenario 1c (Table 6). Outside of the IID parcel located in the Plot Study Area, drawdowns between approximately 0.75 and 1.9 feet were predicted in the area on the playa potentially occupied by GDEs (below an elevation of -201 feet amsl) (Figure 12). The range of predicted drawdown described above would generally not be distinguishable from normal seasonal and inter-annual groundwater level fluctuations measured in the nearby shallow access tubes described in Section 3 (see Attachment C for hydrographs).

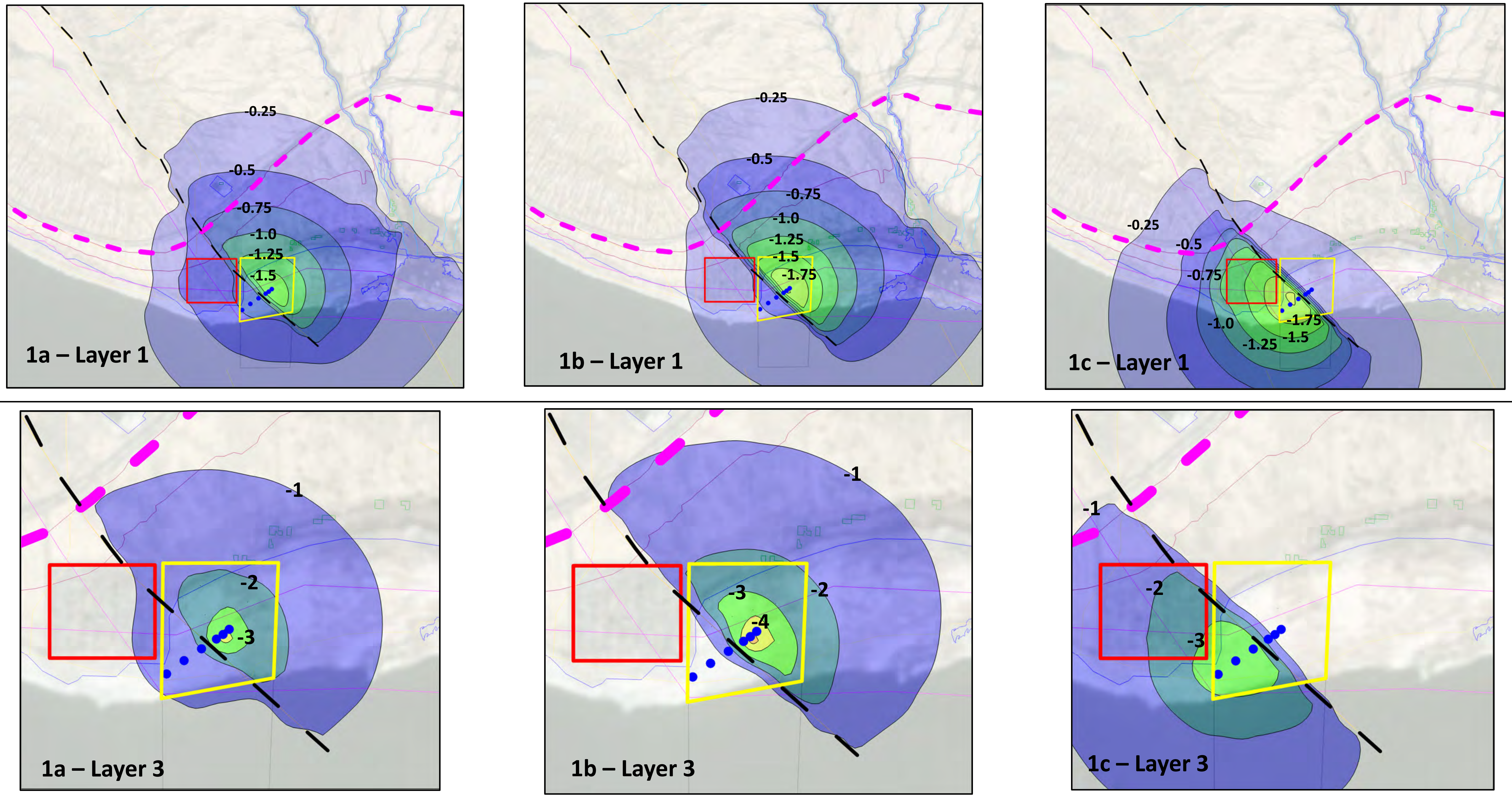
- In Model Layer 3, the pumping layer, the maximum predicted drawdown for Scenario 1 after 20 years is approximately 5.3 feet (Table 6). The maximum drawdown was predicted when pumping three test wells located on the eastside of the San Andreas Fault (Scenario 1b). Lesser drawdowns are predicted when simulated pumping is from alternative well locations that are west of, or straddle, the fault (Scenarios 1a and 1c) (Table 6). Drawdown is predicted to attenuate rapidly with distance from the wells. Predicted drawdown exceeding 5 feet is limited to within the Plot Study Area (Figure 12). The community of Bombay Beach is located to the west of the test wells and the magnitude of the predicted drawdown under the residential area was considered during this analysis and is summarized in Table 6. The maximum predicted drawdown under the community of Bombay Beach is 3.3 feet or less during all three pumping well configurations (Scenarios 1a, b, and c) (Figure 12 and Table 6).

The predicted drawdowns for Scenario 2 are summarized in Table 6 and shown on Figure 13. The distribution and magnitude of the simulated drawdown in Model Layers 1 (water table) and 3 (pumped aquifer) for Scenarios 2a, 2b, and 2c are described below.

- Maximum predicted drawdowns for Layers 1 and 3 are less than those predicted for Scenario 1. In addition, the distribution of the drawdown contours differs from Scenario 1 because the higher conductance simulated for the San Andreas Fault during Scenario 2 has less of an effect on the shape of the simulated cone of depression in Layers 1 and 3.

- As a result of the higher fault conductance simulated during Scenario 2, the distribution and magnitude of the predicted drawdown in Layers 1 and 3 for Scenarios 2a, 2b, and 2c are comparable, because the higher conductance fault zone has little effect on the drawdown distribution when varying pumping well locations.

- In Model Layer 3, the maximum predicted drawdown under the community of Bombay Beach is less than 1.7 feet during all three pumping well configurations (Scenarios 2a, b, and c) (Figure 13 and Table 6).



LEGEND:

🟥 Community of Bombay Beach

– – – – San Andreas Fault (SAF)

🟨 Plot Study Area

– – – Inferred Maximum Extent of ALOC and SUNI, -201 feet amsl

● Test Well Locations

NOTES:

1. Pumping Scenario 1a – one well west of SAF and two wells east of SAF.
2. Pumping Scenario 1b – three wells east of SAF.
3. Pumping Scenario 1c – three wells west of SAF.
4. amsl = above mean sea level

Bombay Beach Study Area
Salton Sea

FIGURE 12

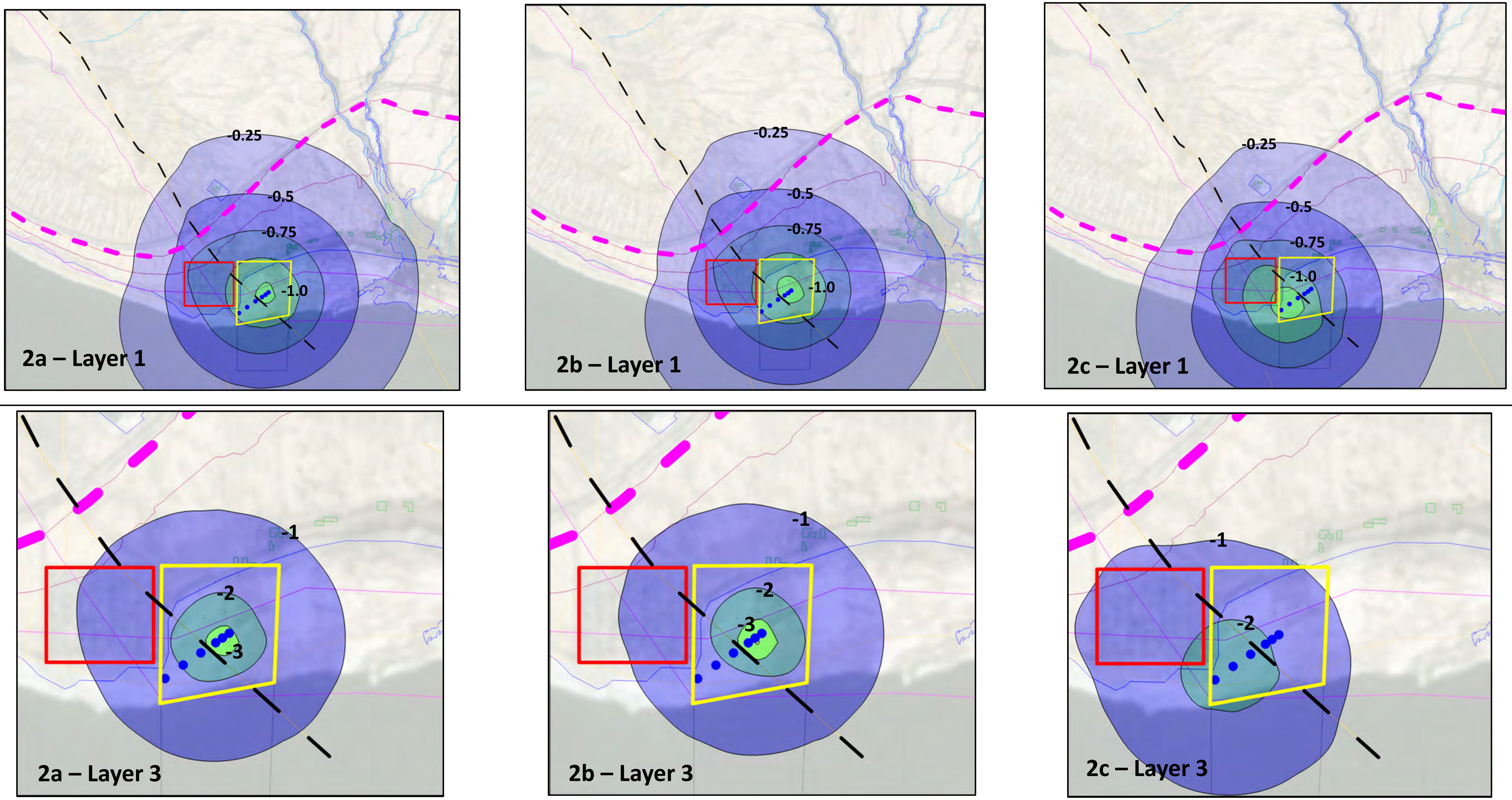
Scenario 1 Predicted Drawdown

DATE: September 2022

BY: NBB

FOR: MT

FORMATION
ENVIRONMENTAL



LEGEND:

🟥 Community of Bombay Beach

🟨 Plot Study Area

– – – Inferred Maximum Extent of ALOC and SUNI, -201 feet amsl

● Test Well Locations

– – – – San Andreas Fault (SAF)

NOTES:

1. Pumping Scenario 2a – one well west of SAF and two wells east of SAF.
2. Pumping Scenario 2b – three wells east of SAF.
3. Pumping Scenario 2c – three wells west of SAF.
4. amsl = above mean sea level

Bombay Beach Study Area
Salton Sea

FIGURE 13

Scenario 2 Predicted Drawdown

DATE: September 2022

BY: NBB

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TABLE 6. PREDICTED DRAWDOWN

Scenario	Well Locations	Fault Conductance	Layer 1 (upper 20 feet bgs)		Layer 3 (40 to 100 feet bgs)	
			Max Predicted Drawdown (feet)	Max Drawdown at IID Property Boundary (feet)	Max Predicted Drawdown (feet)	Maximum Predicted Drawdown Within Bombay Beach Community (feet)
1a	One well west of SAF and two wells east of SAF	Low	1.7	1.4	4.3	1.6
1b	Three wells east of SAF	Low	2.0	1.7	5.3	1.8
1c	Three wells west of SAF	Low	2.0	1.9	3.8	3.3
2a	One well west of SAF and two wells east of SAF	High	1.3	1.1	3.4	1.6
2b	Three wells east of SAF	High	1.3	1.1	4.0	1.5
2c	Three wells west of SAF	High	1.3	1.3	2.9	2.5

Note:

Layer 1: Model layer simulating drawdown in the water table groundwater zone that is potential communication with GDEs.

Layer 3: Pumped model layer simulating drawdown in the groundwater production zone.

5 IMPACT ANALYSIS

This section presents an evaluation of the potential environmental impacts associated with groundwater extraction if the proposed test wells are converted into long-term supply wells. The impact evaluation is provided in the form of reasoned evaluations in answer to each of the applicable significance questions contained in Appendix G of the CEQA Guidelines, listed below, but the evaluations under the threshold questions are limited to assessing impacts related only to hydrogeologic effects. The questions are grouped into “Undesirable Results” from the Sustainable Groundwater Management Act (SGMA) that are potentially applicable to the area surrounding the wells.

5.1 GROUNDWATER-DEPENDENT ECOSYSTEMS AND INTERCONNECTED SURFACE WATER

Question IV(a): Would the project 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?

Question IV(b): Would the project 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 CDFG or USFWS?

Question IV(c): Would the project have a substantial adverse effect on state or federally protected wetlands (including marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The potential GDEs identified near the Plot Study Area are shown in Figure 6. Several potential GDEs have been mapped in the vicinity of the Plot Study Area. In addition, areas where ALOC and SUNI that are at least partially dependent on groundwater, may exist on the playa below an elevation of -201 feet amsl based on recent studies conducted by Formation, as shown in Figure 6. The locations of these areas relative to the maximum predicted drawdown in Layer 1 are shown in Figure 12 and Figure 13. Based on the modeling results, the following conclusions may be made:

- The maximum predicted drawdown in Layer 1 after 20 years of pumping the wells is predicted to be up to approximately 2 feet or less in the areas where potential GDEs or vegetation that is groundwater-dependent may be present (Figure 12 and Figure 13). This drawdown is likely over-predicted due to conservative assumptions used in the modeling predictions. Drawdown is predicted to occur slowly, and the potential groundwater-dependent vegetation species that could be affected would be expected to be able to adapt to such a small amount of drawdown over such a long period of time. Furthermore, maximum drawdowns were predicted within the Plot Study Area, where irrigation water will be applied to support the enhancement of GDEs.

- Predicted drawdown in Layer 1 after 20 years of pumping the wells is not predicted to exceed approximately 0.75 feet in the Bombay Beach wetland area. Furthermore, the Bombay Beach wetland is primarily supported by drainage from the Ken and Pacific Washes, which is perched on a lacustrine clay unit and is therefore hydraulically disconnected from potential pumping effects in the deeper groundwater zones. Figure 8 shows the inferred extent of the Perched Unit.

- Based on the available information, impacts to GDEs from operating the supply test wells will be less than significant.

The predicted area of drawdown in Layer 1 extends to the western portion of the Bombay Beach wetland and the southern shoreline of the Salton Sea. However, the magnitude of the predicted drawdown is limited in these areas and would not be distinguishable from seasonal fluctuations in the water table. Furthermore, the Bombay Beach wetland is believed to be hydraulically disconnected from the water table groundwater zone. Thus, no impact to interconnected surface water will occur.

5.2 WATER QUALITY

Question IX(a): Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Question IX(e): Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

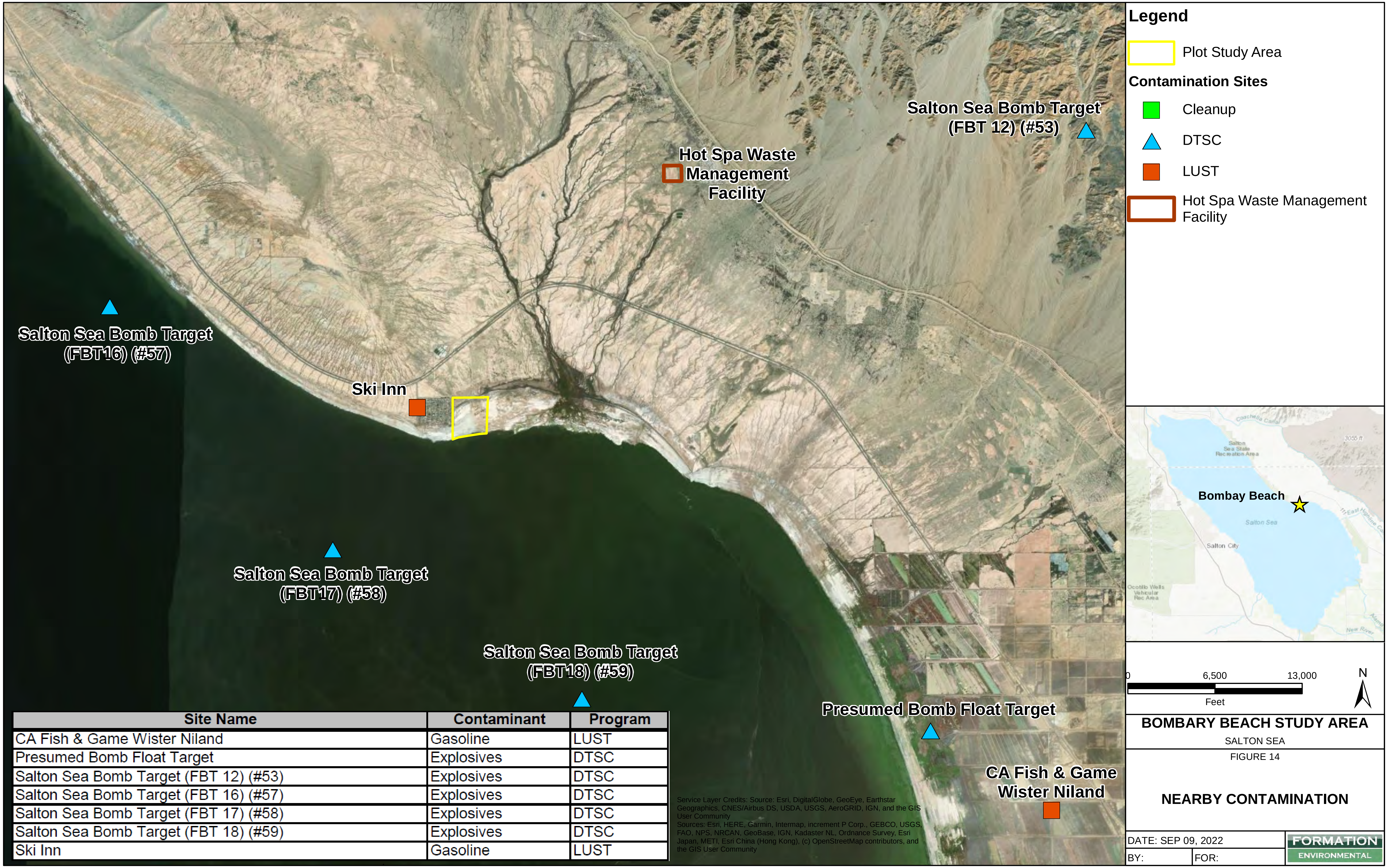
The groundwater in the Lower Lacustrine Unit (groundwater production zone shown in Figure 11) contains TDS at concentrations that range from approximately 10,000 to 12,000 mg/L. Upgradient, approximately 4.5 miles to the northeast of the Plot Study Area, several groundwater monitoring wells have been installed in the Lower Lacustrine Unit underlying the Hot Spa Solid Waste Site. Groundwater samples collected from these monitoring wells between 2005 and 2015 indicate that TDS concentrations range from approximately 7,000 to 14,000 mg/L, similar to the Plot Study Area. This groundwater salinity exceeds agricultural water quality standards. Furthermore, State Water Resources Control Board Resolution 88-63 states that water containing TDS concentrations over 3,000 mg/L would not be considered suitable as a municipal or domestic water supply. However, the brackish water found in the lower Lacustrine unit (the groundwater supply zone for the project) would be suitable for irrigation of the salt-tolerant vegetation planned for use as a dust control measure in the Plot Study Area. Based on this information, pumping of groundwater from the wells is unlikely to result in groundwater quality degradation that would impact existing or potential beneficial uses.

The shallow groundwater in the Upper Lacustrine Unit (water table groundwater zone shown on Figure 11) has much higher TDS concentrations as compared to the lower unit, with concentrations ranging from approximately 40,000 to 50,000 mg/L. As discussed in Section 4.3, communication of drawdown across the aquitard unit is impeded, isolating the shallow zone from the effects of groundwater pumping and impeding the vertical migration of high TDS water into the pumped aquifer. The likelihood of significant groundwater quality degradation that would interfere with existing or potential beneficial uses of groundwater as a result of pumping the wells is therefore low.

Based on the information described above, operation of the proposed wells will not interfere with implementation of a Water Quality Control Plan given the likely limited water quality effects from pumping and the limited beneficial uses for the groundwater within the area of project-induced effects.

Figure 14 shows reported nearby contamination sites. Two sites have reported gasoline releases, and five sites have the primary contaminant of concern listed as “explosives.” These sites are located outside of the area of predicted drawdown effects greater than 1 foot in Model Layer 1, after 20 years of simulated pumping (Figure 12 and Figure 13) and more than ½ mile from the proposed well sites. Thus, if any residual contamination exists at these sites, it is not expected to be affected by gradient changes that would interfere with required discharge requirements or cleanups. Furthermore, the Ski Inn gasoline leaking underground storage tanks (LUST) release site, which is the nearest release location from the Plot Study Area (approximately 0.5 miles), was closed in 1992. The Hot Spa Waste Management facility is located approximately 5 miles to the north of the Plot Study Area, and simulated drawdown effects were not predicted in this area; thus, there are no predicted gradient changes in this area. The landfill has not been operated since 2018 and site reclamation was completed in 2020. Based on this information, pumping the proposed wells is not likely to interfere with ongoing cleanup or other water quality regulatory efforts, or to result in migration of contamination.

Based on the above information, potential impacts to water quality will be less than significant.



Site Name	Contaminant	Program
CA Fish & Game Wister Niland	Gasoline	LUST
Presumed Bomb Float Target	Explosives	DTSC
Salton Sea Bomb Target (FBT 12) (#53)	Explosives	DTSC
Salton Sea Bomb Target (FBT 16) (#57)	Explosives	DTSC
Salton Sea Bomb Target (FBT 17) (#58)	Explosives	DTSC
Salton Sea Bomb Target (FBT 18) (#59)	Explosives	DTSC
Ski Inn	Gasoline	LUST

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

BOMBARY BEACH STUDY AREA

SALTON SEA

FIGURE 14

NEARBY CONTAMINATION

DATE: SEP 09, 2022
BY:
FOR:

FORMATION ENVIRONMENTAL

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5.3 SUBSIDENCE

Question VII(c): Would the project 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?

Land subsidence can occur when compressible clays are depressurized because of groundwater extraction, triggering water to flow from the clays into the surrounding aquifer, and ultimately causing consolidation of the clay under pressure from the overlying sediments. In general, most subsidence occurs when an aquifer is initially depressurized, but it can continue for months, or even years, after clays slowly dewater and adjust to the new pressure regime. If groundwater levels subsequently recover, subsidence generally does not resume (or does not progress as rapidly) until groundwater levels fall below historical low levels. Subsidence can occur especially in confined aquifer conditions, where the drawdown associated with groundwater extraction is greater than in unconfined aquifers.

As described in Section 3, no subsidence has been reported in the vicinity of the Plot Study Area. The proposed test wells will extract a relatively limited amount of water from the lower lacustrine groundwater system. Drawdown is predicted to attenuate rapidly with distance from the test wells. Drawdown exceeding 5 feet is predicted to be limited to Plot Study Area, on land owned by IID.

The community of Bombay Beach is located to the west of the test wells, and the magnitude of the predicted drawdown under the residential area was considered during this analysis. A maximum drawdown of 3.3 feet is predicted during Scenario 1c (Table 6). The other scenarios simulated predicted maximum drawdowns between 1.5 and 2.5 feet after 20 years of pumping. Less than 5 feet of drawdown is unlikely to result in measurable land subsidence or damage to infrastructure (JJ&A 2018).

Given the limited amount of drawdown predicted to be associated with the operation of the proposed test wells and the lack of reported subsidence near the Plot Study Area, subsidence that substantially interferes with surface land uses and infrastructure is unlikely. No impacts are expected.

5.4 CHRONIC DRAWDOWN AND DIMINUTION OF SUPPLY

Question IX(b): Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Question IX(e): Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The potential for operation of the proposed test wells to interfere with implementation of a water quality control plan is discussed in Section 5.2. The East Salton Sea Groundwater Basin is designated as a very low-priority basin by the DWR, and a Groundwater Sustainability Plan (GSP) is not required and has not been prepared or proposed to be prepared. Therefore, pumping of the wells would not conflict with or obstruct the implementation of a GSP.

The long-term groundwater extraction associated with the proposed test wells will be relatively limited. The maximum average annual water demand that is proposed to be met by the wells is at most 18 AFY, which is equivalent to a combined daily average pumping rate of approximately 11.25 gpm for all three wells (Table 1). This would be the only known anthropogenic groundwater demand in the Lacustrine Unit (Figure 8) and is not anticipated to interfere with existing beneficial environmental groundwater used by GDEs.

Operation of the proposed test wells is predicted to result in limited drawdown in close proximity to the pumping wells. Drawdown exceeding 1 foot is predicted to be limited to within approximately 2 miles of the pumping center. No known groundwater wells are located within this area, and such a small amount of drawdown would not result in an observable decrease in well yield, if a well were present. In addition, the limited amount of drawdown induced by the wells would not significantly change the amount of groundwater in storage or interfere with foreseeable groundwater demands.

Based on the above information, project impacts to groundwater supplies, aquifer volume, and lowering of the groundwater table will be less than significant.

5.5 CUMULATIVE IMPACTS

Question XVIII(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.)

As described in Section 3, groundwater resources in the East Salton Sea Groundwater Basin are very sparsely developed. No active groundwater production wells are located in the area, and the town of Bombay Beach is served by the Coachella Valley Water District. The maximum predicted drawdown at the water table after 20 years of pumping (Table 6) represents a small fraction of the anticipated groundwater-level decline in the area as a result of existing trends (approximately 0.5 feet per year) and is not expected to be distinguishable from seasonal and interannual groundwater level fluctuations.

Based on these considerations, the groundwater resources impacts associated with the project will be less than cumulatively considerable.

5.6 WATER SUPPLY AND ENTITLEMENTS

Question XVII(d): Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

IID would be able to extract groundwater for beneficial use on its property under an overlying groundwater right. The basin is not listed as being in critical overdraft. There are no existing or reasonably foreseeable groundwater demands that would change or stress the availability of groundwater supplies during climatic fluctuations. The basin has sufficient resources to reliably supply the project water demand during normal, dry, and multiple dry years. If use of the wells as a long-term irrigation source is found to be feasible, a CUP would be obtained from Imperial County to operate the wells.

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ATTACHMENT A – BORING LOGS

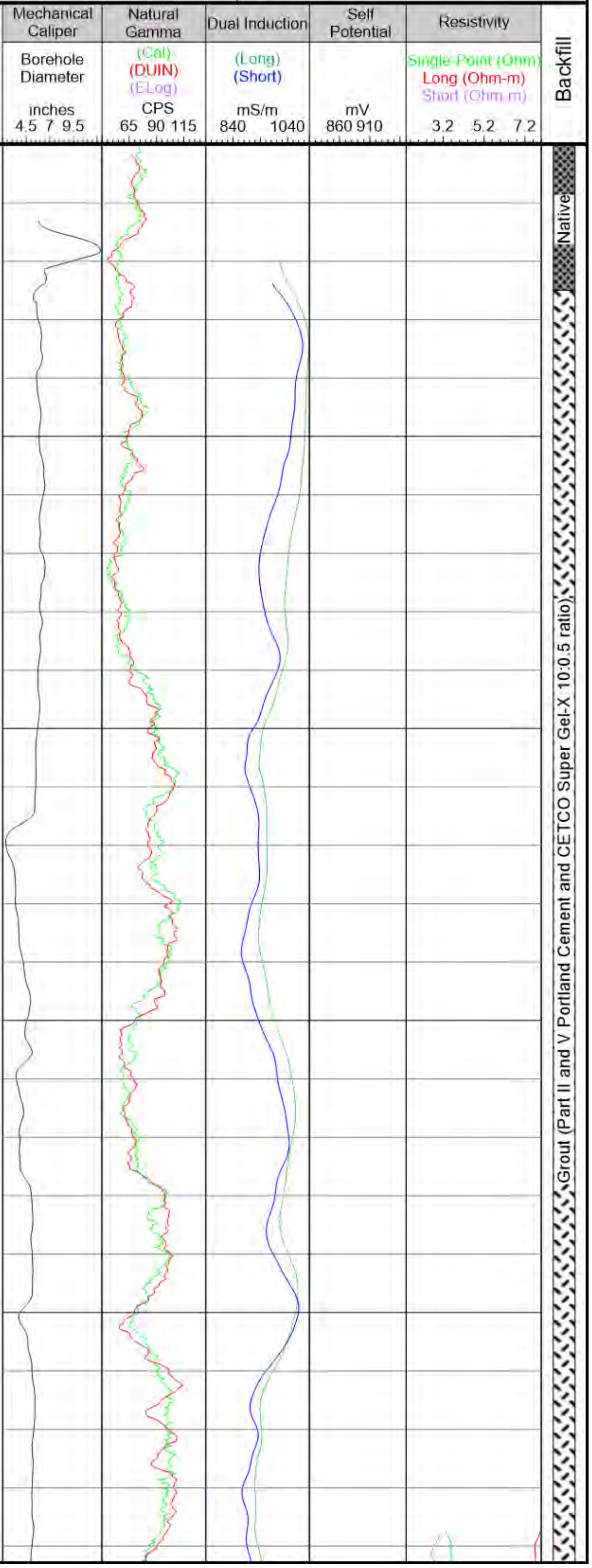
FORMATION ENVIRONMENTAL

Log of Boring Completion: **IID20200506_S01_BB_001_BH**

Page: 1 of 2

Bombay Beach **SALTON SEA, CA**	Drilling Company: **Cascade Drilling, Upland, CA**	Logged By: **Hank Dickey**	Latitude (decimal degrees): **33.3492**
	Drilling Method: **Mud Rotary**	Borehole Diameter (inches): **4.75**	Longitude (decimal degrees): **-115.7239**
Project Number: **061-012 Task 7.3**	Sampling Method: **Hand Auger, Terzaghi Split Spoon (Standard Penetration, 2" O.D., 1.375" I.D.), Cuttings**	Ground Elevation (NAVD 88): **-230.58**	Total Depth (ft bgs): **101.5**
	Top of Casing Elevation: **N/A**	Date Started: **5/4/2020**	Date Completed: **5/6/2020**

Depth (feet)	Description	USCS	Sample Type (Blow Count) (% Recovery)
0	SAND, subrounded, poorly graded, medium grained (~65% Quartz, ~25% feldspathic, ~5% micaceous), ~5% fines, loose, yellowish brown (10YR 5/6), wet/saturated		
2			Hand Auger
4			
6	First Water		
8		SP	Split Spoon (5/5/5) (100%)
10	Subangular, fine to medium grained (~5% micaceous), <5% fines, dark yellowish brown (10YR 4/4)		
12	Angular, very coarse grained (~75% Shells, ~25% siliclastic), light grey (10YR 7/2)		
14			Cuttings
16	SAND, well graded, fine grained, dark yellowish brown (10YR 4/4)		
18		SW	Split Spoon (5/5/5) (100%)
20	CLAY, lean, medium plasticity, compact, dark yellowish brown (10YR 4/4), ~1 mm oxidized laminations	CL	
22	GRAVEL, 2.5x3.5 cm angular gravel at bottom of sample, very dark grey (10YR 3/1), possible shell caste fossil		
24	SANDY CLAY, ~75% lean clay, dark yellowish brown (10YR 4/4), ~25% subangular, very coarse grained sand, dark reddish brown (2.5YR 3/4)	CL	Cuttings
26			
28			Split Spoon (10/10/10) (88%)
30	~85% lean clay, ~15% fine grained sand, compact SAND, subangular, poorly graded, medium grained, <5% fines, dark yellowish brown (10YR 4/6)		
32	Angular, ~50% fine to medium grained, siliclastic, reddish brown (2.5 YR 4/4), ~50% medium to coarse grained shells, white (10YR 8/1)	SP	
34	CLAY, lean, yellowish brown (10YR 5/4), 1.5x0.75 cm pebble included in sample		Cuttings
36		CL	
38			Split Spoon (10/10/16) (100%)
40	SAND, poorly graded, fine grained, yellowish brown (10YR 5/6)	SP	
42	SAND, subangular, well graded, ~70% very coarse grained (~25% shells, white 10YR 8/1), ~30% fine to medium grained, yellowish brown (10YR 5/4)		
44		SW	Cuttings
46			
48			



FORMATION ENVIRONMENTAL

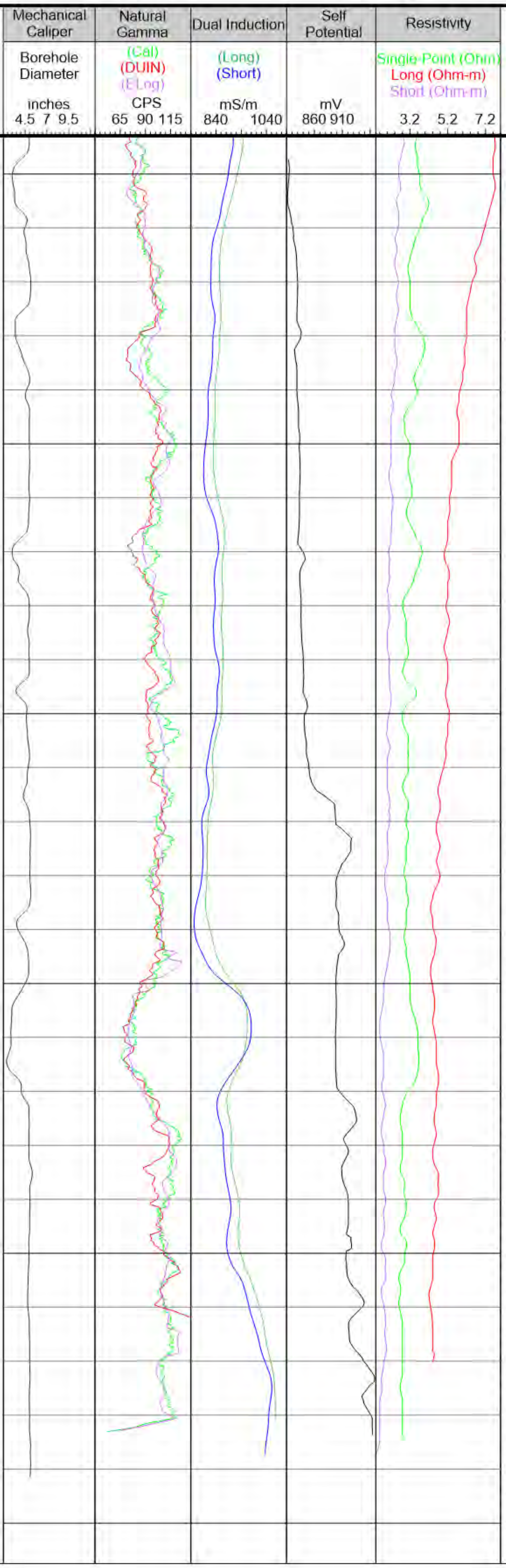
Log of Boring Completion: **IID20200506_S01_BB_001_BH**

Depth (feet): 50–100

Description	USCS
	SW
SILTY SAND, ~80% subrounded, fine grained sand, ~20% silt, brown (10YR 5/3), ~1 mm oxidized laminations, yellowish red (5YR 4/6)	SM
SAND, subangular, well graded, medium to very coarse grained, ~15% shells, <5% fines, dark yellowish brown (10YR 4/4)	SW
CLAY, high plasticity, hard, dark grey (10YR 4/1), <1mm oxidized laminations, yellowish brown (10YR 5/8)	CH
CLAYEY SAND, well graded, ~70% sand (~30% angular, very coarse grained, ~25% subangular, medium grained, ~10% fine grained, ~5% shells, white (10YR 8/1)), ~30% clay, brown (10YR 4/3)	SC
CLAY, fat, high plasticity, compact, olive grey (5Y 4/2), small isolated ~2 mm oxidized enclaves	CH
CLAYEY SAND, well graded (~75% subrounded, fine grained, ~15% subangular, coarse grained, ~5% subangular, very coarse grained, <2% shells white (10YR 8/1)), ~20% fines, yellowish brown (10YR 5/4)	SC
SILTY CLAY, ~85% low plasticity clay, ~15% silt, dark grey (2.5Y 4/1)	CL
SILTY SAND, subrounded fine sand with silt, yellowish brown (10YR 5/4), very faint laminations ~80 subrounded, fine grained sand, ~10% subangular, coarse sand, ~10% silt, light yellowish brown (10YR 6/4)	SM
CLAY, low to medium plasticity, dark grey (2.5Y 4/1)	CL
CLAYEY SAND, well graded, ~80% subangular, fine grained sand (~45% quartz, ~45% feldspathoids, ~10% micas), ~10% subangular, coarse grained sand, ~10% silt, dark yellowish brown (10YR 4/6)	SC
CLAY, fat clay, high plasticity, very dark grey (2.5Y 3/1)	CH

Sample Type (Blow Count) (% Recovery)

Split Spoon (10/10/20) (100%)
Cuttings
Split Spoon (6/6/10) (100%)
Cuttings
Split Spoon (6/8/10) (50%)
Cuttings
Split Spoon (6/24/63) (88%)
Cuttings
Split Spoon (10/10/20) (100%)
Cuttings
Split Spoon (7/10/16) (100%)



Backfill: Grout (Part II and V Portland Cement and CETCO Super Gel-X 10:0.5 ratio)

Notes: Blow Counts assessed every 6"
NAVD 88: North American Vertical Datum of 1988
ft bgs: Feet below ground surface
CPS: Gamma in counts per second
O.D.: Outside Diameter

mS/m: Millisiemens per meter
mV: Millivolts
Ohm-m: Ohms per meter
mm: Millimeter
I.D.: Inside Diameter

Reviewed by: Stephen Carlton, PG #4730

ATTACHMENT B – GEOPHYSICAL INVESTIGATION RESULTS

Intended for

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Report

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GEOPHYSICAL INVESTIGATION, BOMBAY BEACH, CLUBHOUSE, SALTON SEA

tTEM & WalkTEM Surveys

RAMBOLL Bright ideas. Sustainable change.

GEOPHYSICAL INVESTIGATION, BOMBAY BEACH, CLUBHOUSE, SALTON SEA
TTEM & WALKTEM SURVEYS

Project name	FME: Bombay Beach & Clubhouse
Project no.	1690017818
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Approved by	Max Halkjær
Description	FME: Bombay Beach & Clubhouse

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TEM geophysical investigation, Bombay Beach and Clubhouse, Salton Sea

Dear Brian,

Ramboll is pleased to submit this report of the results of the geophysical investigations conducted at the Clubhouse and Bombay Beach sites at Salton Sea in south eastern California.

Ramboll has completed geophysical investigation of the study area where the main purpose was to provide high-resolution information showing geological and hydrogeological variations across the survey areas to support groundwater resources development for the irrigation of vegetation-based dust control..

It has been a pleasure to conduct the study and we will remain available at your convenience to discuss this report or to answer any questions.

Yours sincerely,

A. A. Behroozmand

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APPENDICES

ABBREVIATIONS

AOI	Area of Interest
ATV	All-Terrain Vehicle
CPT	Cone Penetrometer Test
BGS	Below Ground Surface
DEM	Digital Elevation Model
DOI	Depth of Investigation
EM	Electro-Magnetics
GERDA	Geophysical Relationship Database
GPS	Global Positioning System
HM	High Moment
Hz	Hertz
LM	Low Moment
M	Meter
MS	Milli Seconds
NAN	Not A Number
QC	Quality Control
SCI	Spatially Constrained Inversion
TEM	Transient Electro Magnetics
tTEM	Towed-TEM

1. INTRODUCTION

This geophysical investigation was aimed to provide high-resolution information showing geological and hydrogeological variations across the survey areas to support the development of a site conceptual model at two study sites and the siting of water supply test wells.

The towed time-domain electromagnetics (tTEM) and single site TEM (WalkTEM) methods were used to characterize the subsurface along several transects, identified by Formation, at two study sites named Clubhouse and Bombay Beach. The TEM method is ideally suited to distinguish variations in an electrically conductive environment. Within the survey area, it is expected that saline water will be present not only in the Salton Sea itself but also in the sediments along the sea. Forward modelling studies determined that the depth of investigation for an updated tTEM system, specific to this survey and capable of acquiring data with decay curves to 4 ms, is between 20 and 30 m (65 and 100 feet) below the terrain. These studies correlate well with the actual depth of investigation obtained during this project.

TEM is a diffusive method where the electromagnetic field induced in the subsurface will decay very fast. Therefore, a very near surface resolution with TEM requires a fast turn-off of the current followed by immediate recording of the signal. The current turn-off time is shorter for the tTEM system than the WalkTEM system, meaning that higher near-surface resolutions are obtained when using the tTEM system. On the other hand, the WalkTEM system penetrates much deeper into the earth where tTEM loses sensitivity. Combining the two methods provides information for both near surface as well as deeper structures. In this study, it was concluded that the tTEM results provide more accurate information in the top 50 feet and the WalkTEM results are more reliable at depths below 50 feet.

The main sections of this report describe the field operation and the results of the tTEM and WalkTEM surveys in the study area. Appendix 1 contains a general introduction to the TEM method. Appendix 2 contains a detailed documentation of the tTEM and WalkTEM systems, including calibration of the system, repeated data acquired along a test line at the Clubhouse, complete configuration of the system and information about processing and inversion parameters. Appendix 3 provides mean resistivity plan-view maps at different elevation intervals across the study area. Appendix 4 contains cross sectional illustrations of the results. Appendix 5 presents the results as fence diagrams. Appendix 6 contains the WalkTEM results.

Figure 1 The tTEM system in operation at the Clubhouse during nighttime.

Figure 2 The WalkTEM system in operation at the Clubhouse at sunrise.

2. FIELD WORK

The geophysical surveys consisted of two campaigns. The first campaign was conducted during July 25-26, 2020. At this time, the tTEM and WalkTEM data were collected in a portion of the Clubhouse site. On July 25th, the crew stopped work because of an equipment issue and heat stress hazard. The second campaign was conducted during October 15-18, 2020 at both the Clubhouse and Bombay Beach sites. The surveys were carried out by Ahmad-Ali Behroozmand of Ramboll, with support from Formation staff (Mark Roberson and Johnny Alvarez). The tTEM data collection was performed by towing the tTEM system behind a utility terrain vehicle (defender) using a specially designed sled frame with non-metallic parts to avoid potential interferences (Figure 3). The equipment was transported to and from the site with a cargo van.

The tTEM system went through a detailed test and documentation at the National Danish Test site. The results are shown in Appendix 2. The test results demonstrate that the tTEM system reproduces the Danish Test and Reference site accurately.

Figure 3 The tTEM transmitter sled setup at the Formation field house.

The WalkTEM data collection was performed by laying out a 40 m x 40 m (130 ft x 130 ft) square-shaped transmitter loop, along with a receiver loop placed in the center of the transmitter loop for each measurement at pre-planned locations across the study area (Figure 4). These measurements are called ‘soundings’.

Detailed information about the TEM methods and the tTEM & WalkTEM specifications can be found in Appendix 1 and Appendix 2, respectively.

Figure 4 The WalkTEM instrument in operation at the Bombay Beach.

2.1 tTEM Data Collection

Prior to data acquisition, GIS layers containing geographic locations of the study area and tTEM lines were loaded into the tTEM navigation software, which enabled real-time tracking of the paths. This also allowed the operator to view the density of the data being collected and facilitate proper coverage of the site with the tTEM. During the tTEM survey, data quality and the entire system functionality were checked frequently by the operator.

2.2 WalkTEM Data Collection

Prior to data collection, each pre-planned location was assessed carefully to ensure minimal EM noise interference (e.g. from overhead powerlines). Whenever the sounding locations were not optimal, it was moved to the nearest optimal location. Overall, the remoteness of the study areas and strong electromagnetic signals from the electrically conductive layers provided a very high signal to noise ratio.

2.3 Instrumentation

The tTEM instrumentation was modified as part of the mobilization task. The modifications include:

1. Installing an additional cooling unit in the transmitter;
2. Extending the transmitter off times to achieve an increased depth of investigation.

The crew encountered an issue with the tTEM receiver instrument battery. The issue was diagnosed and fixed before the second campaign. This issue had no impact on the data collected in July. The data from July and October are in good agreement (see Appendix 2).

2.4 Survey areas

A location map of the tTEM survey site is shown in Figure 5. Figure 6 and Figure 7 show locations of the tTEM survey lines and the WalkTEM soundings at the Clubhouse and Bombay Beach, respectively.

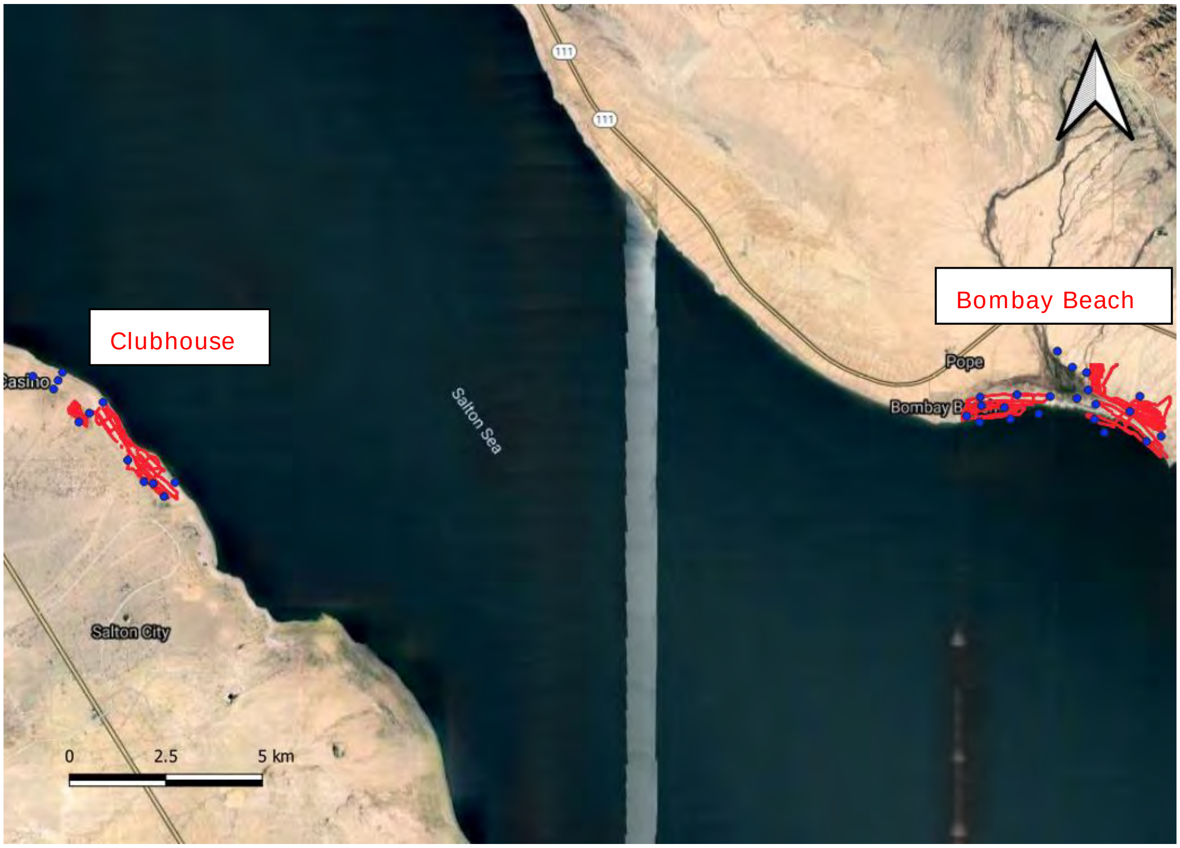


Figure 5 Location map of the study sites. tTEM survey lines are marked as red dots and WalkTEM sounding locations are shown with blue circles.

Figure 6 Location map of the tTEM survey lines and WalkTEM soundings at the Clubhouse. tTEM survey lines are marked as red dots and WalkTEM sounding locations are shown with blue circles.

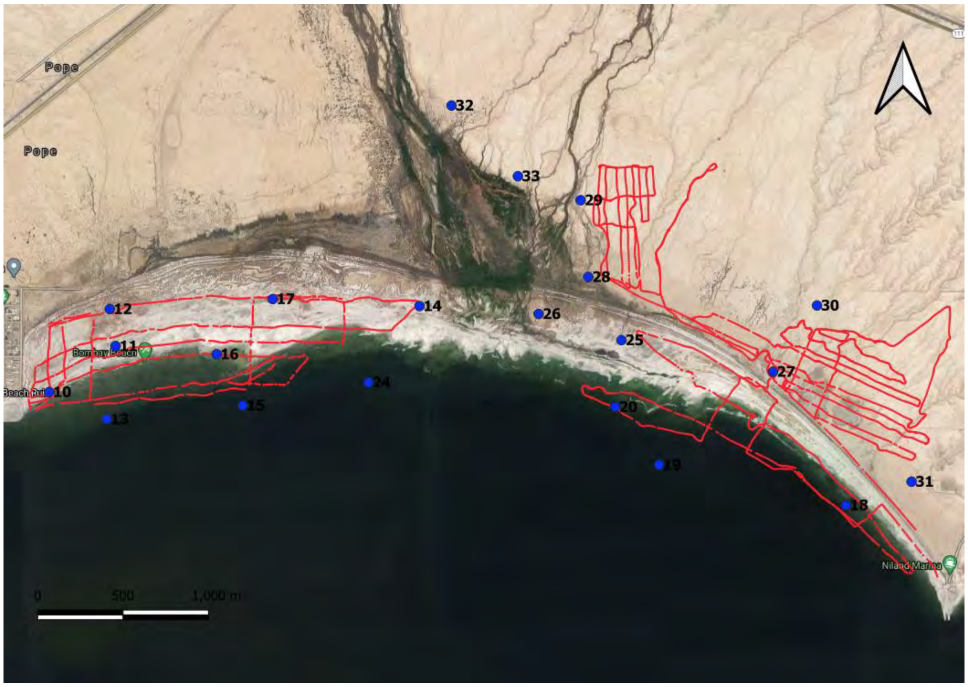


Figure 7 Location map of the tTEM survey lines and WalkTEM soundings at the Bombay Beach. tTEM survey lines are marked as red dots and WalkTEM sounding locations are shown with blue circles.

2.5 Weather

The weather was hot during the July campaign, with temperature above 43°C (110°F) during daytime and at around 32°C (90°F) at night when the survey was conducted. During the October campaign, the weather was dry, wind was low, and temperatures ranged up to 38°C (100°F). The additional cooling unit installed in the tTEM transmitter allowed the instrument to operate despite the high temperatures. The temperature of the transmitter unit reached above 60°C (140°F).

2.6 tTEM Survey lines and WalkTEM sounding locations

The tTEM survey lines and WalkTEM sounding locations were planned by Formation. The tTEM survey lines were adjusted during the survey to avoid areas with obstacles, dense vegetation or very soft soil. At the Clubhouse site, a few of the WalkTEM pre-planned sounding locations were in proximity to electromagnetic noise sources. Those locations were moved to the nearest optimal location to acquire high-quality data.

2.7 Quality control during surveying

During start-up in the morning or at night, Ramboll personnel carefully inspected the tTEM system to ensure that all parts, including wires and bolts & knots were intact and secure. When the system was fully up and running, the GPS and TEM transmitter and receiver were checked.

While surveying, personnel continuously checked data quality and system functionality. At the end of the survey day, the data were quality controlled, and a simple data processing and inversion was performed. The results demonstrated consistency and a good signal to noise ratio. No problems were found during the quality control of the data.

A few segments of tTEM lines (test line) were repeated during the survey. The results of one of the repeated survey lines are shown in Appendix 2, which demonstrate high repeatability of the system and consistency of the inversion schemes.

3. PROCESSING AND INVERSION

The processing and inversion of the tTEM data were completed with the software package, Aarhus Workbench. The workbench is a well-documented and technically sound software package used for processing and inversion of electromagnetic and geoelectrical data (detailed information about the software can be found at https://hgg.au.dk/software/aarhus-workbench/). We utilized an application that is specifically designed for processing and inversion of the tTEM data.

The tTEM data were collected with 282 Hz repetition frequency equivalent to 282 decay curves per second. The high number of data points allows for an advanced data processing scheme to achieve an enhanced signal to noise ratio.

The processing and inversion of the WalkTEM data were completed with the software package, Aarhus SPIA. The SPIA is a well-documented and technically sound software package used for processing and inversion of ground-based electromagnetic and geoelectrical data (detailed information about the software can be found at https://hgg.au.dk/software/spia/). We utilized an application that is specifically designed for processing and inversion of the WalkTEM data.

3.1 tTEM data processing steps

The collected tTEM data underwent the following processing steps:

1. Check if useful data have been mistakenly masked during the data acquisition process.
2. Import data to a Geophysical Relationship database (GERDA).
3. Check if data are masked at turning points to avoid data where the system is not aligned properly.
4. Check all secondary data to ensure they are within specifications and do not vary significantly along the lines.
5. Process GPS data.
6. Assign a standard uniform 3% noise to all data.
7. Define a standard processing scheme to automatically reject data and assign noise to the data.
8. Manually inspect each survey line. Data determined noisy that has not already been rejected in the previous step are removed. The noise can be due to overhead powerlines, buried power cables, metal fences, and other man-made sources. This is done for the individual soundings, as well as for a sequence of soundings along the survey line.
9. Assign elevation from a digital elevation model grid to each data point.
10. Average data along the lines using a trapezoidal filter, where more data from the late time gates are averaged compared to fewer data at the early time gates. This is to improve the signal to noise ratio for the data representing the deeper parts and to maintain the high resolution near-surface features along the line.
11. Develop a final processed dataset with a sounding distance of approximately 9 m (~ 30 ft).

More information about the tTEM data processing can be found in Appendix 2.

3.2 tTEM inversion steps

The entire processed tTEM data were then used together during the inversion and underwent the following steps:

1. Define horizontal and vertical constraints on the resistivities as well as the number of model layers and layer thicknesses.
2. Invert the processed data using the Spatially-constraint (SCI) approach (Viezzoli et al., 2008).
3. Present the data as depth slices. In case the depth slices reveal some distinct anomalies, the processing of the corresponding data is revisited (Step 3.1.1-8) and the data are re-inverted.
4. Calculate the depth of investigation (DOI) for each resistivity model, based on a sensitivity analysis of the model.

More information about the inversion process can be found in Appendix 2.

3.3 WalkTEM data processing steps

The collected WalkTEM data underwent the following processing steps:

1. Manually inspect each dataset for both low-moment (LM) and high-moment (HM) sounding curves.
2. Remove noisy data. The noise can be due to overhead powerlines, buried power cables, metal fences, and other man-made sources.
3. Assign a standard uniform 3% noise to all data.
4. Assign the transmitter loop center coordinate (acquired in the field) to the soundings.

3.4 WalkTEM inversion steps

The processed WalkTEM data were then used in the following inversion scheme:

1. Define vertical constrains on the resistivities as well as the number of model layers and layer thicknesses.
2. Invert the processed data for smooth (multi-layer) resistivity models.
3. Present the data as line models. In case the results are not satisfactory, the inversion setup is revisited, and the data are re-inverted.
4. Calculate the depth of investigation (DOI), based on a sensitivity analysis of the model.

4. RESULTS

This section describes the results of the geophysical surveys. The measured data are modelled to represent the electrical resistivities at different depths, which can then be interpreted as lithology to get an understanding of the site geology. The tTEM results are presented as plan-view maps (Appendix 3), cross sections (Appendix 4) and 3D fence-diagrams (Appendix 5). Because the data quality was high at both sites, most of the data (except at turning points) were used for inversion.

The WalkTEM results are presented in Appendix 6 as smooth (multi-layer) line models.

4.1 Correlation between resistivity and lithology

The tTEM method measures the electrical resistivity of the earth. To obtain the subsurface lithologic information, the measured electrical resistivities must be transformed into lithologies. Transforming resistivity to lithology is based on a general correlation between resistivity and sediment type. Figure 8 shows a general correlation, where low permeability clay has a low resistivity value, sandy clay typically has a medium-range resistivity value, and sand to coarse sand has a relatively large resistivity value. This correlation is a general assumption. The resistivity for each lithologic unit can vary between locations. The water quality within the vadose zone or in the aquifer can also impact the resistivity, i.e. the more saline the water, the lower the formation resistivity. Therefore, correlation with additional data sources (such as information from boreholes and water quality) and general geological knowledge of the study area are crucial to obtain the most accurate geologic description of the subsurface.

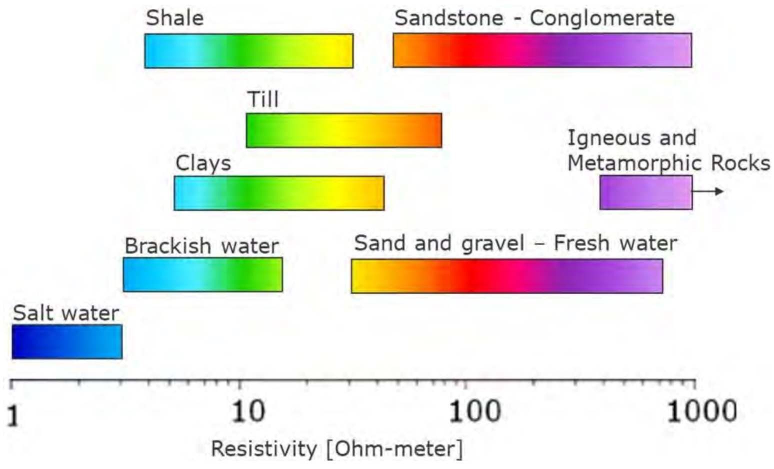


Figure 8 General correlation between resistivity and lithology.

In this project, the resistivity color scale was adjusted to enhance the representation of the geologic variations across the study area. The adjusted color scale, used for all presentations in this report, is shown in Figure 9.

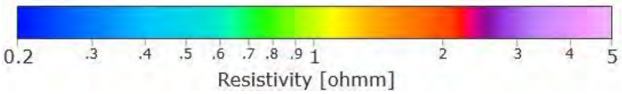


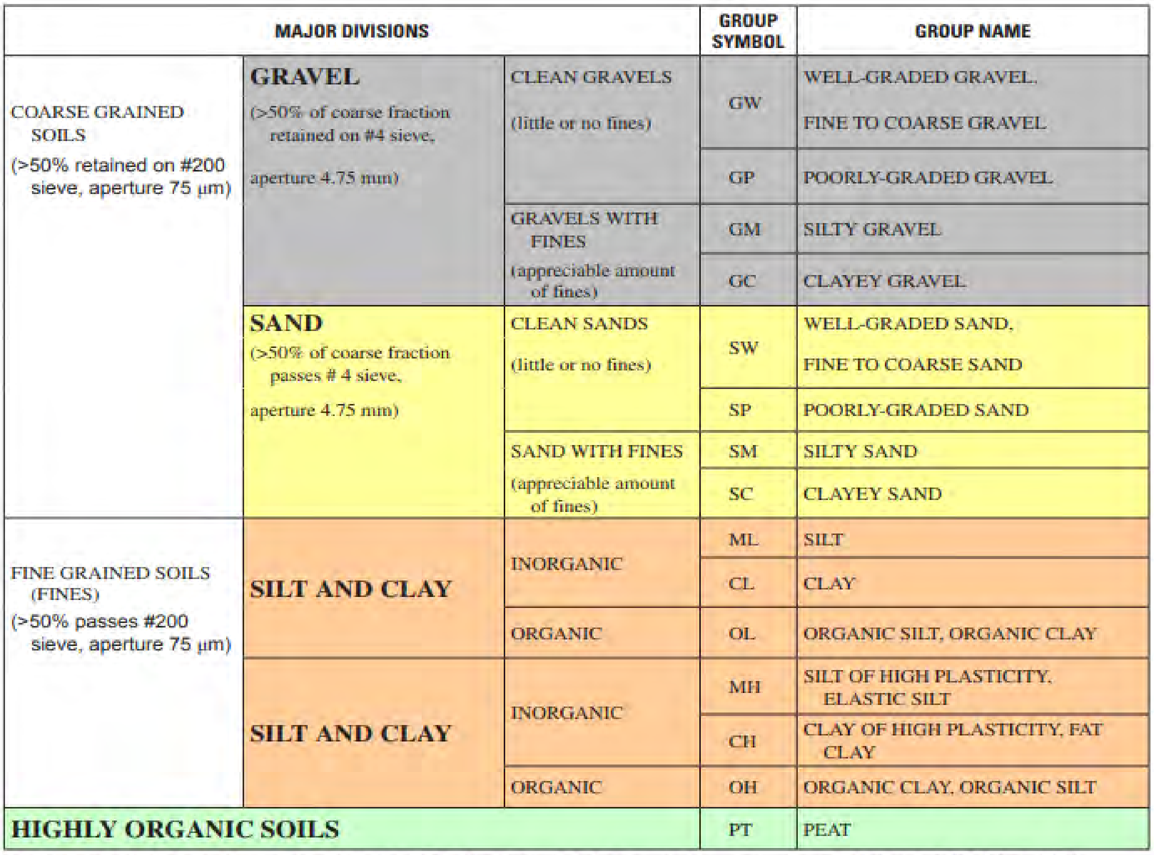
Figure 9 Resistivity color scale used for all presentations in the report.

The adjusted color scale represents atypical low resistivities. But as the TEM method is very sensitive to even small changes in conductive material it is reasonable to adjust the color scale. It should be noted, in intervals with known high salinity in the saturated zone, the resistivity of the saline water appears to determine the geophysical signals. Thus, determination of lithologic information may be masked by the strong signals found in saline intervals

Sandy, well sorted sediments containing sea water (e.g. Pacific Ocean) will typically have a formation resistivity of 1 ohm-m, and sea water itself has a resistivity of 0.27 ohm-m. Hence, resistivities found in the Salton Sea area below 1 ohm-m are interpreted as being more saline than normal sea water (35 g/L). At present, the salinity in the Salton Sea is more than 60 g/L.

4.2 Presentation of lithology

Lithologic information from boreholes were provided by Formation. In this report the USCS group symbols and color scheme were used as shown in Figure 10.The color scheme and the lithology symbols are used on the vertical sections as well as on the depth slices. For the comparison of lithologic logs and geophysical models see examples in Section 4.4.



MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS (>50% retained on #200 sieve, aperture 75 µm)	**GRAVEL** (>50% of coarse fraction retained on #4 sieve, aperture 4.75 mm)	CLEAN GRAVELS (little or no fines)	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVELS WITH FINES (appreciable amount of fines)	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND (>50% of coarse fraction passes # 4 sieve, aperture 4.75 mm)	CLEAN SANDS (little or no fines)	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES (appreciable amount of fines)	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS (FINES) (>50% passes #200 sieve, aperture 75 µm)	**SILT AND CLAY**	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT

Modified from American Society for Testing and Materials, 1985, D 2487-83, Classification of Soils for Engineering Purposes: Annual Book of ASTM Standards. Vol. 04.08, pp 395-408.

Figure 10 Lithologic units followed by the USCS classification.

4.3 Depth of investigation

The depth of investigation (DOI) is referred to a depth to which the resulting model can be considered reliable. The DOI depends on the geological and hydrogeological settings within the survey area, variations in the electromagnetic noise level and the tTEM system specifications. In a very saline environment like the study area, the depth of investigation is significantly less than normal.

The DOIs are calculated for each model and are in the ranges of 20-40 m (65-130 ft) across the two study sites. On the vertical sections, depths larger than the DOI are illustrated by fading colors. As can be seen on the vertical sections the DOI for the WalkTEM soundings are significantly deeper than for the tTEM data (in the range of ~ 90-160m / 290-525 ft). On the plan-view maps, the resistivities below the calculated DOI are masked. Information below the DOI should be considered more uncertain.

As described in appendix 2, the tTEM method provides a high-resolution dataset in the shallow subsurface. Conversely, the WalkTEM method provides more accurate data at greater depths and over larger lateral aquifer volumes. Due to the differences in the two methods, depth-dependent discrepancies are apparent in some cases. The combination of the two methods enables a robust interpretation of the shallow and deep intervals investigated.

Given the hydrogeologic conditions in the study area, the WalkTEM data appear to be the most representative dataset below 15 meters (50 feet) while the tTEM data appear to be the most representative dataset in the upper 15 meters (50 feet). This finding is based on the comparison of the geophysical data to lithologic data gathered at the site by Formation Environmental for the Clubhouse and Bombay Beach sites.

Figure 11 and Figure 12 show location maps of the tTEM DOI across the Clubhouse and Bombay Beach sites, respectively.

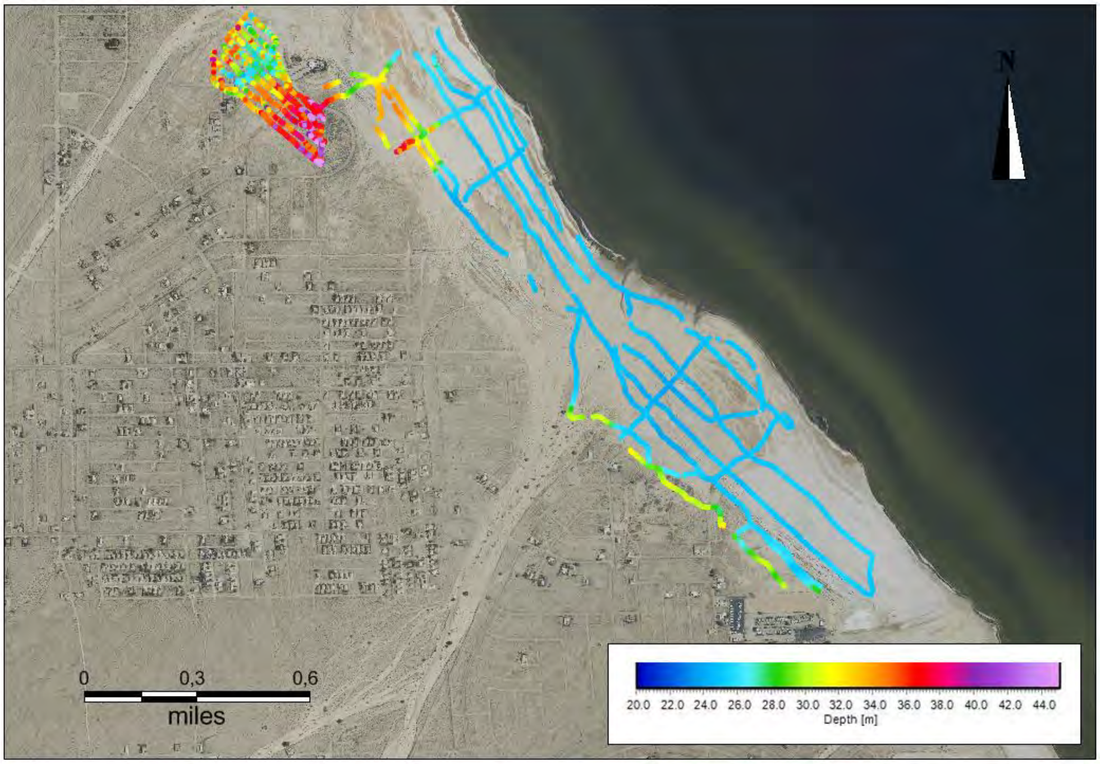


Figure 11 The tTEM depth of investigation at the Clubhouse.

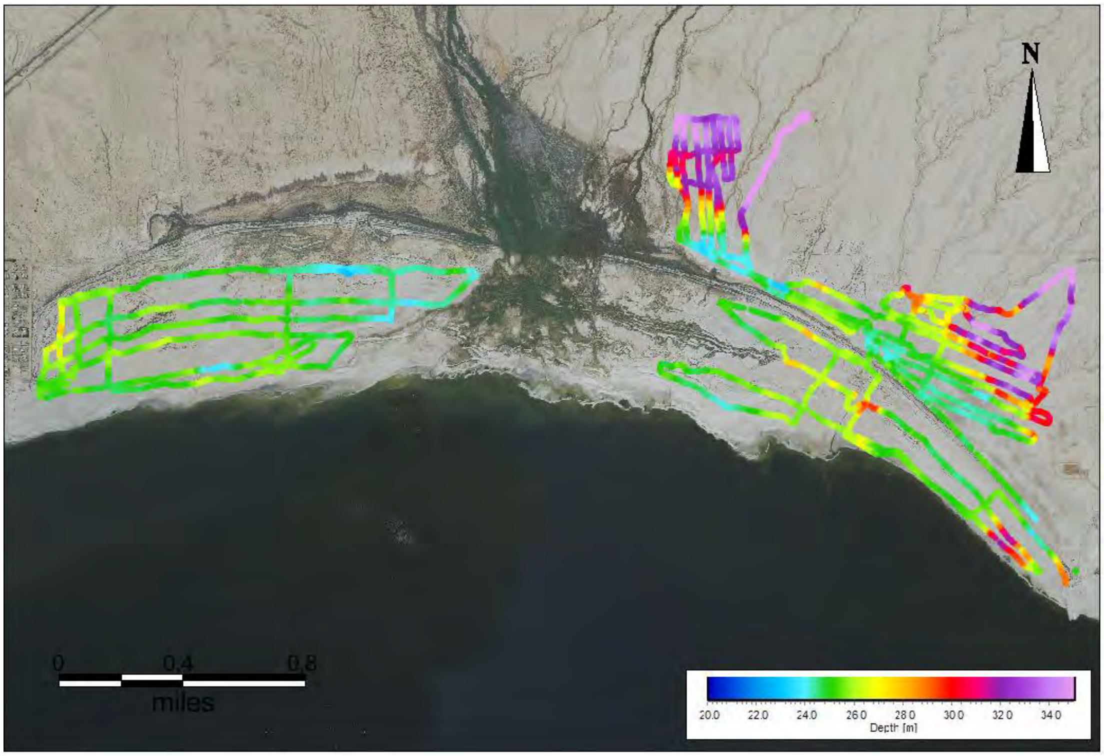


Figure 12 The tTEM depth of investigation at the Bombay Beach.

4.4 Comparison of the tTEM and WalkTEM results with borehole and laboratory information

As part of the validation of the tTEM data, two short vertical sections are presented at locations in proximity to boreholes CH-001 and BB-001.

On each section, the lithologic log is presented following the USCS group symbols, the tTEM models are presented as color bars, and the closest model to each borehole is shown as a stair chart (also called line model). Shown on each section are also gamma and normal resistivity geophysical logs, and a location map of the section. The geophysical logs are used for qualitative comparisons and validations of the surface geophysical models. The tTEM models are faded at depths larger than the calculated DOI. Finally, laboratory-derived electrical conductivity (EC) results from discrete soil samples collected from the formation during drilling are shown as vertical blue lines. The lab EC results were provided by Formation and measured by the following methods. The procedure consisted of air drying and grinding the sample, then wetting with distilled water to a glistening surface and letting it sit for four hours. Afterwards, the samples were put in a Buchner funnel and the liquid was extracted for EC analysis.

Figure 13 shows comparison of the tTEM models with borehole CH-001 at the Clubhouse. The borehole is 61 m (200 ft) apart from the section and the borehole is approximately 40 m (130 ft) from the nearest WalkTEM (CH12). The upper 6 m consists of high resistivity sand, followed mainly by clays with presence of a relatively thin sandy layer in the interval -83 m to -85 m amsl.

The upper sandy layer has a resistivity value of greater than 1 ohm-m. The boundary to the clay layer is nicely found on the tTEM models, which is also in agreement with the geophysical logs. The underlying clay layer has a resistivity value of below 1 ohm-m. At an elevation of −77 m, tTEM models suggest an increase in resistivities. This increase in resistivity is due to lower salinity of the groundwater, which is also confirmed by the laboratory EC results. Similarly, the heavy clays (CH) are not as conductive as the clay layer from 74-77 m. It is interpreted as a reduction in water salinity at the deeper levels. The thin sandy layer at -84 m is not seen in the tTEM data because of inherent physical limitations of the TEM methods to resolve thin layers at depth, with a thickness of significantly less than accumulated thicknesses of overlaying layers.

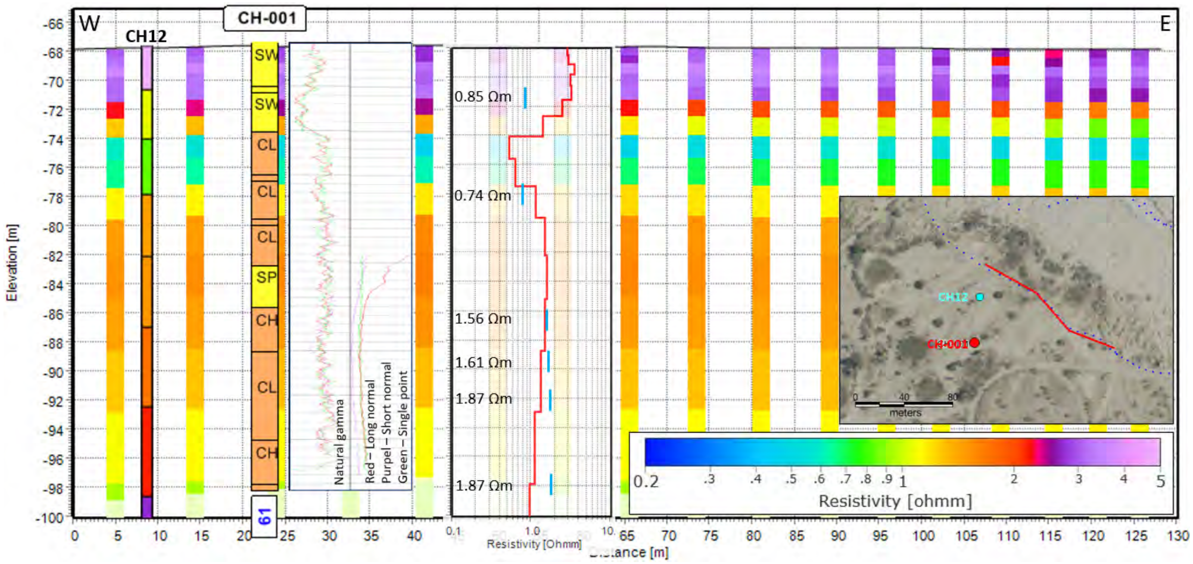


Figure 13 Comparison of the tTEM models with borehole CH-001. The location of the tTEM section with respect to the borehole is shown to the right. The borehole is 61 m apart from the section.

Figure 14 shows comparison of the tTEM models with borehole BB-001 at the Bombay Beach site. The borehole is 35 m (115 feet) apart from the section and the borehole is approximately 50 m (160 ft) from the nearest WalkTEM (BB01). At this location, the geology is described mainly as sandy units, with presence of clay layers in the deeper parts. The upper 7 m consists of sand with resistivities below 1 ohm-m. The low resistivity of this sandy layer is due to high salinity of the groundwater in this interval, which is consistent with the laboratory EC measurement in this interval. Below this layer, a mixture of sand and clays are found, with resistivities of around 1 ohm-m.

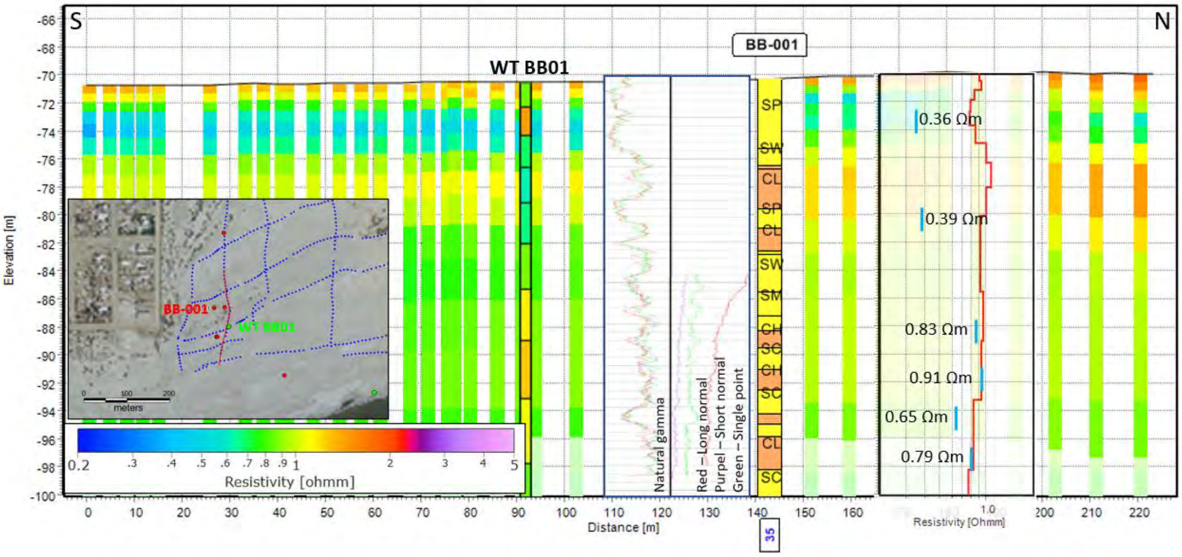


Figure 14 Comparison of the tTEM models with borehole BB-001. The location of the tTEM section with respect to the borehole is shown to the left. The borehole is 35 m apart from the section.

4.5 Comparison of the tTEM and ground conductivity meter results

The tTEM results were also compared with results of a ground conductivity meter (GCM) survey at the Clubhouse. The GCM survey was conducted by Formation and covers the playa portion of the tTEM and WalkTEM surveys. The comparison is shown in Figure 15 as a mean resistivity map in the depth interval 1-2 m.

Similar resistivity variations are observed from the two datasets. Areas with high resistivities from the tTEM correlate with high resistivity areas from the GCM. However, the actual resistivity level is not the same, and in general the contrast between high and low resistivity areas is found higher on the tTEM results.

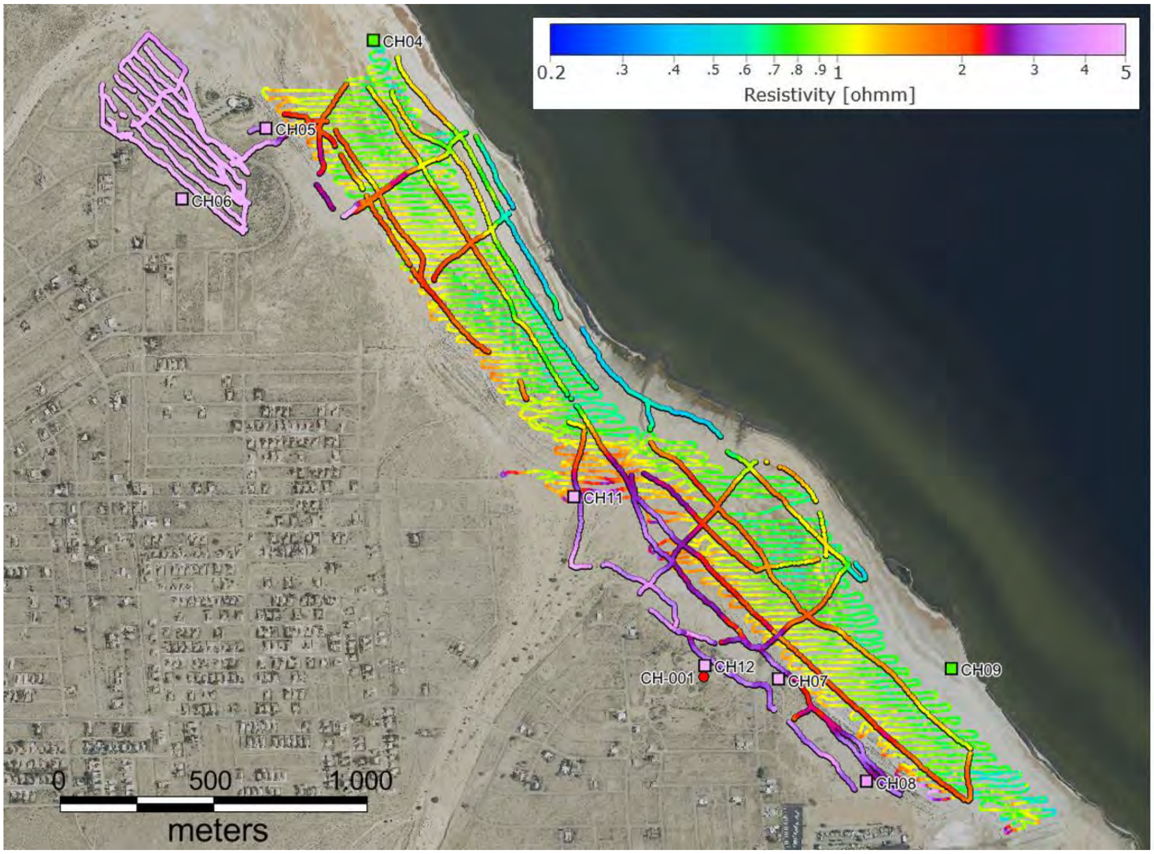


Figure 15 Comparison of the tTEM (depth interval 1-2 m) and CGM (depth 1.05 m) results at the Clubhouse.

4.6 Mean resistivity plan-view maps

Appendix 3 presents mean resistivity plan-view maps at different depth intervals. The mean resistivity maps illustrate detailed structures and provide insight about variations across the surveyed areas at each depth interval.

Mean resistivity maps are presented as depth slices from the terrain to a depth of 35 m. The following depth intervals have been applied:

1. From 0 m to 6 m (0-20 ft) in depth intervals of 1 m (3 ft);
2. From 6 m to 20 m (20-66 ft) in depth intervals of 2 m (7 ft);
3. From 20 m to 35 m (66-115 ft) in depth intervals of 5 m (16 ft).

For each depth interval, the corresponding WalkTEM mean resistivities are presented as color-coded squares. A good agreement is observed between the tTEM and WalkTEM mean resistivity maps.

The key features observed in the tTEM and WalkTEM resistivity models are as follows. It is noteworthy that the results are shown in depth intervals.

4.6.1 Clubhouse

- Depth interval 0-1 m: High resistivity values are seen across the study area, which is interpreted as an unsaturated zone. Resistivities are higher as moving inland, especially to the northwest.
- Depth interval 1-2 m: A conductive feature emerges in the central part, close to the sea.
- Depth interval 2-3 m: The conductive feature extends inland.
- Depth interval 3-4 m: In general, the conductive feature covers the playa. The north western and southern (near the built-up area) areas remain resistive.
- Depth interval 4-5 m: Resistivities get lower in the southern part of the playa. A more resistive structure emerges in the middle part, close to the sea.
- Depth interval 5-6 m: The low resistivities are limited to the southern part of the playa. The resistive feature in the middle part is more pronounced, and to the northwest the resistive structure starts to become more conductive.
- Depth interval 6-8 m: A significant resistive feature appears in the north, close to the sea.
- Depth interval 8-10 m: The above-mentioned resistive feature is more resistive and pronounced. The rest of the area starts to become more resistive.
- Depth interval 10-20 m: An obvious increase in resistivity is observed in the north west. The resistivities in this part decrease in depth intervals below 20 m.

4.6.2 Bombay Beach

- Depth interval 0-1m: High resistivity values are seen across the study area, which is interpreted as an unsaturated zone. Resistivities are higher towards the north/inland.
- Depth interval 1-2m: The geology is significantly more conductive except for the western (near the boreholes) and the northern parts.
- Depth intervals 2-3 m & 3-4 m: The playa is significantly more conductive.
- Depth interval 4-5 m: A resistive feature emerges on the eastern part of the playa.
- Depth interval 5-18 m: High resistivity features are observed on the western part of the playa. In some intervals, the feature is divided by a conductive anomaly.
- Depth intervals below 5 m: A resistive channel is nicely mapped out on the eastern part of the playa. This feature expands as it approaches the sea (see Figure 18 and Appendix 5)

4.7 Vertical sections

Appendix 4 presents vertical model sections slicing through the 3D resistivity model at different locations and directions across the Clubhouse and Bombay Beach study sites. Detailed structural variations are observed along each section. The WalkTEM models located within a 200-m (650-feet) distance from the section are shown as color bars with black outlines. The distance from the section for each WalkTEM model is posted on the cross-sections. The lithologic information from the boreholes are shown on the vertical sections, following the USCS symbol groups.

The vertical sections extend to an elevation of − 100 m (a depth of approximately 30 m [100 ft]). Along the sections there are shorter or even longer intervals where there are no geophysical models. This can be areas where the profile crosses the area and the distance to the nearest tTEM soundings exceed the search distance or it can be due to that some of the tTEM data have

been masked as they have been influenced by noise from powerlines, fences or other installations.
The distance from the WalkTEM soundings to the profile can be up to 200 m (650 feet). As the geology/hydrogeology might vary within such distance, which may cause appearance of disagreements between the tTEM models and the WalkTEM models. In addition, because of the differences in the two methods, depth-dependent discrepancies are apparent, as described in section 4.3. In this study, it was concluded that that tTEM results provide more accurate information in the top 50 feet and the WalkTEM results are more reliable at depths below 50 feet.

In the deepest part of the tTEM models the colors fade out. The depth where the colors start to fade is based on a calculation of the depth of investigation.

Examples of vertical model sections from the two study sites are shown in the following figures.

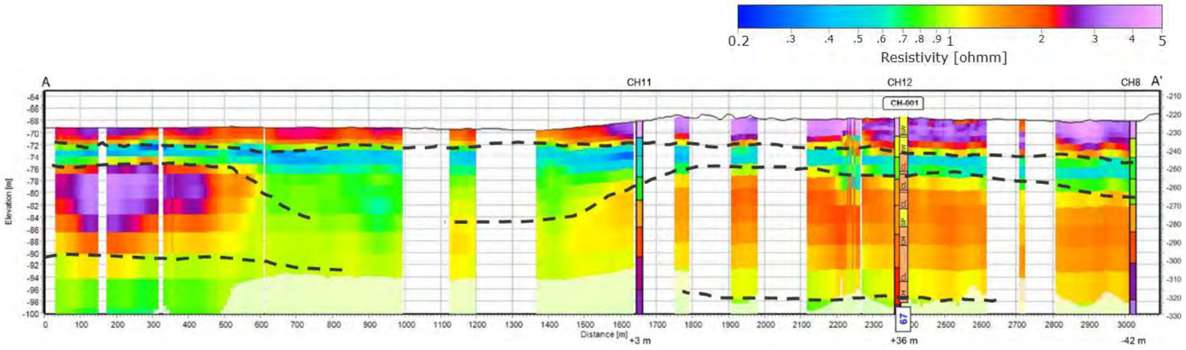


Figure 16 **Vertical model section AA' from the** Clubhouse. Color bars with black outlines show WalkTEM models. A lithologic log, located 67 m from the section, is projected as a color bar, following the USCS symbol groups. See Appendix 4 for a location map of the section.

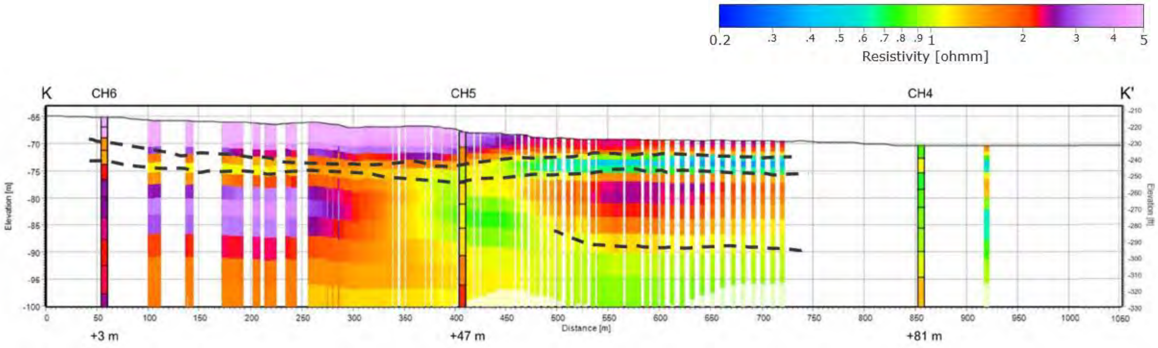


Figure 17 Vertical model section KK**' from the** Clubhouse. See Appendix 4 for a location map of the section.

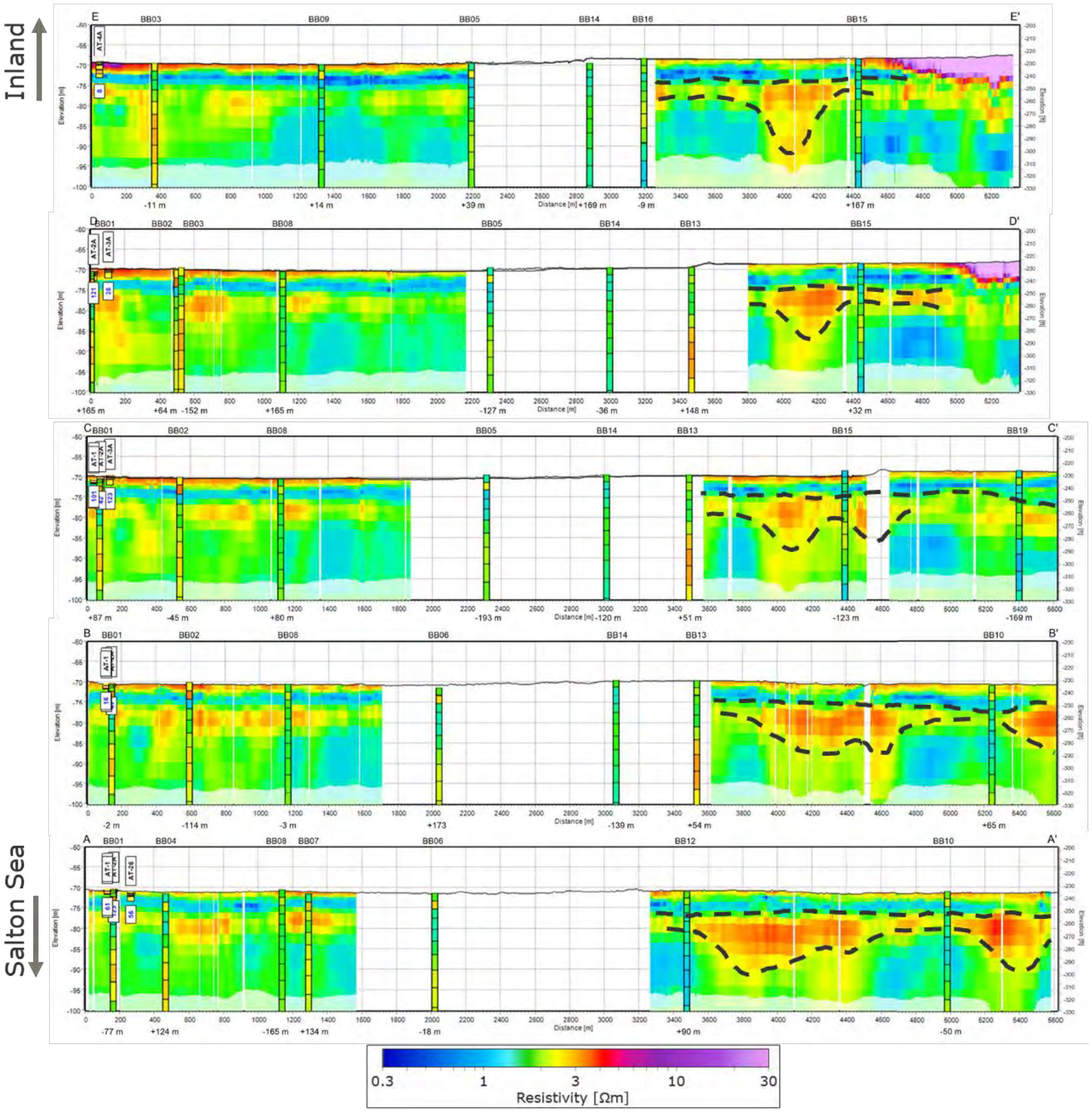


Figure 18 (Bottom to top) Vertical model section**s AA', BB', CC', DD' and EE'** from the Bombay Beach. See Appendix 4 for a location map of the sections.

4.8 Fence diagrams

In Appendix 5 the vertical sections from the Clubhouse and Bombay Beach are stitched together and visualized from different oblique angles. This serves to provide a three-dimensional visualization of the results.

4.9 WalkTEM results

The WalkTEM results are illustrated in Appendix 6. As discussed previously, these data extend significantly deeper and encompass a greater aquifer volume than the tTEM data (in the depth range of ~ 90-160 m / 290-525 ft). Given the hydrogeologic conditions in the study area, the WalkTEM data appear to be the most representative dataset below 15 meters (50 feet).

5. DATA DELIVERABLES

The following data have been provided as part of the report.

1. Raw data as extracted from the instrument, including:
   - A. Ascii files with information about the geographical coordinates, transmitted current and many other supporting data. All files are named YYYYMMDD_HHMMSS_MMM followed by three letters as an extension. The more crucial files have an extension SPS. Other files are primarily LOG files. One file with the extension LIN describes the start and end of each profile.
   - B. Binary data files with the electromagnetic decay measurements. The top section of the binary file is an ascii section with all information about measurement cycles and settings in the instrument.
2. A GERDA Firebird database (https://eng.geus.dk/products-services-facilities/data-and-maps/national-geophysical-database-gerda/) with all the imported data, processed data, as well as the model results.
3. The report is delivered as a PDF file.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The collected tTEM and WalkTEM data provide detailed subsurface information of the study sites. A total of 85 line-kilometers of tTEM data (26 km at the Clubhouse site and 59 km at the Bombay Beach site) and 33 WalkTEM sounding data have been acquired at the Clubhouse and Bombay Beach sites.

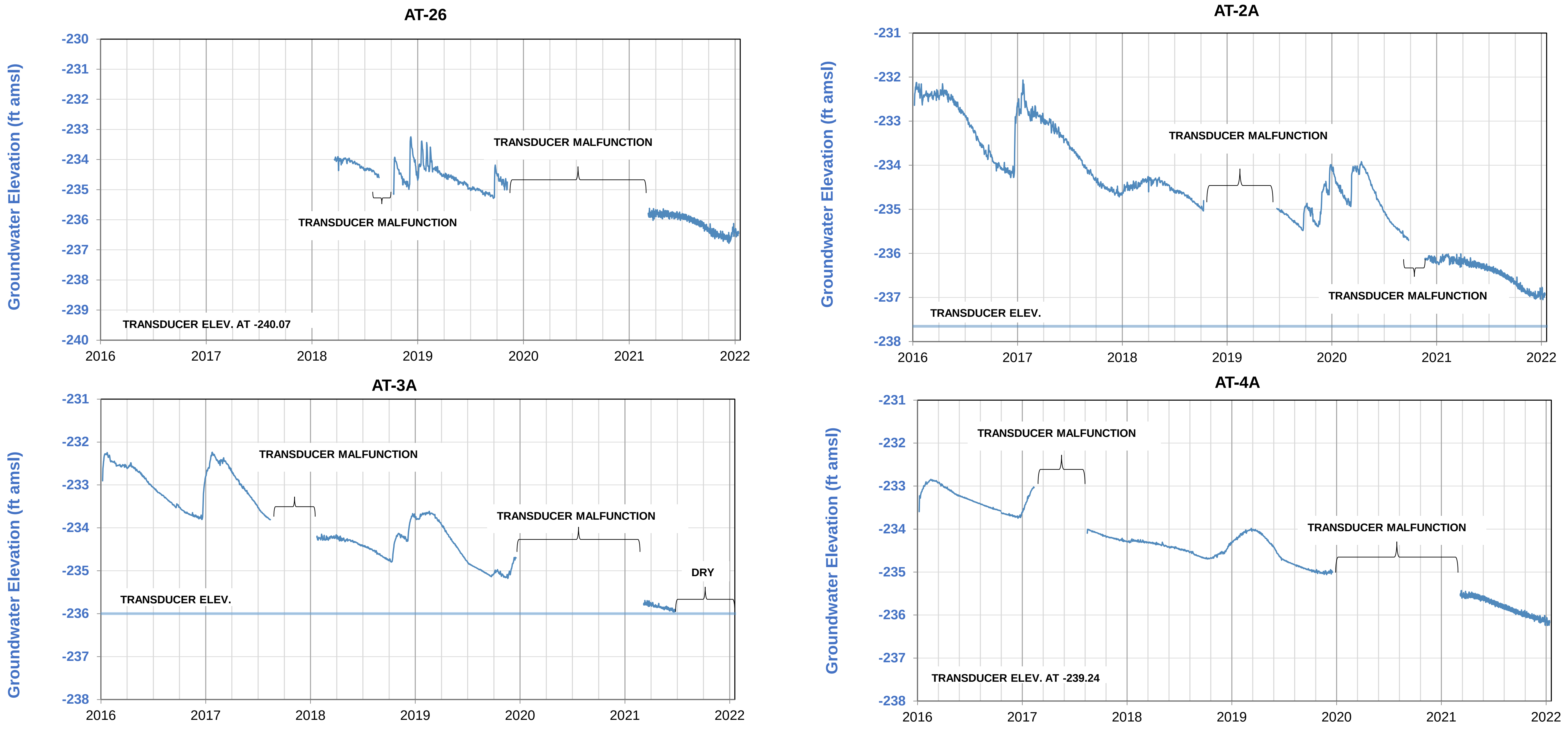
The tTEM as well as the WalkTEM datasets have provided data with a very high signal-to-noise ratio throughout the entire surveys. The very saline environment makes the sediments very electrically conductive; hence the high signal-to-noise ratio. On the other hand, the conductive environment reduces the depth of investigation for the tTEM survey down to 30-35 meters and less than 100 meters for the WalkTEM soundings.

The two types of geophysical data are generally in good agreement with each other as well as the results from two boreholes (one at each site). However, given the hydrogeologic conditions in the study area, the WalkTEM data appear to be the most representative dataset below 15 meters (50 feet). While the tTEM data appear to be the most representative dataset in the upper 15 meters (50 feet). The geophysical models map out the geologic and hydrogeologic structures heavily influenced by variations in the salinity of the porous water.
The obtained resistivity structures support the ability to interpret variations in salinity across the areas. The areas with relatively less saline water can be located where the resistivities are highest.

6.2 Recommendations

We recommend using the results to determine where to allocate new investigation boreholes to reflect variations in geology/hydrogeology. When doing future drilling, we recommend taking a measure of electrical resistivity and in-situ water salinity. This is to obtain a better understanding of the correlation in between variations in salinity and variations in geologic sediments.

ATTACHMENT C – HYDROGRAPHS



LEGEND

― Groundwater Elevation (Transducer)

NOTES:

1. ft amsl = feet above mean sea level
2. Date on x-axis begins with the first day of the month
3. Datum: NAVD88

SALTON SEA
IMPERIAL IRRIGATION DISTRIC

FIGURE C-1

GROUNDWATER ELEVATION HYDROGRAPHS
BOMBAY BEACH

DATE: FEBRUARY 2022
BY: BAL
FOR: NBB

FORMATION ENVIRONMENTAL

K:\IID_SaltonSea\Tasks\WaterSupply\Groundwater\Groundwater Resources Characterization\Shallow Piezometer Program\Investigation\Transducers\WaterDepth\Piezometer_Hydrographs\Data_Hydrographs_BombayBeach_v2.xlsx

LEGEND

– – –	SPC (uS/cm)	– – –	Groundwater Elevation (Transducer)
		▲	Manual Measurement

NOTES:

1. ft amsl = feet above mean sea level
2. Date on x-axis begins with the first day of the month
3. TDS = total dissolved solids
4. mg/L= milligrams per liter

SALTON SEA
IMPERIAL IRRIGATION DISTRICT

FIGURE C-2
GROUNDWATER ELEVATION HYDROGRAPHS AND TDS
HOT SPA LANDFILL

DATE: JUNE 2022
BY: NBB
FOR: BMS

FORMATION
ENVIRONMENTAL

APPENDIX E

Noise Impact Assessment

Noise Impact Assessment
for the
Bombay Beach Vegetation Plots Project

County of Imperial, California

Prepared For:

Imperial Irrigation District

Prepared By:

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS
55 Hanover Lane, Suite A
Chico, California 95973

November 2022

CONTENTS

LIST OF TABLES

ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
County	Imperial County
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	Decibel is A-weighted
FHWA	Federal Highway Administration
FICON	Federal Interagency Commission on Noise
FTA	Federal Transit Administration
HMMH	Harris Miller, Miller & Hanson Inc.
Hz	Hertz
IID	Imperial Irrigation District
L_{eq}	Measure of ambient noise

L_{dn}	a 24-hour average L_{eq} with a 10-dBA “weighting” added to noise during the hours of 10:00 pm to 7:00 am to account for noise sensitivity in the nighttime
L_{max}	The maximum A-weighted noise level during the measurement period
L_{min}	The maximum and minimum A-weighted noise level during the measurement period
OPR	Office of Planning and Research
OSHA	Federal Occupational Safety and Health Administration
OSHPD	Office of State Health Planning and Development
PPV	Peak particle velocity
Project	Bombay Beach Vegetation Plots Project
RMS	Root mean square
SSAQMP	Salton Sea Air Quality Mitigation Program
STC	Sound Transmission Class
VdB	Vibration Velocity Level
WEAL	Western Electro-Acoustic Laboratory, Inc.

1.0 INTRODUCTION

This report documents the results of a Noise Impact Assessment completed for the Bombay Beach Vegetation Plots Project (Project), which includes the implementation of Bombay Beach Plot Study as a part of the Salton Sea Air Quality Mitigation Program (SSAQMP) on approximately 149.2 acres of vacant land in Imperial County, California. This report was prepared as a comparison of predicted Project noise levels to noise standards promulgated by the County of Imperial General Plan Noise Element. The purpose of this report is to estimate Project-generated noise and to determine the level of impact the Project would have on the environment.

1.1 Project Overview

The Project Site is currently vacant land located adjacent to the eastern edge of the town of Bombay Beach on the eastern playa of the Salton Sea in Imperial County (County). Water conservation and transfer programs have reduced the volume of agricultural return flow to the Salton Sea. As a result, the Salton Sea is shrinking in size. As the Sea dries up, it exposes dry lakebed (also called playa) which subject to wind erosion. The increase in the rate of playa exposure increases the potential for dust emissions that could affect communities near and around the Sea. The Project proposes to implement several surface treatments along the Salton Sea shoreline to provide dust control and habitat enhancements adjacent to the community of Bombay Beach, California. More specifically, the Project proposes to evaluate groundwater supply and quality, vegetation establishment in hedgerows, enhancement of existing vegetation through rainwater harvesting (bunds) techniques, and waterless dust control measures (DCMs) in the Project Area. The Proposed Project will be a crucial part of the SSAQMP.

The main elements of the proposed Project are as follows:

- Installation of site exclusion barriers to prevent vehicle disturbance on the Project Site;
- Installation of access routes totaling 5,250 linear feet;
- Construction and development of three wells and completion of aquifer testing;
- Placement and use of approximately nine 5,000-gallon water storage tanks;
- Installation of irrigation system from wells to storage tanks and from storage tanks to vegetation on the exposed playa;
- Enhancement of up to 53 acres of existing vegetation and establishment of 86.5 acres of vegetated hedgerows, including site preparation, seeding and transplanting, and installation of managed irrigation systems. Vegetation would be seeded or transplanted iodine bush.

The purpose of the Project is the development of sufficient groundwater (both quantity and quality) to establish and sustain vegetation cover and implementation of DCMs. The primary DCMs would include vegetation establishment using irrigation from groundwater wells and vegetation enhancement using bunds for surface water capture. Existing vegetation includes native species such as iodine bush (*Allenrolfea* *occidentalis* or ALOC), fourwing saltbush (*Atriplex canescens* or ATCA), big saltbush (*Atriplex lentiformis* or ATLE), and bush seepweed (*Suaeda nigra* or SUNI).

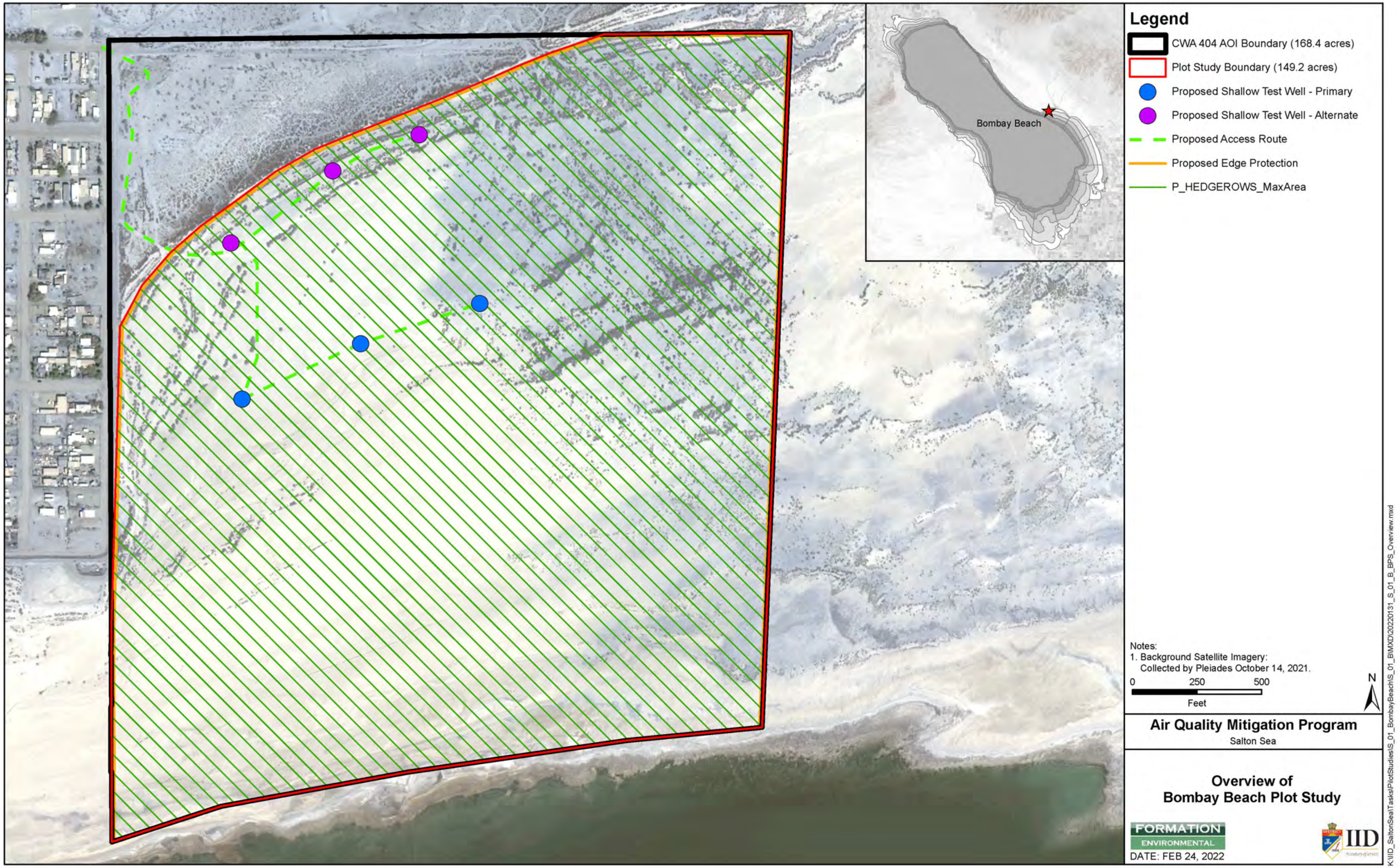
Vegetation establishment activities include earthworks, seeding, and the installation and operation of an irrigation system. The vegetated hedgerows would be planted with ALOC Playa Mix. Site preparation includes site staking, grubbing, construction of hedgerow seedbeds, and hedgerow seeding.

Bunds would be used to mimic the surface water retention achieved by natural beach ridges and promote vegetation expansion into areas were natural beach ridges to not occur. Bund construction is proposed to consist of staking, grubbing, excavation, compaction, and site restoration. Diversion swales would be installed to divert surface flow to the bund arrays.

Waterless DCMs include hay bales and sand fencing. Hay bales are proposed to be placed on the eastern and southern perimeter of the Project Area for site exclusion. Sand fencing would be installed on the western and northern perimeter of the Project Area for site exclusion and upwind control. A concrete barrier would also be placed along a portion of the western perimeter to prevent vehicle disturbance to the Project Site.

1.2 Project Location

The Project Area is directly adjacent to southeastern edge of the community of Bombay Beach, on the eastern edge of the Salton Sea (see Figure 1-1). Site access would be available from State Highway 111 via Avenue A to the roads within the community of Bombay Beach..



Map Date: 11/08/2022
Photo (or Base) Source: Formation Environmental 2022

Figure 1-1. Project Location

2022-061 Bombay Beach Vegetation Plots Project

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

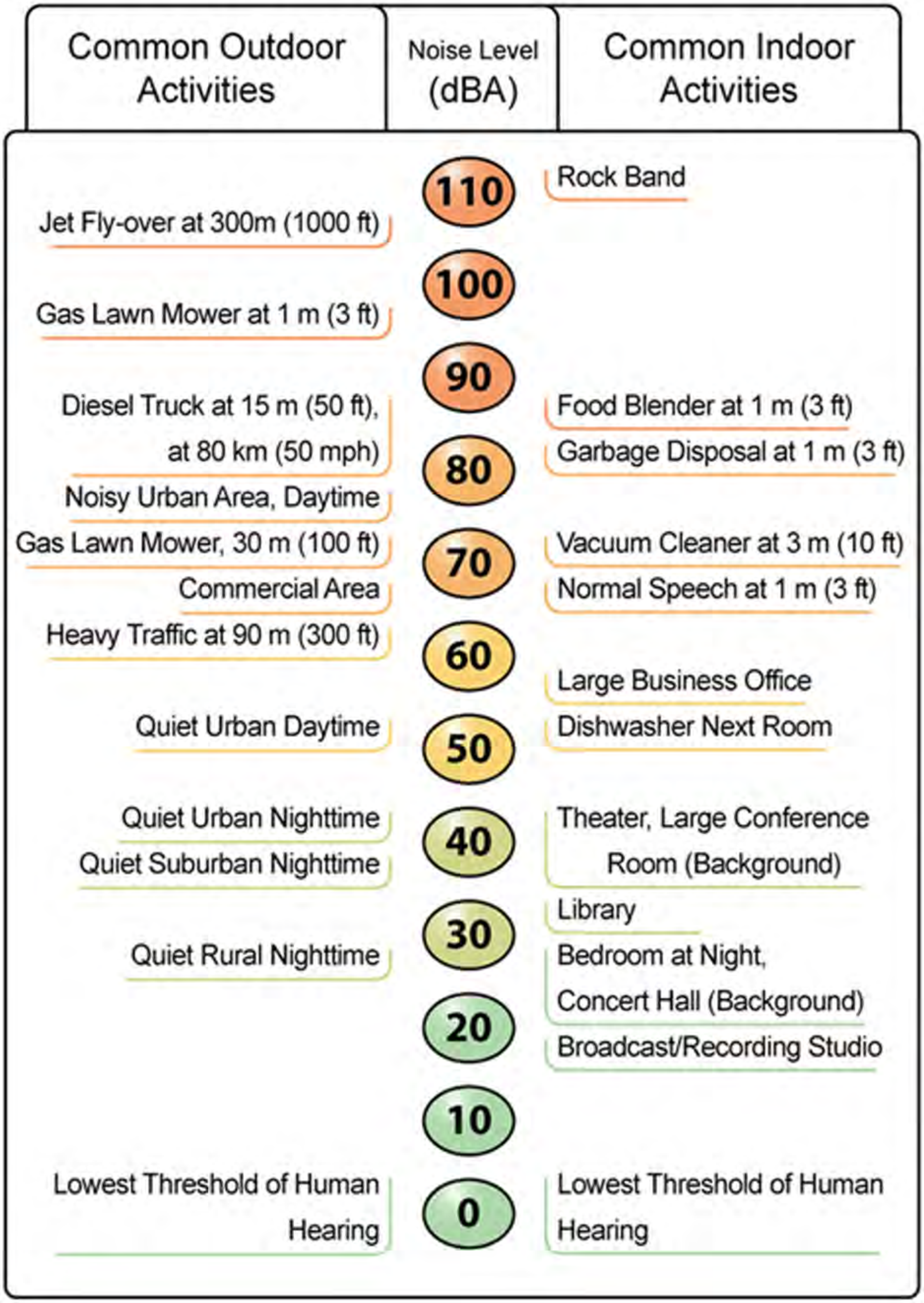
2.0 ENVIRONMENTAL NOISE AND GROUNDBORNE VIBRATION ANALYSIS

2.1 Fundamentals of Noise and Environmental Sound

2.1.1 Addition of Decibels

The decibel (dB) scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted (dBA), an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be three dB higher than one source under the same conditions (Federal Transit Administration [FTA] 2018). For example, a 65-dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by three dB). Under the decibel scale, three sources of equal loudness together would produce an increase of five dB.

Typical noise levels associated with common noise sources are depicted in Figure 2-1. *Common Noise Levels*



Source: California Department of Transportation (Caltrans) 2020a

Figure 2-1. Common Noise Levels

2022-061 Bombay Beach Vegetation Plots Project

2.1.2 Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB (dBA) for each doubling of distance from a stationary or point source (FHWA 2017). Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dBA for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (Federal Highway Administration [FHWA] 2017). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dBA per doubling of distance is normally assumed. For line sources, an overall attenuation rate of three dB per doubling of distance is assumed (FHWA 2011).

Noise levels may also be reduced by intervening structures; generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about five dBA (FHWA 2006), while a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise can provide a sound reduction 35 dBA or greater (Western Electro-Acoustic Laboratory, Inc. [WEAL] 2000). To achieve the most potent noise-reducing effect, a noise enclosure/barrier must physically fit in the available space, must completely break the “line of sight” between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend lengthwise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver.

The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows (Caltrans 2002). The exterior-to-interior reduction of newer residential units is generally 30 dBA or more (Harris Miller, Miller & Hanson Inc. [HMMH] 2006). Generally, in exterior noise environments ranging from 60 dBA Community Noise Equivalent Level (CNEL) to 65 dBA CNEL, interior noise levels can typically be maintained below 45 dBA, a typical residential interior noise standard, with the incorporation of an adequate forced air mechanical ventilation system in each residential building, and standard thermal-pane residential windows/doors with a minimum rating of Sound Transmission Class (STC) 28. (STC is an integer rating of how well a building partition attenuates airborne sound. In the U.S., it is widely used to rate interior partitions, ceilings, floors, doors, windows, and exterior wall configurations). In exterior noise environments of 65 dBA CNEL or greater, a combination of forced-air mechanical ventilation and sound-rated construction methods is often required to meet the interior noise level limit. Attaining the necessary noise reduction from exterior to interior spaces is readily achievable in noise environments less than 75 dBA CNEL with proper wall construction techniques following California Building Code methods, the selections of proper windows and doors, and the incorporation of forced-air mechanical ventilation systems.

2.1.3 Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise include the average hourly noise level (in L_{eq}) and the average daily noise levels/community noise equivalent level (in L_{dn}/CNEL). The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL are measures of community noise. Each is applicable to this analysis and defined as follows:

- **Equivalent Noise Level (L_{eq})** is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- **Day-Night Average (L_{dn})** is a 24-hour average L_{eq} with a 10-dBA "weighting" added to noise during the hours of 10:00 pm to 7:00 am to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
- **Community Noise Equivalent Level (CNEL)** is a 24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 pm to 10:00 pm and a 10-dBA weighting added to noise during the hours of 10:00 pm to 7:00 am to account for noise sensitivity in the evening and nighttime, respectively.

Table 2-1 provides a list of other common acoustical descriptors.

Table 2-1. Common Acoustical Descriptors

Descriptor	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	A 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
Community Noise Equivalent Level, CNEL	A 24-hour average L_{eq} with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.

The A-weighted decibel sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about ±1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source. Close to the noise source, the models are accurate to within about ±1 to 2 dBA.

2.1.4 Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in A-weighted noise levels (dBA), the following relationships should be noted in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in community response would be expected. An increase of 5 dBA is typically considered substantial.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

2.1.5 Effects of Noise on People

2.1.5.1 Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise.

The Occupational Safety and Health Administration (OSHA) has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over eight hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

2.1.5.2 Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources.

2.2 Fundamentals of Environmental Groundborne Vibration

2.2.1 Vibration Sources and Characteristics

Sources of earthborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or manmade causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions).

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

PPV is generally accepted as the most appropriate descriptor for evaluating the potential for building damage. For human response, however, an average vibration amplitude is more appropriate because it takes time for the human body to respond to the excitation (the human body responds to an average vibration amplitude, not a peak amplitude). Because the average particle velocity over time is zero, the RMS amplitude is typically used to assess human response. The RMS value is the average of the amplitude squared over time, typically a 1- sec. period (FTA 2018).

Table 2-2 displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high-noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. For instance, heavy-duty trucks generally generate groundborne vibration velocity levels of 0.006 PPV at 50 feet under typical circumstances, which as identified in Table 2-2 is considered very unlikely to cause damage to buildings of any type. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment.

Table 2-2. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

Peak Particle Velocity (inches/second)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Threshold at which there is a risk of architectural damage to extremely fragile historic buildings, ruins, ancient monuments
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Threshold at which there is a risk of architectural damage to fragile buildings. Virtually no risk of architectural damage to normal buildings
0.25	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to historic and some old buildings
0.3	96	Vibrations may begin to feel severe to people in buildings	Threshold at which there is a risk of architectural damage to older residential structures
0.5	103	Vibrations considered unpleasant by people subjected to continuous vibrations	Threshold at which there is a risk of architectural damage to new residential structures and Modern industrial/commercial buildings

Source: Caltrans 2020b

3.0 EXISTING ENVIRONMENTAL NOISE SETTING

3.1 Noise Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as hospitals, historic sites, cemeteries, and certain recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The nearest existing sensitive receptors to the Project Site are several single-family residences located on the road Aisle of Palms, which is directly adjacent to the western border of the Project Site.

3.2 Existing Ambient Noise Environment

The American National Standards Institute (ANSI) Standard 12.9-2013/Part 3 "Quantities and Procedures for Description and Measurement of Environmental Sound – Part 3: Short-Term Measurements with an Observer Present" provides a table of approximate background sound levels in L_{dn}, daytime L_{eq}, and nighttime L_{eq}, based on land use and population density. The ANSI standard estimation divides land uses into six distinct categories. Descriptions of these land use categories, along with the typical daytime and nighttime levels, are provided in Table 3-1. At times, one could reasonably expect the occurrence of periods that are both louder and quieter than the levels listed in the table. ANSI notes, "*95% prediction interval [confidence interval] is on the order of +/- 10 dB*." The majority of the Project Area would be considered ambient noise Category 6.

Table 3-1. ANSI Standard 12.9-2013/Part 3 A-weighted Sound Levels Corresponding to Land Use and Population Density

Category	Land Use	Description	People per Square Mile	Typical L_{dn}	Daytime L_{eq}	Nighttime L_{eq}
1	Noisy Commercial & Industrial Areas and Very Noisy Residential Areas	Very heavy traffic conditions, such as in busy, downtown commercial areas; at intersections for mass transportation or other vehicles, including elevated trains, heavy motor trucks, and other heavy traffic; and at street corners where many motor buses and heavy trucks accelerate.	63,840	67 dBA	66 dBA	58 dBA
2	Moderate Commercial & Industrial Areas and Noisy Residential Areas	Heavy traffic areas with conditions similar to Category 1, but with somewhat less traffic; routes of relatively heavy or fast automobile traffic, but where heavy truck traffic is not extremely dense.	20,000	62 dBA	61 dBA	54 dBA
3	Quiet Commercial, Industrial Areas and Normal Urban & Noisy Suburban Residential Areas	Light traffic conditions where no mass-transportation vehicles and relatively few automobiles and trucks pass, and where these vehicles generally travel at moderate speeds; residential areas and commercial streets, and intersections, with little traffic, compose this category.	6,384	57 dBA	55 dBA	49 dBA
4	Quiet Urban & Normal Suburban Residential Areas	These areas are similar to Category 3, but for this group, the background is either distant traffic or is unidentifiable; typically, the population density is one-third the density of Category 3.	2,000	52 dBA	50 dBA	44 dBA
5	Quiet Residential Areas	These areas are isolated, far from significant sources of sound, and may be situated in shielded areas, such as a small wooded valley.	638	47 dBA	45 dBA	39 dBA
6	Very Quiet Sparse Suburban or rural Residential Areas	These areas are similar to Category 4 but are usually in sparse suburban or rural areas; and, for this group, there are few if any nearby sources of sound.	200	42 dBA	40 dBA	34 dBA

Source: The American National Standards Institute (ANSI) 2013

4.0 REGULATORY FRAMEWORK

4.1 Federal

4.1.1 Occupational Safety and Health Act of 1970

OSHA regulates onsite noise levels and protects workers from occupational noise exposure. To protect hearing, worker noise exposure is limited to 90 decibels with A-weighting (dBA) over an eight-hour work shift (29 Code of Regulations 1910.95). Employers are required to develop a hearing conservation program when employees are exposed to noise levels exceeding 85 dBA. These programs include provision of hearing protection devices and testing employees for hearing loss on a periodic basis.

4.2.2 Federal Interagency Commission on Noise

The 2000 Federal Interagency Commission on Noise (FICON) findings provide guidance as to the significance of changes in ambient noise levels due to transportation noise sources. FICON recommendations are based on studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing noise-sensitive land uses (e.g. residential, etc.) are less than 60 dBA CNEL and the Project creates a readily perceptible 5 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels range from 60 to 65 dBA CNEL and the Project creates a barely perceptible 3 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels already exceed 65 dBA CNEL, and the Project creates a community noise level increase of greater than 1.5 dBA CNEL.

4.2 State

4.2.1 State of California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The State of California General Plan Guidelines (State of California 2003), published by the Governor's Office of Planning and Research (OPR), also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

4.2.2 State Office of Planning and Research Noise Element Guidelines

The State OPR *Noise Element Guidelines* include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a Land Use Compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL.

4.2.3 California Department of Transportation

In 2020, the California Department of Transportation (Caltrans) published the Transportation and Construction Vibration Manual (Caltrans 2020b). The manual provides general guidance on vibration issues associated with the construction and operation of projects concerning human perception and structural damage. Table 2-2 above presents recommendations for levels of vibration that could result in damage to structures exposed to continuous vibration.

4.3 Local

4.3.1 Imperial County General Plan Noise Element

The County of Imperial General Plan Noise Element establishes maximum allowable average-hourly noise limits for various land use designations (refer to Table 4-1). In instances where the adjoining land use designations differ from that of the noise-generating land use, the more restrictive noise standard shall applies. Where the ambient noise level is equal to or exceeds the property line noise standard, the increase of the existing or proposed noise shall not exceed 3 dBA L_{eq}, which is a just-perceivable increase in noise. L_{eq} is defined as the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure.

Table 4-1 County of Imperial Property Line Noise Standards

Land Use Zone	Time Period	Average-Hourly Noise Level (dBA L_{eq})
Residential	7 a.m. - 10 p.m.	50
	10 p.m. - 7 a.m.	45
Multi-residential	7 a.m. - 10 p.m.	55
	10 p.m. - 7 a.m.	50
Commercial	7 a.m. -10 p.m.	60
	10 p.m. - 7 a.m.	55
Light Industrial/Industrial Park	Any time	70
General Industrial	Any time	75

Source: Imperial County 2015.

Notes: When the noise-generating property and the receiving property have different uses, the more restrictive standard shall apply. When the ambient noise level is equal to or exceeds the Property Line noise standard, the increase of the existing or proposed noise shall not exceed 3 dBA L_{eq}.

4.3.1.1 Construction Noise Standards

Construction noise, from a single piece of equipment or a combination of equipment, shall not exceed 75 dB L_{eq}, when averaged over an eight (8) hour period, and measured at the nearest sensitive receptor. This standard assumes a construction period, relative to an individual sensitive receptor of days or weeks. In cases of extended length construction times, the standard may be tightened so as not to exceed 75 dB L_{eq} when averaged over a one (1) hour period.

Construction equipment operations are required to be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. Saturday. No commercial construction operations are permitted on Sunday or holidays. In cases of a person constructing or modifying a residence for himself/herself, and if the work is not being performed as a business, construction equipment operations may be performed on Sundays and holidays between the hours of 9:00 a.m. and 5:00 p.m. Such non-commercial construction activities may be further restricted where disturbing, excessive, or offensive noise causes discomfort or annoyance to reasonable persons of normal sensitivity residing in an area.

5.0 Impact Assessment

5.1 Thresholds of Significance

The impact analysis provided below is based on the following California Environmental Quality Act Guidelines Appendix G thresholds of significance. The Project would result in a significant noise-related impact if it would produce:

1) 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.

2) Generation of excessive groundborne vibration or groundborne noise levels.

3) 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.

In order to evaluate the potential health-related effects (physical damage to the ear and mental damage from lack of sleep or focus) from construction noise, such noise generated by the Project is compared against the construction-related noise level threshold established by the County. For purposes of this analysis, Project construction noise is compared to the County's construction noise standard of 75 dBA, when averaged over an eight-hour period and measured at the nearest sensitive receptor.

5.2 Methodology

This analysis of the existing and future noise environments is based on empirical observations. Predicted construction noise levels were calculated utilizing the FHWA's Roadway Construction Noise Model (2006). Groundborne vibration levels associated with construction-related activities for the Project have been evaluated utilizing typical groundborne vibration levels associated with construction equipment. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby structures and typically applied criteria for structural damage and human annoyance.

5.3 Impact Analysis

5.3.1 Would the Project Result in Short-Term Construction-Generated Noise in Excess of County Standards?

Construction noise associated with the Proposed Project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for onsite construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, pile drivers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site.

The nearest existing noise-sensitive land use to the Project Site are several single-family residences located along the western border of the Project Site boundary. As previously described, the County's General Plan Noise Element states construction equipment operation shall be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. on Saturdays. No commercial construction operations are permitted on Sundays or holidays. Construction noise, from a single piece of equipment or a combination of equipment, must not exceed 75 dB L_{eq}, when averaged over an eight-hour period, and measured at the nearest sensitive receptor. This standard, established by the County to prevent physical and mental damage consistent with exposure to excessive noise, assumes a construction period, relative to an individual sensitive receptor of days or weeks.

It is assumed that construction would only take place during daytime hours (7:00 a.m. to 7:00 p.m.) (see mitigation measure NOI-1 below). The nearest off-site sensitive receptors to the Project Site are approximately 80 feet west of the Project Site boundary. However, it is acknowledged that the majority of construction equipment is not situated at any one location during construction activities, but rather spread throughout the Project Site and at various distances from sensitive receptors. Therefore, this analysis employs the FTA guidance for calculating construction noise, which recommends measuring construction noise produced by all construction equipment from the center of the Project Site (FTA 2018), which in this case is approximately 1,374 feet from the nearest sensitive receptor. The anticipated short-term construction noise levels generated for the necessary stationary and mobile equipment during each phase is presented in Table 5-1.

Table 5-1. Construction Average (dBA) Noise Levels at Nearest Receptor

Equipment	Estimated Exterior Construction Noise Level at Existing Residences	Construction Noise Standards (dBA L_{eq})	Exceeds Standards?
Access Road Equipment	57.0 dBA	*75*	**No**
Irrigation Equipment	56.8 dBA	*75*	**No**
Sand Fencing Equipment	44.0 dBA	*75*	**No**
Site Exclusion Equipment	57.2 dBA	*75*	**No**
Site Preparation Equipment	53.4 dBA	*75*	**No**
Vegetation Enhancement Equipment	53.0 dBA	*75*	**No**
Well Construction and Aquifer Testing Equipment	50.4 dBA	*75*	**No**

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Attachment A for Model Data Outputs.

Notes: Construction equipment used based on the Dust Control Plan for Bombay Beach Plot Study (Imperial Irrigation District [IID] 2022). The nearest residence is approximately 1,374 feet from the center of the Project Site. There is an estimated 3 dBA of shielding, due to the dirt berm along the western edge of the Project Site.

L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

As shown in Table 5-1, during construction activities no individual or cumulative piece of construction equipment would exceed the County's 75 dBA County construction noise standard during any phase of construction at the nearby noise-sensitive receptors.

While no noise standard would be exceeded by construction of the Proposed Project, the following best management practices are recommended during the times when construction occurs while school is in session.

Measure NOI-1: The following measures shall be applied to the Project during construction:

1. All construction equipment, fixed or mobile, will be equipped with properly operating and maintained mufflers, consistent with manufacturer standards.
2. All stationary construction equipment will be placed so that emitted noise is directed away from the noise sensitive receptors nearest the Project Site.
3. As applicable, shut off all equipment when not in use.

4. Equipment staging shall be located in areas that create the greatest distance between construction-related noise/vibration sources and sensitive receptors surrounding the project site.

6. No amplified music and/or voice will be allowed on the construction site.

7. In accordance with the County Guidelines, construction equipment operation shall be limited to the hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, and 9:00 a.m. to 5:00 p.m. on Saturdays. No commercial construction operations are permitted on Sundays or holidays.

5.3.2 Would the Project Result in a Substantial Permanent Increase in Ambient Noise Levels in Excess of County Standards During Operations?

Operational noise impacts associated with the Project would include maintenance and monitoring of the irrigation system, would result in negligible noise impacts. Once construction is complete, no regular additional daily vehicle trips or personnel would be added to operate or maintain the Project Site. No major diesel-powered equipment would be required as part of ongoing Project operations. The operations of the Project include infrequent maintenance and monitoring of the irrigation system. This would produce brief, and in most cases, negligible noise levels.

5.3.3 Would the Project Expose Structures to Substantial Groundborne Vibration During Construction?

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Construction on the Project Site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. It is noted that pile drivers would be necessary during Project construction. Vibration decreases rapidly with distance and it is acknowledged that construction activities would occur throughout the Project Site and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with typical construction equipment at 25 feet distant are summarized in Table 5-2.

Table 5-2. Representative Vibration Source Levels for Construction Equipment

Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)
Large Bulldozer	0.089
Pile Driver	0.170
Loaded Trucks	0.076
Hoe Ram	0.089
Jackhammer	0.035
Small Bulldozer/Tractor	0.003
Vibratory Roller	0.210

Source: FTA 2018; Caltrans 2020b

The County of Imperial does not regulate vibrations associated with construction. However, a discussion of construction vibration is included for full disclosure purposes. For comparison purposes, the Caltrans (2020b) recommended standard of 0.3 inch per second PPV with respect to the prevention of structural damage for older residential buildings is used as a threshold. This is also the level at which vibrations may begin to annoy people in buildings. Consistent with FTA recommendations for calculating construction vibration, construction vibration was measured from the center of the Project Site (FTA 2018). The nearest structure of concern to the construction site, with regard to groundborne vibrations, are the residences on the western boundary of the Project Site, which are approximately 1,374 feet from the center of the site.

Based on the representative vibration levels presented for various construction equipment types in Table 5-2 and the construction vibration assessment methodology published by the FTA (2018), it is possible to estimate the potential project construction vibration levels. The FTA provides the following equation:

$$[PPVequip = PPVref \times (25/D)^{1.5}]$$

Table 5-3 presents the expected Project related vibration levels at a distance of 1,374 feet.

Table 5-3. Construction Vibration Levels at 1,374 Feet

Receiver PPV Levels (in/sec)[1]					**Peak Vibration**	**Threshold**	**Exceed Threshold**
Large Bulldozer, Caisson Drilling, & Hoe Ram	**Loaded Trucks**	**Jackhammer**	**Pile Driver**	**Vibratory Roller**			
0.000	0.000	0.000	0.000	0.001	**0.001**	*0.2*	**No**

Notes: [1]Based on the Vibration Source Levels of Construction Equipment included on Table 5-3 (FTA 2018). Distance to the nearest structure of concern is approximately 1,374 feet measured from Project Site boundary.

As shown in Table 5-3, vibration as a result of construction activities would not exceed 0.2 PPV at the nearest structure. Thus, Project construction would not exceed the recommended threshold.

5.3.4 Would the Project Expose Structures to Substantial Groundborne Vibration During Operations?

Project operations would not include the use of any large-scale stationary equipment that would result in excessive vibration levels. Therefore, the project would not result groundborne vibration impacts during operations.

5.3.5 Would the Project Expose People Residing or Working in the Project area to Excessive Airport Noise?

The Project Site is located approximately 13.4 miles northeast of the Salton City Airport in Salton City and 16.5 miles northwest of the Calipatria Municipal Airport in Calipatria. The Imperial County Airport Land Use Commission has established a set of land use compatibility criteria for lands surrounding the airports in Imperial County in the Imperial County Airport Land Use Compatibility Plan (1996). As identified in the Imperial County Airport Land Use Compatibility Maps, the Proposed Project Site lays outside of the noise contours of all airports. Therefore, the Project would not expose Project workers to excessive airport noise.

6.0 REFERENCES

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LIST OF ATTACHMENTS

ATTACHMENT A

Federal Highway Administration Roadway Construction Noise Model Outputs – Project Construction Noise

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/1/2022
Case Description: Access Road

Description	**Land Use**
Access Road	Residential

Equipment

Description	**Impact Device**	**Usage(%)**	**Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Grader	No	40	85		1374	3
Grader	No	40	85		1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
All Other Equipment > 5 HP	No	50	85		1374	3
Dozer	No	40		81.7	1374	3
Dozer	No	40		81.7	1374	3
Tractor	No	40	84		1374	3
Tractor	No	40	84		1374	3

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Grader	53.2	49.2
Grader	53.2	49.2
Pickup Truck	43.2	39.2
Pickup Truck	43.2	39.2
All Other Equipment > 5 HP	53.2	50.2
Dozer	49.9	45.9
Dozer	49.9	45.9
Tractor	52.2	48.2
Tractor	52.2	48.2
Total	**53.2**	**57**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/2/2022
Case Description: Irrigation

Description	**Land Use**
Irrigation	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Equipment Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Grader	No	40	85		1374	3
All Other Equipment > 5 HP	No	50	85		1374	3
All Other Equipment > 5 HP	No	50	85		1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Tractor	No	40	84		1374	3
Dozer	No	40		81.7	1374	3
Excavator	No	40		80.7	1374	3
Excavator	No	40		80.7	1374	3

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Grader	53.2	49.2
All Other Equipment > 5 HP	53.2	50.2
All Other Equipment > 5 HP	53.2	50.2
Pickup Truck	43.2	39.2
Pickup Truck	43.2	39.2
Tractor	52.2	48.2
Dozer	49.9	45.9
Excavator	48.9	45
Excavator	48.9	45
Total	**53.2**	**56.8**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date:	11/1/2022
Case Description:	Sand Fencing

Description	**Land Use**
Sand Fencing	Residential

			Equipment			
			Spec	**Actual**	**Receptor**	**Estimated**
	Impact		**Lmax**	**Lmax**	**Distance**	**Shielding**
Description	**Device**	**Usage(%)**	**(dBA)**	**(dBA)**	**(feet)**	**(dBA)**
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3

		Calculated (dBA)	
Equipment		*Lmax	Leq
Pickup Truck		43.2	39.2
Pickup Truck		43.2	39.2
Pickup Truck		43.2	39.2
	Total	**43.2**	**44**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/1/2022
Case Description: Site Exclusion

Description	**Land Use**
Site Exclusion	Residential

			Equipment			
			Spec	**Actual**	**Receptor**	**Estimated**
	Impact		**Lmax**	**Lmax**	**Distance**	**Shielding**
Description	**Device**	**Usage(%)**	**(dBA)**	**(dBA)**	**(feet)**	**(dBA)**
Gradall	No	40		83.4	1374	3
Gradall	No	40		83.4	1374	3
All Other Equipment > 5 HP	No	50	85		1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
All Other Equipment > 5 HP	No	50	85		1374	3
Front End Loader	No	40		79.1	1374	3
Front End Loader	No	40		79.1	1374	3
Tractor	No	40	84		1374	3
Tractor	No	40	84		1374	3

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Gradall	51.6	47.6
Gradall	51.6	47.6
All Other Equipment > 5 HP	53.2	50.2
Pickup Truck	43.2	39.2
Pickup Truck	43.2	39.2
Pickup Truck	43.2	39.2
All Other Equipment > 5 HP	53.2	50.2
Front End Loader	47.3	43.4
Front End Loader	47.3	43.4
Tractor	52.2	48.2
Tractor	52.2	48.2
Total	**53.2**	**57.2**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/1/2022
Case Description: Site Prep

Description	**Land Use**
Site Prep	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Equipment Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
All Other Equipment > 5 HP	No	50	85		1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Tractor	No	40	84		1374	3
Excavator	No	40		80.7	1374	3

Calculated (dBA)

Equipment	***Lmax**	**Leq**
All Other Equipment > 5 HP	53.2	50.2
Pickup Truck	43.2	39.2
Pickup Truck	43.2	39.2
Tractor	52.2	48.2
Excavator	48.9	45
Total	**53.2**	**53.4**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/1/2022
Case Description: Vegetation Enhancement

Description	**Land Use**
Vegetation Enhancement	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Equipment Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Compactor (ground)	No	20		83.2	1374	3
Compactor (ground)	No	20		83.2	1374	3
Compactor (ground)	No	20		83.2	1374	3
Dozer	No	40		81.7	1374	3
Front End Loader	No	40		79.1	1374	3
Excavator	No	40		80.7	1374	3

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Pickup Truck		43.2	39.2
Pickup Truck		43.2	39.2
Pickup Truck		43.2	39.2
Compactor (ground)		51.4	44.5
Compactor (ground)		51.4	44.5
Compactor (ground)		51.4	44.5
Dozer		49.9	45.9
Front End Loader		47.3	43.4
Excavator		48.9	45
	Total	**51.4**	**53**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/1/2022

Case Description: Well Construction and Aquifer Testing

Description	**Land Use**
Well Construction and Aquifer Testing	Residential

			Equipment			
Description	**Impact Device**	**Usage(%)**	**Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Drill Rig Truck	No	20		79.1	1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Pickup Truck	No	40		75	1374	3
Dozer	No	40		81.7	1374	3

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Drill Rig Truck		47.4	40.4
Pickup Truck		43.2	39.2
Pickup Truck		43.2	39.2
Pickup Truck		43.2	39.2
Pickup Truck		43.2	39.2
Pickup Truck		43.2	39.2
Pickup Truck		43.2	39.2
Pickup Truck		43.2	39.2
Dozer		49.9	45.9
	Total	**49.9**	**50.4**

*Calculated Lmax is the Loudest value.