



Jim Minnick
DIRECTOR

Imperial County Planning & Development Services Planning / Building

July 18, 2025

Subject: Request for Proposal – Environmental Impact Report (EIR) for Solar Energy Generation and Battery Energy Storage project.
Project Applicant: Virgo Renewables LLC

- Water Supply Assessment (WSA)
- General Plan Amendment (GPA) #24-0005
- Zone Change (ZC) #24-0007
- Conditional Use Permit (CUP) #24-0022
- Conditional Use Permit (CUP) #24-0023
- Initial Study (IS) #24-0032

Dear Consultant:

The Imperial County Planning & Development Services Department is soliciting proposals for the **preparation of a comprehensive Environmental Impact Report (EIR)** for the Virgo Solar/Battery Energy Storage System (BESS) Project, which will require a General Plan Amendment (GPA), Zone Change (ZC), and two (2) Conditional Use Permits (CUP). **The Planning & Development Services Department (ICPDS)** will act as the "Lead Agency" for the preparation of this EIR pursuant to the California Environmental Quality Act (CEQA). The successful consultant will work directly for the County Planning & Development Services Director in the preparation of the Draft and Final EIR.

The Virgo Renewables LLC Project includes:

1. **Water Supply Assessment (WSA) review.**
2. **General Plan Amendment #24-0005: for the "RE" Renewable Energy Overlay Zone designation.**
3. **Zone Change #24-0007: for the "RE" Renewable Energy Overlay Zone expansion.**
4. **Conditional Use Permit #24-0022: for the construction and operation of the solar energy generation and battery energy storage facility.**
5. **Conditional Use Permit #24-0023: for a water well to serve the proposed Solar PV and BESS energy generation project.**
6. **Environmental Impact Report (EIR).**
 - PV System will generate approximately 270 MW
 - 540 MW Battery Energy Storage System
 - APN: 019-110-010-000, 034-010-006-000, 034-010-023-000, 019-120-007-000, 019-120-001-000, 019-120-004-000, 019-120-006-000; Approximately 1,918 acres.
 - Current Zone S-2 (Open Space Preservation), proposed Zone Change to S-2-RE (Open Space Preservation with Renewable Energy Overlay).

Attached is a copy of the application package.

I. The County hereby requests the following information; for each item (as appropriate), the hourly rate and estimated total hours for the specific task must be documented.

- a. Project scope to be utilized in the preparation of a legally adequate CEQA document;
- b. Identified milestones representing specific tangible work products (tasks) to which payments by the County would be linked and become part of the legal contract. (Please note that all subsequent bills/invoices will be required to include both the identified milestones and percent completed).
- c. All potential subcontractor(s) that will be utilized along with their estimated staff time and cost breakdown;
- d. An estimated "not to exceed cost" to prepare the Drafts (DEIR) and Final Environmental (FEIR) documents;
- e. Review the attached proposed General Plan Amendment and Zoning Change and make findings of consistency regarding the proposed General Plan Amendment, Zone Change with the Imperial County General Plan Renewable and Transmission Element; and
- f. A digital (thumb drive) version of all documents prepared by the prime CEQA consultant and potential subcontractor(s).

The only exception to the "not to exceed" cost shall be the response to public comments received as a result of the joint environmental document's circulation. If the County receives excessive comments on the draft document, then the costs will be determined on a "negotiated basis" when the draft document and comments on the project become available.

Excessive comments are generally considered to be more than twenty (20) commenting agencies/individuals and/or over 150 comments that require answers other than "comment noted."

The proposal must incorporate the cost estimate for the printing of **five (5) hard copies of the Administrative Draft EIR, five (5) hard copies of the Draft EIR and five (5) hard copies of the Final EIR, along with a digital copy provided on a thumb drive.** of the aforementioned environmental documents, as determined. Also, the proposal must provide a cost estimate for each additional hard copy and thumb drive, if additional copies are needed.

The proposal must provide that prior to any cost overruns; the consultant shall discuss first and then seek written approval from the County Planning and Development Services Director, Jim Minnick before such costs are incurred. Failure to get prior written approval may result in such costs being disallowed.

II. We request that you provide within your cost estimate for the proposed EIR, including the hourly rate and total estimated hours, a preparation of the following studies and/or analysis.

- Aesthetics/Visual Impacts
- Air Quality/ Greenhouse Gas emissions
- Agriculture and Forest Resources
- Hazards and Hazardous Materials
- Land Use and Planning
- Noise
- Mineral Resources
- Population and Housing
- Public Health & Safety
- Public Services

- Recreation
- Utilities and Service Systems
- Energy
- Wildfire
- Hydrology and Water Quality
- Water Supply Assessment

The following sections may need to be addressed in the EIR and Findings of Fact for the project.

- SB18/AB-52 Tribal Cultural Resources
- CEQA Findings for Project
- Mitigation, Monitoring & Reporting Program (MM&RP)

At the very least, the applicant has already provided us with studies conducted. You will be expected to review such studies as a third-party review and determine whether or not they are adequate, need to be revised, updated or, in fact, be reproduced. It is expected that the applicant will be submitting the following documentation for review; we request that you provide within your estimate for the EIR the cost for the peer-review of this work and these studies, prepared by the applicant and their consultants.

- Biological Resources Report
- Burrowing Owl Habitat Assessment
- Cultural Resources Survey Report
- Water Supply Assessment
- Transportation Analysis
- Air Quality Analysis
- Greenhouse Gas Analysis
- Visual Impact Analysis
- Noise Analysis

III. The following format should be used in preparing the proposal, additional information/items may be used to further bolster your proposal:

One page cover letter introducing your firm.

1. Project Understanding

2. Project Team

- Identify all company and consultant team personnel who will work on the project and short description of their education and work experience.
- Resumes of the prime and technical consultants should be included and can be attached to the proposal as an appendix.
- Organization Charts-Elaborate organization charts are not necessary.

3. Scope of Work

- Describe the proposed tasks to accomplish the scope of work.
- Include deliverables, when applicable, for each task.
- Include all applicable site visits, scoping meetings, staff meetings and public hearings.
- Be specific regarding your approach to complete the CEQA noticing requirements.

4. The tasks should be presented as follows:

- a. Project Initiation
Include research, site visit, data collection, CEQA notices, scoping meetings, etc.;
- b. Administrative Draft EIR
Include mandatory CEQA sections, required and technical studies, peer review of applicant-prepared technical studies, number of revisions, meetings and coordination with County Staff;
- c. Public Review Draft
Include document preparation, CEQA notice, and coordination with County Staff;
- d. Final EIR
Include document preparation, Response to Comments, CEQA notice, meetings, coordination with County Staff and attendance at Planning Commission and Board of Supervisors hearings;
- e. Mitigation, Monitoring and Reporting Program
Include the preparation per CEQA identification of all mitigation measures, identification of all responsible parties, timing and enforcement;
- f. CEQA Findings and Notice of Determination
Include the preparation per CEQA requirements,
- g. Assumptions
Please provide a specific section for assumptions. Include your assumptions regarding travel time, mileage, public noticing, or anything else that needs clarification; and
- h. Meetings
The number of meetings and hearings that are included in your proposal should be detailed under each task.

5. Proposed Schedule

Provide the number of weeks for each task in tabular form from project initiation to public hearings, Planning Commission, and Board of Supervisors.

6. Cost Estimate/Milestones

- Provide a discussion of the proposed cost and any optional costs.
- Include a spread sheet that details your personnel, any subcontractors to be used, their estimated hours, and associated costs per task (can be attached as an appendix).
- A table of project milestones should be included in the Cost Estimate discussion.

7. Consultant Selection Criteria

- a) **Understanding of the project:** the proposer should demonstrate understanding of key elements of the project and, accordingly, provide the names of personnel and their expertise.
- b) **Approach to the project:** The selection process will evaluate the extent to which the proposer has recognized and identified special circumstances on the project and whether the proposer has provided logical approach to tasks and issues of the project.
- c) **Professional qualifications necessary for satisfactory performance:** The project manager and key team members should be qualified to perform the work categories on the project; and the proposer's knowledge of standards and procedures will be examined.

d) **Specialized experience and technical competence in the type of work required:** The proposer should provide information about comparable projects they have been involved with and/or successfully accomplished; past performance on contracts with government agencies and private industry will be considered together with past performance evaluations; and the capacity to accomplish the work in the required time will also be evaluated.

IV. **It is requested that you disclose any conflict** or potential conflict that you may have if you are submitting a proposal. The conflict by the County envisions, at the very minimum, current/ongoing or previous contracts (within the past year) with the applicant(s); this also includes current technical studies that either are or have been prepared for the applicant(s) within the last year.

V. **Not providing the extent of information (including hourly rate and total estimated hours per task) may negatively impact the evaluation of your proposal.**

If you are interested in submitting a proposal, please submit it to the Director at Imperial County Planning & Development Services Department, 801 Main Street, El Centro, CA, 92243, **no later than August 18, 2025 at 5:00 p.m.** This must be postmarked on or before this date and time.

Please note that it is **not necessary to present us with voluminous references or individualized background data** on persons or personnel within your organization. We may require this at a later date. We look forward to receiving your RFP submittal.

Please submit a total of 5 hard copies along with a digital copy provided on a thumb drive.

Should you have any questions or comments, please contact the assigned Planner for this project, Luis Bejarano, at (442) 265-1736, extension 1745, or via-email at luisbejarano@co.imperial.ca.us.

Sincerely,

By: 
Luis Bejarano
Planner II

Jim Minnick, Director
Planning & Development Services Department

Attachments: Virgo Renewables LLC, Solar Energy Generation and BESS Project Application Package

cc: Jim Minnick, Director of Planning and Development Services
Michael Abraham, AICP, Asst. Director of Planning & Development Services
Diana Robinson, Planning Division Manager
David Black, Planner IV
Luis Bejarano, Planner II
Project File: GPA24-0005, ZC24-0007, CUP24-0022, CUP24-0023, IS24-0032
APN: 019-110-010-000
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CONDITIONAL USE PERMIT

I.C. PLANNING & DEVELOPMENT SERVICES DEPT.
801 Main Street, El Centro, CA 92243 (442) 265-1736

- APPLICANT MUST COMPLETE ALL NUMBERED (black) SPACES - Please type or print -

1. PROPERTY OWNER'S NAME See attached for list of owners	EMAIL ADDRESS C/O jurgheuberger@gmail.com	
2. MAILING ADDRESS (Street / P O Box, City, State) see attached	ZIP CODE	PHONE NUMBER c/o jurg 760-996-0313
3. APPLICANT'S NAME Virgo Renewables LLC	EMAIL ADDRESS N A	
4. MAILING ADDRESS (Street / P O Box, City, State) 1 Park Plaza, Suite 600, Irvine, Ca	ZIP CODE 92614	PHONE NUMBER c/o jurg 760-996-0313
4. ENGINEER'S NAME N A	CA. LICENSE NO.	EMAIL ADDRESS
5. MAILING ADDRESS (Street / P O Box, City, State) N A	ZIP CODE N A	PHONE NUMBER N A
6. ASSESSOR'S PARCEL NO. See attached	SIZE OF PROPERTY (in acres or square foot) See attached	ZONING (existing) See attached
7. PROPERTY (site) ADDRESS Pending		
8. GENERAL LOCATION (i.e. city, town, cross street) see attached		
9. LEGAL DESCRIPTION see attached PTR		

PLEASE PROVIDE CLEAR & CONCISE INFORMATION (ATTACH SEPARATE SHEET IF NEEDED)

10. DESCRIBE PROPOSED USE OF PROPERTY (list and describe in detail) Develop a Solar PV and BESS energy generation project	
11. DESCRIBE CURRENT USE OF PROPERTY Vacant	
12. DESCRIBE PROPOSED SEWER SYSTEM N A	
13. DESCRIBE PROPOSED WATER SYSTEM Well	
14. DESCRIBE PROPOSED FIRE PROTECTION SYSTEM County Standards	
15. IS PROPOSED USE A BUSINESS? ☒ Yes ☐ No	IF YES, HOW MANY EMPLOYEES WILL BE AT THIS SITE? 0

I / WE THE LEGAL OWNER (S) OF THE ABOVE PROPERTY
CERTIFY THAT THE INFORMATION SHOWN OR STATED HEREIN
IS TRUE AND CORRECT.

Sunny Xing
Print Name
Signature
Date
Aug. 7, 2024

REQUIRED SUPPORT DOCUMENTS

- A. SITE PLAN
- B. FEE
- C. OTHER
- D. OTHER

APPLICATION RECEIVED BY:	DATE	REVIEW / APPROVAL BY OTHER DEPT'S required ☐ P W ☐ E H S ☐ A P C D ☐ O E S ☐
APPLICATION DEEMED COMPLETE BY:	DATE	
APPLICATION REJECTED BY:	DATE	
TENTATIVE HEARING BY:	DATE	
FINAL ACTION: ☐ APPROVED ☐ DENIED	DATE	

CUP #
24-0022

7524-0032

CONDITIONAL USE PERMIT

I.C. PLANNING & DEVELOPMENT SERVICES DEPT.
801 Main Street, El Centro, CA 92243 (442) 265-1736

- APPLICANT MUST COMPLETE ALL NUMBERED (black) SPACES - Please type or print -

1. PROPERTY OWNER'S NAME Property owners are listed on the attached	EMAIL ADDRESS c/o jurgheuberger@gmail.com	
2. MAILING ADDRESS (Street / P O Box, City, State) see attached	ZIP CODE	PHONE NUMBER c/o jurg 760-996-0313
3. APPLICANT'S NAME Virgo Renewables, LLC	EMAIL ADDRESS N A	
4. MAILING ADDRESS (Street / P O Box, City, State) 1 Park Plaza, Suite 600, Irvine, Ca	ZIP CODE 92614	PHONE NUMBER c/o jurg 760-996-0313
4. ENGINEER'S NAME N A	CA. LICENSE NO.	EMAIL ADDRESS N A
5. MAILING ADDRESS (Street / P O Box, City, State) N A	ZIP CODE N A	PHONE NUMBER N A
6. ASSESSOR'S PARCEL NO. see attached	SIZE OF PROPERTY (in acres or square foot) see attached	ZONING (existing) see attached
7. PROPERTY (site) ADDRESS Pending		
8. GENERAL LOCATION (i.e. city, town, cross street) See attached		
9. LEGAL DESCRIPTION See attached PTR		

PLEASE PROVIDE CLEAR & CONCISE INFORMATION (ATTACH SEPARATE SHEET IF NEEDED)

10. DESCRIBE PROPOSED USE OF PROPERTY (list and describe in detail) this application is for a water well to serve the proposed Solar PV and BESS energy generation project	
11. DESCRIBE CURRENT USE OF PROPERTY Vacant	
12. DESCRIBE PROPOSED SEWER SYSTEM None	
13. DESCRIBE PROPOSED WATER SYSTEM Well	
14. DESCRIBE PROPOSED FIRE PROTECTION SYSTEM County Fire Dept Standard	
15. IS PROPOSED USE A BUSINESS? ☒ Yes ☐ No	IF YES, HOW MANY EMPLOYEES WILL BE AT THIS SITE?

I / WE THE LEGAL OWNER (S) OF THE ABOVE PROPERTY
CERTIFY THAT THE INFORMATION SHOWN OR STATED HEREIN
IS TRUE AND CORRECT

Sunny Xing

Print Name

Signature

Print Name

Signature

Aug. 7, 2024

Date

Date

REQUIRED SUPPORT DOCUMENTS

A. SITE PLAN

B. FEE

C. OTHER

D. OTHER

APPLICATION RECEIVED BY:

APPLICATION DEEMED COMPLETE BY:

APPLICATION REJECTED BY:

TENTATIVE HEARING BY:

FINAL ACTION: ☐ APPROVED ☐ DENIED

DATE

DATE

DATE

DATE

DATE

REVIEW / APPROVAL BY
OTHER DEPT'S required

☐ P W

☐ E H S

☐ A P C D

☐ O E S

☐

☐

CUP #

24-0023

CHANGE OF ZONE

I.C. PLANNING & DEVELOPMENT SERVICES DEPT.
801 Main Street, El Centro, CA 92243 (442) 265-1736

- APPLICANT MUST COMPLETE ALL NUMBERED (black & blue) SPACES - Please type or print -

1. PROPERTY OWNER'S NAME See attached list of property owners	EMAIL ADDRESS c/o jurg jurgheuberger@gmail.com	
2. MAILING ADDRESS (Street / P O Box, City, State) see attached	ZIP CODE	PHONE NUMBER c/o jurg 760-996-0313
3. ENGINEER'S NAME N A	CA. LICENSE NO.	EMAIL ADDRESS N A
4. MAILING ADDRESS (Street / P O Box, City, State) N A	ZIP CODE N A	PHONE NUMBER N A
5. ASSESSOR'S PARCEL NO. see attached	ZONING (existing) see attached	ZONING (proposed)
6. PROPERTY (site) ADDRESS pending	SIZE OF PROPERTY (in acres or square foot) see attached	
7. GENERAL LOCATION (i.e. city, town, cross street)		
8. LEGAL DESCRIPTION see attached PTR		
8. DESCRIBE CURRENT USE ON / OF PROPERTY (list and describe in detail) Vacant open desert		
9. PLEASE STATE REASON FOR PROPOSED USE (be specific) develop a Solar PV and BESS electrical generating project to meet CA green energy goal		
10. DESCRIBE SURROUNDING PROPERTY USES Vacant open desert land		

I / WE THE LEGAL OWNER (S) OF THE ABOVE PROPERTY
CERTIFY THAT THE INFORMATION SHOWN OR STATED
HEREIN IS TRUE AND CORRECT.

Sunny Xing
Print Name

Aug. 7, 2024
Date

Signature

REQUIRED SUPPORT DOCUMENTS

- A. SITE PLAN
- B. PRELIMINARY TITLE REPORT (6 months or newer)
- C. FEE
- D. OTHER

APPLICATION RECEIVED BY:

APPLICATION DEEMED COMPLETE BY:

APPLICATION REJECTED BY:

TENTATIVE HEARING BY:

FINAL ACTION: ☐ APPROVED ☐ DENIED

DATE

DATE

DATE

DATE

DATE

REVIEW / APPROVAL BY
OTHER DEPT'S required

☐ P W

☐ E H S

☐ A P C D

☐ O E S

☐

☐

ZC #

24-0007

LETTER OF TRANSMITTAL

May 11, 2025

TO: David Black, Planner IV, Imperial County Planning Dept.
FROM: Jurg Heuberger, Consultant for VIRGO Solar/BESS project 
RE: Virgo Solar PV and BESS application

Dave:

Attached hereto please find the following documentation in support of the application filed in Dec. of 2024 and subsequently deemed incomplete by your office.

The application and fees submitted in Dec. 2024 were incomplete in several regards, and there were a number of changes that had to be made between Dec. 2024 and now which are reflected in this updated submittal.

The revised technical studies included in digital format via a USB are:

- Biological
- Cultural
- Water Supply
- Transportation
- Air Quality and GHG
- Visual
- Noise

In addition, given the prior PTR is more than six month's old, a revised PTR will also be delivered to you electronically within a few days of this transmittal.

Since this project also has a BLM involvement, all documents that will be submitted to BLM will be copied to you as they become available.

If you have any questions or have need for additional information or clarification, please contact me directly at jurgheuberger@gmail.com or 760-996-0313.

CC: Ramon Gonzalez
Tom Zales

Virgo Project Description

Project:

Virgo is a PV Solar power generation project by Virgo Renewables LLC, located on approximately 1918 acres. The PV system will generate approximately 270 MW and will have a BESS with a maximum capacity of 540 MW, although the initial development will start with 270 MW. The BESS may expand if market conditions warrant.

The 1918 acre area consists of a number of parcels as identified by the attached Assessor Parcel list. The individual parcels are currently under different ownerships as shown on the attached, with an option to purchase by Virgo Renewalbe upon receipt of required permits. It is the intent of the applicant to enter into "lot tie agreements" to join the parcels rather than merge them into one parcel

The project is intended to be operated for a minimum of 30 years. Depending on conditions at the end of the 30 years the project may continue to operate for additional 10-20 years.

Location:

The project is located south of HWY 86 south of what is commonly known as the Elmore Ranch. This land is open space desert land and not agricultural land.

Transmission:

Power from the Virgo project will be exported via the IID system. The project will connect to the IID's "L" line that currently runs northwest along the south side of HWY 86. The "L" line is currently a 161 KV line. Since there are other potential solar projects that will tie into the "L" line, it is expected that the "L" line will be upgraded to a 230 KV line to which this project would connect.

Tentative plans being considered would reconstruct the "L" line with new steel poles with the 230 KV line on top with the existing 161 line on the same poles below. This project can only be developed if the "L" line is upgraded to a 230 KV line.

A portion of the "L" line is located on Bureau of Land Management (USA) BLM land. The IID has Right of Way for the existing line and it is anticipated that the upgraded "L" line will remain within the existing ROW.

Ultimately power from this and other projects that are expected to tie into the "L" line will be transmitted to the Wixom Substation near Seeley Ca.

Technical Studies:

Various technical studies in support of the permitting process have been prepared and are listed below:

Virgo Project Description

- Biological
- Cultural
- Water Supply
- Transportation
- Air Quality and GHG
- Visual
- Noise

In addition a Preliminary title report has also been prepared and is submitted along with the application.

BLM permitting:

In addition to the Conditional Use Permit being required by the County, the BLM will also be involved for access ROW and Gentie ROW. Therefore concurrent with the CUP application an SF 299 and POD is being submitted to the El Centro BLM office.

Virgo Renewables, LLC
1 Park Plaza, Suite 600
Irvine, Ca. 92614

July 31, 2024

Imperial County Planning/Development Service Dept.
801 W. Main St.
El Centro, Ca. 92243

RE: Request to amend General Plan for the Virgo Applications

ATTN: Jim Minnick, Director

Mr. Minnick:

As requested it is our understanding that we are required to file a General Plan Amendment in order for us to file the applications for a Change of Zone and concurrent Conditional Use Permit(s) for the VIRGO Solar/Bess project.

Please consider this letter as our request to amend the County's General Plan on the attached list of APN's to have these parcels included in the Renewable Energy Overlay Zone.

Concurrent with this request we have/are filing the applications as follows:

Change of Zone

CUP for Solar / BESS energy generation project

CUP for a water well

If you have any questions, please feel free to contact Jurg Heuberger at 7670-996-0313 or by email at jurgheuberger@gmail.com. Also Mr. Heuberger represents us on this project so please direct all correspondence to him.

Thank you kindly


Sunny Xing
Virgo Renewables, LLC

VIRGO Solar PV and BESS project

APN list for Virgo Project as of 8 7 24

019-110-010

034-010-006

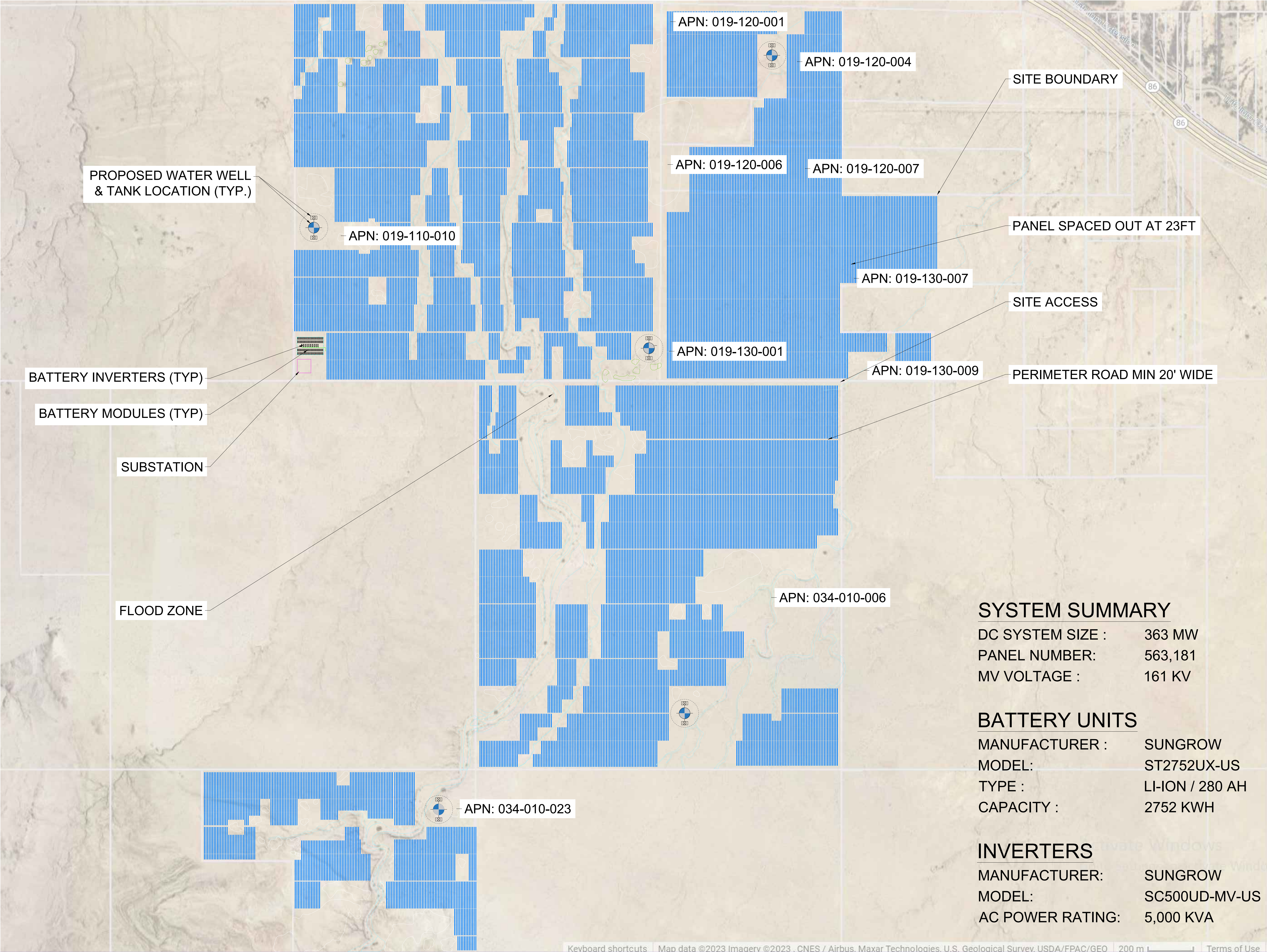
034-010-023

019-120-007

019-120-001

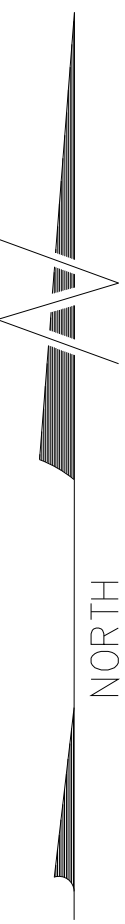
019-120-004

019-120-006



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REV.	BY	DESCRIPTION	DATE	APPRD BY
1	RO		27/05/2023	HP
2	RO		08/09/2023	HP
3	RO		06/25/2024	RG



NOT FOR CONSTRUCTION



604 SUTTER ST, STE 250
FOLSOM, CA 95630
Phone : 916.985.9461
Fax: 916.985.9467

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SHEET TITLE:

DRAWN BY:	RO	DRAWING No.
CHECKED:	RG	
SCALE:		
JOB NO:		

DATE:	REV No.	1

SYSTEM SUMMARY

DC SYSTEM SIZE : 363 MW
PANEL NUMBER: 563,181
MV VOLTAGE : 161 KV

BATTERY UNITS

MANUFACTURER : SUNGROW
MODEL: ST2752UX-US
TYPE : LI-ION / 280 AH
CAPACITY : 2752 KWH

INVERTERS

MANUFACTURER: SUNGROW
MODEL: SC500UD-MV-US
AC POWER RATING: 5,000 KVA



**Air Quality Analysis for the
Virgo Solar PV Project
Imperial County, California**

Prepared for
SunCode Energy
1 Park Plaza, Suite 600
Irvine, CA 92614
Contact: Ramon Gonzalez

Prepared by
RECON Environmental, Inc.
3111 Camino del Rio North, Suite 600
San Diego, CA 92108
P 619.308.9333

RECON Number 10317
February 12, 2025

A handwritten signature in black ink that reads "Jessica Fleming".

Jessica Fleming, Senior Environmental Specialist
Noise, Air Quality, and Greenhouse Gas

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ATTACHMENTS

1:	CalEEMod Output
2:	Construction Equipment Mobilization Fugitive Dust Calculations
3:	Access Road Fugitive Dust Reduction Calculations
4:	Combined Emissions Summary

Acronyms and Abbreviations

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
AAQS	Ambient Air Quality Standards
AB	Assembly Bill
BESS	battery energy storage system
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DPM	diesel particulate matter
ICAPCD	Imperial County Air Pollution Control District
IID	Imperial Irrigation District
mph	miles per hour
NAAQS	National Ambient Air Quality Standards
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
O_3	ozone
Pb	lead
PM_{10}	particulate matter less than 10 microns
$\text{PM}_{2.5}$	particulate matter less than 2.5 microns
ppb	parts per billion
ppm	parts per million
project	Virgo Solar Project
ROG	reactive organic gases
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	oxides of sulfur
SR-78	State Route 78
SR-86	State Route 86
SRA	Source Receptor Areas
SSAB	Salton Sea Air Basin
TAC	toxic air contaminant
U.S. EPA	U.S. Environmental Protection Agency
U.S.C.	U.S. Code
USGS	U.S. Geological Survey
VOC	volatile organic compounds

Executive Summary

This report provides the results of the air quality emissions analysis completed for the Virgo Solar PV Project (project) located within unincorporated Imperial County, California. The project site is currently undeveloped. The project would develop approximately 1,348.77 acres of the project site with photovoltaic solar panels capable of generating up to 370 megawatts of renewable energy. The project would also develop a battery energy storage system (BESS) capable of storing 800 megawatt hours of energy generated by the project solar panels. The project would also include a substation connection point to connect to an existing Imperial Irrigation District 161-kilovolt line that traverses the project boundary.

This analysis evaluates the significance of potential air quality impacts that may be generated by the project in accordance with the California Environmental Quality Act, and guidance from the Imperial County Air Pollution Control District (ICAPCD). The project was evaluated to determine if it would (1) be inconsistent with the applicable air quality plan, (2) result in cumulative impacts to air quality, (3) impact sensitive receptors, or (4) expose a substantial number of people to objectionable odors.

The applicable ICAPCD air quality plans include the 2009, 2013, and 2017 State Implementation Plans for reducing particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and ozone (O_3). The project would construct a renewable energy use consisting of solar panels and a BESS that would not be a significant source of emissions. The project would be consistent with the growth projections and air quality plans criteria pollutant emissions estimates. Additionally, project operation would not result in an air quality violation. Therefore, the project would not conflict with or obstruct the implementation of the regional air quality plans, and impacts would be less than significant.

During construction, emissions would be less than the significance thresholds for all criteria pollutants except PM_{10} . Fugitive dust emissions would exceed the threshold of 150 pounds per day of PM_{10} without any dust control measures taken for the access road during construction. This is due to the workers driving on the access road to and from the project site. The application of a soil stabilizer would be required to reduce PM_{10} emissions to less than 150 pounds per day. Therefore, in addition to the standard and discretionary measures outlined in Sections 6.1.2 and 6.1.3, the following mitigation measure would be required:

MM-AIR-1: The following measures would be required for construction activities:

- Prior to the start of construction, a soil stabilizer (chemical dust suppressant) shall be applied to the 1.02-mile unpaved segment of the western access route to be constructed heading southeast towards the project site. The soil stabilizer shall be reapplied as necessary during the duration of construction to reduce fugitive dust emissions to the maximum extent feasible.
- A speed limit of 25 miles per hour on the access road shall be enforced.

With implementation of MM-AIR-1 as well as all standard and discretionary measures for fugitive PM_{10} control and standard and enhanced measures for construction combustion equipment,

construction emissions would be reduced to less than the applicable thresholds for all criteria pollutants. Therefore, with mitigation, project construction would not result in a cumulatively considerable net increase in emissions of ozone, PM₁₀, or PM_{2.5}, and impacts would be less than significant.

Long-term emissions of regional air pollutants occur from operational sources. Operation of the project would result in minimal emissions that would be less than the applicable thresholds for all criteria pollutants. Therefore, project operation would not result in a cumulatively considerable net increase in emissions of ozone, PM₁₀, or PM_{2.5}, and impacts would be less than significant.

Project construction would not result in the exposure of sensitive receptors to significant levels of diesel particulate matter that could result in excess cancer risks due to the distance to the nearest sensitive receptor (over 3,000 feet), the limited duration of construction activities, implementation of standard and enhanced measures for construction combustion equipment, and implementation of the In-Use Off-Road Diesel-Fueled Fleets Regulation. Additionally, the project would not result in the creation of a carbon monoxide (CO) hot spot. Therefore, construction and operation of the project would not expose sensitive receptors to substantial pollutant concentrations, and impacts would be less than significant.

During construction, potential odor sources would be associated with construction equipment; however, exposure to odors associated with project construction would be short term and temporary in nature. Operation of the project would not include any uses that would generate substantial odors. Therefore, the project would not generate odors adversely affecting a substantial number of people, and impacts would be less than significant.

1.0 Introduction

This report evaluates the significance of potential air quality impacts that may be generated by the proposed Virgo Solar PV Project (project). This report characterizes existing conditions at the project site and in the region, identifies applicable rules and regulations, and assesses impacts to air quality from construction and operation of the project. The significance of potential air quality impacts is assessed based on the air quality thresholds defined by the regional air quality management district, the Imperial County Air Pollution Control District (ICAPCD).

Air pollution affects all southern Californians. Effects can include increased respiratory infections, increased discomfort, missed days from work and school, and increased mortality. Polluted air also damages agriculture and our natural environment.

The state of California is divided geographically into 15 air basins for managing the air resources of the state on a regional basis. Areas within each air basin are considered to share the same air masses and therefore are expected to have similar ambient air quality. The project site is located within the Salton Sea Air Basin (SSAB). The Imperial County portion of the SSAB is classified as a federal moderate non-attainment area for the 2008 8-hour ozone (O_3) standards, marginal non-attainment area for the 2015 8-hour ozone standards, a partial serious maintenance area for the particulate matter less than 10 microns (PM_{10}) standards, and a partial moderate non-attainment area for the particulate matter less than 2.5 microns ($PM_{2.5}$) standards. The county is a non-attainment area for the state ozone standards and the state PM_{10} standard.

Air quality impacts can result from construction and operation of the project. Construction impacts are short term and result from fugitive dust, equipment exhaust, and indirect effects associated with construction workers and deliveries. Operational impacts can occur on two levels: regional impacts resulting from growth-inducing development, or local hot spot effects stemming from sensitive receivers being placed close to highly congested roadways. In the case of this project, operational impacts would be primarily due to construction-related emissions to the SSAB, particularly fugitive dust from earthmoving activities and worker travel over unpaved roads.

The analysis of impacts is based on federal and state Ambient Air Quality Standards (AAQS) and is assessed in accordance with the guidelines, policies, and standards established by the ICAPCD. Project compatibility with the adopted air quality plan for the area is also assessed. Measures are recommended, as required, to reduce potentially significant impacts.

2.0 Project Description

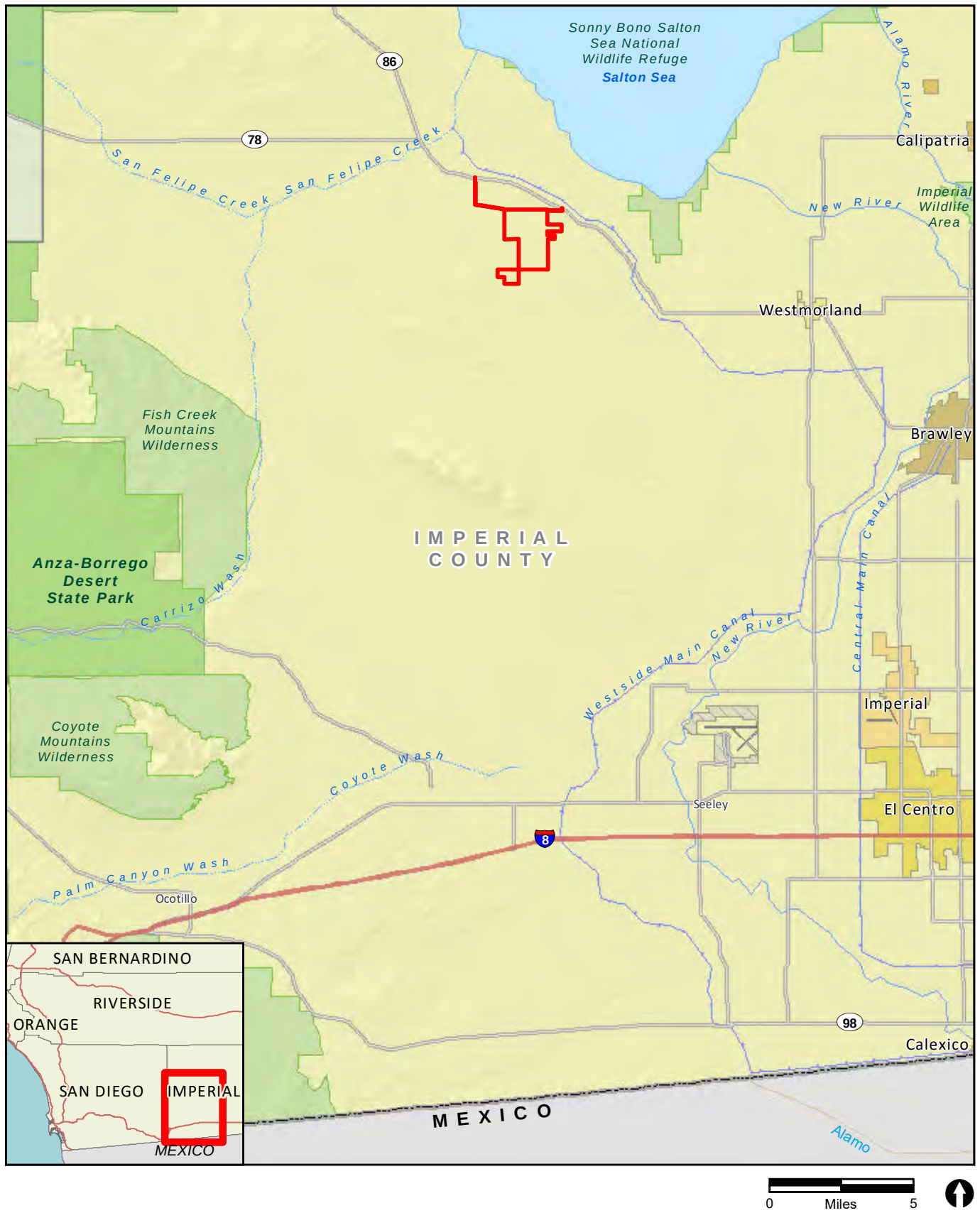
The project is located within unincorporated Imperial County, California, approximately 19 miles east of Ocotillo Wells, 10 miles west of the city of Westmorland, and approximately 5 miles south of the Salton Sea (Figure 1). The project site is located approximately 1,500 feet south of State Route 86 (SR-86). The 1,964.47-acre project site consists of the following 11 parcels: assessor parcel numbers 019-110-010, 034-010-006, 034-010-023, 019-120-001, 019-120-004, 019-120-005, 019-120-006, 019-120-007, 019-130-001, 019-130-007, and 019-130-009. All 11 parcels are designated in the County of Imperial General Plan Land Use Maps as Recreation/Open Space and zoned as Open Space/Preservation (S-2). The project site is surrounded by undeveloped desert land. Figure 2 shows an aerial photograph of the project site and vicinity.

The project would develop approximately 1,348.77 acres of the project site with photovoltaic solar panels capable of generating up to 370 megawatts of renewable energy. The project would also develop a battery energy storage system (BESS) capable of storing 800 megawatt hours of energy generated by the project solar panels. The project would also include a substation connection point to connect to an existing Imperial Irrigation District (IID) 161-kilovolt line that traverses the project boundary. The project has been designed to minimize encroachment into an existing flood zone that traverses north to south and dividing the solar panels proposed to the east and west. Access to the project site would be provided via one of the two following options:

- The 1.96-mile western access route would exit south off SR-86, utilizing a 0.94-mile paved access road for an existing CalEnergy Operating Corporation facility, followed by a 1.02-mile dirt road to be constructed heading southeast towards the project site.
- The 0.59-mile eastern access route would exit south off SR-86 at the intersection with Barth Road, followed by a dirt road to be constructed heading west towards the project site.

The alignments of both access routes would have negligible encroachment into land under the jurisdiction of the Bureau of Land Management. Figure 3 shows the proposed site plan.

Construction is anticipated to last 21 months and would consist of the following phases: grading (5 months), electrical infrastructure (5 months), structural construction (6 months), and equipment installation (5 months). Construction of the project would require a maximum of 250 daily construction works and a maximum of seven daily truck trips.



Project Location

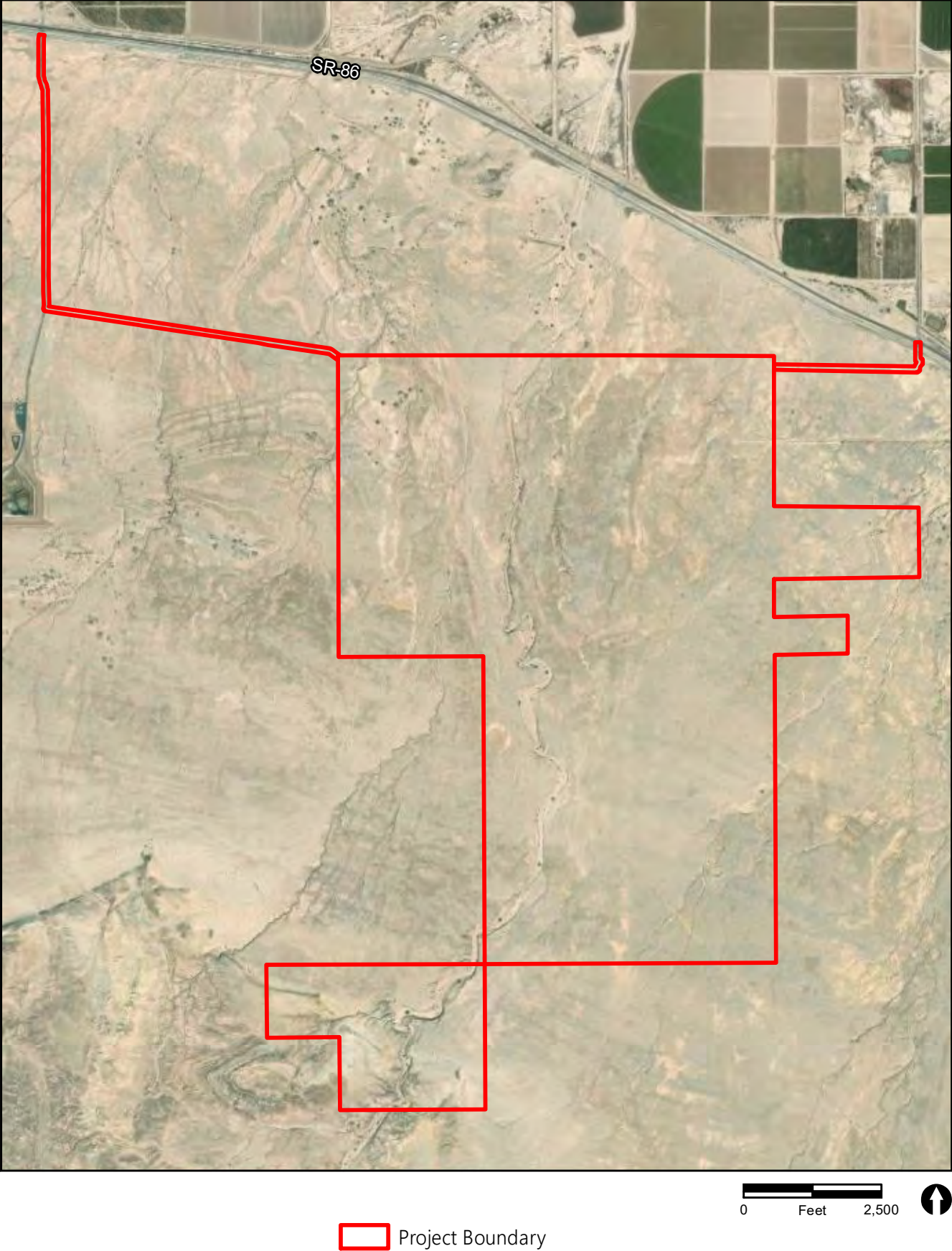
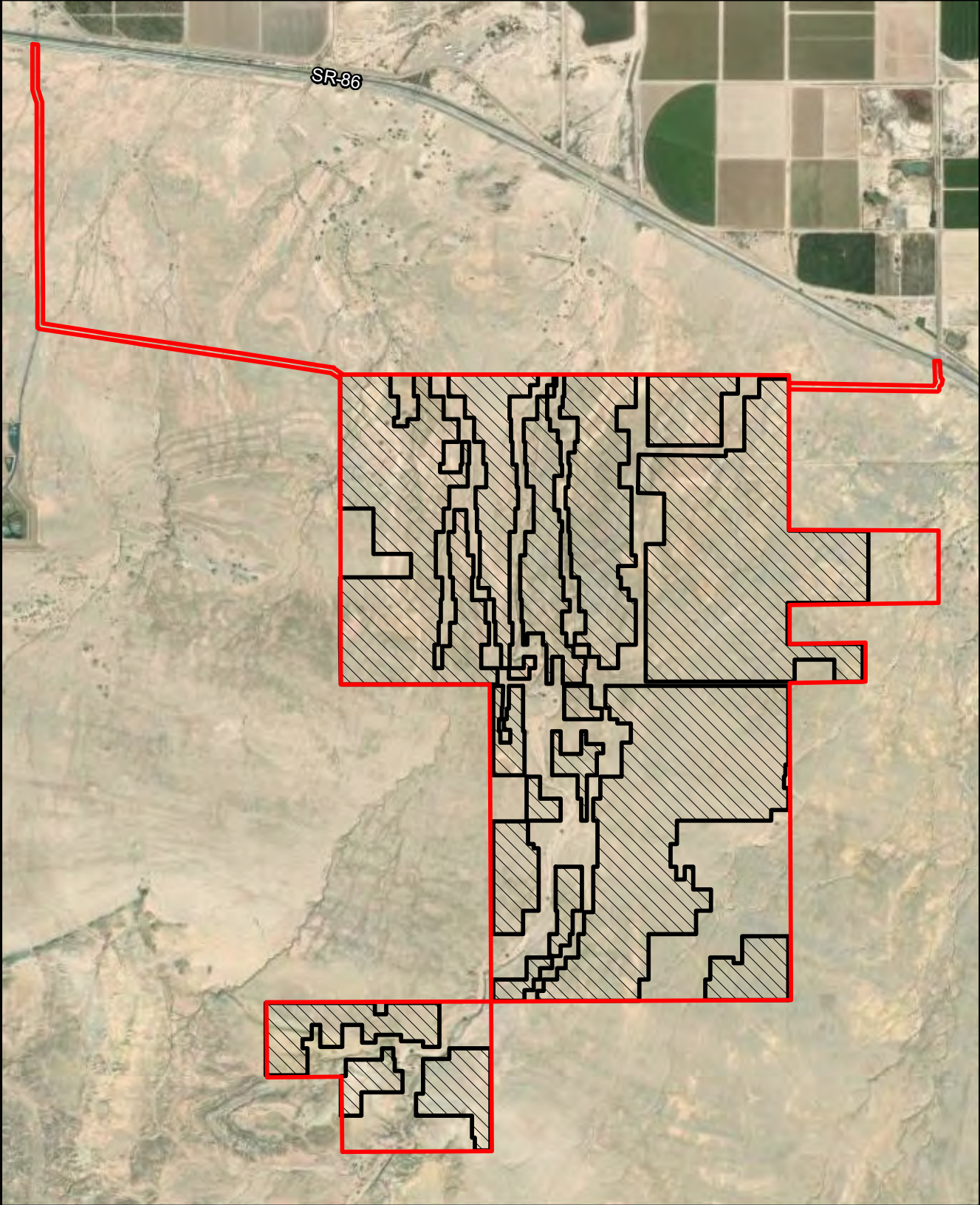


FIGURE 2
Project Location on Aerial Photograph



 Project Boundary
 Site Plan



FIGURE 3
Site Plan

3.0 Regulatory Framework

3.1 Federal Regulations

AAQS represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. The federal Clean Air Act (CAA) was enacted in 1970 and amended in 1977 and 1990 (42 U.S. Code [U.S.C.] 7401) for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity. In 1971, in order to achieve the purposes of Section 109 of the CAA (42 U.S.C. 7409), the U.S. Environmental Protection Agency (U.S. EPA) developed primary and secondary National AAQS (NAAQS).

Six pollutants of primary concern were designated: ozone, carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), lead (Pb), PM₁₀, and PM_{2.5}. The primary NAAQS "in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health . . ." and the secondary standards ". . . protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air" [42 U.S.C. 7409(b)(2)]. The primary NAAQS were established, with a margin of safety, considering long-term exposure for the most sensitive groups in the general population (i.e., children, senior citizens, and people with breathing difficulties). The NAAQS are presented in Table 1 (California Air Resources Board [CARB] 2024a).

If an air basin is not in either federal or state attainment for a particular pollutant, the basin is classified as non-attainment area for that pollutant. The project is located within the SSAB. As discussed, the Imperial County portion of the SSAB is classified as a federal moderate non-attainment area for the 2008 8-hour ozone standards, marginal non-attainment area for the 2015 8-hour ozone standards, a partial serious maintenance area for the PM₁₀ standards, and a partial moderate non-attainment area for the PM_{2.5} standards.

3.2 State Regulations

3.2.1 Criteria Pollutants

The CARB has developed the California AAQS (CAAQS) and generally has set more stringent limits on the criteria pollutants than the NAAQS (see Table 1). In addition to the federal criteria pollutants, the CAAQS also specify standards for visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride.

Table 1 Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards ¹		National Standards ²		
		Concentration ³	Method ⁴	Primary ^{3,5}	Secondary ^{3,6}	Method ⁷
Ozone ⁸	1 Hour	0.09 ppm (180 µg/m ³)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.07 ppm (137 µg/m ³)		0.070 ppm (137 µg/m ³)		
Respirable Particulate Matter (PM ₁₀) ⁹	24 Hour	50 µg/m ³	Gravimetric or Beta Attenuation	150 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m ³		–		
Fine Particulate Matter (PM _{2.5}) ⁹	24 Hour	–	–	35 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m ³	Gravimetric or Beta Attenuation	9 µg/m ³	15 µg/m ³	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m ³)	Non-dispersive Infrared Photometry	35 ppm (40 mg/m ³)	–	Non-dispersive Infrared Photometry
	8 Hour	9.0 ppm (10 mg/m ³)		9 ppm (10 mg/m ³)	–	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m ³)		–	–	
Nitrogen Dioxide (NO ₂) ¹⁰	1 Hour	0.18 ppm (339 µg/m ³)	Gas Phase Chemi-luminescence	100 ppb (188 µg/m ³)	–	Gas Phase Chemi-luminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)		53 ppb (100 µg/m ³)	Same as Primary Standard	
Sulfur Dioxide (SO ₂) ¹¹	1 Hour	0.25 ppm (655 µg/m ³)	Ultraviolet Fluorescence	75 ppb (196 µg/m ³)	–	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	–		–	0.5 ppm (1,300 µg/m ³)	
	24 Hour	0.04 ppm (105 µg/m ³)		0.14 ppm (for certain areas) ¹¹	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas) ¹¹	–	
Lead ^{12,13}	30 Day Average	1.5 µg/m ³	Atomic Absorption	–	–	High Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m ³ (for certain areas) ¹²	Same as Primary Standard	
	Rolling 3-Month Average	–		0.15 µg/m ³		
Visibility Reducing Particles ¹⁴	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m ³	Ion Chroma-tography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	Ultraviolet Fluorescence			
Vinyl Chloride ¹²	24 Hour	0.01 ppm (26 µg/m ³)	Gas Chroma-tography			
See footnotes on next page.						

See footnotes on next page.

Table 1
Ambient Air Quality Standards

ppm = parts per million; ppb = parts per billion; $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter; – = not applicable. ¹ California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, particulate matter (PM₁₀, PM_{2.5}, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. ² National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu\text{g}/\text{m}^3$ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies. ³ Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25 degrees Celsius and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25 degrees Celsius and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas. ⁴ Any equivalent measurement method which can be shown to the satisfaction of the Air Resources Board to give equivalent results at or near the level of the air quality standard may be used. ⁵ National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. ⁶ National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. ⁷ Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA. ⁸ On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. ⁹ On February 7, 2024, the national annual PM_{2.5} primary standard was lowered from 12.0 $\mu\text{g}/\text{m}^3$ to 9.0 $\mu\text{g}/\text{m}^3$. The existing national 24-hour PM_{2.5} standards (primary and secondary) were retained at 35 $\mu\text{g}/\text{m}^3$, as was the annual secondary standards of 15 $\mu\text{g}/\text{m}^3$. The existing 24-hour PM₁₀ standards (primary and secondary) of 150 $\mu\text{g}/\text{m}^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years. ¹⁰ To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of ppb. California standards are in units of ppm. To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm. ¹¹ On June 2, 2010, a new 1-hour SO₂ standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO₂ national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated non-attainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of ppb. California standards are in units of ppm. To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm. ¹² The Air Resources Board has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants. ¹³ The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu\text{g}/\text{m}^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated non-attainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved. ¹⁴ In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

SOURCE: CARB 2024a.

Similar to the federal CAA, the state classifies either “attainment” or “non-attainment” areas for each pollutant based on the comparison of measured data with the CAAQS. The county is a non-attainment area for the state ozone standards and the state PM₁₀ standard. The California CAA, which became effective on January 1, 1989, requires all areas of the state to attain the CAAQS at the earliest practicable date. The California CAA has specific air quality management strategies that must be adopted by the agency responsible for the non-attainment area. In the case of the SSAB, the responsible agency is the ICAPCD.

3.2.2 Toxic Air Contaminants

The public’s exposure to toxic air contaminants (TACs) is a significant public health issue in California. Diesel particulate matter (DPM) emissions have been identified as TACs. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health (Assembly Bill [AB] 1807: Health and Safety Code Sections 39650–39674). The California Legislature established a two-step process to address the potential health effects from TACs. The first step is the risk assessment (or identification) phase. The second step is the risk management (or control) phase of the process.

The California Air Toxics Program establishes the process for the identification and control of TACs and includes provisions to make the public aware of significant toxic exposures and for reducing risk. Additionally, the Air Toxics “Hot Spots” Information and Assessment Act (AB 2588, 1987, Connelly Bill) was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances routinely released into the air.

The goals of the Air Toxics “Hot Spots” Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, to notify nearby residents of significant risks, and to reduce those significant risks to acceptable levels.

The Children’s Environmental Health Protection Act, California Senate Bill 25 (Chapter 731, Escutia, Statutes of 1999), focuses on children’s exposure to air pollutants. The act requires CARB to review its air quality standards from a children’s health perspective, evaluate the statewide air monitoring network, and develop any additional air toxic control measures needed to protect children’s health. Locally, toxic air pollutants are regulated through the ICAPCD Regulation X. Of particular concern statewide are DPM emissions. DPM was established as a TAC in 1998 and is estimated to represent a majority of the cancer risk from TACs statewide (based on the statewide average). Diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB and are listed as carcinogens either under the state’s Proposition 65 or under the federal Hazardous Air Pollutants program.

Following the identification of DPM as a TAC in 1998, CARB has worked on developing strategies and regulations aimed at reducing the risk from DPM. The overall strategy for achieving these reductions is found in the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB 2000). A stated goal of the plan is to reduce the statewide cancer risk arising from exposure to DPM by 85 percent by 2020.

In April 2005, CARB published the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB 2005). The handbook makes recommendations directed at protecting sensitive land uses from air pollutant emissions while balancing a myriad of other land use issues (housing, transportation needs, economics, etc.). Sensitive land uses include but are not limited to, schools, hospitals, residences, resident care facilities, and day-care centers. The handbook is not regulatory or binding on local agencies and recognizes that application takes a qualitative approach. Therefore, the CARB has provided guidelines for the siting of land uses near heavily traveled roadways. Of pertinence to this study, the CARB guidelines indicate that siting new sensitive land uses within 500 feet of a freeway or urban roads with 100,000 or more vehicles/day should be avoided when possible.

As an ongoing process, CARB will continue to establish new programs and regulations for the control of DPM and other air-toxics emissions as appropriate. The continued development and implementation of these programs and policies will ensure that the public's exposure to DPM and other TACs will continue to decline.

3.2.3 State Implementation Plan

The State Implementation Plan (SIP) is a collection of documents that set forth the state's strategies for achieving the NAAQS. In California, the SIP is a compilation of new and previously submitted plans, programs (such as air quality management plans, monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. The CARB is the lead agency for all purposes related to the SIP under state law. Local air districts and other agencies, such as the Department of Pesticide Regulation and the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. The CARB then forwards SIP revisions to the U.S. EPA for approval and publication in the Federal Register. All of the items included in the California SIP are listed in the Code of Federal Regulations (CFR) at 40 CFR 52.220.

The ICAPCD is the air district responsible for the project area. Applicable ICAPCD SIPs include the following:

- Imperial County 2009 State Implementation Plan for Particulate Matter Less than 10 Microns in Aerodynamic Diameter;
- Imperial County 2013 State Implementation Plan for the 2006 24-Hour PM_{2.5} Moderate Non-attainment Area; and
- Imperial County 2017 State Implementation Plan for the 2008 8-Hour Ozone Standard.

3.2.4 The California Environmental Quality Act

Section 15125(d) of the California Environmental Quality Act (CEQA) Guidelines requires discussion of any inconsistencies between the project and applicable general plans and regional plans, including the applicable air quality attainment or maintenance plan (or SIP).

3.3 Local Regulations

3.3.1 CEQA Air Quality Handbook

The ICAPCD adopted its *CEQA Air Quality Handbook: Guidelines for the Implementation of the California Environmental Quality Act of 1970* in 2007 and amended the handbook in December 2017 (ICAPCD 2017a). The ICAPCD CEQA Air Quality Handbook provides guidance on how to determine the significance of impacts, including air pollutant emissions, related to the development of residential, commercial, and industrial projects. Where impacts are determined to be significant, the ICAPCD CEQA Air Quality Handbook provides guidance to mitigate adverse impacts to air quality from development projects.

3.3.2 Stationary Source Permitting

Pursuant to ICAPCD Rule 207 (New & Modified Stationary Source Review) and associated rules such as Rule 201 (Permits Required) and Rule 208 (Permit to Operate), the construction, installation, modification, replacement, and operation of any equipment which may emit air contaminants requires ICAPCD permits. The ICAPCD requires that all such equipment be assessed for the potential to result in health risk impacts and permits to operate equipment must be renewed each year equipment is in use or upon the modification of equipment.

3.3.3 Policy Number 5 – Off-site Mitigation/In-Lieu Fee

The ICAPCD issued Policy Number 5, Off-site Mitigation/In-lieu Fee in April 2014. The policy references the ICAPCD CEQA Air Quality Handbook and discusses how project proponents may achieve additional mitigation by either proposing an off-site mitigation project or paying an in-lieu mitigation fee. Mitigation fees collected by the ICAPCD are used to fund the emissions offsets projects through the ICAPCD Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program). Specific projects funded by the program achieve emissions reductions by replacing old, highly polluting equipment with newer, cleaner equipment earlier than required by regulation or through normal attrition. As outlined in Policy Number 5, total in-lieu fees for mitigation of construction emissions are calculated based on the quantity and duration of the project's construction emissions and the cost-effectiveness of the Carl Moyer Program for offsetting oxides of nitrogen (NO_x) and PM₁₀ emissions.

3.3.4 Operational Development Fee Mitigation Program

Adopted in November 2007, Rule 310, Operational Development Fee Mitigation Program, is designed to assist in the reduction of excess air emissions resulting from new residential and commercial development (warehousing is considered a commercial use under the program) in Imperial County. Funds collected by the program are used to offset NO_x and PM₁₀ emissions through local emission reduction projects, such as paving unpaved roadways to reduce fugitive dust.

3.3.5 Fugitive Dust Control

The ICAPCD Regulation VIII regulates emissions of fugitive dust. Fugitive dust is:

Particulate Matter entrained in the ambient air which is caused from man-made and natural activities such as, but not limited to, movement of soil, vehicles, equipment, blasting, and wind. This excludes Particulate Matter emitted directly in the exhaust of motor vehicles or other fuel combustion devices, from portable brazing, soldering, or welding equipment, pile drivers, and stack emissions from stationary sources [ICAPCD, Rule 800 (c)(18)].

Regulation VIII includes the following specific rules:

- Rule 800–Fugitive Dust Requirements for Control of PM_{2.5}
- Rule 801–Construction and Earthmoving Activities
- Rule 802–Bulk Materials
- Rule 803–Carry Out and Track Out
- Rule 804–Open Areas
- Rule 805–Paved and Unpaved Roads
- Rule 806–Conservation Management Practices

3.3.6 ICAPCD Rule 428

Adopted on September 11, 2018, Rule 428, Wood Burning Appliances, is to limit emissions of particulate matter from wood burning appliances. This rule applies to any person who manufactures, sells, offers for sale, or operates a permanently installed, indoor or outdoor, wood burning appliance within the Imperial County PM_{2.5} nonattainment area. This rule also applies to any person who installs a wood burning appliance in any residential or commercial, single- or multi-building unit within the Imperial County PM_{2.5} nonattainment area.

4.0 Environmental Setting

4.1 Site Conditions

The project site is currently undeveloped and is surrounded by undeveloped desert land. The project site is zoned S-2 (Open Space/Preservation). The surrounding parcels are zoned A-2 (General Agricultural) to the north and S-2 (Open Space/Preservation) to the east. Bureau of Land Management land is located to the southeast, south, and west, and military land is located to the southwest. There are no sensitive receptors located in the vicinity of the project site. The nearest sensitive receptors are the residential uses located on Barth Road north of SR-86, more than 3,000 feet northeast of the project site.

4.2 Climate and Meteorology

Climate conditions at the project site, like the rest of Imperial County, are governed by the large-scale sinking and warming of air in the semi-permanent tropical high-pressure center of the Pacific Ocean. The high-pressure ridge blocks out most storms, except in winter when it is weakest and farthest south. The coastal mountains prevent the intrusion of any cool, damp air found in California coastal environs. Because of the barrier and weakened storms, Imperial County experiences clear skies, extremely hot summers, mild winters, and little rainfall (ICAPCD 2017b).

Winters are mild and dry with daily average temperatures ranging between 65 and 75 degrees Fahrenheit. Summers are extremely hot with daily average temperatures ranging between 104 and 115 degrees Fahrenheit. The flat terrain and the strong temperature differentials created by intense solar heating result in moderate winds and deep thermal convection. The combination of subsiding air, protective mountains, and distance from the ocean all combine to severely limit precipitation (ICAPCD 2017b).

Imperial County experiences surface inversions almost every day of the year. Due to strong surface heating, these inversions are usually broken and allow pollutants to be more easily dispersed. In some circumstances, the presence of the Pacific high-pressure cell can cause the air to warm to a temperature higher than the air below. This highly stable atmospheric condition, termed a subsidence inversion, can act as a nearly impenetrable lid to the vertical mixing of pollutants. The strength of these inversions makes them difficult to disrupt. Consequently, they can persist for one or more days, causing air stagnation and the buildup of pollutants. Highest and worst-case ozone levels are often associated with the presence of subsidence inversions (ICAPCD 2017b).

The large daily oscillation of temperature produces a corresponding large variation in the relative humidity. Nocturnal humidity rises to 50 to 60 percent but drops to about 10 percent during the day. Prevailing winds are from the west-northwest through southwest; a secondary flow maximum from the southeast is also evident. The prevailing winds from the west and northwest occur seasonally from fall through spring and are known to be from the Los Angeles area. Occasionally, Imperial County experiences periods of extremely high wind speeds. Wind speeds can exceed 31 miles per hour (mph), and this occurs most frequently during the months of April and May. However, speeds of less than 6.8 mph account for more than one-half of the observed wind measurements (ICAPCD 2017b).

4.3 Criteria Pollutants

4.3.1 Ozone

Ozone is the primary component of smog. Ozone is not directly emitted into the air but is formed through complex chemical reactions between precursor emissions of nitrogen oxides (NO_x) and reactive organic gases (ROG; also known as volatile organic compounds or reactive organic compounds) in the presence of sunlight. The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthma sufferers and children, but healthy adults

as well. Exposure to ozone has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes (the amount of air inhaled and exhaled), and impairing respiratory mechanics. Symptomatic responses include throat dryness, chest tightness, headache, and nausea. About half of smog-forming emissions come from automobiles.

4.3.2 Carbon Monoxide

CO is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue (U.S. EPA 2017a).

Small-scale, localized concentrations of CO above the NAAQS and CAAQS may occur at intersections with stagnation points such as those that occur on major highways and heavily traveled and congested roadways. Localized high concentrations of CO are referred to as “CO hotspots” and are a concern at congested intersections, where automobile engines burn fuel less efficiently and their exhaust contains more CO.

4.3.3 Nitrogen Dioxide

NO₂ is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO₂ are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Inhalation is the most common route of exposure to NO₂. Because NO₂ has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4 to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat.

4.3.4 Sulfur Dioxide

SO₂ is a combustion product, with the primary source being power plants and heavy industries that use coal or oil as fuel. SO₂ is also a product of diesel engine combustion. The health effects of SO₂ include lung disease and breathing problems for people with asthma. SO₂ in the atmosphere contributes to the formation of acid rain.

4.3.5 Particulate Matter

Health studies have shown a significant association between exposure to particulate matter and premature death in people with heart or lung diseases. Other important effects include aggravation

of respiratory and cardiovascular disease, lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and irregular heartbeat (U.S. EPA 2017b).

4.3.5.1 Inhalable Coarse Particles (PM₁₀)

PM₁₀ is particulate matter with an aerodynamic diameter of 10 microns or less. Ten microns is about one-seventh of the diameter of a human hair. Particulate matter is a complex mixture of very tiny solid or liquid particles composed of chemicals, soot, and dust. Under typical conditions (i.e., no wildfires) particles classified under the PM₁₀ category are mainly emitted directly from activities that disturb the soil including travel on roads and construction, mining, or agricultural operations. Other sources include windblown dust, salts, brake dust, and tire wear.

4.3.5.2 Inhalable Fine Particles (PM_{2.5})

Airborne, inhalable particles with an aerodynamic diameter of 2.5 microns or less have been recognized as an air quality concern requiring regular monitoring. Federal regulations required that PM_{2.5} monitoring begin January 1, 1999. Similar to PM₁₀, PM_{2.5} is also inhaled into the lungs and causes serious health problems.

4.3.6 Lead

Lead is a metal found naturally in the environment as well as in manufactured products. At high levels of exposure, lead can have detrimental effects on the central nervous system. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions.

4.4 Existing Air Quality

Air quality at a particular location is a function of the kinds, amounts, and dispersal rates of pollutants being emitted into the air locally and throughout the basin. The major factors affecting pollutant dispersion are wind speed and direction, the vertical dispersion of pollutants (which is affected by inversions), and the local topography.

Air quality is commonly expressed as the number of days in which air pollution levels exceed state standards set by the CARB or federal standards set by the U.S. EPA. The ICAPCD maintains air quality monitoring stations throughout the SSAB. Air pollutant concentrations and meteorological information are continuously recorded at these stations. Measurements are then used by scientists to help forecast daily air pollution levels.

The Westmoreland monitoring station, located at 202 West First Street approximately 11 miles east of the project site, is the nearest station to the project site. The Westmoreland monitoring station measures ozone and PM₁₀. The El Centro–9th Street monitoring station, located at 150 9th Street approximately 24 miles southeast of the project site, is the nearest station to the project site that also includes measurements of NO₂ and PM_{2.5}. Table 2 provides a summary of measurements collected at the Westmoreland and El Centro monitoring stations for the years 2019 through 2023.

Table 2 Summary of Air Quality Measurements Recorded at the Westmoreland and El Centro Monitoring Stations					
Pollutant/Standard	2019	2020	2021	2022	2023
WESTMORELAND MONITORING STATION					
Ozone					
Federal Max 8-hour (ppm)	0.060	0.059	0.072	0.067	0.084
Days 2015 Federal 8-hour Standard Exceeded (0.07 ppm)	0	0	1	0	6
Days 2008 Federal 8-hour Standard Exceeded (0.075 ppm)	0	0	0	0	1
State Max 8-hour (ppm)	0.061	0.059	0.073	0.068	0.084
Days State 8-hour Standard Exceeded (0.07 ppm)	0	0	1	0	7
Max. 1-hour (ppm)	0.071	0.067	0.081	0.085	0.090
Days State 1-hour Standard Exceeded (0.09 ppm)	0	0	0	0	0
PM ₁₀ *					
Federal Max. Daily (µg/m ³)	188.3	286.8	547.1	867.2	610.2
Measured Days Federal 24-hour Standard Exceeded (150 µg/m ³)	1	2	3	19	14
Calculated Days Federal 24-hour Standard Exceeded (150 µg/m ³)	1.0	2.0	3.0	19.4	14.4
Federal Annual Average (µg/m ³)	34.3	40.1	45.0	58.5	48.8
State Max. Daily (µg/m ³)	187.8	297.2	543.1	896.2	621.5
Measured Days State 24-hour Standard Exceeded (50 µg/m ³)	56	89	104	123	82
Calculated Days State 24-hour Standard Exceeded (50 µg/m ³)	56.5	91.3	105.5	125.6	86.9
State Annual Average (µg/m ³)	34.9	40.2	44.7	60.0	44.9
EL CENTRO MONITORING STATION					
Ozone					
Federal Max 8-hour (ppm)	0.071	0.077	0.083	0.078	0.091
Days 2015 Federal 8-hour Standard Exceeded (0.07 ppm)	1	2	6	10	15
Days 2008 Federal 8-hour Standard Exceeded (0.075 ppm)	0	1	2	3	7
State Max 8-hour (ppm)	0.071	0.077	0.084	0.079	0.091
Days State 8-hour Standard Exceeded (0.07 ppm)	1	2	7	10	15
Max. 1-hour (ppm)	0.080	0.097	0.096	0.113	0.100
Days State 1-hour Standard Exceeded (0.09 ppm)	0	1	1	2	5
Nitrogen Dioxide					
Max 1-hour (ppm)	0.0367	0.0448	0.0558	0.0513	0.0507
Days State 1-hour Standard Exceeded (0.18 ppm)	0	0	0	0	0
Days Federal 1-hour Standard Exceeded (0.100 ppb)	0	0	0	0	0
Annual Average (ppm)	--	--	--	--	0.006
PM ₁₀ *					
Federal Max. Daily (µg/m ³)	123.9	197.5	194.5	554.6	231.6
Measured Days Federal 24-hour Standard Exceeded (150 µg/m ³)	0	2	1	2	3
Calculated Days Federal 24-hour Standard Exceeded (150 µg/m ³)	0.0	2.0	1.0	2.1	3.0
Federal Annual Average (µg/m ³)	34.9	41.5	41.8	44.7	36.7
State Max. Daily (µg/m ³)	130.0	197.7	186.9	553.6	224.0
Measured Days State 24-hour Standard Exceeded (50 µg/m ³)	53	92	88	97	64
Calculated Days State 24-hour Standard Exceeded (50 µg/m ³)	53.7	92.0	88.6	99.3	64.8
State Annual Average (µg/m ³)	35.6	41.5	41.6	45.5	36.7

Table 2 Summary of Air Quality Measurements Recorded at the Westmoreland and El Centro Monitoring Stations					
Pollutant/Standard	2019	2020	2021	2022	2023
PM _{2.5} *					
Federal Max. Daily (µg/m ³)	21.4	28.5	19.1	30.6	42.0
Measured Days Federal 24-hour Standard Exceeded (35 µg/m ³)	0	0	0	0	1
Calculated Days Federal 24-hour Standard Exceeded (35 µg/m ³)	0.0	0.0	0.0	0.0	--
Federal Annual Average (µg/m ³)	7.8	9.7	8.3	8.8	--
State Max. Daily (µg/m ³)	21.4	28.5	19.1	30.6	42.0
State Annual Average (µg/m ³)	7.9	9.8	8.3	8.9	--
ppm = parts per million; µg/m ³ = micrograms per cubic meter; -- = Not available. *Calculated days value. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year. SOURCE: CARB 2024b.					

5.0 Significance Criteria

Thresholds used to evaluate potential impacts to air quality are based on applicable criteria in the CEQA Guidelines Appendix G. The project would have a significant air quality impact if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
3. Expose sensitive receptors to substantial pollutant concentrations.
4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

As stated in the State CEQA Guidelines, these questions are “intended to encourage thoughtful assessment of impacts and do not necessarily represent thresholds of significance” (Title 14, Division 6, Chapter 3 Guidelines for Implementation of the CEQA, Appendix G, Environmental Checklist Form). The State CEQA Guidelines encourage lead agencies to adopt regionally specific thresholds of significance. When adopting these thresholds, the amended State CEQA Guidelines allow lead agencies to consider thresholds of significance adopted or recommended by other public agencies, or recommended by experts, provided that the thresholds are supported by substantial evidence.

The ICAPCD CEQA Air Quality Handbook establishes the following four separate evaluation categories (ICAPCD 2017a):

1. Comparison of calculated project emissions to ICAPCD emission thresholds.
2. Consistency with the most recent Clean Air Plan for Imperial County.
3. Comparison of predicted ambient pollutant concentrations resulting from the project to state and federal health standards, when applicable.
4. The evaluation of special conditions which apply to certain projects.

Any development with a potential to emit criteria pollutants below significance levels defined by the ICAPCD is called a "Tier I project," and is considered by the ICAPCD to have less than significant potential adverse impacts on local air quality. For Tier I projects, the project proponent should implement a set of feasible "standard" mitigation measures (enumerated by the ICAPCD) to reduce the air quality impact to an insignificant level. A "Tier II project" is one whose emissions exceed any of the thresholds. Its impact is significant, and the project proponent should select and implement all feasible "discretionary" mitigation measures (also enumerated by the ICAPCD) in addition to the standard measures.

5.1 Operational Impacts

Table 3 provides general guidelines for determining the significance of impacts based on the total emissions that are expected from project operation established by the ICAPCD.

Table 3 Significance Thresholds for Operations		
Pollutant	Tier I	Tier II
NO _x and ROG	Less than 137 lbs./day	137 lbs./day and greater
PM ₁₀ and SO _x	Less than 150 lbs./day	150 lbs./day and greater
CO and PM _{2.5}	Less than 550 lbs./day	550 lbs./day and greater
ROG = reactive organic gas; NO _x = oxides of nitrogen; SO _x = oxides of sulfur; CO = carbon monoxide; PM ₁₀ = particulate matter less than 10 microns; PM _{2.5} = particulate matter with an aerodynamic diameter 2.5 microns or less; lbs./day = pounds per day SOURCE: ICAPCD 2017a.		

As stated above, Tier 1 projects are required to implement all feasible standard measures specified by the ICAPCD. Tier II projects are required to implement all feasible standard measures as well as all feasible discretionary measures specified by the ICAPCD.

5.2 Construction Impacts

The ICAPCD has also established thresholds of significance for project construction. Table 4 provides general guidelines for determining significance of impacts based on the total emissions that are expected from project construction.

Table 4 Significance Thresholds for Construction	
Pollutant	Thresholds (pounds/day)
PM ₁₀	150
ROG	75
NO _x	100
CO	550
PM ₁₀ =particulate matter less than 10 microns; ROG = reactive organic gas; NO _x = oxides of nitrogen; CO = carbon monoxide SOURCE: ICAPCD 2017a.	

Regardless of project size, all feasible standard measures specified by the ICAPCD for construction equipment and fugitive PM₁₀ control for construction activities should be implemented at construction sites. Control measures for fugitive PM₁₀ construction emissions in Imperial County are found in ICAPCD Regulation VIII and in the ICAPCD CEQA Air Quality Handbook and are discussed below.

5.3 Public Nuisance Law (Odors)

State of California Health and Safety Code Sections 41700 and 41705 and ICAPCD Rule 407 prohibit emissions from any source whatsoever in quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to the public health or damage to property.

The ICAPCD CEQA Air Quality Handbook provides screening level distances for potential odor sources. If a project is proposed within one mile of a wastewater treatment plant, sanitary landfill, composting station, feedlot, asphalt plant, painting and coating operation, or rendering plant, a potential odor problem may result (ICAPCD 2017a).

6.0 Air Quality Calculations

The project would result in air pollutant emissions associated with construction and operation. Emissions were calculated using California Emissions Estimator Model (CalEEMod) Version 2022.1 (California Air Pollution Control Officers Association 2022). The CalEEMod program is a tool used to estimate emissions resulting from land development projects in the state of California. CalEEMod was developed with the participation of several state air districts.

CalEEMod estimates parameters such as the type and amount of construction equipment required, trip generation, and utility consumption based on the size and type of each specific land use using

data collected from surveys performed by the ICAPCD. Where available, parameters were modified to reflect project-specific data.

6.1 Construction Emissions

Construction-related activities are temporary, short-term sources of air pollutant emissions. Sources of construction-related emissions include the following:

- Fugitive dust from grading activities;
- Exhaust emissions from construction equipment;
- Application of chemical coatings (paints, stains, sealants, etc.); and
- Exhaust and fugitive dust emission from on-road vehicles (trips by workers, delivery trucks, and material-hauling trucks).

Heavy-duty construction equipment is usually diesel powered. Based on CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation, heavy-duty construction equipment includes off-road diesel vehicles 25 horsepower or greater. In general, emissions from diesel-powered equipment contain more NO_x, SO_x, and particulate matter than gasoline-powered engines. However, diesel-powered engines generally produce less CO and less ROG than do gasoline-powered engines. Standard construction equipment includes tractors/loaders/backhoes, rubber-tired dozers, excavators, graders, cranes, forklifts, rollers, paving equipment, generator sets, welders, cement and mortar mixers, and air compressors.

Primary inputs are the numbers of each piece of equipment and the length of each construction stage. The construction equipment estimates are based on surveys performed by the South Coast Air Quality Management District (SCAQMD) and the Sacramento Metropolitan Air Quality Management District of typical construction projects which provide a basis for scaling equipment needs and schedule with a project's size. Air emission estimates in CalEEMod are based on the duration of construction phases; construction equipment type, quantity, and usage; grading area; season; and ambient temperature, among other parameters.

Construction activities associated with the project would include grading (5 months), electrical infrastructure construction (5 months), structural construction (6 months), and equipment installation (5 months). Construction activities were modeled beginning in 2026. Default construction equipment for a light industrial use was modeled, which is conservative since it assumes ground-up construction of buildings. Rather, equipment would be delivered to the project site and installed.

Construction activities would require up to 250 workers and seven truck deliveries per day. Regional access to the project site would occur over SR-78 and SR-86, which are paved freeways. Access to the project site would be provided via an existing unpaved utility easement and road that follows IID power lines branching off SR-86 north of the project site. As discussed in Section 2.0 above, two different access routes are being considered. This analysis calculates emissions associated with the longer western access route. The 1.96-mile western access route would travel 0.94 mile south along a paved road, followed by 1.02 miles along a dirt road to be constructed heading southeast towards the project site. As a conservative assessment and to account for windblown dust that may

accumulate on the paved segment of the western access route, a two-mile unpaved road was modeled.

6.1.1 Mobilization Fugitive Dust

Hauling equipment on the access road from SR-86 to the project site would result in emissions of fugitive dust. Fugitive dust (PM₁₀ and PM_{2.5}) emissions were calculated using U.S. EPA AP-42 methodology for calculating unpaved road dust emissions. The following equation was used:

$$E = k \times (s/12)^a \times (W/3)^b \div (M/0.2)^c$$

Where,

- E = Emission factor (pounds per mile traveled)
- s = surface material silt content (percent)
- W = mean vehicle weight (tons)
- M = surface material moisture content (percent)
- k, a, b, c = empirical constants for PM₁₀ and PM_{2.5}

For construction equipment mobilization, emissions were calculated without dust control measures. Based on similar projects, it is anticipated that up to seven pieces of construction equipment would be hauled to the project site per day during project mobilization.

6.1.2 Fugitive Dust

Fugitive dust would be associated with construction activities that involve ground disturbance. Fugitive dust emissions vary greatly during construction and are dependent on the amount and type of activity, silt content of the soil, and the weather. Vehicles moving over paved and unpaved surfaces, demolition, excavation, earth movement, grading, and wind erosion from exposed surfaces are all sources of fugitive dust. Calculation of fugitive dust emissions are based on the area of disturbed ground and the fugitive dust measures implemented. The dust control efficiencies of various control methods are summarized in Table 5.

Table 5 Fugitive Dust Mitigation Efficiencies		
Activity	Measure	PM ₁₀ Control Efficiency
Track-out	Use a gravel apron, 25 feet long by road width, to reduce mud/dirt track-out from unpaved truck exit routes.	46%
Travel over unpaved roads (15 mph)	Limit maximum speed on unpaved roads to 15 mph.	57%
Travel over unpaved roads (25 mph)	Limit maximum speed on unpaved roads to 25 mph.	44%
Water Truck	Apply water every 3 hours to disturbed areas within a construction site.	61%
Grading	Replace ground cover in disturbed areas as quickly as possible.	5%
Travel over unpaved roads	Apply chemical dust suppressant annually to unpaved parking areas.	84%
mph = miles per hour; PM ₁₀ = particulate matter less than 10 microns SOURCE: SCAQMD 2007		

The ICAPCD requires that, regardless of the size of a project, all feasible standard measures for fugitive PM₁₀ must be implemented at construction sites. Additionally, all feasible discretionary measures for PM₁₀ apply to those construction sites that are 5 acres or more for non-residential developments or 10 acres or more in size for residential developments. Standard and discretionary measures from the ICAPCD handbook that are required for project implementation include the following:

Standard Measures for Fugitive PM₁₀ Control:

- a) 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.
- b) 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, dust suppressants and/or watering.
- c) All unpaved traffic areas one acre or more with 75 or more average vehicle trips per day will be effectively stabilized and visible emission 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 six 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 delivery site after removal of bulk material.
- d) The transport of bulk materials shall be completely covered unless six 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 delivery site after removal of bulk material.
- e) 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.
- f) Movement of 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.
- g) 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.

Discretionary Measures for Fugitive PM₁₀ Control

- a) Water exposed soil with adequate frequency for continued moist soil.
- b) Replace ground cover in disturbed areas as quickly as possible.
- c) Automatic sprinkler system installed on all soil piles.
- d) Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site.
- e) Develop a trip reduction plan to achieve a 1.5 average vehicle ridership for construction employees.
- f) Implement a shuttle service to and from retail services and food establishments during lunch hours.

6.1.3 Construction Equipment

CalEEMod calculates emissions of all pollutants from construction equipment using emission factors from CARB's off-road diesel equipment emission factors database. All construction equipment required during a phase was modeled over the entire duration of the phase even if it would only be required for a portion of the phase. Additionally, two off-highway trucks and a generator were added to each phase to account for water trucks and a generator needed to power the construction office. The modeled construction equipment is summarized in Table 6.

Table 6 Construction Phases and Equipment		
Equipment	Quantity	Daily Operation Time (hours)
Grading (5 months)		
Excavators	2	8
Grader	1	8
Rubber Tired Dozer	1	8
Scrapers	2	8
Tractors/Loaders/Backhoes	2	8
Water Trucks	2	8
Generator (Office)	1	24
Electrical, Structural, Installation (16 months)		
Crane	1	7
Forklifts	3	8
Generator	1	8
Tractors/Loaders/Backhoes	3	7
Welder	1	8
Water Trucks	2	8
Generator (Office)	1	24
NOTE: Each phase would also include vehicles associated with work commutes, dump trucks for hauling, and trucks for deliveries.		

The ICAPCD requires that, regardless of the size of a project, all feasible standard measures for construction equipment must be implemented at construction sites. Standard measures from the ICAPCD handbook include the following:

Standard Measures for Construction Combustion Equipment

- a) Use of alternative fueled or catalyst equipped diesel construction equipment, including all off-road and portable diesel powered equipment.
- b) Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes as a maximum.
- c) Limit, to the extent feasible, the hours of operation of heavy duty equipment and/or the amount of equipment in use.
- d) Replace fossil fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set).

To help provide a greater degree of reduction of particulate matter emissions from construction combustion equipment, the ICAPCD recommends the following enhanced measures:

Enhanced Mitigation Measures for Construction Combustion Equipment

- a) Curtail construction during periods of high ambient pollutant concentrations; this may include ceasing of construction activity during the peak hour of vehicular traffic on adjacent roadways.
- b) Implement activity management (e.g. rescheduling activities to reduce short-term impacts).

6.1.4 Unpaved Roads

Construction would generate mobile source emissions from worker trips and delivery trips. CalEEMod calculates emissions of all pollutants from on-road trucks and passenger vehicles using emission factors derived from CARB's motor vehicle emission inventory program EMFAC2021 (CARB 2021). Vehicle emission factors were multiplied by the model default total estimated number of trips and the average trip length to calculate the total mobile emissions. The project would require up to 200 workers per day and five deliveries per day. The average worker and delivery trip lengths were increased to 20 miles.

CalEEMod calculates dust emissions from travel on paved and unpaved roads. By default, CalEEMod assumes the percentage of paved and unpaved roads for each district as provided by the district. For Imperial County, the default assumption is 50 percent paved and 50 percent unpaved. However, this is not characteristic of the roads in the vicinity of the project site. Construction vehicles would access the site via SR-78 and SR-86, which are paved. However, it should be noted that Imperial County roadways do experience higher levels of entrained roadway dust. As a conservative assessment and to account for windblown dust that may accumulate on the paved segment of the

western access route, a two-mile unpaved road was modeled. To account for these dust emissions, ICAPCD recommends modeling 90 percent paved roads during construction activities.

In accordance with ICAPCD rules and regulations, the project would be required to implement dust control measures both on-site and on the unpaved access road. CalEEMod does not calculate emission reductions associated with off-site measures, therefore, these reductions were post-processed. This analysis presents the uncontrolled emissions as well as emissions associated with watering combined with a reduced speed, and the use of soil stabilizers combined with a reduced speed. Based on discussions with ICAPCD staff, watering during ground disturbing activities would achieve a 50 percent reduction in fugitive dust. Soil stabilizers would achieve an 84 percent reduction, and reducing speed would achieve an additional 44 percent reduction in fugitive dust (SCAQMD 2007, California Air Pollution Control Officers Association 2022).

6.1.5 Construction Emissions Estimates

Table 7 provides a summary of the criteria pollutant emissions generated by the project construction without any dust control on the access road. Table 8 provides a summary of the construction emissions with the application of water on the access road. Table 9 provides a summary of the construction emissions with the application of soil stabilizer on the access road.

CalEEMod output files are contained in Attachment 1. Equipment mobilization calculations are contained in Attachment 2. Fugitive dust emissions reduction calculations are contained in Attachment 3. A summary of all combined emissions is provided in Attachment 4. As shown in Table 7, fugitive dust emissions would exceed the threshold of 150 pounds per day of PM₁₀ without any dust control measures taken for the access road. As shown in Table 8, watering the access road would significantly reduce PM₁₀ emissions, but not to a level less than 150 pounds per day. As shown in Table 9, application of soil stabilizer on the access road would be required to reduce PM₁₀ emissions to less than 150 pounds per day.

Table 7 Maximum Daily Construction Emissions – No Dust Control on Access Road						
Emission Source	Maximum Daily Emissions (pounds)					
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Mobilization/Equipment Delivery (Up to 7 equipment delivery trips per day) ¹						
Equipment Delivery	<1	1	<1	<1	57	8
Total	<1	1	<1	<1	57	8
<i>Significance Threshold</i>	75	100	550	-	150	-
Exceeds Threshold?	No	No	No	-	No	-
Grading (5 months)						
Construction Equipment	4	35	35	<1	1	1
On-site Fugitive Dust (Grading)	-	-	-	-	5	2
Worker Trips	3	3	58	<1	1,478	148
Total	7	38	93	<1	1,484	151
<i>Significance Threshold</i>	75	100	550	-	150	-
Exceeds Threshold?	No	No	No	-	Yes	-
Electrical/Structural/Installation (16 months)						
Construction Equipment	2	17	20	<1	1	1
Material Deliveries	<1	1	<1	<1	41	4
Worker Trips	3	3	58	<1	1,478	148
Total	5	22	79	<1	1,520	153
<i>Significance Threshold</i>	75	100	550	-	150	-
Exceeds Threshold?	No	No	No	-	Yes	
ROG = reactive organic gas; NO _x = oxides of nitrogen; CO = carbon monoxide; SO _x = oxides of sulfur; CO = carbon monoxide; PM ₁₀ =particulate matter less than 10 microns; PM _{2.5} = particulate matter less than 2.5 microns SOURCE: Attachments 1, 2, and 4. NOTE: Totals may vary due to independent rounding. ¹ Delivery truck emissions from engine combustion were assumed to be the same as the delivery emission associated with the electrical/structural/installation phase since 7 deliveries per day were also assumed for those activities. Non-dust emissions were obtained from CalEEMod modeling (Attachment 1). Equipment mobilization fugitive dust emissions were obtained from AP-42 calculations (Attachment 2).						

Table 8 Maximum Daily Construction Emissions – Access Road Watering						
Emission Source	Maximum Daily Emissions (pounds)					
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Mobilization/Equipment Delivery (Up to 7 equipment delivery trips per day) ¹						
Equipment Delivery	<1	1	<1	<1	57	8
Total	<1	1	<1	<1	57	8
<i>Significance Threshold</i>	75	100	550	-	150	-
Exceeds Threshold?	No	No	No	-	No	-
Grading (5 months)						
Construction Equipment	4	35	35	<1	1	1
On-site Fugitive Dust (Grading)	-	-	-	-	5	2
Worker Trips	3	3	58	<1	414	42
Total	7	38	93	<1	420	45
<i>Significance Threshold</i>	75	100	550	-	150	-
Exceeds Threshold?	No	No	No	-	Yes	-
Electrical/Structural/Installation (16 months)						
Construction Equipment	2	17	20	<1	1	1
Material Deliveries	<1	1	<1	<1	12	1
Worker Trips	3	3	58	<1	414	42
Total	5	22	79	<1	426	43
<i>Significance Threshold</i>	75	100	550	-	150	-
Exceeds Threshold?	No	No	No	-	Yes	-
ROG = reactive organic gas; NO _x = oxides of nitrogen; CO = carbon monoxide; SO _x = oxides of sulfur; CO = carbon monoxide; PM ₁₀ = particulate matter less than 10 microns; PM _{2.5} = particulate matter less than 2.5 microns SOURCE: Attachments 1 through 4. NOTE: Totals may vary due to independent rounding. ¹ Delivery truck emissions from engine combustion were assumed to be the same as the delivery emission associated with the electrical/structural/installation phase since 7 deliveries per day were also assumed for those activities. Non-dust emissions were obtained from CalEEMod modeling (Attachment 1). Equipment mobilization fugitive dust emissions were obtained from AP-42 calculations (Attachment 2).						

Table 9 Maximum Daily Construction Emissions – Access Road Soil Stabilizer						
Emission Source	Maximum Daily Emissions (pounds)					
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Mobilization/Equipment Delivery (Up to 7 equipment delivery trips per day) ¹						
Equipment Delivery	<1	1	<1	<1	57	8
Total	<1	1	<1	<1	57	8
<i>Significance Threshold</i>	75	100	550	-	150	-
Exceeds Threshold?	No	No	No	-	No	-
Grading (5 months)						
Construction Equipment	4	35	35	<1	1	1
On-site Fugitive Dust (Grading)	-	-	-	-	5	2
Worker Trips	3	3	58	<1	132	13
Total	7	38	93	<1	138	16
<i>Significance Threshold</i>	75	100	550	-	150	-
Exceeds Threshold?	No	No	No	-	No	-
Electrical/Structural/Installation (16 months)						
Construction Equipment	2	17	20	<1	1	1
Material Deliveries	<1	1	<1	<1	4	<1
Worker Trips	3	3	58	<1	132	13
Total	5	22	79	<1	137	14
<i>Significance Threshold</i>	75	100	550	-	150	-
Exceeds Threshold?	No	No	No	-	No	-
ROG = reactive organic gas; NO _x = oxides of nitrogen; CO = carbon monoxide; SO _x = oxides of sulfur; CO = carbon monoxide; PM ₁₀ = particulate matter less than 10 microns; PM _{2.5} = particulate matter less than 2.5 microns SOURCE: Attachments 1 through 4. NOTE: Totals may vary due to independent rounding. ¹ Delivery truck emissions from engine combustion were assumed to be the same as the delivery emission associated with the electrical/structural/installation phase since 7 deliveries per day were also assumed for those activities. Non-dust emissions were obtained from CalEEMod modeling (Attachment 1). Equipment mobilization fugitive dust emissions were obtained from AP-42 calculations (Attachment 2).						

6.2 Operational Emissions

Operation-related sources of air pollutant emissions include the direct emission of criteria pollutants. Common direct emission sources associated with typical projects include mobile sources such as project-generated traffic, area sources such as the use of landscaping equipment, and energy sources such as the combustion of natural gas.

6.2.1 Mobile Sources

CalEEMod calculates mobile source emissions using emission factors derived from CARB's motor vehicle emission inventory program, EMFAC2021 (CARB 2021). The project would be an unmanned facility that would be operated remotely. Therefore, the project would not generate routine daily trips. Occasional maintenance trips would be required. To account for these trips, a total of one

round trip (two one-way trips) was modeled per weekday. The default trip length was increased to 20 miles. CalEEMod default emission factors for the soonest operational year of 2027 were modeled.

As discussed under the construction emission methodology for on-road vehicles, CalEEMod calculates dust emissions from travel on paved and unpaved roads. For Imperial County, the default assumption is 50 percent paved and 50 percent unpaved. However, this is not characteristic of the roads in the vicinity of the project site. During project operation, the majority of the access route to and from the project site would be paved, with only the access road from SR-86 being unpaved. Therefore, as with construction activities, to account for these dust emissions and any entrained dust on paved roads and the unpaved access road, 90 percent paved roads was modeled for operation. No access road fugitive dust control measures were modeled.

6.2.2 Area and Energy Sources

Area source emissions associated with typical development projects include consumer products, natural gas used in space and water heating, architectural coatings, landscaping equipment, and mechanical equipment such as boilers or backup generators. Hearths (fireplaces) and woodstoves are also a source of area emissions. Emissions are generated from energy use such as the combustion of natural gas used in space and water heating. As discussed, the project would be an unmanned facility that would not be a source of area or energy emissions. However, as a conservative analysis, the project was modeled as a light industrial land use and default emission factors for light industrial area and energy sources were modeled.

6.2.3 Total Operational Emissions

Table 10 provides a summary of the criteria pollutant emissions generated by the project operations. CalEEMod output files for project construction and operations are contained in Attachment 1. As shown in Table 10, operational emissions would be less than the significance thresholds for all criteria pollutants.

Table 10 Daily Operational Emissions (pounds per day)						
Source	Emissions					
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Mobile Sources	<1	<1	<1	<1	3	<1
Area Sources	18	<1	2	<1	<1	<1
Energy Sources	<1	<1	<1	<1	<1	<1
TOTAL	18	<1	3	<1	3	<1
<i>Significance Threshold</i>	<i>137</i>	<i>137</i>	<i>550</i>	<i>150</i>	<i>150</i>	<i>550</i>
<i>Exceeds Threshold?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>
ROG = reactive organic gas; NO _x = oxides of nitrogen; CO = carbon monoxide; SO _x = oxides of sulfur; CO = carbon monoxide; PM ₁₀ = particulate matter less than 10 microns; PM _{2.5} = particulate matter less than 2.5 microns NOTE: Totals may vary due to independent rounding.						

6.3 Impact Analysis

1. Would the project obstruct or conflict with the implementation of the applicable air quality plan?

CARB is the lead agency for preparation of the SIP, which outlines the state measures to achieve NAAQS. CARB delegates responsibility for preparation of SIP elements to local air districts and requires local air districts to prepare Air Quality Attainment Plans outlining measures required to achieve CAAQS.

The ICAPCD is the air district responsible for the project area. Applicable ICAPCD air quality plans include the following:

- Imperial County 2009 State Implementation Plan for Particulate matter Less than 10 Microns in Aerodynamic Diameter;
- Imperial County 2013 State Implementation Plan for the 2006 24-Hour PM_{2.5} Moderate Non-attainment Area; and
- Imperial County 2017 State Implementation Plan for the 2008 8-Hour Ozone Standard.

The primary concern for assessing consistency with air quality plans is whether the project would induce growth that would result in a net increase in criteria pollutant emissions that exceed the assumptions used to develop the plan. The criteria pollutant emission projections for the ICAPCD air quality plans are based on Southern California Association of Governments' (SCAG) population growth and regional vehicle miles traveled projections, which are based in part on the land uses established by local general plans. As such, projects that propose development that is consistent with the local land use plans would be consistent with growth projections and air quality plans criteria pollutant emissions estimates. In the event that a project would result in development that is less dense than anticipated by the growth projections, the project would be considered consistent with the air quality plans. In the event a project would result in development that results in greater than anticipated growth projections, the project would result in air pollutant emissions that may not have been accounted for in the air quality plans and thus may obstruct or conflict with the air quality plans.

The project site is designated as Recreation/Open Space land use in the Imperial County General Plan and is zoned S-2 (Open Space/Preservation). The project would construct a renewable energy use consisting of solar panels and a BESS that would not be a significant source of emissions. The project would be consistent with the growth projections and air quality plans criteria pollutant emissions estimates. Furthermore, the project would not construct housing or other uses that would result in regional population growth. The project would provide needed energy storage for the region and the state. Therefore, the project would not result in new growth beyond what was originally anticipated in SCAG's growth projections for Imperial County. Additionally, as summarized in Table 10, operation of the project would result in emissions that are below all applicable project-level significance thresholds. Therefore, project emissions would be consistent with SCAG's growth projections and the ICAPCD's air quality plans, and impacts would be less than significant.

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

The project site is in non-attainment areas for NAAQS and CAAQS for ozone and particulate matter. The majority of regional PM₁₀ and PM_{2.5} emissions originate from dust stirred up by wind or by vehicle traffic on unpaved roads (ICAPCD 2009). Other PM₁₀ and PM_{2.5} emissions originate from grinding operations, combustion sources such as motor vehicles, power plants, wood burning, forest fires, agricultural burning, and industrial processes. Ozone is not emitted directly but is a result of atmospheric activity on precursors. NO_x and ROG are known as the chief “precursors” of ozone. These compounds react in the presence of sunlight to produce ozone. Approximately 88 percent of NO_x and 40 percent of ROG regional emissions originate from on- and off-road vehicles (ICAPCD 2010). Other major sources include solvent evaporation and miscellaneous processes such as pesticide application.

As discussed in Section 6.1.5, fugitive dust emissions would exceed the threshold of 150 pounds per day of PM₁₀ without any dust control measures taken for the access road during construction (see Table 7). This is due to the workers driving on the access road to and from the project site. Emissions would be less than the applicable thresholds for all other criteria pollutants. Watering the access road would significantly reduce PM₁₀ emissions, but not to a level less than 150 pounds per day (see Table 8). The application of soil stabilizer on the access road would be required to reduce PM₁₀ emissions to less than 150 pounds per day (see Table 9). Therefore, in addition to the standard and discretionary measures outlined in Sections 6.1.2 and 6.1.3, the following mitigation measure would be required:

MM-AIR-1: The following measures would be required for construction activities:

- Prior to the start of construction, a soil stabilizer (chemical dust suppressant) shall be applied to the 1.02-mile unpaved segment of the western access route to be constructed heading southeast towards the project site. The soil stabilizer shall be reapplied as necessary during the duration of construction to reduce fugitive dust emissions to the maximum extent feasible.
- A speed limit of 25 mph on the access road shall be enforced.

With implementation of MM-AIR-1, construction emissions would be reduced to less than the applicable thresholds for all criteria pollutants. These thresholds are designed to provide limits below which project emissions would not significantly change regional air quality. The project would also implement all standard and discretionary measures for fugitive PM₁₀ control and standard and enhanced measures for construction combustion equipment. Therefore, with mitigation, project construction would not result in a cumulatively considerable net increase in emissions of ozone, PM₁₀, or PM_{2.5}, and impacts would be less than significant.

Long-term emissions of regional air pollutants occur from operational sources. As shown in Table 10 above, operation of the project would result in minimal emissions that would be less than the applicable thresholds for all criteria pollutants. Therefore, project operation would not result in a

cumulatively considerable net increase in emissions of ozone, PM₁₀, or PM_{2.5}, and impacts would be less than significant.

3. *Would the project expose sensitive receptors to substantial pollutant concentration including air toxics such as diesel particulates?*

Sensitive land uses include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential communities. There are no sensitive receptors located in the vicinity of the project site. The nearest sensitive receptors are the residential uses located on Barth Road northeast of SR-86, more than 3,000 feet north of the project site, and on Allen Road north of SR-86, more than 6,000 feet north of the project site.

Diesel Particulate Matter – Construction

Construction of the project and associated infrastructure would result in short-term diesel exhaust emissions from on-site heavy-duty equipment. Construction of the project would result in the generation of diesel-exhaust DPM emissions from the use of off-road diesel equipment required for grading and other construction activities and on-road diesel equipment used to bring materials to and from the project site.

Generation of DPM from construction projects typically occurs in a single area for a short period. Construction is anticipated to last for approximately 21 months (grading – 5 months, electrical infrastructure construction – 5 months, structural construction – 6 months, and equipment installation – 5 months). The dose of DPM to which the receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that person has to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the Maximally Exposed Individual. The risks estimated for a Maximally Exposed Individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (Office of Environmental Health Hazard Assessment 2015). Thus, if the duration of proposed construction activities near any specific sensitive receptor were 21 months, the exposure would be 6 percent (1.75 years divided by 30 years) of the total exposure period used for health risk calculation. Furthermore, the project would implement the standard and enhanced measures for construction combustion equipment summarized in Section 6.1.3 above. Additionally, with ongoing implementation of U.S. EPA and CARB requirements for cleaner fuels; off-road diesel engine retrofits; and new, low-emission diesel engine types, the DPM emissions of individual equipment would be reduced over time. All construction equipment is subject to the CARB In-Use Off-Road Diesel-Fueled Fleets Regulation, which limits unnecessary idling to 5 minutes, requires all construction fleets to be labeled and reported to CARB, bans Tier 0 equipment and phases out Tier 1 and 2 equipment (thereby replacing fleets with cleaner equipment), and requires that fleets comply with Best Available Control Technology requirements. Therefore, due to the distance to the nearest sensitive receptor (over 3,000 feet), the limited duration of construction activities, implementation of standard and enhanced measures for construction combustion equipment, and implementation of the In-Use Off-Road Diesel-Fueled Fleets Regulation, DPM generated by project construction is not expected to create

conditions where the probability is greater than 10 in 1 million of contracting cancer for the Maximally Exposed Individual or to generate ground-level concentrations of non-carcinogenic TACs that exceed a Hazard Index greater than 1 for the Maximally Exposed Individual. Therefore, project construction would not expose sensitive receptors to substantial pollutant concentration, and impacts would be less than significant.

Carbon Monoxide Hot Spots

A CO hot spot is an area of localized CO pollution that is caused by severe vehicle congestion on major roadways, typically near signalized intersections. CO hot spots have the potential to violate state and federal CO standards at intersections, even if the broader basin is in attainment for federal and state levels. Due to increased requirements for cleaner vehicles, equipment, and fuels, CO levels in the state have dropped substantially. All air basins are attainment or maintenance areas for CO. Therefore, recent screening procedures based on more current methodologies have been developed. The Sacramento Metropolitan Air Quality Management District developed a screening threshold in 2011, which states that any project involving an intersection experiencing 31,600 vehicles per hour or more will require detailed analysis. In addition, the Bay Area Air Quality Management District developed a screening threshold in 2010, which states that any project involving an intersection experiencing 44,000 vehicles per hour would require detailed analysis. Project construction would require up to 250 workers and 7 deliveries per day. This level of traffic is not anticipated to create a CO hot spot. Additionally, there are no signalized intersections in the vicinity of the project site. Traffic generated by the project would not result in any heavily congested intersections. Therefore, project construction and operation would not result in a CO hot spot, and impacts would be less than significant.

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

The potential for an odor impact is dependent on a number of variables, including the nature of the odor source, distance between the receptor and odor source, and local meteorological conditions. Project construction would result in the emission of diesel fumes and other odors typically associated with construction activities. As discussed, there are no sensitive receptors in the vicinity of the project site. The nearest residential receptors are located more than 3,000 feet northeast of the project site. Project construction would be short term (13 months) and temporary in nature. Further, per CARB's Airborne Toxic Control Measures 13 (California Code of Regulations Chapter 10 Section 2485), the applicant shall not allow idling time to exceed five minutes unless more time is required per engine manufacturers' specifications or for safety reasons. Therefore, project construction would not generate odors adversely affecting a substantial number of people, and impacts would be less than significant.

The ICAPCD CEQA Air Quality Handbook provides screening level distances for potential odor sources. If a project is proposed within one mile of a wastewater treatment plant, sanitary landfill, composting station, feedlot, asphalt plant, painting and coating operation, or rendering plant, a potential odor problem may result (ICAPCD 2017a). The project does not include the construction of any of these uses. Energy storage facilities are not known to emit odors during operation. Project operation would include occasional inspection and maintenance. These operational activities are not

known to emit odors. Therefore, project operation would not generate odors adversely affecting a substantial number of people, and impacts would be less than significant.

7.0 Conclusions

The project's potential to result in impacts to air quality was assessed in accordance with the guidelines, policies, and standards established by the ICAPCD. The applicable ICAPCD air quality plans include the 2009, 2013, and 2017 SIPs for reducing PM₁₀, PM_{2.5}, and ozone. The project would construct a renewable energy use consisting of solar panels and a BESS that would not be a significant source of emissions. The project would be consistent with the growth projections and air quality plans criteria pollutant emissions estimates. Additionally, project operation would not result in an air quality violation. Therefore, the project would not conflict with or obstruct the implementation of the regional air quality plans, and impacts would be less than significant.

During construction, emissions would be less than the significance thresholds for all criteria pollutants except PM₁₀. Fugitive dust emissions would exceed the threshold of 150 pounds per day of PM₁₀ without any dust control measures taken for the access road during construction. The application of a soil stabilizer would be required to reduce PM₁₀ emissions to less than 150 pounds per day. Therefore, in addition to the standard and discretionary measures outlined in Sections 6.1.2 and 6.1.3, the following mitigation measure would be required:

MM-AIR-1: The following measures would be required for construction activities:

- Prior to the start of construction, a soil stabilizer (chemical dust suppressant) shall be applied to the 1.02-mile unpaved segment of the western access route to be constructed heading southeast towards the project site. The soil stabilizer shall be reapplied as necessary during the duration of construction to reduce fugitive dust emissions to the maximum extent feasible.
- A speed limit of 25 mph on the access road shall be enforced.

With implementation of MM-AIR-1 as well as all standard and discretionary measures for fugitive PM₁₀ control and standard and enhanced measures for construction combustion equipment, construction emissions would be reduced to less than the applicable thresholds for all criteria pollutants. Therefore, with mitigation, project construction would not result in a cumulatively considerable net increase in emissions of ozone, PM₁₀, or PM_{2.5}, and impacts would be less than significant.

Long-term emissions of regional air pollutants occur from operational sources. Operation of the project would result in minimal emissions that would be less than the applicable thresholds for all criteria pollutants. Therefore, project operation would not result in a cumulatively considerable net increase in emissions of ozone, PM₁₀, or PM_{2.5}, and impacts would be less than significant.

Project construction would not result in the exposure of sensitive receptors to significant levels of DPM that could result in excess cancer risks due to the distance to the nearest sensitive receptor (3,000 feet), the limited duration of construction activities, implementation of standard and enhanced

measures for construction combustion equipment, and implementation of the In-Use Off-Road Diesel-Fueled Fleets Regulation. Additionally, the project would not result in the creation of a CO hot spot. Therefore, construction and operation of the project would not expose sensitive receptors to substantial pollutant concentrations, and impacts would be less than significant.

During construction, potential odor sources would be associated with construction equipment; however, exposure to odors associated with project construction would be short term and temporary in nature. Operation of the project would not include any uses that would generate substantial odors. Therefore, the project would not generate odors adversely affecting a substantial number of people, and impacts would be less than significant.

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ATTACHMENTS

ATTACHMENT 1

CalEEMod Output

Virgo Solar Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Virgo Solar
Construction Start Date	1/1/2026
Operational Year	2027
Lead Agency	Imperial County
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.30
Precipitation (days)	4.80
Location	33.095934460855275, -115.80150902918521
County	Imperial
City	Unincorporated
Air District	Imperial County APCD
Air Basin	Salton Sea
TAZ	5615
EDFZ	19
Electric Utility	Imperial Irrigation District
Gas Utility	Southern California Gas
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
General Light Industry	50.0	1000sqft	5.00	50,000	0.00	0.00	—	—

Other Non-Asphalt Surfaces	1,959	Acre	1,959	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	8.43	7.36	37.7	93.1	0.09	1.40	1,520	1,520	1.28	153	153	—	17,737	17,737	0.70	0.42	28.9	17,883
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.79	6.71	38.2	67.6	0.09	1.40	1,520	1,520	1.28	153	153	—	16,471	16,471	0.72	0.42	0.75	16,592
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.70	4.09	20.2	48.4	0.05	0.69	1,057	1,058	0.63	107	107	—	10,684	10,684	0.44	0.28	8.62	10,786
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.86	0.75	3.70	8.83	0.01	0.13	193	193	0.12	19.4	19.6	—	1,769	1,769	0.07	0.05	1.43	1,786
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	75.0	100	550	—	—	—	150	—	—	—	—	—	—	—	—	—	—
Unmit.	—	No	No	No	—	—	—	Yes	—	—	—	—	—	—	—	—	—	—

Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	75.0	100	550	—	—	—	150	—	—	—	—	—	—	—	—	—	—
Unmit.	—	No	No	No	—	—	—	Yes	—	—	—	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	8.43	7.36	37.7	93.1	0.09	1.40	1,520	1,520	1.28	153	153	—	17,737	17,737	0.70	0.42	28.9	17,883
2027	5.90	5.20	20.2	73.3	0.06	0.62	1,520	1,520	0.57	153	153	—	14,206	14,206	0.54	0.42	26.2	14,372
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	7.79	6.71	38.2	67.6	0.09	1.40	1,520	1,520	1.28	153	153	—	16,471	16,471	0.72	0.42	0.75	16,592
2027	5.09	4.40	20.7	49.9	0.06	0.62	1,520	1,520	0.57	153	153	—	12,966	12,966	0.56	0.42	0.68	13,107
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	4.70	4.09	20.2	48.4	0.05	0.69	1,057	1,058	0.63	107	107	—	10,684	10,684	0.44	0.28	8.62	10,786
2027	2.93	2.56	10.9	31.0	0.03	0.33	801	802	0.30	80.4	80.7	—	7,199	7,199	0.29	0.22	6.05	7,277
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.86	0.75	3.70	8.83	0.01	0.13	193	193	0.12	19.4	19.6	—	1,769	1,769	0.07	0.05	1.43	1,786
2027	0.54	0.47	1.99	5.65	0.01	0.06	146	146	0.06	14.7	14.7	—	1,192	1,192	0.05	0.04	1.00	1,205

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	18.2	18.1	0.47	2.69	< 0.005	0.04	3.00	3.04	0.04	0.30	0.34	55.6	1,711	1,767	5.80	0.07	13.1	1,947
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	17.8	17.8	0.45	0.46	< 0.005	0.03	3.00	3.04	0.03	0.30	0.34	55.6	1,698	1,753	5.80	0.07	13.0	1,933
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	18.0	17.9	0.46	1.52	< 0.005	0.04	2.12	2.15	0.03	0.21	0.25	55.6	1,695	1,751	5.80	0.07	13.0	1,930
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.28	3.27	0.08	0.28	< 0.005	0.01	0.39	0.39	0.01	0.04	0.05	9.20	281	290	0.96	0.01	2.16	320
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	137	137	550	150	—	—	150	—	—	550	—	—	—	—	—	—	—
Unmit.	—	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	137	137	550	150	—	—	150	—	—	550	—	—	—	—	—	—	—
Unmit.	—	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	0.01	0.01	0.01	0.14	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	34.3	34.3	< 0.005	< 0.005	0.10	34.8
Area	18.1	18.1	0.02	2.17	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.94	8.94	< 0.005	< 0.005	—	8.97
Energy	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	1,628	1,628	0.18	0.02	—	1,638
Water	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Waste	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Total	18.2	18.1	0.47	2.69	< 0.005	0.04	3.00	3.04	0.04	0.30	0.34	55.6	1,711	1,767	5.80	0.07	13.1	1,947
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.01	0.01	0.01	0.09	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	30.1	30.1	< 0.005	< 0.005	< 0.005	30.5
Area	17.7	17.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	1,628	1,628	0.18	0.02	—	1,638
Water	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Waste	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Total	17.8	17.8	0.45	0.46	< 0.005	0.03	3.00	3.04	0.03	0.30	0.34	55.6	1,698	1,753	5.80	0.07	13.0	1,933
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.01	0.01	0.01	0.08	< 0.005	< 0.005	2.12	2.12	< 0.005	0.21	0.21	—	22.7	22.7	< 0.005	< 0.005	0.03	23.1
Area	17.9	17.9	0.01	1.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.41	4.41	< 0.005	< 0.005	—	4.43
Energy	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	1,628	1,628	0.18	0.02	—	1,638
Water	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Waste	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Total	18.0	17.9	0.46	1.52	< 0.005	0.04	2.12	2.15	0.03	0.21	0.25	55.6	1,695	1,751	5.80	0.07	13.0	1,930
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	0.39	0.39	< 0.005	0.04	0.04	—	3.76	3.76	< 0.005	< 0.005	0.01	3.82
Area	3.27	3.27	< 0.005	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.73	0.73	< 0.005	< 0.005	—	0.73

Energy	0.01	< 0.005	0.08	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	270	270	0.03	< 0.005	—	271
Water	—	—	—	—	—	—	—	—	—	—	—	3.67	6.61	10.3	0.38	0.01	—	22.4
Waste	—	—	—	—	—	—	—	—	—	—	—	5.53	0.00	5.53	0.55	0.00	—	19.4
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.15	2.15
Total	3.28	3.27	0.08	0.28	< 0.005	0.01	0.39	0.39	0.01	0.04	0.05	9.20	281	290	0.96	0.01	2.16	320

3. Construction Emissions Details

3.1. Grading (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.04	4.23	34.7	35.1	0.09	1.40	—	1.40	1.28	—	1.28	—	9,577	9,577	0.39	0.08	—	9,610
Dust From Material Movement	—	—	—	—	—	—	4.60	4.60	—	1.83	1.83	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.04	4.23	34.7	35.1	0.09	1.40	—	1.40	1.28	—	1.28	—	9,577	9,577	0.39	0.08	—	9,610

Dust From Material Movement	—	—	—	—	—	—	4.60	4.60	—	1.83	1.83	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.48	1.24	10.2	10.3	0.03	0.41	—	0.41	0.38	—	0.38	—	2,808	2,808	0.11	0.02	—	2,817
Dust From Material Movement	—	—	—	—	—	—	1.35	1.35	—	0.54	0.54	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.27	0.23	1.86	1.88	< 0.005	0.07	—	0.07	0.07	—	0.07	—	465	465	0.02	< 0.005	—	466
Dust From Material Movement	—	—	—	—	—	—	0.25	0.25	—	0.10	0.10	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.40	3.13	3.05	58.0	0.00	0.00	1,478	1,478	0.00	148	148	—	8,160	8,160	0.31	0.26	26.8	8,273
Vendor	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	0.00
Hauling	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	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.76	2.48	3.49	32.5	0.00	0.00	1,478	1,478	0.00	148	148	—	6,894	6,894	0.33	0.26	0.69	6,982
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.86	0.78	1.02	12.1	0.00	0.00	428	428	0.00	42.9	42.9	—	2,173	2,173	0.09	0.08	3.39	2,202
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.16	0.14	0.19	2.21	0.00	0.00	78.0	78.0	0.00	7.83	7.83	—	360	360	0.02	0.01	0.56	365
Vendor	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	0.00
Hauling	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	0.00

3.3. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.69	2.25	17.3	20.5	0.05	0.65	—	0.65	0.60	—	0.60	—	5,376	5,376	0.22	0.04	—	5,394
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	2.69	2.25	17.3	20.5	0.05	0.65	—	0.65	0.60	—	0.60	—	5,376	5,376	0.22	0.04	—	5,394
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	0.94	7.25	8.57	0.02	0.27	—	0.27	0.25	—	0.25	—	2,251	2,251	0.09	0.02	—	2,259
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.17	1.32	1.56	< 0.005	0.05	—	0.05	0.05	—	0.05	—	373	373	0.02	< 0.005	—	374
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.40	3.13	3.05	58.0	0.00	0.00	1,478	1,478	0.00	148	148	—	8,160	8,160	0.31	0.26	26.8	8,273
Vendor	0.03	0.02	0.77	0.29	0.01	0.01	41.4	41.4	0.01	4.17	4.18	—	831	831	0.01	0.11	2.13	867
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.76	2.48	3.49	32.5	0.00	0.00	1,478	1,478	0.00	148	148	—	6,894	6,894	0.33	0.26	0.69	6,982
Vendor	0.03	0.02	0.86	0.29	0.01	0.01	41.4	41.4	0.01	4.17	4.18	—	831	831	0.01	0.11	0.06	866
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	1.23	1.12	1.45	17.3	0.00	0.00	611	611	0.00	61.3	61.3	—	3,104	3,104	0.13	0.11	4.85	3,146
Vendor	0.01	0.01	0.35	0.12	< 0.005	0.01	17.1	17.1	0.01	1.72	1.73	—	348	348	< 0.005	0.05	0.38	363
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.20	0.27	3.16	0.00	0.00	111	111	0.00	11.2	11.2	—	514	514	0.02	0.02	0.80	521
Vendor	< 0.005	< 0.005	0.06	0.02	< 0.005	< 0.005	3.12	3.13	< 0.005	0.31	0.32	—	57.6	57.6	< 0.005	0.01	0.06	60.1
Hauling	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	0.00

3.5. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.65	2.21	16.6	20.4	0.05	0.60	—	0.60	0.55	—	0.55	—	5,375	5,375	0.22	0.04	—	5,393
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.65	2.21	16.6	20.4	0.05	0.60	—	0.60	0.55	—	0.55	—	5,375	5,375	0.22	0.04	—	5,393
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road	1.41	1.18	8.88	10.9	0.03	0.32	—	0.32	0.30	—	0.30	—	2,871	2,871	0.12	0.02	—	2,881
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	0.22	1.62	1.99	0.01	0.06	—	0.06	0.05	—	0.05	—	475	475	0.02	< 0.005	—	477
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.22	2.97	2.81	52.6	0.00	0.00	1,478	1,478	0.00	148	148	—	8,017	8,017	0.31	0.26	24.4	8,128
Vendor	0.03	0.02	0.73	0.26	0.01	0.01	41.4	41.4	0.01	4.17	4.18	—	814	814	0.01	0.11	1.85	850
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.43	2.16	3.25	29.2	0.00	0.00	1,478	1,478	0.00	148	148	—	6,777	6,777	0.33	0.26	0.63	6,865
Vendor	0.02	0.02	0.81	0.26	0.01	0.01	41.4	41.4	0.01	4.17	4.18	—	814	814	0.01	0.11	0.05	849
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.50	1.36	1.61	19.9	0.00	0.00	779	779	0.00	78.2	78.2	—	3,892	3,892	0.16	0.14	5.63	3,942
Vendor	0.02	0.01	0.43	0.14	< 0.005	0.01	21.8	21.8	0.01	2.20	2.21	—	435	435	< 0.005	0.06	0.43	454
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.25	0.29	3.63	0.00	0.00	142	142	0.00	14.3	14.3	—	644	644	0.03	0.02	0.93	653
Vendor	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	3.99	3.99	< 0.005	0.40	0.40	—	72.0	72.0	< 0.005	0.01	0.07	75.1

Hauling	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	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.01	0.01	0.01	0.14	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	34.3	34.3	< 0.005	< 0.005	0.10	34.8
Other Non-Asphalt Surfaces	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	0.00
Total	0.01	0.01	0.01	0.14	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	34.3	34.3	< 0.005	< 0.005	0.10	34.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.01	0.01	0.01	0.09	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	30.1	30.1	< 0.005	< 0.005	< 0.005	30.5
Other Non-Asphalt Surfaces	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	0.00
Total	0.01	0.01	0.01	0.09	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	30.1	30.1	< 0.005	< 0.005	< 0.005	30.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	0.39	0.39	< 0.005	0.04	0.04	—	3.76	3.76	< 0.005	< 0.005	0.01	3.82

Other Non-Asphalt Surfaces	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	0.00
Total	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	0.39	0.39	< 0.005	0.04	0.04	—	3.76	3.76	< 0.005	< 0.005	0.01	3.82

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	1,107	1,107	0.14	0.02	—	1,116
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,107	1,107	0.14	0.02	—	1,116
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	1,107	1,107	0.14	0.02	—	1,116
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,107	1,107	0.14	0.02	—	1,116
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	183	183	0.02	< 0.005	—	185

Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	183	183	0.02	< 0.005	—	185

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	521	521	0.05	< 0.005	—	522
Other Non-Asphalt Surfaces	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
Total	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	521	521	0.05	< 0.005	—	522
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	521	521	0.05	< 0.005	—	522
Other Non-Asphalt Surfaces	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
Total	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	521	521	0.05	< 0.005	—	522
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.01	< 0.005	0.08	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	86.2	86.2	0.01	< 0.005	—	86.4

Other Non-Asphalt Surfaces	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
Total	0.01	< 0.005	0.08	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	86.2	86.2	0.01	< 0.005	—	86.4

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	7.78	7.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	9.95	9.95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.39	0.36	0.02	2.17	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.94	8.94	< 0.005	< 0.005	—	8.97
Total	18.1	18.1	0.02	2.17	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.94	8.94	< 0.005	< 0.005	—	8.97
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	7.78	7.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural Coatings	9.95	9.95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	17.7	17.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	1.42	1.42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.82	1.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.03	0.03	< 0.005	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.73	0.73	< 0.005	< 0.005	—	0.73
Total	3.27	3.27	< 0.005	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.73	0.73	< 0.005	< 0.005	—	0.73

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	3.67	6.61	10.3	0.38	0.01	—	22.4
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	3.67	6.61	10.3	0.38	0.01	—	22.4

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	5.53	0.00	5.53	0.55	0.00	—	19.4
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	5.53	0.00	5.53	0.55	0.00	—	19.4

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.15	2.15
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.15	2.15

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipm ent Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Grading	Grading	1/1/2026	5/31/2026	5.00	107	—
Building Construction	Building Construction	6/1/2026	9/30/2027	5.00	349	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Back hoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Off-Highway Trucks	Diesel	Average	2.00	8.00	376	0.38
Grading	Generator Sets	Diesel	Average	1.00	24.0	14.0	0.74
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29

Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Back hoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Off-Highway Trucks	Diesel	Average	2.00	8.00	376	0.38
Building Construction	Generator Sets	Diesel	Average	1.00	24.0	14.0	0.74

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Grading	—	—	—	—
Grading	Worker	500	20.0	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	500	20.0	LDA,LDT1,LDT2
Building Construction	Vendor	14.0	20.0	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Apply dust suppressants to unpaved roads	84%	84%

Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Grading	0.00	0.00	192	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	Other	50%	50%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
General Light Industry	0.00	0%
Other Non-Asphalt Surfaces	1,959	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00	457	0.03	< 0.005
2027	0.00	457	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VM/Weekday	VM/Saturday	VM/Sunday	VM/Year
General Light Industry	2.00	0.00	0.00	521	40.0	0.00	0.00	10,429
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	75,000	25,000	5,121,271

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO₂ and CH₄ and N₂O and Natural Gas (kBtu/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBtu/yr)
General Light Industry	1,518,721	266	0.0330	0.0040	1,624,230
Other Non-Asphalt Surfaces	0.00	266	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	11,562,500	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Light Industry	62.0	—
Other Non-Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	31.3	annual days of extreme heat
Extreme Precipitation	0.00	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	1.40	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about $\frac{3}{4}$ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	0	0	0	N/A

Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	1	1	1	2
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	55.4
AQ-PM	19.3
AQ-DPM	3.04
Drinking Water	25.7
Lead Risk Housing	17.5
Pesticides	61.6
Toxic Releases	9.45
Traffic	9.11
Effect Indicators	—
CleanUp Sites	85.6
Groundwater	30.9
Haz Waste Facilities/Generators	16.6
Impaired Water Bodies	100.0
Solid Waste	9.67
Sensitive Population	—
Asthma	25.4
Cardio-vascular	17.1
Low Birth Weights	20.3
Socioeconomic Factor Indicators	—
Education	91.6
Housing	—
Linguistic	69.5
Poverty	48.0
Unemployment	80.4

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	—
Employed	—
Median HI	—
Education	—
Bachelor's or higher	—
High school enrollment	—
Preschool enrollment	—
Transportation	—
Auto Access	—
Active commuting	—
Social	—
2-parent households	—
Voting	—
Neighborhood	—
Alcohol availability	—
Park access	—
Retail density	—
Supermarket access	—
Tree canopy	—
Housing	—
Homeownership	—
Housing habitability	—
Low-inc homeowner severe housing cost burden	—
Low-inc renter severe housing cost burden	—
Uncrowded housing	—
Health Outcomes	—

Insured adults	—
Arthritis	0.0
Asthma ER Admissions	57.9
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	0.0
Cognitively Disabled	4.9
Physically Disabled	4.1
Heart Attack ER Admissions	44.2
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	0.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	98.0
Elderly	98.1

English Speaking	0.0
Foreign-born	0.0
Outdoor Workers	4.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	97.4
Traffic Density	0.0
Traffic Access	23.0
Other Indices	—
Hardship	0.0
Other Decision Support	—
2016 Voting	0.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	36.0
Healthy Places Index Score for Project Location (b)	—
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Grading - 5 months Building Construction - 5 months electrical, 6 months structural, 5 months installation
Construction: Trips and VMT	Up to 250 workers and 7 deliveries per day
Construction: On-Road Fugitive Dust	ICAPCD recommends modeling 90% unpaved roads.
Operations: Vehicle Data	Assumes one work round trip per weekday for maintenance
Operations: Road Dust	ICAPCD recommends modeling 90% unpaved roads.
Operations: Consumer Products	—
Construction: Off-Road Equipment	2 off-highway trucks added to account for water trucks, and generator added to account for construction office power
Construction: Dust From Material Movement	Based on discussions with ICAPCD staff, watering during ground disturbing activities would achieve a 50 percent reduction in fugitive dust.
Land Use	1,964.47 acre project site

ATTACHMENT 2

Construction Equipment Mobilization Fugitive Dust Calculations

Equipment Mobilization

AP-42 - Construction Equipment Mobilization - Unpaved Road Dust Emissions

$E = k \times (s/12)^a \times (W/3)^b \div (M/0.2)^c$

		Truck Loaded with Equipment	Truck without Equipment
E =	emission factor (lbs/VMT)		
s =	surface material silt content (%)	4.3	4.3 % service road silt content
W =	mean vehicle weight (tons)	35	17.5 tons
M =	surface material moisture content (%)	0.5	0.5 % unpaved road moisture content

Empirical Constant	PM2.5	PM10
k	0.38	2.6
a	0.8	0.8
b	0.4	0.4
c	0.3	0.3

E10 =	2.32	1.76 lbs/VMT
E2.5 =	0.34	0.26 lbs/VMT
# Trips	7	7
Distance	2	2 miles
VMT	14	14 miles
PM10	33	25 lbs
PM2.5	5	4 lbs

	Total Uncontrolled (lbs)	Water Emission Reduction (50%)	Soil Stabilizer Reduction (84%)
PM10	57	29	9
PM2.5	8	4	1

ATTACHMENT 3

Access Road Fugitive Dust Reduction Calculations

Virgo Solar - Fugitive Dust Emission Reduction Calculations - Watering

Measure	PM Reduction					
Water Exposed Areas	50%					
Speed Limit	44%					
GRADING						
	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T
On-Site Emissions, No Dust Control						
Off-Road Equipment	1.40		1.40	1.28		1.28
Dust From Material Movement		4.60	4.60		1.83	1.83
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.40	4.60	6.00	1.28	1.83	3.11
Off-Site Emissions, No Dust Control						
Worker	0.00	1,478.18	1,478.18	0.00	148.35	148.35
Vendor	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	1,478.18	1,478.18	0.00	148.35	148.35
TOTAL	1.40	1,482.78	1,484.17	1.28	150.18	151.47
On-Site Emissions, With Dust Control						
Off-Road Equipment	1.40		1.40	1.28		1.28
Dust From Material Movement		4.60	4.60		1.83	1.83
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.40	4.60	6.00	1.28	1.83	3.11
Off-Site Emissions, With Dust Control						
Worker	0.00	413.89	413.89	0.00	41.54	41.54
Vendor	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	413.89	413.89	0.00	41.54	41.54
TOTAL	1.40	418.49	419.89	1.28	43.37	44.65
BUILDING						
	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T
On-Site Emissions, No Dust Control						
Off-Road Equipment	0.65		0.65	0.60		0.60
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.65	0.00	0.65	0.60	0.00	0.60
Off-Site Emissions, No Dust Control						
Worker	0.00	1,478.18	1,478.18	0.00	148.35	148.35
Vendor	0.01	41.43	41.44	0.01	4.17	4.18
Hauling	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.01	1,519.60	1,519.61	0.01	152.53	152.54
TOTAL	0.67	1,519.60	1,520.27	0.61	152.53	153.14
On-Site Emissions, With Dust Control						
Off-Road Equipment	0.65		0.65	0.60		0.60
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.65	0.00	0.65	0.60	0.00	0.60
Off-Site Emissions, With Dust Control						
Worker	0.00	413.89	413.89	0.00	41.54	41.54
Vendor	0.01	11.60	11.61	0.00	1.17	1.17
Hauling	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.01	425.49	425.50	0.00	42.71	42.71
TOTAL	0.67	425.49	426.15	0.60	42.71	43.31

Virgo Solar - Fugitive Dust Emission Reduction Calculations - Soil Stabilizer

Measure	PM Reduction					
Soil Stabilizer	84%					
Speed Limit	44%					
GRADING						
	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T
On-Site Emissions, No Dust Control						
Off-Road Equipment	1.40		1.40	1.28		1.28
Dust From Material Movement		4.60	4.60		1.83	1.83
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.40	4.60	6.00	1.28	1.83	3.11
Off-Site Emissions, No Dust Control						
Worker	0.00	1,478.18	1,478.18	0.00	148.35	148.35
Vendor	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	1,478.18	1,478.18	0.00	148.35	148.35
TOTAL	1.40	1,482.78	1,484.17	1.28	150.18	151.47
On-Site Emissions, With Dust Control						
Off-Road Equipment	1.40		1.40	1.28		1.28
Dust From Material Movement		4.60	4.60		1.83	1.83
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.40	4.60	6.00	1.28	1.83	3.11
Off-Site Emissions, With Dust Control						
Worker	0.00	132.44	132.44	0.00	13.29	13.29
Vendor	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	132.44	132.44	0.00	13.29	13.29
TOTAL	1.40	137.05	138.44	1.28	15.12	16.40
BUILDING						
	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T
On-Site Emissions, No Dust Control						
Off-Road Equipment	0.65		0.65	0.60		0.60
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.65	0.00	0.65	0.60	0.00	0.60
Off-Site Emissions, No Dust Control						
Worker	0.00	1,478.18	1,478.18	0.00	148.35	148.35
Vendor	0.01	41.43	41.44	0.01	4.17	4.18
Hauling	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.01	1,519.60	1,519.61	0.01	152.53	152.54
TOTAL	0.67	1,519.60	1,520.27	0.61	152.53	153.14
On-Site Emissions, With Dust Control						
Off-Road Equipment	0.65		0.65	0.60		0.60
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.65	0.00	0.65	0.60	0.00	0.60
Off-Site Emissions, With Dust Control						
Worker	0.00	132.44	132.44	0.00	13.29	13.29
Vendor	0.01	3.71	3.72	0.00	0.37	0.37
Hauling	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.01	136.16	136.17	0.00	13.67	13.67
TOTAL	0.67	136.16	136.82	0.60	13.67	14.27

ATTACHMENT 4

Combined Emissions Summary

Summary - Uncontrolled

	ROG	Nox	CO	SOX	PM10 Exhaust	PM10 Dust	PM10 Total	PM2.5 Exhaust	PM2.5 Dust	PM2.5 Total
Equipment Mobilization	0.02	0.86	0.29	0.01	0.01	57.14	57.15	0.01	8.35	8.36
Grading										
On-Site										
Off-Road Equipment	4.23	34.69	35.08	0.09	1.40		1.40	1.28		1.28
Dust from Material Movement						4.60	4.60		1.83	1.83
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
On-site Total	4.23	34.69	35.08	0.09	1.40	4.60	6.00	1.28	1.83	3.11
Off-Site										
Worker	3.13	3.49	58.01	0.00	0.00	1,478.18	1,478.18	0.00	148.35	148.35
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Site Total	3.13	3.49	58.01	0.00	0.00	1,478.18	1,478.18	0.00	148.35	148.35
Grading Total	7.36	38.19	93.09	0.09	1.40	1,482.78	1,484.17	1.28	150.18	151.47
Electrical/Structural/Installation										
On-Site										
Off-Road Equipment	2.25	17.32	20.47	0.05	0.65		0.65	0.60		0.60
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
On-site Total	2.25	17.32	20.47	0.05	0.65	0.00	0.65	0.60	0.00	0.60
Off-Site										
Worker	3.13	3.49	58.01	0.00	0.00	1,478.18	1,478.18	0.00	148.35	148.35
Vendor	0.02	0.86	0.29	0.01	0.01	41.43	41.44	0.01	4.17	4.18
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Site Total	3.15	4.35	58.30	0.01	0.01	1,519.60	1,519.61	0.01	152.53	152.54
Building Total	5.41	21.67	78.78	0.06	0.67	1,519.60	1,520.27	0.61	152.53	153.14
Significance Threshold	75	100	550				150			

Summary - Watering Access

	ROG	Nox	CO	SOX	PM10 Exhaust	PM10 Dust	PM10 Total	PM2.5 Exhaust	PM2.5 Dust	PM2.5 Total
Equipment Mobilization	0.02	0.86	0.29	0.01	0.01	57.14	57.15	0.01	8.35	8.36
Grading										
On-Site										
Off-Road Equipment	4.23	34.69	35.08	0.09	1.40		1.40	1.28		1.28
Dust from Material Movement						4.60	4.60		1.83	1.83
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
On-site Total	4.23	34.69	35.08	0.09	1.40	4.60	6.00	1.28	1.83	3.11
Off-Site										
Worker	3.13	3.49	58.01	0.00	0.00	413.89	413.89	0.00	41.54	41.54
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Site Total	3.13	3.49	58.01	0.00	0.00	413.89	413.89	0.00	41.54	41.54
Grading Total	7.36	38.19	93.09	0.09	1.40	418.49	419.89	1.28	43.37	44.65
Electrical/Structural/Installation										
On-Site										
Off-Road Equipment	2.25	17.32	20.47	0.05	0.65		0.65	0.60		0.60
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
On-site Total	2.25	17.32	20.47	0.05	0.65	0.00	0.65	0.60	0.00	0.60
Off-Site										
Worker	3.13	3.49	58.01	0.00	0.00	413.89	413.89	0.00	41.54	41.54
Vendor	0.02	0.86	0.29	0.01	0.01	11.60	11.61	0.00	1.17	1.17
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Site Total	3.15	4.35	58.30	0.01	0.01	425.49	425.50	0.00	42.71	42.71
Building Total	5.41	21.67	78.78	0.06	0.67	425.49	426.15	0.60	42.71	43.31
Significance Threshold	75	100	550				150			

Summary - Stabilize Access

	ROG	Nox	CO	SOX	PM10 Exhaust	PM10 Dust	PM10 Total	PM2.5 Exhaust	PM2.5 Dust	PM2.5 Total
Equipment Mobilization	0.02	0.86	0.29	0.01	0.01	57.14	57.15	0.01	8.35	8.36
Grading										
On-Site										
Off-Road Equipment	4.23	34.69	35.08	0.09	1.40		1.40	1.28		1.28
Dust from Material Movement						4.60	4.60		1.83	1.83
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
On-site Total	4.23	34.69	35.08	0.09	1.40	4.60	6.00	1.28	1.83	3.11
Off-Site										
Worker	3.13	3.49	58.01	0.00	0.00	132.44	132.44	0.00	13.29	13.29
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Site Total	3.13	3.49	58.01	0.00	0.00	132.44	132.44	0.00	13.29	13.29
Grading Total	7.36	38.19	93.09	0.09	1.40	137.05	138.44	1.28	15.12	16.40
Electrical/Structural/Installation										
On-Site										
Off-Road Equipment	2.25	17.32	20.47	0.05	0.65		0.65	0.60		0.60
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
On-site Total	2.25	17.32	20.47	0.05	0.65	0.00	0.65	0.60	0.00	0.60
Off-Site										
Worker	3.13	3.49	58.01	0.00	0.00	132.44	132.44	0.00	13.29	13.29
Vendor	0.02	0.86	0.29	0.01	0.01	3.71	3.72	0.00	0.37	0.37
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Site Total	3.15	4.35	58.30	0.01	0.01	136.16	136.17	0.00	13.67	13.67
Building Total	5.41	21.67	78.78	0.06	0.67	136.16	136.82	0.60	13.67	14.27
Significance Threshold	75	100	550				150			



Biological Resources Report for the
Virgo Solar PV Project
Imperial County, California

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A handwritten signature in black ink that reads "Gerry Scheid".

Gerry Scheid, Senior Biologist

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1:	Plants Observed
2:	Wildlife Observed
3:	Virgo Solar PV Burrowing Owl Habitat Assessment

Acronyms and Abbreviations

APN	Assessor Parcel Numbers
BLM	Bureau of Land Management
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
ESA	Endangered Species Act
GIS	Geographic information systems
IID	Imperial Irrigation District
MBTA	Migratory Bird Treaty Act
O&M	operations & maintenance
project	Virgo Solar PV Project
project proponent	SunCode Energy
RECON	RECON Environmental, Inc.
RWQCB	Regional Water Quality Control Board
SDNHM	San Diego Natural History Museum
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VegCAMP	Vegetation Classification and Mapping Program
WMMA	West Mesa Management Area

1.0 Introduction

This biological resources report was prepared by RECON Environmental, Inc. (RECON) for the Virgo Solar PV (project) proposed by SunCode Energy (project proponent). The purpose of this biological resource report is to: (1) document the existing biological conditions within the project survey area; (2) evaluate the survey area for the potential to support sensitive biological resources; (3) provide an analysis of potential impacts to biological resources associated with the project; and (4) provide a discussion of potential avoidance, minimization, and mitigation measures that may be required to reduce potential impacts to sensitive biological resources to below a level of significance.

1.1 Project Location

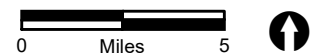
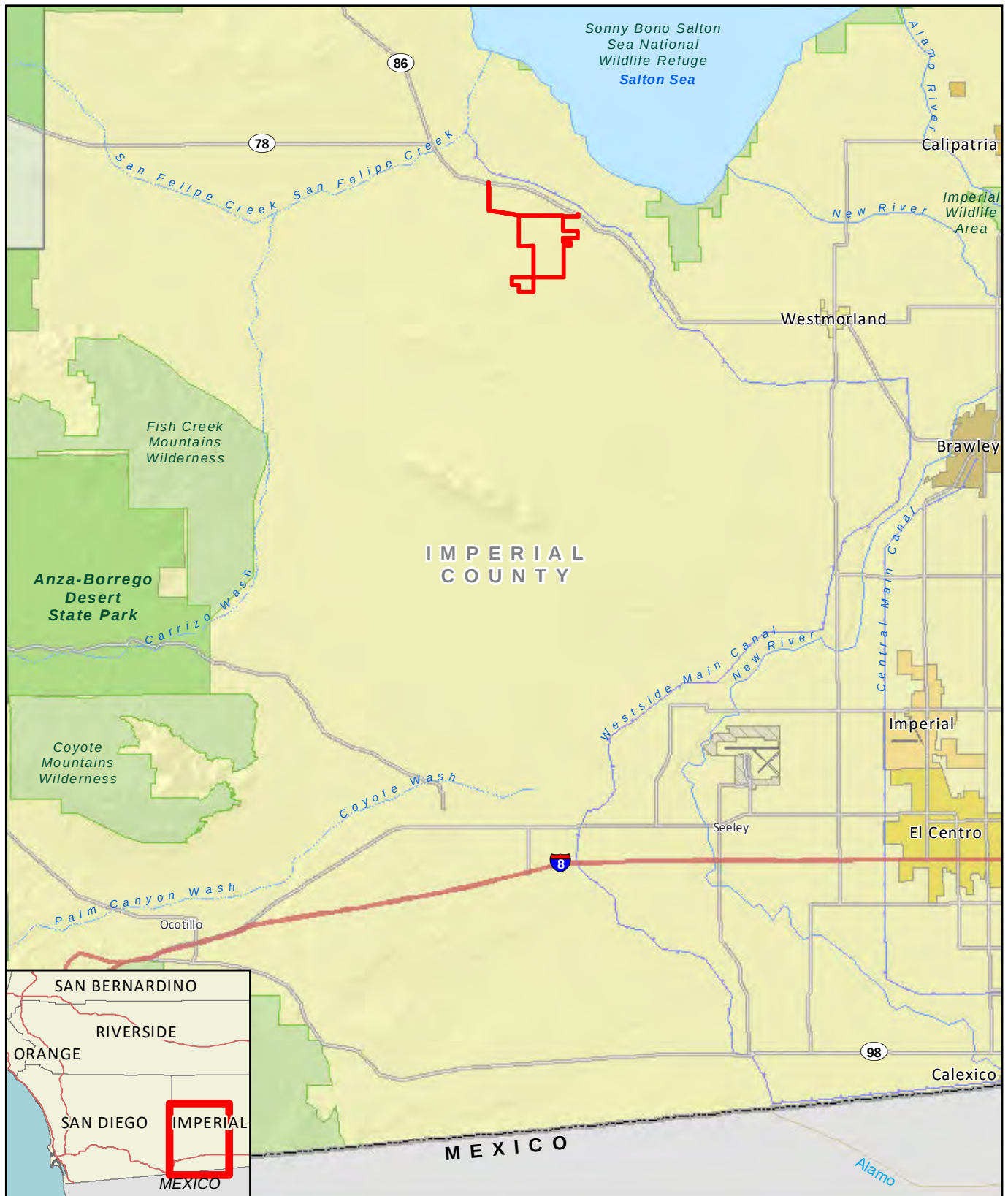
The project site is located within unincorporated Imperial County, California, approximately 19 miles east of Ocotillo Wells, 10 miles west of the city of Westmorland, and approximately 5 miles south of the Salton Sea (Figure 1). The project site is located approximately 1,500 feet south of State Route 86 (SR-86). The project occurs within Sections 1, 11, 35, and 36 of Townships 12 and 13 South, Range 11 East as depicted on the U.S. Geological Survey (USGS) Kane Spring quadrangle (Figure 2). The approximately 1,964.47-acre project site consists of the following eleven parcels: assessor parcel numbers (APN) 019-110-006, 019-110-006-010, 034-010-023, 019-120-001, 019-120-004, 019-120-005, 019-120-006, 019-120-007, 019-130-001, 019-130-007, and 019-130-009. All eleven parcels are designated in the County of Imperial General Plan Land Use Maps as Recreation/Open Space and zoned as Open Space Preservation (S-2). The project site is surrounded by undeveloped desert land. Figure 3 shows the project site and vicinity on an aerial photograph.

1.2 Project Description

The project would develop approximately 1,348.77 acres of the project site with photovoltaic solar panels capable of generating up to 370 megawatts of renewable energy. The project would also develop a battery energy storage system capable of storing 800-megawatt hours of energy generated by the project solar panels. The project would connect to an existing Imperial Irrigation District (IID) 161-kilovolt line that traverses the project boundary. The project has been designed to minimize encroachment into an existing flood zone that traverses north to south and dividing the solar panels proposed to the east and west. Access to the project site would be provided via one of the two following options:

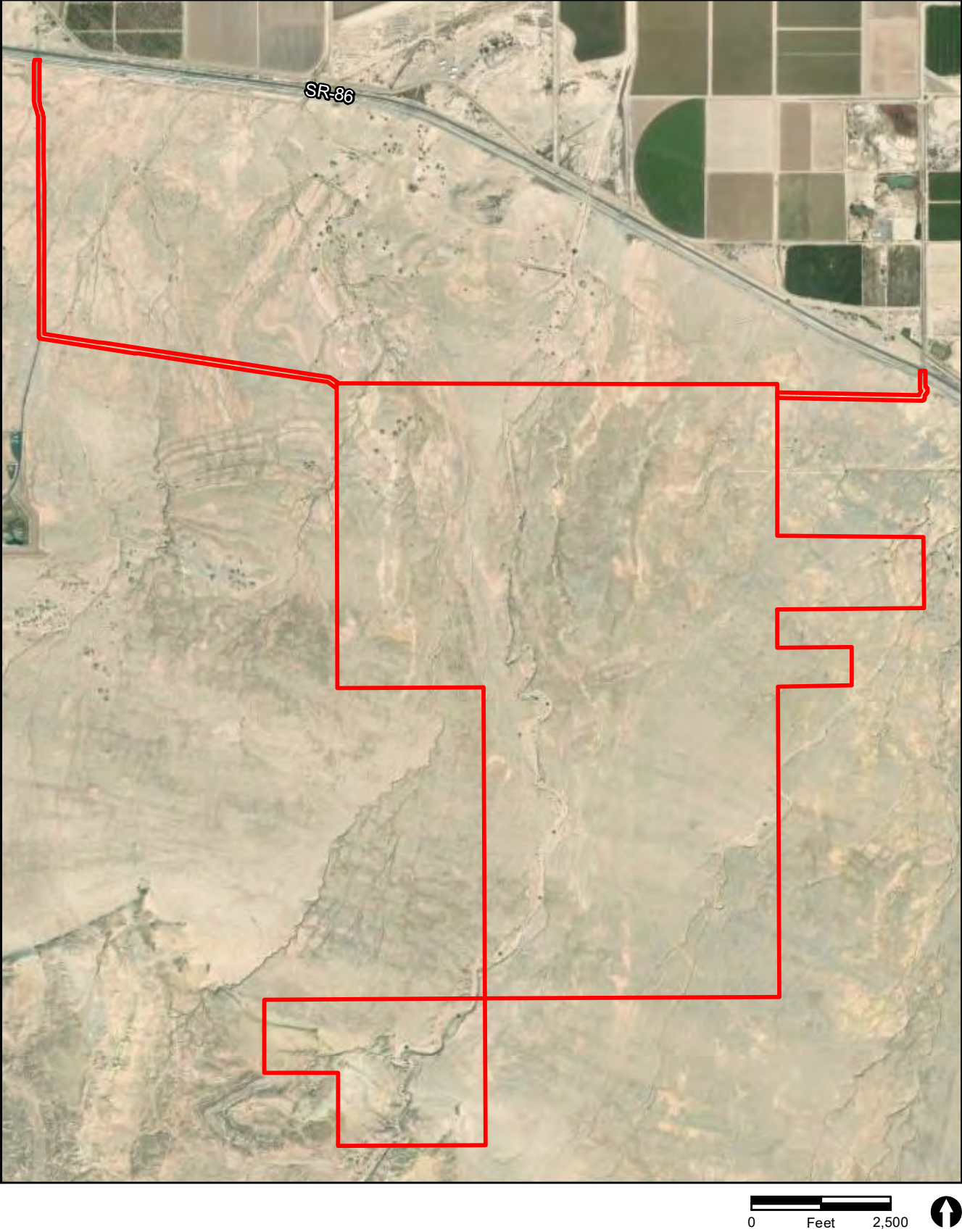
- The western access route would exit south off SR-86, utilizing a paved access road for an existing CalEnergy Operating Corporation facility, followed by a dirt road to be constructed heading southeast towards the project site.
- The eastern access route would exit south off SR-86 at the intersection with Barth Road, followed by a dirt road to be constructed heading west towards the project site.

The alignments of both access routes would have negligible encroachment into land under the jurisdiction of the Bureau of Land Management.



Project Location

FIGURE 1
Regional Location



 Project Boundary

FIGURE 3
Project Location on Aerial Photograph

2.0 Methods and Survey Limitations

Biological resource data for the project was obtained from a combination of literature review and a general biological survey. The literature review and survey methods are discussed below.

2.1 Literature Review

RECON conducted an analysis of existing sensitive species data recorded within one mile of the project site. This analysis included searches of the California Natural Diversity Database (CNDDDB; California Department of Fish and Wildlife [CDFW] 2023a), the All-Species Occurrences Database (U.S. Fish and Wildlife Service [USFWS] 2019), and a search of the California Native Plant Society (CNPS) online rare plants database within the USGS quadrangles containing the site (CNPS 2023). Additional maps, imagery, and databases reviewed included USGS topographic maps (1992), soils survey maps (U.S. Department of Agriculture [USDA] 1981, aerial photography, the Consortium of California Herbaria (2019), and the Amphibian and Reptile Atlas of Peninsular California (San Diego Natural History Museum [SDNHM] 2019).

2.2 General Biological Survey

RECON biologists conducted general biology surveys of 1,995.42 acres (including the 1,964.47-acre project site, 23.78 acres for the western access route survey area, and 7.17 acres for the eastern access route survey area) in 2023, 2024, and 2025 that included the following: general plant and wildlife, rare plant, burrowing owl habitat assessment, and a preliminary assessment of jurisdictional waters (Table 1). Vegetation was mapped during the surveys and the vegetation community classifications followed Sawyer et al. (2009). Digital photographs of representative areas were taken during the reconnaissance survey.

A preliminary assessment of the locations of potential jurisdictional waters was conducted during the general surveys. Major and minor washes were noted in the field on aerial photographs of the site. Representative ground-level photographs of these washes were taken for reference. Further refinements to the field mapping of the washes and drainage courses were conducted using ArcMap Geographical Information System (GIS) software and recent topographical data provided by the project proponent to produce a preliminary waters map.

Surveys were limited by temporal factors, as all surveys were conducted during the day. As a result, some nocturnal animals would not have been observed directly, however, signs of their presence (e.g., burrows, tracks, scat, etc.) could be observed during the daytime. The 2023 survey was conducted in the spring and therefore a period when annual plant species would be at their peak. Early winter and summer annual plants could be missed, however. The 2024 and 2025 surveys were conducted in late-fall and early winter, respectively, during a period when winter, spring, and summer annuals would not be observable.

Table 1
2023 Survey Dates, Times, Personnel, and Conditions for the Virgo Solar Project

Date	Survey	Personnel	Beginning Conditions	Ending Conditions
4/13/2023	Burrowing Owl Habitat Assessment, General Biological Survey, Preliminary Aquatic Resource Mapping	A. Smisek J. Sundberg C. Thomson	10:50 a.m.; 76°F; 3–7 mph; 15% cc	5:40 p.m.; 81°F; 9–15 mph; 5% cc
4/14/2023	Burrowing Owl Habitat Assessment, General Biological Survey, Preliminary Aquatic Resource Mapping	A. Smisek J. Sundberg C. Thomson	6:25 a.m.; 64°F; 1–4 mph; 0% cc	2:20 p.m.; 87°F; 3–7 mph; 0% cc
4/17/2023	Burrowing Owl Habitat Assessment, General Biological Survey, Preliminary Aquatic Resource Mapping	C. Beck C. Polevy C. Thomson	10:35 a.m.; 73°F; 3–7 mph; 0% cc	2:25 p.m.; 85°F; 5–9 mph; 0% cc
4/18/2023	Burrowing Owl Habitat Assessment, General Biological Survey, Preliminary Aquatic Resource Mapping	C. Beck, C. Polevy C. Thomson	6:35 a.m.; 63°F; 8–13 mph; 10% cc	12:50 p.m.; 79°F; 3–6 mph; 30% cc
4/19/2023	Burrowing Owl Habitat Assessment, General Biological Survey, Preliminary Aquatic Resource Mapping	C. Beck C. Polevy C. Thomson	6:25 a.m.; 62°F; 2–5 mph; 0% cc	10:05 a.m.; 75°F; 3–6 mph; 0% cc
11/04/2024	Burrowing Owl Habitat Assessment, General Biological Survey, Preliminary Aquatic Resource Mapping	A. Fromer J. Sundberg C. Polevy D. Gadia	9:30 a.m.; 77°F; 8–10 mph; 0% cc	3:30 p.m.; 82°F; 3–6 mph; 0% cc
11/05/2024	Burrowing Owl Habitat Assessment, General Biological Survey, Preliminary Aquatic Resource Mapping	A. Fromer J. Sundberg C. Polevy D. Gadia	8:15 a.m.; 63°F; 0–1 mph; 5% cc	2:00 p.m.; 77°F; 2–4 mph; 10% cc
11/06/2024	Burrowing Owl Habitat Assessment, General Biological Survey, Preliminary Aquatic Resource Mapping	A. Fromer J. Sundberg C. Polevy D. Gadia	9:00 a.m.; 68°F; 12–15 mph; 5% cc	2:00 p.m.; 72°F; 2–5 mph; 0% cc
01/17/2025	Burrowing Owl Habitat Assessment, General Biological Survey, Preliminary Aquatic Resource Mapping	A. Fromer J. Sundberg	10:45 a.m.; 77°F; 5–8 mph; 0% cc	3:00 p.m.; 72°F; 2–5 mph; 0% cc
°F = degrees Fahrenheit at ground level; mph = miles per hour; cc = cloud cover				

3.0 Survey Results/Existing Conditions

This section describes the existing physical and biological conditions of the project site. This includes a summary of land use, topographical features, and hydrological features observed during the general biological survey.

3.1 Physical Characteristics

3.1.1 Existing Land Use

The project site consists entirely of relatively undisturbed desert land. There are a few dirt roads that cross the area, and one road is used for access along an electric utility line.

3.1.2 Topography

Elevation on the project site ranges from sea level in the far southwestern corner to -148 feet in the northeastern corner. Topography within the project site is generally level, bisected by some large washes and smaller drainages. It slopes gently towards the Salton Sea which is located approximately five miles to the northeast.

3.1.3 Hydrology

The project site is within the Salton Sea Transboundary Watershed in the Colorado River Basin Region (State of California Water Boards 2018). The area was once part of the ancient Lake Cahuilla and was likely underwater at that time. Currently, it is part of a large alluvial plain that drains to the northeast towards the Salton Sea. A series of major wash systems cross the site that drain into the Salton Sea. Numerous smaller tributary washes occur throughout the site and the flows from these generally confluence with the larger washes. All these washes have ephemeral flow regimes.

3.2 Biological Resources

A discussion of the botanical and zoological resources observed during the general biological surveys of the site is presented below. Vegetation community names follow the Manual of California Vegetation (Sawyer et. al. 2009). Floral nomenclature for common plants follows Baldwin (2012) as updated by the Jepson Online Interchange (University of California 2023) and for sensitive plants the CNPS online database (CNPS 2023). If a plant's common name was not provided in these resources, common names were obtained from Rebman and Simpson (2014), or the USDA maintained database (USDA 2013). Zoological nomenclature is in accordance with the Checklist of North and Middle American Birds (Chesser et al. 2018); Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico (Crother et al. 2012); the Revised Checklist of North American Mammals North of Mexico (Baker et al. 2003); and Evans (2008), SDNHM (2002), and AntWeb (2018) for insects and spiders.

3.2.1 Botanical Resources

The following vegetation communities and land cover types were mapped within the project site: creosote bush scrub (*Larrea tridentata* Shrubland Alliance), honey mesquite (*Prosopis glandulosa* Woodland Alliance), and tamarisk thicket (*Tamarix ramosissima* Shrubland Semi-Natural Alliance). Figure 4 presents the distribution of these vegetation community types and locations of the major washes and minor streambeds and Table 2 is a summary of the acreage of each vegetation community type. A minimum of 25 plant species was observed within the project site with 21 species (84 percent) considered native and the remaining 4 species (16 percent) considered non-native and/or naturalized into the area. Dominant plant species are discussed by each vegetation community below, and a complete list of plant species detected is included as Attachment 1.

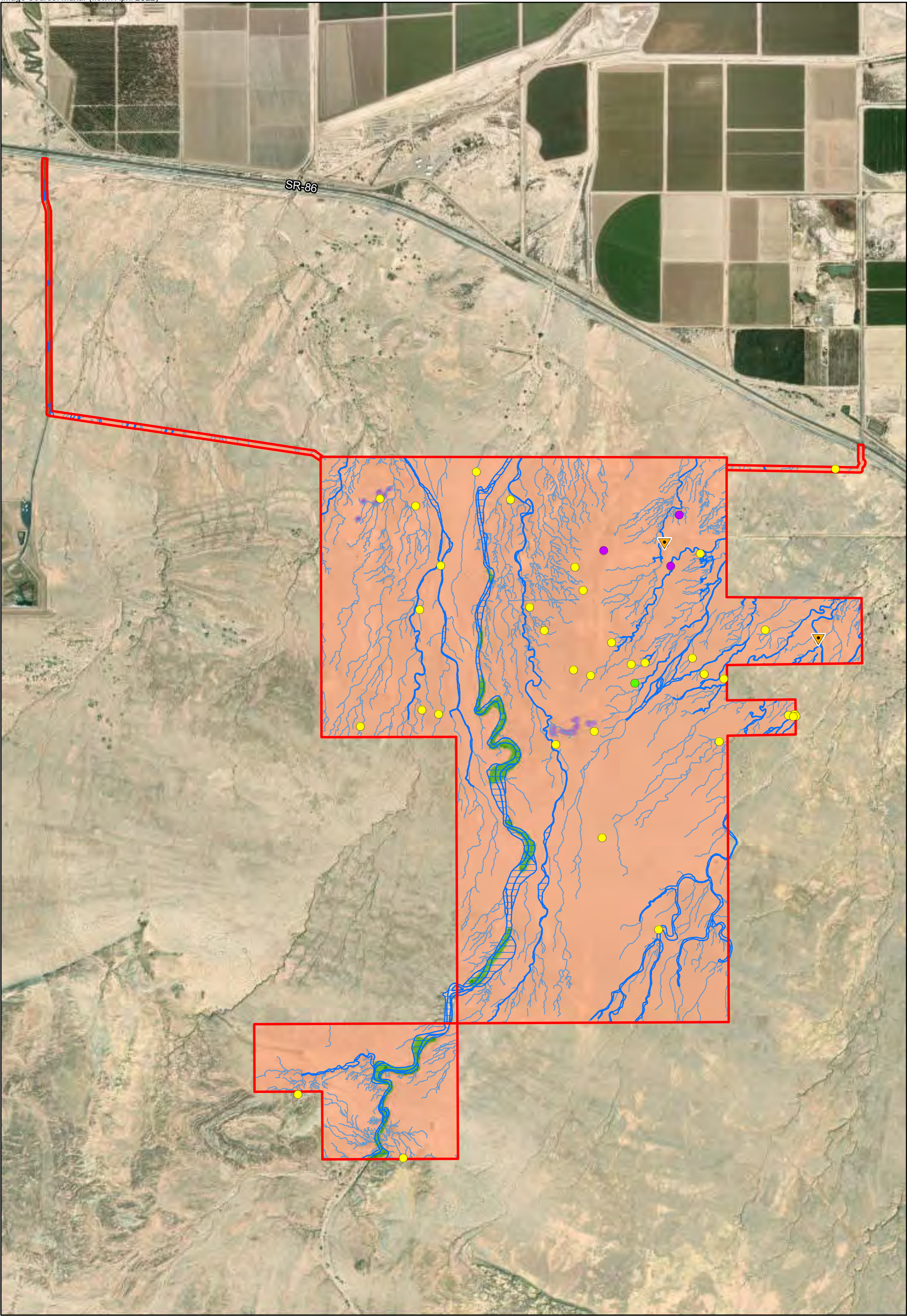
3.2.1.1 Creosote Bush Scrub

Creosote bush scrub is a vegetation community within the *Larrea tridentata* Shrubland Alliance. It is the major vegetation community in the project site (see Figure 4) and is dominated by a sparse cover of creosote bushes (*Larrea tridentata*; Photographs 1 and 2). Co-dominant shrub species that occur in low numbers include white bur-sage (*Ambrosia dumosa*), desert alkali goldenbush (*Isocoma acradenia*), and allscale saltbush (*Atriplex polycarpa*).

Table 2 Existing Vegetation Communities (acres)			
Vegetation Community	Project Site	Access Road West	Access Road East
Creosote Bush Scrub	1,855.22	13.90	6.97
Mesquite Thickets	2.01	--	--
Tamarisk Thicket	3.82	--	--
Disturbed Land	--	7.94	--
Major Washes	58.43	1.61	0.05
Minor Streambeds	44.99	0.32	0.15
TOTAL	1,964.47	23.77	7.17

3.2.1.2 Mesquite Thicket

The mesquite thicket in the project site is a vegetation community within the *Prosopis glandulosa* Woodland Alliance. It is present in two groups of small, isolated patches in the northern portion of the project site (see Figure 4). The primary plant species in this woodland thicket is the honey mesquite (*Prosopis glandulosa* var. *torreyana*). The patches of honey mesquite trees occur on hummocks of sandy soils (Photographs 3 and 4).



- Project Boundary
- Major Wash
- Minor Streambed

- Vegetation Community
- Creosote Bush Scrub
 - Mesquite Thicket
 - Tamarisk Thicket
 - Disturbed Land

- Suitable Unoccupied Burrow
 - Suitable Unoccupied Burrow Complex
 - Suitable Burrow with BUOW Sign
- Sensitive Wildlife Observations
- Western Burrowing Owl
(*Athene cunicularia hypugaea*)

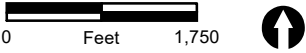


FIGURE 4
Existing Biological Resources



PHOTOGRAPH 1
View of Sparse Creosote Bush Scrub Habitat



PHOTOGRAPH 2
View of Creosote Bush Scrub Habitat with Powerline in Background



PHOTOGRAPH 3
View of Mesquite Thicket on Sandy Mound



PHOTOGRAPH 4
View of Mesquite Thickets on Low Sandy Mounds (Center and Left of Photo)

3.2.1.3 Tamarisk Thicket

Tamarisk thicket is a vegetation community within the *Tamarix ramosissima* Shrubland Semi-Natural Alliance. It occurs in linear patches along the major wash that traverses the central part of the project site. The dominant species in this community is the non-native tamarisk (*Tamarix ramosissima*) and it occurs as a sparse cover of trees in portions of the major wash (Photographs 5 and 6). A co-dominant species that occurs sporadically with the tamarisk trees is desert holly (*Atriplex hymenelytra*).

3.2.2 Zoological Resources

A total of 39 animal species were detected within the project site during the biological survey. These comprise 4 invertebrates, 6 reptiles, 2 mammals, and 27 birds, typical of Colorado Desert communities. A complete list of animal species detected during the survey is included as Attachment 2.

3.2.2.1 Invertebrates

Invertebrates detected during the surveys included three butterfly species and one bee species. These insects were observed visiting plants that were in flower at the time of the survey.

3.2.2.2 Reptiles

The six reptile species that were observed include four lizard species, one iguana species, and one snake species. These reptile species were observed sunning themselves or under shrubs in the project site.

3.2.2.3 Birds

Avian species were the most common wildlife observed during the surveys. Species of wood warblers (six), flycatchers (three), and swallows (three) were the most observed birds. The remaining 14 bird species observed were represented by a single species.

3.2.2.4 Mammals

Two mammal species were observed on the project site. Individuals of the desert black-tailed jackrabbit (*Lepus californicus deserticola*) were observed in the creostate bush scrub habitat. In addition, a pack of coyotes (*Canis latrans*) was observed in the project site.



PHOTOGRAPH 5
View of Scattered Tamarisk Thickets in Wash Habitat



PHOTOGRAPH 6
View of Scattered Tamarisk Thickets in Wash Habitat
(Note Flood Debris in Center of Photo)

3.3 Sensitive Biological Resources

This section addresses the sensitive biological resources observed and with the potential to occur on the project site. It is divided into a regulatory section, sensitive criteria section, and sections that describe the sensitive vegetation communities, plant species, wildlife species observed or with the potential to occur. These sub-sections are followed by a discussion of wildlife movement corridors and a preliminary jurisdictional water discussion.

3.3.1 Regulatory Setting

3.3.1.1 Regulatory Framework

Various federal and state regulations or policies apply to biological resources on or adjacent to the project site and are summarized below.

a. Federal Regulations

The federal Endangered Species Act (ESA) provides the legal framework for the listing and protection of species (and their habitats) that are identified as being endangered or threatened with extinction. Actions that jeopardize endangered or threatened species and the habitats upon which they rely are considered 'take' under the ESA. Section 9(a) of the ESA defines 'take' as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." The ESA is administered by the USFWS.

The Migratory Bird Treaty Act (MBTA; 16 United States Code 703 et seq.) is a federal statute that implements treaties with several countries on the conservation and protection of migratory birds. The number of bird species covered by the MBTA is listed at 50 Code of Federal Regulations (CFR) 10.13. The regulatory definition of "migratory bird" is broad and includes any mutation or hybrid of a listed species and any part, egg, or nest of such birds (50 CFR 10.12). The MBTA, which is enforced by USFWS, makes it unlawful "by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory bird, or attempt such actions, except as permitted by regulation. The take, possession, import, export, transport, sale, purchase, barter, or offering of these activities is prohibited, except under a valid permit or as permitted in the implementing regulations (50 CFR 21.11). Pursuant to U.S. Department of the Interior Memorandum M-37050, the federal MBTA is no longer interpreted to cover incidental take of migratory birds (U.S. Department of the Interior 2017). Therefore, impacts that are incidental to implementation of an otherwise lawful project would not be considered significant.

The Rivers and Harbors Act of 1899 and the Clean Water Act (CWA) regulate project activities within non-marine navigable waters and/or waters of the U.S. The discharge of any pollutant from a point source into navigable waters is illegal unless a permit under the CWA's provisions is acquired. Permitting for projects that include both permanent and temporary dredging and filling in wetlands and waters of the U.S. is overseen by the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA. Projects can be permitted on an individual basis or be covered by one of several approved nationwide or regional general permits.

b. State Regulations

The California Environmental Quality Act (CEQA) requires an environmental review for projects with potentially adverse impacts on the environment. Adverse environmental impacts are typically mitigated in accordance with state laws and regulations.

The California ESA is similar to the federal ESA in that it provides the legal framework for the listing and protection of species (and their habitats) that are identified as being endangered or threatened with extinction.

Section 3503 of the California Fish and Game Code states that it is “unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto,” and Section 3503.5 states that it is “unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird” unless authorized (State of California 1991).

The California Fish and Game Code (Sections 1600 through 1603) regulates project activities within wetlands and riparian habitats. The CDFW can issue a Streambed Alteration Agreement for projects affecting riparian and wetland habitats.

Project activities that fill or dredge within wetland waters of the U.S. and waters of the U.S. as well as wetland waters of the state and waters of the state, including isolated waters such as vernal pools and other waters showing lack of connectivity to a Traditional Navigable Waters, require a Water Quality Certification by the California Regional Water Quality Control Board (RWQCB) under Section 401 of the CWA and Section 13000 et seq. of the California Water Code under the Porter-Cologne Water Quality Control Act.

3.3.1.2 Sensitivity Criteria

Vegetation communities are considered sensitive natural communities if they are of limited distribution; have federal, state, or local laws regulating their development; and/or support concentrations of sensitive plant or wildlife species. For purposes of this report, the following natural communities are considered sensitive: (1) communities with state rarity ranks of S1-S3, as reviewed by the Vegetation Classification and Mapping Program (VegCAMP) and CNPS as recognized by CDFW (2023b); and (2) wetlands and waters under the jurisdiction of federal and state agencies.

For purposes of this report, plant and wildlife species would be considered sensitive if they are: (1) listed by state or federal agencies as rare, threatened, or endangered or are proposed for listing; (2) given a California Rare Plant Rank 1B (considered endangered throughout its range), 2 (considered endangered in California but more common elsewhere), 3 (more information about the plant’s distribution and rarity needed), or 4 (plants of limited distribution) in the CNPS Inventory of Rare and Endangered Vascular Plants of California (2023); (3) considered rare, endangered, or threatened by CDFW (2023c-g); or (4) identified by another recognized conservation or scientific group as being depleted, potentially depleted, declining, rare, critical, endemic, endangered, or threatened.

3.3.2 Sensitive Vegetation Communities

One sensitive vegetation community occurs in the project site: mesquite thickets. This vegetation community is considered threatened in the state of California due to losses of habitat.

3.3.3 Sensitive Plant Species

No sensitive plant species were observed during the site surveys. A search of the CNDDDB and USFWS All-Species databases showed recorded sensitive plant species occurrences in the vicinity of the project site, as defined by the USGS Kane Springs 7.5-minute quadrangle. One sensitive plant species occurrence was recorded near the northeast corner of the project site. This record is for the stem parasitic plant species Thurber's pilostyles (*Pilostyles thurberi*) which has a CNPS rank of 4.3 Watchlist species. This species can be found growing on the stems of Emory's indigobush (*Psoralea emoryi*). Emory's indigobush was observed on the project site as widely scattered individuals within the creosote bush scrub and therefore there is a moderate potential for this species to occur on the project site.

Four other sensitive plant species have recorded occurrences in the vicinity of the project site but no records on-site. These four species are listed in Table 3 along with justification for their potential to occur. Of these four species, three species have a low potential for occurrence and one species is not expected to occur.

3.3.4 Sensitive Wildlife Species

Individuals of four sensitive wildlife species were observed on the project site: Great Basin whiptail (*Aspidoscelis tigris tigris*), loggerhead shrike (*Lanius ludovicianus*), burrowing owl (*Athene cunicularia*), and California horned lark (*Eremophila alpestris actia*). An additional three wildlife species are considered to have a high to moderate potential to occur on the site due to the presence of suitable habitat and recorded occurrence in the vicinity of the project: flat-tailed horned lizard (*Phrynosoma mcallii*), crissal thrasher (*Toxostoma crissale*), and LeConte's thrasher (*Toxostoma lecontei*). Each of these species is discussed below.

An additional five sensitive wildlife species that have recorded occurrences in the vicinity of the project site are considered to have a low or unexpected potential for occurrence on the site due to the lack of suitable habitat as presented in Table 4.

Table 3 Sensitive Plant Species Observed or with the Potential to Occur							
Major Plant Group	Family	Scientific Name / Common Name	Federal Status	State Status	CNPS Rare Plant Rank	Potential to Occur On-Site (Observed or L/M/H/U)	Basis for Determination of Occurrence Potential
Angiosperms: Eudicots	Asteraceae / Sunflower Family	<i>Malperia tenuis</i> / Brown turbans			2B.3	L	While within the range of the species and suitable habitat is present, this species would have been observed as surveys were conducted during optimal blooming period.
	Euphorbiaceae / Spurge Family	<i>Chameaesyce platysperma</i> / flat seeded spurge			1B.2	U	This species has not been seen in California since 1914 and is assumed extirpated.
	Fabaceae (Leguminosae) / Legume Family	<i>Astragalus sabulonum</i> / gravel milkvetch			2B.2	L	Only a small portion of the southwest corner of the site is within the elevation range for this species. While some suitable habitat for the species is present in the project site surveys were conducted at optimal time of blooming period and the species would have been observable.
	Lennoaceae / Lennoa Family	<i>Pholisma sonora</i> / sand food			1B.2	L	Although host plants for this root parasitic plant are present in the project site, the site lacks the sand dune habitat preferred by this species. Surveys were conducted at optimal time for observance.
	Rafflesiaceae / Rafflesia Family	<i>Pilostyles thurberi</i> / Thurber's pilostyles			4.3	M	Host plant for this stem parasitic plant species is present in the Project site. An occurrence was recorded in the past at the northeast corner of the project site.
STATUS CODES <u>California Native Plant Society (CNPS): California Rare Plant Ranks (CRPR)</u> 1B = Species rare, threatened, or endangered in California and elsewhere. These species are eligible for state listing. 2B = Species rare, threatened, or endangered in California but more common elsewhere. These species are eligible for state listing. 4 = A watch list of species of limited distribution. These species need to be monitored for changes in the status of their populations. 0.2 = Species fairly threatened in California (20-80% occurrences threatened; moderate degree and immediacy of threat). 0.3 = Species not very threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known). POTENTIAL TO OCCUR ON-SITE L = Low M = Medium U = Unexpected							

Table 4 Sensitive Wildlife Species Observed or with the Potential to Occur							
Major Wildlife Group	Family	Scientific Name / Common Name	Federal Status	State Status	Habitat Preference / Requirements	Potential to Occur On-Site (Observed or L/M/H/U)	Basis for Determination of Occurrence Potential
Reptiles	Teiidae / Whiptail Lizards	<i>Aspidozelis tigris</i> / Great Basin whiptail		SSC	Coastal sage scrub, chaparral, woodlands, and streamsides where plants are sparsely distributed.	H	Species observed.
Birds	Laniidae / Shrikes	<i>Lanius ludovicianus</i> / loggerhead shrike		SSC	Open foraging areas near scattered bushes and low trees.	H	Species observed.
	Alaudidae / Larks	<i>Eremophila alpestris actia</i> / California horned lark		WL	Sandy shores, mesas, disturbed areas, grasslands, agricultural lands, sparse creosote bush scrub.	H	Species observed.
	Strigidae / Typical Owls	<i>Athene cunicularia</i> / burrowing owl		SSC	Grassland, agricultural land, coastal dunes. Require rodent burrows. Declining resident	H	Species Observed
Reptiles	Gekkonidae / Geckos	<i>Coleonyx switaki</i> / peninsula [=Barefoot] banded gecko		SCT	Rock outcrops on arid hillsides and canyons in desert scrub vegetation types.	L	Site lacks the large boulder fields and rocky outcrops preferred by this species.
	Phrynosomatidae / Spiny Lizards	<i>Phrynosoma mcallii</i> / flat-tailed horned lizard		SSC	Dunes and sandy flats of low desert.	M	Some suitable habitat present for this species on the site. The site is within a designated management area for the species.
		<i>Uma notata</i> / Colorado [=Sonoran] desert fringe-toed lizard		SSC	Loose sand of desert dunes, flats, riverbanks, and washes. Prefers scant vegetation.	L	Site lacks suitable loose sand dune habitat.
Mammals	Vespertilionidae / Vesper Bats	<i>Antrozous pallidus</i> / pallid bat		SSC	Arid deserts and grasslands. Day and night roosts in rock crevices in outcrops and cliffs, caves, mines, trees, bridges, and other human structures. Roosts tend to be warm and elevated. Forage for large-	L	Site lacks the types of rock outcrops suitable for this species to roost.

Table 4 Sensitive Wildlife Species Observed or with the Potential to Occur							
Major Wildlife Group	Family	Scientific Name / Common Name	Federal Status	State Status	Habitat Preference / Requirements	Potential to Occur On-Site (Observed or L/M/H/U)	Basis for Determination of Occurrence Potential
					bodied arthropods over open shrublands, grasslands, and orchards.		
Fishes	Cyprinodontidae / Pupfish	<i>Cyprinodon macularius</i> / desert pupfish	FE	SE	Desert pools and streams.	U	No perennial streams or permanent water sources occur in the project site.
Birds	Falconidae / Falcons	<i>Falco mexicanus</i> / prairie falcon		WL	Grassland, agricultural fields, desert scrub. Uncommon winter resident. Rare breeding resident.	L	Site lacks suitable cliff ledges preferred by the species for nesting.
	Rallidae / Rails, Gallinules, & Coots	<i>Rallus obsoletus</i> [=longirostris] yumanensis / Yuma Ridgway's [=clapper] rail	FE	SCT, CFP	Marshland vegetation, dense cattail stands, bulrush, reeds. Resident.	U	No wetland marshes, cattail stands, ponds, or permanent water sources occur in the project site.
	Mimidae / Mockingbirds & Thrashers	<i>Toxostoma crissale</i> / crissal thrasher		SSC	Mesquite thickets in Borrego Springs area. Rare resident.	M	Suitable habitat present on the site.
		<i>Toxostoma lecontei</i> / LeConte's thrasher		SSC	Desert washes, creosote bush scrub. Uncommon resident.	M	Suitable habitat present on the site.
STATUS CODES					POTENTIAL TO OCCUR ON-SITE		
<u>Federal Status</u>					L = Low		
FE = Listed as endangered by the federal government					M = Medium		
<u>State Status</u>					H = High		
CFP = California fully protected species					U = Unexpected		
SCT = State candidate for listing as Threatened							
SSC = California Department of Fish and Wildlife species of special concern							
WL = California Department of Fish and Wildlife watch list species							

3.3.4.1 Sensitive Wildlife Species Observed

a. Great Basin Whiptail

The Great Basin whiptail lizard is a state species of special concern. In the California deserts it prefers open scrub and wash habitats. This lizard species was observed on the project site in areas of the creosote bush scrub and wash habitats.

b. Loggerhead Shrike

Loggerhead shrikes are a state species of special concern. In the deserts of California, this species is found primarily in desert washes or in areas with patches of mesquite or saltbush. Loggerhead shrike was observed in the project site around the mesquite thickets and could also use the tamarisk scrub within the washes.

c. California Horned Lark

The California horned lark is on the state watch list as a species to be monitored. The lark species prefers sandy shores, mesas, disturbed areas, grasslands, agricultural lands, and sparse creosote bush scrub habitats. The species was observed on the project site within the creosote bush scrub habitat.

d. Western Burrowing Owl

Burrowing owl (burrow sites and some wintering sites) is a CDFW species of special concern and BLM sensitive species. This species occurs as a year-round resident and winter visitor in Imperial County. Habitat for the burrowing owl includes dry, open, short-grass areas with level to gentle topography and well-drained soils, as well as agricultural areas.

As described in the burrowing owl habitat assessment report (Attachment 3), two burrowing owl individuals were observed and burrowing owl sign was observed at several existing burrows on the project site. Other suitable burrows for use by burrowing owls were observed within the project site. Therefore, it was assumed that the species has a high potential for occurrence. The locations of the observed burrowing owls and suitable burrows are shown in Figure 4.

3.3.4.2 Sensitive Wildlife Species with Moderate to High Potential to Occur

a. Flat-tailed Horned Lizard

Flat-tailed horned lizard is a CDFW species of special concern and Bureau of Land Management (BLM) sensitive species. Flat-tailed horned lizard is found in the low deserts of southwestern Arizona, southeastern California, and adjacent portions of northwestern Sonora and northern Baja California, Mexico. In California, flat-tailed horned lizard is restricted to desert washes and desert flats in central Riverside, eastern San Diego, and Imperial counties.

The project site occurs within the current known range of the flat-tailed horned lizard and therefore there is a high potential for the species to occur on the project site. The southwestern portion of the northern parcel, the western portion of the central parcel, and the entire southern parcel of the project site occurs within the West Mesa Management Area (WMMA; Flat-tailed Horned Lizard

Interagency Coordinating Committee [ICC] 2003) for the flat-tailed horned lizard (Figure 5). The creosote bush scrub on the project site within and outside of this management area provides suitable habitat for this species.

b. Crissal Thrasher

The Crissal thrasher is considered a state species of special concern. It occupies a variety of desert riparian and scrub habitats. In California, this thrasher is found predominately in riparian scrub or woodland habitats along washes and using patches of mesquite. This species has a moderate potential for occurrence on the site due to the presence of tamarisk tree habitat found along the central major wash and the small mesquite thickets within the creosote bush scrub.

c. LeConte's Thrasher

The LeConte's thrasher is considered a state species of special concern. This bird species occupies sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills that have species of saltbush and/or species cylindrical cholla cactus. This species has a moderate potential for occurrence on the site due to the presence of saltbush scattered within the washes and creosote bush scrub.

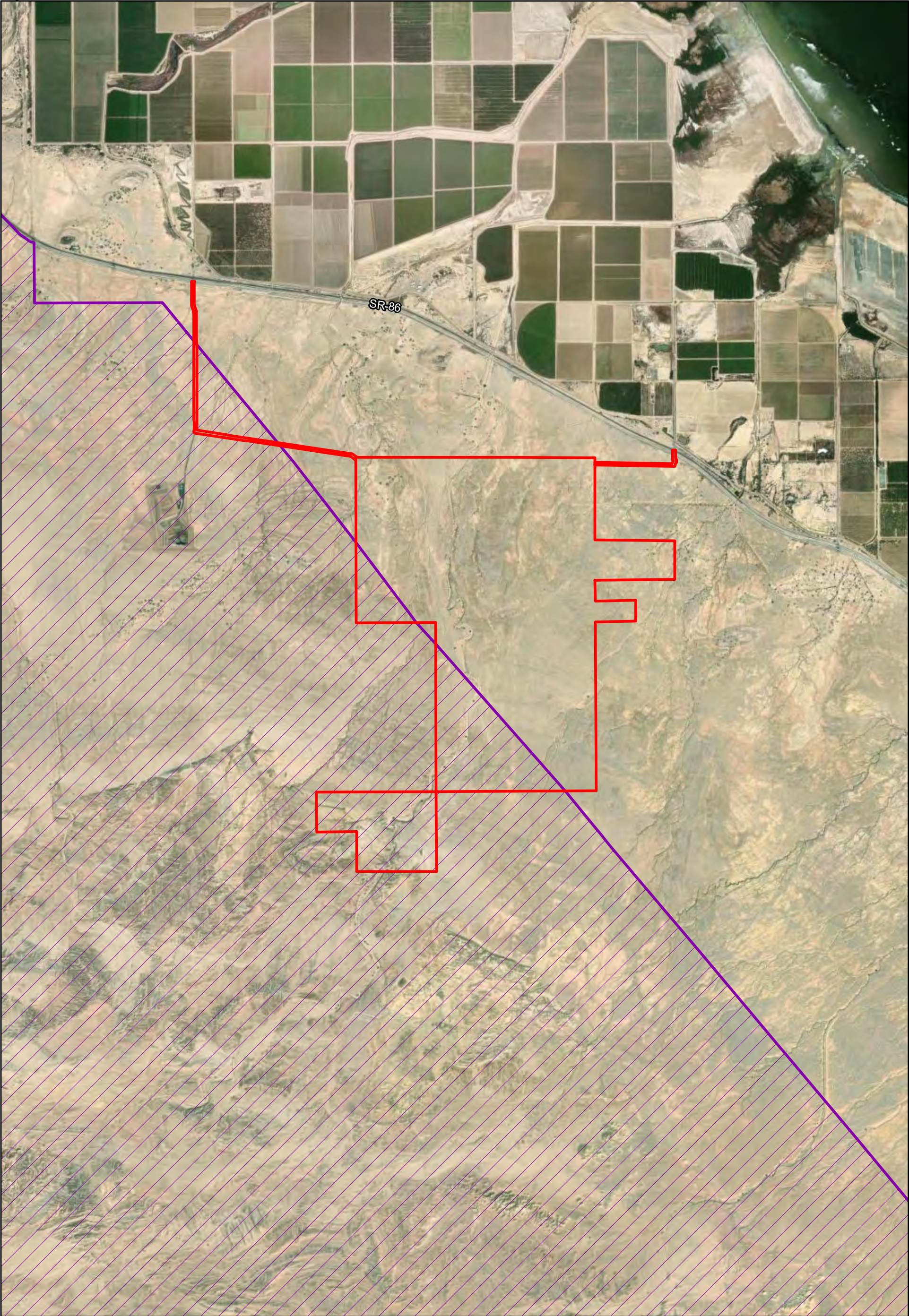
3.3.5 Wildlife Movement Corridors

Wildlife movement corridors are defined as areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. The project site lies within a large expanse of undeveloped desert in the Imperial Valley, which provides relatively unconstrained habitat connectivity between the Salton Sea and the border with Baja California to the south and the rugged mountains to the northwest and west. The project site itself does not function as major wildlife movement corridor but rather is a portion of a much larger expanse of a desert corridor in this area.

3.3.6 Preliminary Jurisdictional Waters Assessment

Potential jurisdictional waters in the form of streambeds (washes) were mapped on the project site based on the preliminary waters assessment (Figure 6). These are comprised of major washes and minor tributary streambeds that cover a good portion of the project site. Acreages of these features are summarized in Table 5. Representative photographs of these features are provided in Photographs 7-12. These washes and streambeds are considered waters of the state under the jurisdiction of the RWQCB and CDFW. In addition, these ephemeral drainages have the potential to be considered waters of the U.S. under the jurisdiction of the USACE.

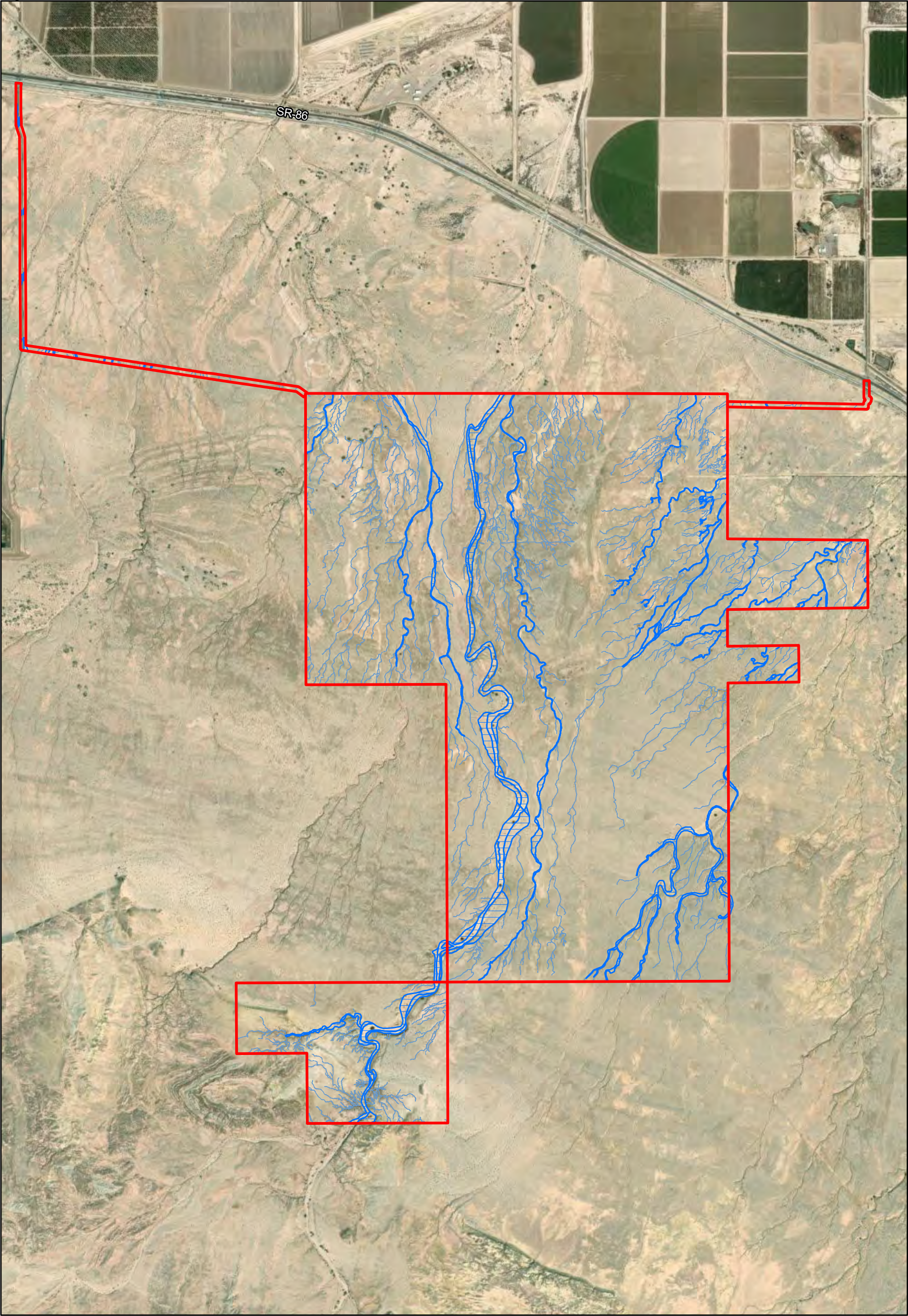
Table 5 Existing Preliminary Jurisdictional Waters Assessment	
Potential Jurisdictional Water Type	Total Impact Acreage
Federal Waters of the U.S. (USACE)*	
Non-wetland Waters	103.42
Waters of the State (RWQCB/CDFW)*	
Streambed	103.42
*USACE = U.S. Army Corps of Engineers; RWQCB = Regional Water Quality Control Board; CDFW = California Department of Fish and Wildlife	



 Project Boundary
 Flat-tailed Horned Lizard - West Mesa Management Area

 0 Feet 3,000 

FIGURE 5
Project Site in Relation to Flat-tailed Horned Lizard Management Area



Project Boundary

Potential Federal Waters of the U.S. / Waters of the State

Non-wetland water / Streambed (Major Wash)

Non-wetland water / Streambed (Minor Streambed)



FIGURE 6
Preliminary Locations of
Potential Jurisdictional Waters



PHOTOGRAPH 7
View of a Major Wash on the Project Site



PHOTOGRAPH 8
View of a Major Wash with an Associated Low Floodplain



PHOTOGRAPH 9

View of a Major Wash with an Associated Low Sandy Floodplain



PHOTOGRAPH 10

View of a Minor Streambed with Loose Sandy Bed



PHOTOGRAPH 11
View of a Minor Streambed in Rocky Soil



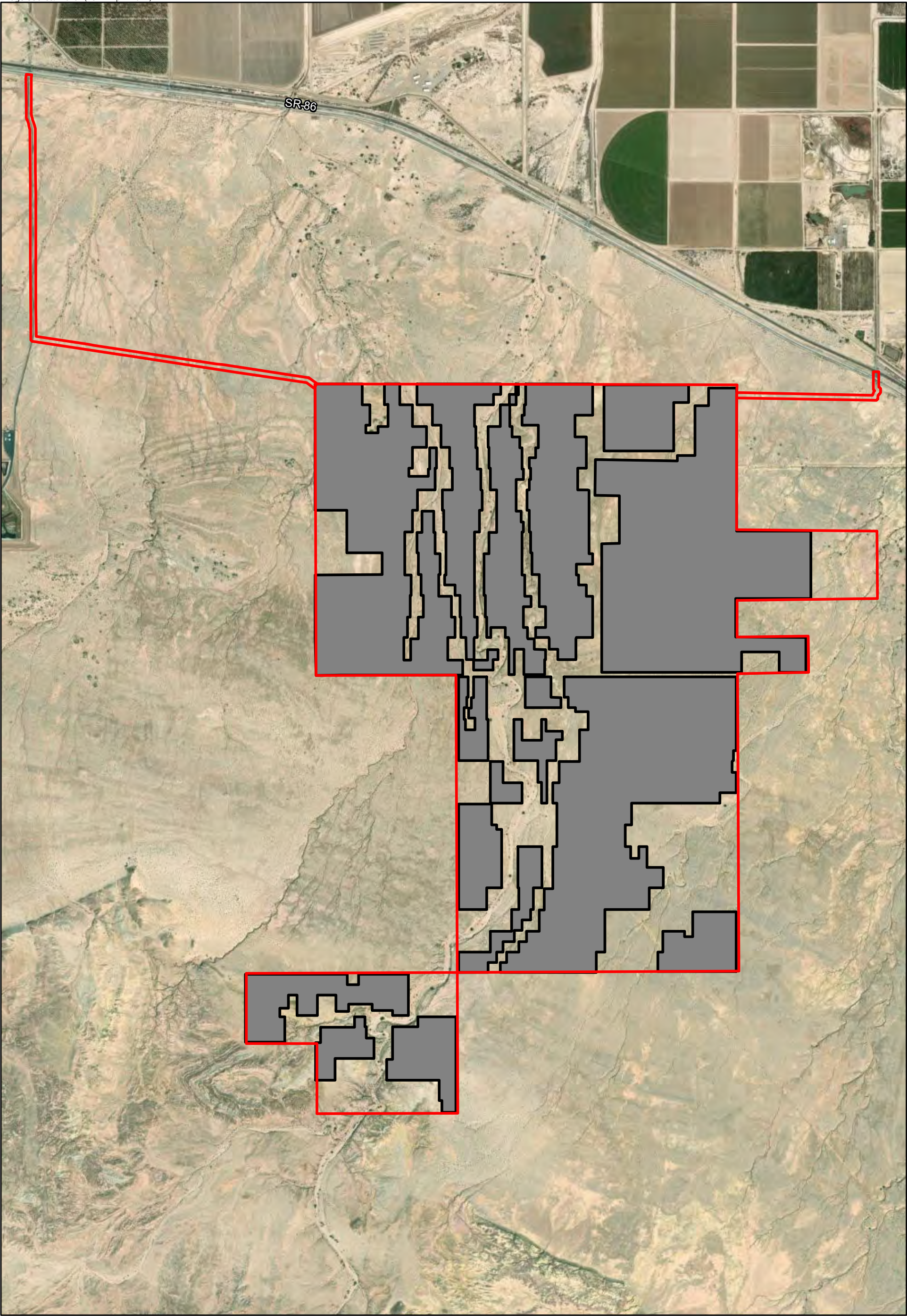
PHOTOGRAPH 12
View of Minor Streambed with Sandy Bed
in Creosote Bush Scrub

4.0 Project Impact Analysis

The following sections analyze the direct and indirect impacts to biological resources that may result from the project. Figure 7 presents the project's proposed development footprint, which would result in direct permanent impacts to 1,348.77 acres within the project site. Table 6a provides the breakdown of impacts within the project site and Table 6b provides the impacts for the two alternative access road alignments..

Table 6a Summary of Project Site Impacts to Vegetation Communities			
Vegetation Community	Impact Acres Outside WMMA*	Impact Acres Inside WMMA*	Total Impact Acreage
Creosote Bush Scrub	1,017.04	293.58	1,310.62
Mesquite Thickets	0.24	--	0.24
Tamarisk Thicket	--		--
Major Washes	4.87	0.02	4.89
Minor Streambeds	26.82	6.20	33.02
TOTAL	1,048.97	299.8	1,348.77
WMMA = West Mesa Management Area for the flat-tailed horned lizard.			

Table 6b Summary of Access Road Alternatives Impacts to Vegetation Communities (acres)						
Vegetation Community	Access Road West			Access Road East		
	Impact Outside WMMA*	Impact Inside WMMA*	Total Impact	Impact Outside WMMA*	Impact Inside WMMA*	Total Impact
Creosote Bush Scrub	2.32	2.23	4.55	2.58	--	2.58
Mesquite Thickets				--	--	
Tamarisk Thicket				--	--	
Disturbed Land	0.65	0.96	1.61	--	--	
Major Washes	0.07	0.24	0.31	0.02	--	0.02
Minor Streambeds	--	0.07	0.07	0.06	--	0.06
TOTAL	3.04	3.50	6.54	2.66	--	2.66
WMMA = West Mesa Management Area for the flat-tailed horned lizard.						



 Project Boundary
 Solar Field Layout

 0 Feet 1,700 

FIGURE 7
Proposed Project Layout

4.1 Impacts to Vegetation Communities

The proposed project would have direct permanent impacts to a total of 1,017.28 acres consisting of creosote bush scrub and mesquite thicket (Figure 8). Impacts to mesquite thicket, a sensitive vegetation community, would be considered significant. Impacts to tamarisk thicket would not be considered significant as this vegetation community type is not considered sensitive. Direct impacts to creosote bush scrub, while not considered a sensitive vegetation community type, are evaluated as part of the sensitive wildlife impact analysis presented in Section 4.3 below. The remainder of impacts within the project site would occur to major washes and minor streambeds that are evaluated in Section 4.4 below.

4.2 Impacts to Sensitive Plant Species

Although not observed, there is a moderate potential for impacts to Thurber's pilostyles due to the loss of Emory's indigobush individuals. However, this potential impact would not be considered significant as the plant species is not a federal or state listed species and the impacts would not jeopardize the continued existence of the species. No other sensitive plant species are expected to occur on the project site. Therefore, no impacts to sensitive plant species are anticipated.

4.3 Impact to Sensitive Wildlife Species

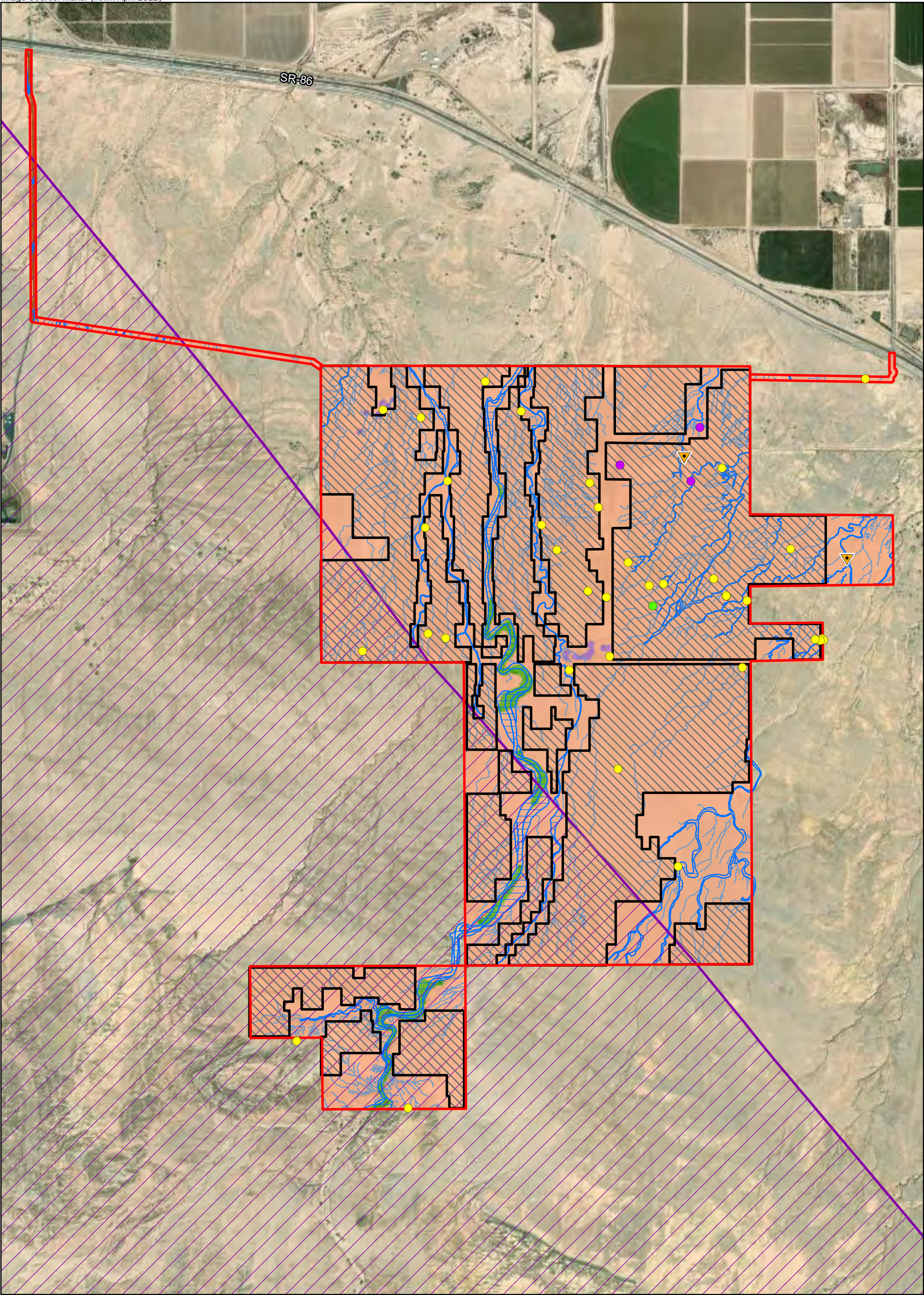
Direct impacts to vegetation communities within the project construction footprint could affect individuals of sensitive wildlife species observed or with a moderate to high potential to occur on the site. Direct impacts would result from incidental mortality and habitat removal.

4.3.1 Reptiles

Two sensitive reptiles were identified as having potential to occur on-site: one observed (Great Basin whiptail) and the other (flat-tailed horned lizard) has a high potential for occurrence. Both species are CDFW species of special concern, and the flat-tailed horned lizard is also considered a BLM sensitive species.

The project has the potential to directly impact approximately 1,316.62 acres of suitable creosote bush scrub habitat for the Great Basin whiptail lizard through habitat loss. While the desert wash habitat may also support this species, impacts to this habitat are addressed in Section 4.4 below. Direct impacts to individual lizards would be considered significant and require mitigation.

The project has the potential to directly impact approximately 1,316.62 acres of suitable and assumed-occupied creosote bush scrub habitat for the flat-tailed horned lizard through habitat loss. Of this total impact, 293.58 acres would occur within the WMMA. Direct impacts to individual lizards would be considered significant and require mitigation.



Project Boundary

Limit of Impact

Flat-tailed Horned Lizard - West Mesa Management Area

Major Wash

Minor Streambed

Vegetation Community

Creosote Bush Scrub

Mesquite Thicket

Tamarisk Thicket

Disturbed Land

Suitable Unoccupied Burrow

Suitable Unoccupied Burrow Complex

Suitable Burrow with BUOW Sign

Sensitive Wildlife Observations

Western Burrowing Owl
(Athene cunicularia hypugaea)

0

Feet

1,700

FIGURE 8
Impacts to Biological Resources

RECON
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4.3.2 Birds

Five sensitive bird species, three observed (loggerhead shrike, burrowing owl, and California horned lark) and two that have a moderate potential for occurrence (Crissal thrasher, and LeConte's thrasher), have the potential to be impacted on the project site through the loss of desert habitat. Each of these species is addressed below.

Direct impacts to habitat the supports or may support loggerhead shrike, California horned lark, Crissal thrasher, and LeConte's thrasher from construction activities would be considered less than significant for the following reasons: the project site is surrounded by the larger tracts of BLM ownership to the south and southeast that provides foraging habitat for all of these species and nesting habitat for the shrike, thrasher, and horned lark; the population of any of these species on-site would not represent a substantial component of the region's population and impacts to individuals would not preclude the ability for the species to be self-sustaining. No mitigation beyond what would be required for nesting birds (see Section 5.3.4 below) would be required.

There is a potential for project construction to result in direct impacts to the burrowing owl. Two individual owls were observed and suitable wintering and breeding habitat was identified on the site during the habitat assessment conducted for the species (see Attachment 3). Impacts to breeding individuals could occur if the species is using the site during the breeding season. Suitable habitat is present within the project site and would be impacted during project construction. Impacts to wintering and breeding individuals and their habitat would be considered significant and require mitigation. Pre-construction surveys would be conducted to verify the presence/absence of this species prior to the start of construction activities along with other avoidance measures (see Section 5.3.3 below)

Nesting birds including raptors covered under the California Fish and Game Code 3503 and 3503.5 have potential to be directly impacted by the project if construction activities (i.e., clearing, grubbing, grading) occur during the general nesting season of February 1 to September 15. Direct impacts to nesting birds and raptors would be considered significant and require avoidance measures (see Section 5.3.4 below).

Ongoing operations & maintenance (O&M) is not expected to significantly impact any of these species as the project site would be maintained in the converted state and not expected to attract the species post-construction. In addition, the level of night lighting should be minimal and directed down and toward the interior of the site and noise generated should be minimal, to minimize any indirect impacts to the species on adjacent habitat.

Ongoing O&M could result in impacts though the introduction of trash and litter, attracting greater numbers of predators, such as ravens and large mammals, which could in turn prey upon sensitive bird species. These would be considered significant and require mitigation.

4.3.3 Impacts to Wildlife Corridors

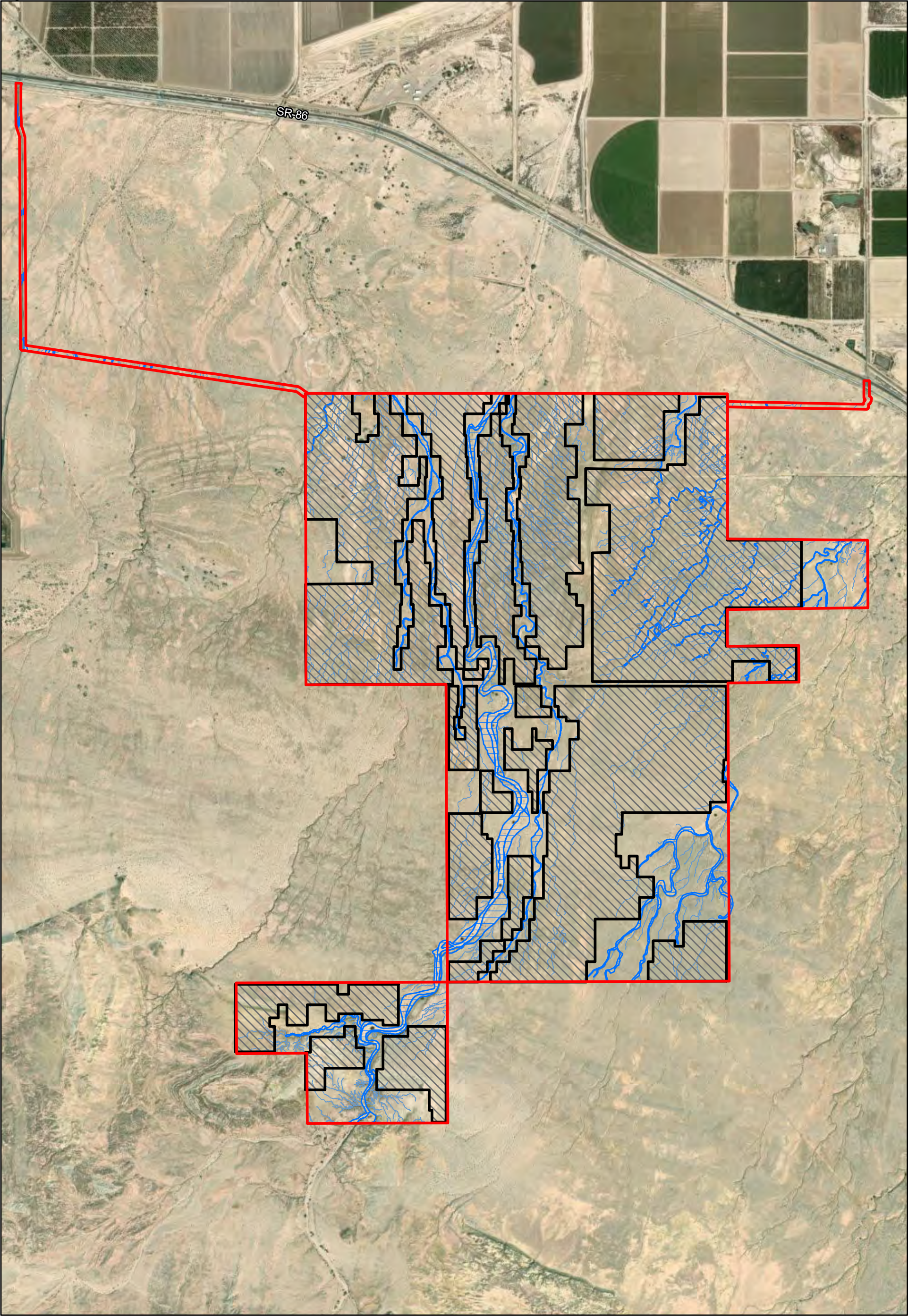
As described in Section 3.3.5 above, the project parcels do not function as a true wildlife movement corridor. Therefore, the project would not result in significant direct or indirect impacts to wildlife movement.

4.4 Preliminary Impact Assessment to Jurisdictional Waters

The following impact assessment to potential jurisdictional waters is a worst-case scenario as it is based on a preliminary assessment of washes/streambeds mapped on the site based on field notes and not on a formal delineation of these features. The existing acreage of the mapped washes/streambeds was estimated through digital mapping with the aid of GIS software, topographic data, and recent aerial photography.

No federal or state wetlands were observed on the project site. The project site does have major washes and numerous minor streambeds that traverse the site (see Figure 6). All these washes/streambeds have the potential to be considered federal non-wetland waters of the U.S. and streambed waters of the state. Impacts to these potential federal and state waters would consist of an estimated 37.92 acres of wash/streambed area (Table 7; Figure 9). These impacts to washes/streambeds would be significant and require mitigation. In addition, a USACE 404 Clean Water Act Permit, RWQCB 401 Water Quality Certification, and CDFW Streambed Alteration Agreement would be required.

Table 7 Preliminary Summary of Impacts to Potential Jurisdictional Waters	
Potential Jurisdictional Water Type	Total Impact Acreage
Federal Waters of the U.S.	
Non-wetland Waters	37.92
Waters of the State	
Streambed	37.92



- Project Boundary
- Limit of Impact
- Potential Federal Waters of the U.S. / Waters of the State**
 - Non-wetland water / Streambed (Major Wash)
 - Non-wetland water / Streambed (Minor Streambed)



FIGURE 9
Impacts to Potential Jurisdictional Waters

5.0 Mitigation and Monitoring Recommendations

The mitigation and monitoring recommendations for general biological resources, sensitive species, and jurisdictional waters are presented below.

5.1 Mitigation and Monitoring Recommendations for General Biological Resources

As currently designed, the project has the potential to result in significant direct and indirect impacts to sensitive biological resources. The following general mitigation for biological resource protection during construction would be included in the environmental document:

BIO-1. General Measures Prior to Construction

1. The owner/permittee would engage a qualified biological monitor to implement the project's biological monitoring program.
2. The following measures should be implemented to reduce potential impacts to bird populations. These measures incorporate the Avian Power Line Interaction Committee design guidelines for overhead utilities by incorporating recommended or other methods that enhance the visibility of the lines to avian species. These would include, at a minimum, the following measures:
 - Minimize noise and nighttime outdoor lighting.
 - Establish and implement measures for storage and disposal of all litter and trash produced during construction and O&M. This is designed to discourage scavengers, such as ravens that may also prey on wildlife in the vicinity.
 - To avoid direct impacts to avian species, removal of habitat that supports active nests in the proposed area of disturbance should occur outside the breeding season for these species (February 1 to September 15).
 - If removal of habitat in the proposed area of disturbance must occur during the breeding season, the qualified biological monitor would conduct a pre-construction survey to determine the presence or absence of nesting birds on the proposed area of disturbance. The pre-construction survey would be conducted within 10 calendar days prior to the start of construction activities (including removal of vegetation). The applicant would submit the results of the pre-construction survey for review and approval prior to initiating any construction activities.
 - If nesting birds are detected, a letter report or mitigation plan in conformance with applicable state and federal law (i.e., appropriate follow up surveys, monitoring schedules, construction, and noise barriers/buffers, etc.) would be prepared and include proposed measures to be implemented to ensure that take of birds or eggs or disturbance of breeding activities is avoided. The report or mitigation plan would be submitted for review and approval.

3. The qualified biological monitor would attend the pre-construction meeting, discuss the Project's biological monitoring program, and arrange to perform any follow up mitigation measures and reporting such as site-specific.
4. A Worker Education Training Program should be established by the qualified biological monitor for all employees and any subcontractors to provide instruction on sensitive species identification; measures to avoid contact, disturbance, and injury; and reporting procedures in the case of dead and/or injured wildlife species.
5. Prior to commencement of construction activities, the qualified biological monitor would meet with the owner/permittee or designee and the construction crew and implement the Worker Education Training Program. This training will be repeated, as necessary, when new crew members begin work on the project.
6. Prior to construction activities, the qualified biological monitor would supervise the placement of orange construction fencing or equivalent along the limits of disturbance adjacent to sensitive biological habitats and verify compliance with any other project conditions. Appropriate steps/care should be taken to minimize attraction of nest predators to the site.

BIO-2. General Measures During Construction

1. Speed limits along all access roads and within the project site should not exceed 15 miles per hour. This is designed to prevent flat-tailed horned lizard mortality.
2. All construction (including access/staging areas) would be restricted to areas previously identified, proposed for development/staging, or previously disturbed. The qualified biological monitor would monitor construction activities as needed to ensure that construction activities do not encroach into biologically sensitive areas, or cause other similar damage, and that the work plan has been amended to accommodate any sensitive species located during the pre-construction surveys.
3. The qualified biological monitor would note/act to prevent any new disturbances to habitat, flora, and/or fauna onsite (e.g., flag plant specimens for avoidance during access). If active nests or other previously unknown sensitive resources are detected, all project activities that directly impact the resource would be delayed until species specific local, state, or federal regulations have been determined and applied by the qualified biologist.

BIO-3. General Measures Post-Construction

1. A monitoring report would be submitted to the relevant resource agencies documenting the implementation of the general measures during construction as well as any resource-specific measures such as habitat restoration, compensation, and species-specific avoidance and minimization measures.

BIO-4. General Measures During O&M

1. Speed limits along all access roads and within the project site should not exceed 15 miles per hour. Access for O&M activities would be kept to the minimum necessary for operations. This limited access is designed to prevent flat-tailed horned lizard mortality.
2. A worker education program should be presented to all employees conducting O&M to inform staff of resource protection measures in place. This should be presented to any new employees.

5.2 Mitigation and Monitoring Recommendations for Sensitive Vegetation Communities

The following measure is proposed to fulfill habitat-based mitigation requirements for impacts to mesquite thicket, a sensitive vegetation community:

BIO-5. Habitat-based Mitigation

The mitigation for impacts to 0.24 acre of mesquite thicket on the project site would be accomplished as part of the land used to mitigate impacts to sensitive wildlife species presented in mitigation measure BIO-8. It is anticipated that these lands would also contain enough mesquite thicket area that would be preserved as part of this mitigation effort.

5.3 Mitigation and Monitoring Recommendations for Sensitive Wildlife Species

Additional species-specific recommended measures to avoid, minimize, and/or mitigate significant Project impacts to sensitive wildlife species are provided in this section.

5.3.1 Mitigation and Monitoring Recommendations for Flat-tailed Horned Lizard and Great Basin Whiptail

The following measures are recommended to mitigate for direct and indirect impacts to flat-tailed horned lizard and its habitat. It is assumed that these same measures would also mitigate the direct and indirect impacts to the Great Basin whiptail lizard. Implementation of mitigation measure BIO-4 described above, including enforcement of speed limits and implementing the worker education program, would minimize impacts during O&M activities.

BIO-6. Flat-tailed Horned Lizard Measures Prior to Construction

In accordance with the Flat-tailed Horned Lizard Rangewide Management Strategy (ICC 2003), the measures proposed below are designed to avoid, minimize, and/or compensate for potential direct and indirect effects construction may have on flat-tailed horned lizard, also including the great Basin

whiptail lizard. The following construction measures would be implemented, when conducting construction activities within the creosote bush scrub vegetation:

1. Prior to ground-disturbing activities, an individual would be designated and approved by the wildlife regulatory agencies (e.g., CDFW, BLM) as a qualified biological monitor (i.e., field contact representative). Only persons authorized by CDFW (in California) shall conduct surveys and handle flat-tailed horned lizards. Investigators shall have experience in surveying for flat-tailed horned lizards, including ability to recognize and follow flat-tailed horned lizard tracks, or shall obtain training from an experienced investigator. Prior to any survey or monitoring effort, a proposal shall be developed and approved by CDFW (in California), and/or by the state or federal agency that manages the lands to be surveyed. The qualified biological monitor would be designated for the period during which on-going construction and post-construction monitoring and reporting by an approved biologist is required, such as annual reporting on habitat restoration. Each successive qualified biological monitor would be approved by the wildlife regulatory agencies. The qualified biological monitor would have the authority to ensure compliance with the conservation measures for the flat-tailed horned lizard and would be the primary agency contact for the implementation of these measures. The qualified biological monitor would have the authority and responsibility to halt activities that are in violation of the conservation measures. A detailed list of responsibilities for the qualified biologist is summarized:
2. The qualified biological monitor shall notify the wildlife regulatory agencies at least 14 calendar days before initiating ground-disturbing activities.
3. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) would be delineated with stakes and flagging prior to construction activities. Spoils would be stockpiled in disturbed areas lacking native vegetation or where habitat quality is poor. To the extent possible, disturbance of shrubs and surface soils due to stockpiling would be minimized. All disturbances, vehicles, and equipment would be confined to the flagged areas. To the extent possible, surface disturbance would be timed to minimize mortality to flat-tailed horned lizard.
4. Prior to project initiation, a worker education program would be developed and implemented by the qualified biological monitor and would be available in both English and Spanish. Wallet-sized cards summarizing this information would be provided to all construction, operation, and maintenance personnel. The education program would include the following aspects:
 - Biology and status of the flat-tailed horned lizard,
 - Protection measures designed to reduce potential impacts to the species,
 - Function of flagging designating authorized work areas,
 - Reporting procedures to be used if a flat-tailed horned lizard or Great Basin whiptail lizard is encountered in the field, and
 - Driving procedures and techniques, for commuting, and driving on, to the Project site, to reduce mortality of flat-tailed horned lizard on roads.

BIO-7. Flat-tailed Horned Lizard Measures During Construction

1. The qualified biological monitor would have the authority and responsibility to halt activities that are in violation of the conservation measures. A detailed list of responsibilities for the monitor during construction is summarized:
 - Be present during construction (e.g., grubbing, grading, facility installation) activities that take place in flat-tailed horned lizard habitat to avoid or minimize take of flat-tailed horned lizard or Great Basin whiptail lizard. Activities include, but are not limited to, ensuring compliance with all impact avoidance and minimization measures, monitoring for flat-tailed horned lizards/Great Basin whiptail lizards and removing lizards from harm's way, and checking avoidance areas (e.g., washes) to ensure that signs, and stakes are intact and that human activities are restricted in these avoidance zones.
 - At the end of each workday, inspect all potential wildlife pitfalls (trenches, bores and other excavations) for wildlife and then ensure that each feature is either backfilled or completely and securely covered to prevent wildlife access.
 - Immediately notify the wildlife regulatory agencies in writing, if the Project applicant is not in compliance with any conservation measures, including but not limited to any actual or anticipated failure to implement conservation measures within the time periods specified.
 - During construction, examine areas of active surface disturbance periodically, at least hourly, when surface temperatures exceed 29 degrees Celsius (°C; 85°degrees Fahrenheit [°F]) for the presence of flat-tailed horned lizard.
2. Flat-tailed horned lizards and Great Basin whiptails would be removed from harm's way during all construction activities. Flat-tailed horned lizard removal would be conducted by two or more biological monitors when construction activities are being conducted in suitable habitat. To the extent feasible, methods to find flat-tailed horned lizards would be designed to achieve a maximal capture rate and would include, but not be limited to using strip transects, tracking, and raking around shrubs. During construction, the minimum survey effort would be 30 minutes per 0.40 hectare (30 minutes per 1 acre). Persons that handle flat-tailed horned lizards would first obtain all necessary permits and authorization from the CDFG. Flat-tailed horned lizard removal surveys would also include:
 - A Horned Lizard Observation Data Sheet and a Project Reporting Form, per Appendix 8 of the Rangewide Management Strategy, would be completed. During construction, quarterly reports describing flat-tailed horned lizards removal activity would be submitted to the wildlife regulatory agencies.
3. The removal of flat-tailed horned lizard or Great Basin whiptail out of harm's way would include relocation to nearby suitable habitat in low-impact areas of the West Mesa Management Area, which is located to the west of the project site. Relocated flat-tailed horned lizards/Great Basin whiptails would be placed in the shade of a large shrub in an undisturbed habitat. If surface temperatures in the sun are less than 24°C (75°F) or exceed 38°C (100°F), the designated biologist or biological monitor, if authorized, would hold the flat-tailed horned lizard/Great Basin whiptail lizard for later release. Initially, captured flat-

tailed horned lizards/Great Basin whiptail lizards would be held in a cloth bag, cooler, or other appropriate clean, dry container from which the lizard cannot escape. Lizards would be held at temperatures between 75°F and 90°F and would not be exposed to direct sunlight. Release would occur as soon as possible after capture and during daylight hours. The designated biologist or biological monitor would be allowed some judgment and discretion when relocating lizards to maximize survival of flat-tailed horned lizards/Great Basin whiptails found in the project site.

4. To the maximum extent practicable, grading in flat-tailed horned lizard/Great Basin whiptail habitat would be conducted during the active season, which is defined as March 1 through September 30, or when ground temperatures are between 24°C (75°F) and 38°C (100°F). If grading cannot be conducted during this time, any flat-tailed horned lizards/Great Basin whiptails found would be removed to low-impact areas (see above) where suitable burrowing habitat exists, (e.g., sandy substrates and shrub cover).

BIO-8. Flat-tailed Horned Lizard Compensation

Pursuant to Title 43 CFR and the Federal Land Policy and Management Act of 1976, federal land management agencies may permit actions that result in flat-tailed horned lizard habitat loss on their lands; however, for losses both within and outside the management areas, compensation is charged if residual effects would occur after all reasonable on-site mitigation has been applied. The goal of compensation is to prevent the net loss of flat-tailed horned lizard habitat and make the net effect of a project neutral or positive to flat-tailed horned lizards by maintaining a habitat base for flat-tailed horned lizards. To achieve this goal, compensation will be based on the acreage of flat-tailed horned lizard habitat lost after all reasonable on-site mitigation has been applied at a 1:1 ratio for habitat lost outside and a minimum ratio of 3:1 for habitat lost within a flat-tailed horned lizard management area. For the current project, compensation for a loss of 1,316.62 acres of flat-tailed horned lizard habitat would total 1,897.78 acres (Table 8).

Table 8 Mitigation Requirement for Flat-tailed Horned Lizard			
Impact to Creosote Bush Scrub Habitat	Direct Impact (acres)	Mitigation Ratio	Mitigation Requirement (acres)
Outside WMMA*	1,017.04	1:1	1,017.04
Inside WMMA	293.58	3:1**	880.74
TOTAL	1,316.62		1,897.78
*WMMA – West Mesa Management Area for Flat-tailed Horned Lizard			
**Minimum mitigation ratio for impacts inside a management area.			

Implementation of the mitigation and monitoring measures listed above would reduce impacts to flat-tailed horned lizard and Great Basin whiptail to a level of less than significant.

5.3.2 Mitigation and Monitoring Recommendations for Burrowing Owl

The following measures are recommended to mitigate potential direct and indirect impacts to burrowing owl and its habitat. Implementation of mitigation measure BIO-4 described above, including enforcement of speed limits and implementing the worker education program, would minimize impacts during O&M activities. Implementation of mitigation measure BIO-8 would also compensate for habitat loss for the burrowing owl.

BIO-9. Recommended Burrowing Owl Measures

1. Initial grading should take place between September 1 and January 31 to avoid impact to breeding burrowing owls (CDFW 2012). If construction is to begin during the breeding season, it is recommended that the measures below be implemented prior to February 1 to discourage the nesting of the burrowing owls within the area of impact. As construction continues, any area where owls are sighted should be subject to frequent surveys for burrows before the breeding season begins, so that owls can be relocated before nesting occurs.
2. Pre-construction surveys would be conducted for burrowing owls prior to the commencement of construction activities. The surveys would conform to the survey protocol in the CDFW 2012 Staff Report. No more than 14 days prior to any ground-disturbing activities, a Qualified Biologist would conduct a take avoidance survey for burrowing owls. If no owls are found during this first survey, a final survey would be conducted 24 hours prior to ground disturbance to confirm that burrowing owls are absent.
3. If burrowing owls are found on the site during the surveys, any potentially impacted burrowing owl individuals must be relocated out of the impact area using passive or active methodologies approved by the resource agencies. A Burrow Exclusion Plan would be prepared according to the 2012 CDFW guidelines and approved by CDFW. The Burrow Exclusion Plan may include the use of artificial burrows as a means of replacing burrows lost to impacts.
4. A biologist familiar with burrowing owl biology would monitor construction activities to make sure that burrowing owls that may move into the area during construction are detected and impacts are avoided.

Implementation of the mitigation and monitoring measures listed above would reduce impacts to burrowing owl to a level of less than significant.

5.3.3 Mitigation and Monitoring Recommendations for Nesting Birds

Implementation of mitigation measure BIO 1 is expected to avoid direct impacts to nesting birds. Implementation of these mitigation and monitoring measures and other species-specific measures discussed above would reduce impacts to nesting birds to a level of less than significant.

5.4 Mitigation and Monitoring Recommendations for Jurisdictional Wetlands and Waters

The project has the potential to impact an estimated total of 37.92 acres of federal waters of the U.S. and waters of the state. Mitigation for these impacts would be achieved through one or a combination, of the following methods: (1) the purchase of credits from an established and approved mitigation bank at a 1:1 ratio (i.e., 60 one-acre credits); (2) a fee payment to an approved in-lieu fee program, the amount of which to be determined by the particular program used; and/or (3) permittee responsible mitigation through the establishment of streambeds either on-site or at an off-site location at a minimum ratio of 1:1 (i.e., 37.92 acres).

Impact to waters of the U.S. on-site would require a permit under Section 404 CWA from USACE and a Section 401 state water quality certification from RWQCB. In addition, a Section 1600 Streambed Alteration Agreement would also need to be authorized for impact to CDFW resources. Final mitigation ratios would be determined at that time.

Implementation of the mitigation measures listed above and contained within the permit authorizations to be issued at a later date would reduce impacts to jurisdictional waters to a level of less than significant.

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ATTACHMENTS

ATTACHMENT 1

Plant Species Observed

Attachment 1 Plant Species Observed			
Major Plant Group	Family	Scientific Name / Common Name	Origin
Angiosperms: Eudicots	Asteraceae / Sunflower Family	<i>Ambrosia dumosa</i> / white bur-sage, burro-weed	N
		<i>Isocoma acradenia</i> var. <i>eremophila</i> / desert alkali goldenbush	N
		<i>Stephanomeria pauciflora</i> / wire-lettuce	N
		<i>Palafoxia arida</i> / Spanish needle	N
	Boraginaceae / Borage Family	<i>Cryptantha</i> sp. / cryptantha	N
	Brassicaceae (Cruciferae) / Mustard Family	<i>Brassica tournefortii</i> / Sahara mustard	I
		<i>Lepidium</i> sp. / peppergrass	N
	Chenopodiaceae / Goosefoot Family	<i>Atriplex hymenelytra</i> / desert holly	N
		<i>Atriplex polycarpa</i> / allscale saltbush	N
	Euphorbiaceae / Spurge Family	<i>Stillingia linearifolia</i> / linear-leaf stillingia	I
		<i>Euphorbia</i> sp. / sandmat	N
	Fabaceae (Leguminosae) / Legume Family	<i>Dalea mollissima</i> / downy dalea, silky dalea, soft prairie clover	N
		<i>Prosopis glandulosa</i> var. <i>torreyana</i> / honey mesquite	N
		<i>Psoralea arguta</i> / dyebush, Emory's indigobush	N
	Nyctaginaceae / Four O'clock Family	<i>Abronia villosa</i> / desert sand verbena	N
	Onagraceae / Evening-Primrose Family	<i>Camissoniopsis</i> sp. [= <i>Camissonia</i> sp.] / sun cup	N
		<i>Chylismia claviformis</i> / clavate fruited primrose	N
	Orobanchaceae / Broom-Rape Family	<i>Orobanche cooperi</i> / Cooper's broom-rape, desert broom-rape	N
	Plantaginaceae / Plantain Family	<i>Plantago ovata</i> / desert plantain	N
	Resedaceae / Mignonette Family	<i>Oligomeris linifolia</i> / narrow-leaf oligomeris	I
	Tamaricaceae / Tamarisk Family	<i>Tamarix ramosissima</i> / saltcedar	I
	Zygophyllaceae / Caltrop Family	<i>Larrea tridentata</i> / creosote bush	N
Angiosperms: Monocots	Poaceae (Gramineae) / Grass Family	<i>Aristida Aristida adscensionis</i> / six weeks three-awn	N
Gnetales	Ephedraceae / Ephedra Family	<i>Ephedra</i> sp. / ephedra, Mormon tea	N
	Ehretiaceae / Ehretia Family	<i>Tiquilia palmeri</i> / Palmer's tiquilia	N
ORIGIN N =Native to locality. I = Introduced species from outside locality.			

ATTACHMENT 2

Wildlife Species Observed

Attachment 2
Wildlife Species Observed

Major Wildlife Group	Family	Scientific / Common Name	Origin
Reptiles	Crotaphytidae / Collared and Leopard Lizards	<i>Gambelia wislizenii</i> / long-nosed leopard lizard	N
	Phrynosomatidae / Spiny Lizards	<i>Uta stansburiana elegans</i> / western side-blotched lizard	N
		<i>Callisaurus draconoides rhodostictus</i> / western zebra-tailed lizard	N
	Teiidae / Whiptail Lizards	<i>Aspidoscelis tigris tigris</i> / Great Basin whiptail	N
	Crotalidae / Rattlesnakes	<i>Crotalus cerastes laterorepens</i> / Colorado Desert sidewinder	N
	Iguanidae / Iguanas	<i>Dipsosaurus dorsalis</i> / desert iguana	N
Mammals	Leporidae / Rabbits & Hares	<i>Lepus californicus deserticola</i> / desert black-tailed jackrabbit	N
	Canidae / Canids	<i>Canis latrans</i> / coyote	N
Invertebrates	Apidae / Honey Bees, Bumble Bees, and Allies	<i>Apis mellifera</i> / honey bee	I
	Lycaenidae / Blues, Coppers, & Hairstreaks	<i>Polyommata</i> sp. / blue	N
	Nymphalidae / Brush-footed Butterflies	<i>Argynnis</i> sp. / fritillary	N
		<i>Vanessa cardui</i> / painted lady	N
Birds	Cathartidae / New World Vultures	<i>Cathartes aura</i> / turkey vulture	N
	Scolopacidae / Sandpipers & Phalaropes	<i>Arenaria interpres</i> / black turnstone	N
	Columbidae / Pigeons & Doves	<i>Zenaida macroura</i> / mourning dove	N
	STRIGIDAE / TYPICAL OWLS	<i>Athene cunicularia</i> / burrowing owl	N
	Caprimulgidae / Goatsuckers	<i>Chordeiles acutipennis</i> / lesser nighthawk	N
	Tyrannidae / Tyrant Flycatchers	<i>Myiarchus cinerascens</i> / ash-throated flycatcher	N
		<i>Sayornis saya</i> / Say's phoebe	N
		<i>Tyrannus verticalis</i> / western kingbird	N
	Laniidae / Shrikes	<i>Lanius ludovicianus</i> / loggerhead shrike	N
	Corvidae / Crows, Jays, & Magpies	<i>Corvus corax</i> / common raven	N
	Alaudidae / Larks	<i>Eremophila alpestris actia</i> / California horned lark	N
	Hirundinidae / Swallows	<i>Hirundo rustica</i> / barn swallow	N
		<i>Petrochelidon pyrrhonota</i> / cliff swallow	N
		<i>Stelgidopteryx serripennis</i> / northern rough-winged swallow	N
	Remizidae / Verdin	<i>Auriparus flaviceps</i> / verdin	N
	Polioptilidae / Gnatcatchers	<i>Polioptila melanura</i> / black-tailed gnatcatcher	N

Attachment 2
Wildlife Species Observed

Major Wildlife Group	Family	Scientific / Common Name	Origin
Birds (cont.)	Parulidae / Wood Warblers	<i>Setophaga</i> [=Dendroica] <i>coronata</i> / yellow-rumped warbler	N
		<i>Cardellina</i> [=Wilsonia] <i>pusilla</i> / Wilson's warbler	N
		<i>Geothlypis</i> [=Oporornis] <i>tolmiei</i> / MacGillivray's warbler	N
		<i>Leiothlypis</i> [=Vermivora, Oreothlypis] <i>celata</i> / orange-crowned warbler	N
		<i>Leiothlypis</i> [=Vermivora, Oreothlypis] <i>ruficapilla</i> / Nashville warbler	N
		<i>Setophaga</i> [=Dendroica] <i>nigrescens</i> / black-throated gray warbler	N
		<i>Setophaga</i> [=Dendroica] <i>townsendi</i> / Townsend's warbler	N
	Passerellidae / New World Passerines	<i>Spizella breweri</i> / Brewer's sparrow	N
	Cardinalidae / Cardinals & Grosbeaks	<i>Passerina amoena</i> / lazuli bunting	N
	Icteridae / Blackbirds & New World Orioles	<i>Euphagus cyanocephalus</i> / Brewer's blackbird	N
	Fringillidae / Finches	<i>Haemorhous</i> [=Carpodacus] <i>mexicanus</i> / house finch	N

ORIGIN

N =Native to locality.

I = Introduced species from outside locality.

ATTACHMENT 3

Virgo Solar PV Burrowing Owl Habitat Assessment



An Employee-Owned Company

February 5, 2025

Mr. Ramon Gonzalez
Z Global
750 West Main Street
El Centro, CA 92243

Reference: Virgo Solar PV Burrowing Owl Habitat Assessment (RECON Number 10317)

Dear Mr. Gonzalez:

This letter summarizes the results of the burrowing owl (*Athene cunicularia*) habitat assessment for the Virgo Solar PV Project (project) located in unincorporated Imperial County, California (Figures 1 and 2). The project boundary consists of assessor parcel numbers 019-110-010, 034-010-006, 034-010-023, 019-120-001, 019-120-004, 019-120-005, 019-120-006, 019-120-007, 019-130-001, 019-130-007, 019-130-009, 019-050-018, 019-070-020, 019-100-003, 019-110-012, 019-110-002, 019-110-011, 019-120-002, and 019-110-016, 019-160-091, located in Sections 1, 11, and 35 of the U.S. Geological Survey (USGS) Kane Spring quadrangle, Townships 12 and 13 South, Range 11 East (USGS 1992; see Figure 2).

RECON Environmental, Inc. (RECON) biologists conducted the survey in accordance with the guidelines developed by the California Department of Fish and Wildlife (CDFW) Staff Report on Burrowing Owl Mitigation (CDFW 2012). The habitat assessment was conducted to determine the likelihood of this species occurring within the project boundary. Two burrowing owl individuals were detected within the project boundary in addition to several suitable unoccupied burrows within the project boundary and 500-foot buffer. A discussion of the results of the survey conducted is provided below.

SURVEY METHODS

RECON biologists Alex Fromer, Andrew Smisek, Chelsea Polevy, Chris Thomson, Christine Beck, Danelle Gadia, and J.R. Sundberg conducted a burrowing owl habitat assessment in accordance with the guidelines developed by the CDFW (CDFW 2012). For the purposes of this report, the "survey area" includes the project's proposed ground disturbance footprint (project boundary) and a 500-foot buffer (Figure 3). Meandering transects were walked through all suitable habitat identified within the project boundary. Suitable habitat off-site within the 500-foot buffer was evaluated visually from the project boundary using binoculars, as access to the adjacent property was not granted. Vegetation classification follows the California Native Plant Society Manual of California Vegetation (2023). Survey dates, times, and weather conditions are provided in Table 1.

Table 1 Survey Information				
Date	Survey Type	Surveyors	Beginning Conditions	Ending Conditions
4/13/2023	Burrowing Owl Habitat Assessment	A. Smisek, J. Sundberg, C. Thomson	10:50 a.m.; 76°F; 3–7 mph; 15% cc	5:40 p.m.; 81°F; 9–15 mph; 5% cc
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4/17/2023	Burrowing Owl Habitat Assessment	C. Beck, C. Polevy, C. Thomson	10:35 a.m.; 73°F; 3–7 mph; 0% cc	2:25 p.m.; 85°F; 5–9 mph; 0% cc
4/18/2023	Burrowing Owl Habitat Assessment	C. Beck, C. Polevy, C. Thomson	6:35 a.m.; 63°F; 8–13 mph; 10% cc	12:50 p.m.; 79°F; 3–6 mph; 30% cc
4/19/2023	Burrowing Owl Habitat Assessment	C. Beck, C. Polevy, C. Thomson	6:25 a.m.; 62°F; 2–5 mph; 0% cc	10:05 a.m.; 75°F; 3–6 mph; 0% cc
11/4/2024	Burrowing Owl Habitat Assessment	A. Fromer, J. Sundberg, C. Polevy, D. Gadia	9:30 a.m.; 77°F; 8–10 mph; 0% cc	3:30 p.m.; 82°F; 3–6 mph; 0% cc
11/5/2024	Burrowing Owl Habitat Assessment	A. Fromer, J. Sundberg, C. Polevy, D. Gadia	8:15 a.m.; 68°F; 0–1 mph; 5% cc	2:00 p.m.; 73°F; 2–4 mph; 10% cc
11/6/2024	Burrowing Owl Habitat Assessment	A. Fromer, J. Sundberg, C. Polevy, D. Gadia	9:00 a.m.; 68°F; 10–15 mph; 5% cc	2:00 p.m.; 72°F; 2–5 mph; 0% cc
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°F = degrees Fahrenheit; mph = miles per hour; % = percent; cc = cloud cover.				

HABITAT ASSESSMENT RESULTS

Existing Conditions

The project boundary consists of undeveloped desert open space and a paved road and is located approximately 0.5 mile southwest of State Route 78/State Route 86 in unincorporated Imperial County (see Figure 1). The project boundary is immediately surrounded by undeveloped desert open space in all directions, with State Route 78/State Route 86 and agricultural fields to the north. Elevations within the project boundary range from -178 to 70 feet above mean sea level.

Potential Burrowing Owl Habitat

The project boundary supports four vegetation community/land cover types: *Larrea tridentata* shrubland alliance, *Prosopis glandulosa* woodland alliance, *Tamarix ramosissima* shrubland semi-natural alliance, and developed land (see Figure 3). *Larrea tridentata* shrubland alliance and *Prosopis glandulosa* woodland alliance have some potential to support burrowing owl due to the presence of suitable unoccupied burrows and areas of low-lying and sparse vegetation. Suitable unoccupied burrows are characterized as unoccupied burrows of appropriate size (e.g., greater than 4 inches diameter) and structure (e.g., unvegetated or sparsely vegetated, ramped tunnel) to support burrowing owl, with no sign or direct observations of burrowing owl within 100 feet. In addition, several suitable unoccupied burrows contained burrowing owl sign but no direct observations of burrowing owl within 100 feet. Two burrowing owl individuals, and their associated occupied burrows, were identified within the survey area (see Figure 3).

Larrea tridentata shrubland alliance consists of land dominated by creosote bush (*Larrea tridentata*) and bare ground, with sparse intermixed shrubs including white bur-sage (*Ambrosia dumosa*) and longleaf ephedra (*Ephedra trifurca*) (Photographs 1 through 3). Suitable occupied and unoccupied burrows were observed sparsely scattered within the survey area. Suitable burrows were found where soils were loose enough to support burrowing animals and where

rock formations and erosional features occurred that contained suitable structures and cavities (Photographs 4 through 6).

Prosopis glandulosa woodland alliance consists of small, mounded patches of dense screwbean mesquite (*Prosopis glandulosa*). Mounded soils within this vegetation community are generally loose and appropriate for burrowing animals. Suitable unoccupied burrows were observed within this vegetation community at the base of mesquite shrubs (see Photograph 1; Photograph 7). However, no burrowing owl or sign were noted within this vegetation community during the survey.

Tamarix ramosissima shrubland semi-natural alliance consists of patches of saltcedar (*Tamarix ramosissima*) shrubs and trees, with bare sandy soils, within a large drainage channel. Sparse intermixed herbs and shrubs including creosote bush, white bur-sage, and desert plantain (*Plantago ovata*) are also present within this vegetation community. No suitable burrows, burrowing owl, or sign were observed within this vegetation community.

Developed land within the survey area consists of an unnamed paved road and a small portion of State Route 78/ State Route 86. These areas contained no vegetation and no suitable burrows were observed along any portions of the roads (Photograph 8).

The 500-foot buffer contains similar *Larrea tridentata* shrubland alliance, *Prosopis glandulosa* woodland alliance, and *Tamarix ramosissima* shrubland semi-natural alliance vegetation as well as developed land primarily consisting of State Route 78/State Route 86. The surrounding undeveloped desert open space to the north, south, east, and west and agricultural fields farther north have some potential to support burrowing owl due to the presence of suitable unoccupied burrows and open, low-lying vegetation. Suitable unoccupied burrows were observed along the edge of the project boundary within the survey buffer during the habitat assessment (Photographs 9 and 10); however, no burrowing owl or sign were noted.

Based on the results of the habitat assessment, burrowing owl surveys in accordance with the guidelines developed by CDFW are recommended. If you have any questions concerning the contents of this letter, please contact me at afromer@reconenvironmental.com or (619) 308-9333 extension 193.

Sincerely,



Alex Fromer

Biologist

APF:sh

REFERENCES CITED

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2012 Staff Report on Burrowing Owl Mitigation. March 7.

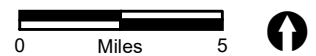
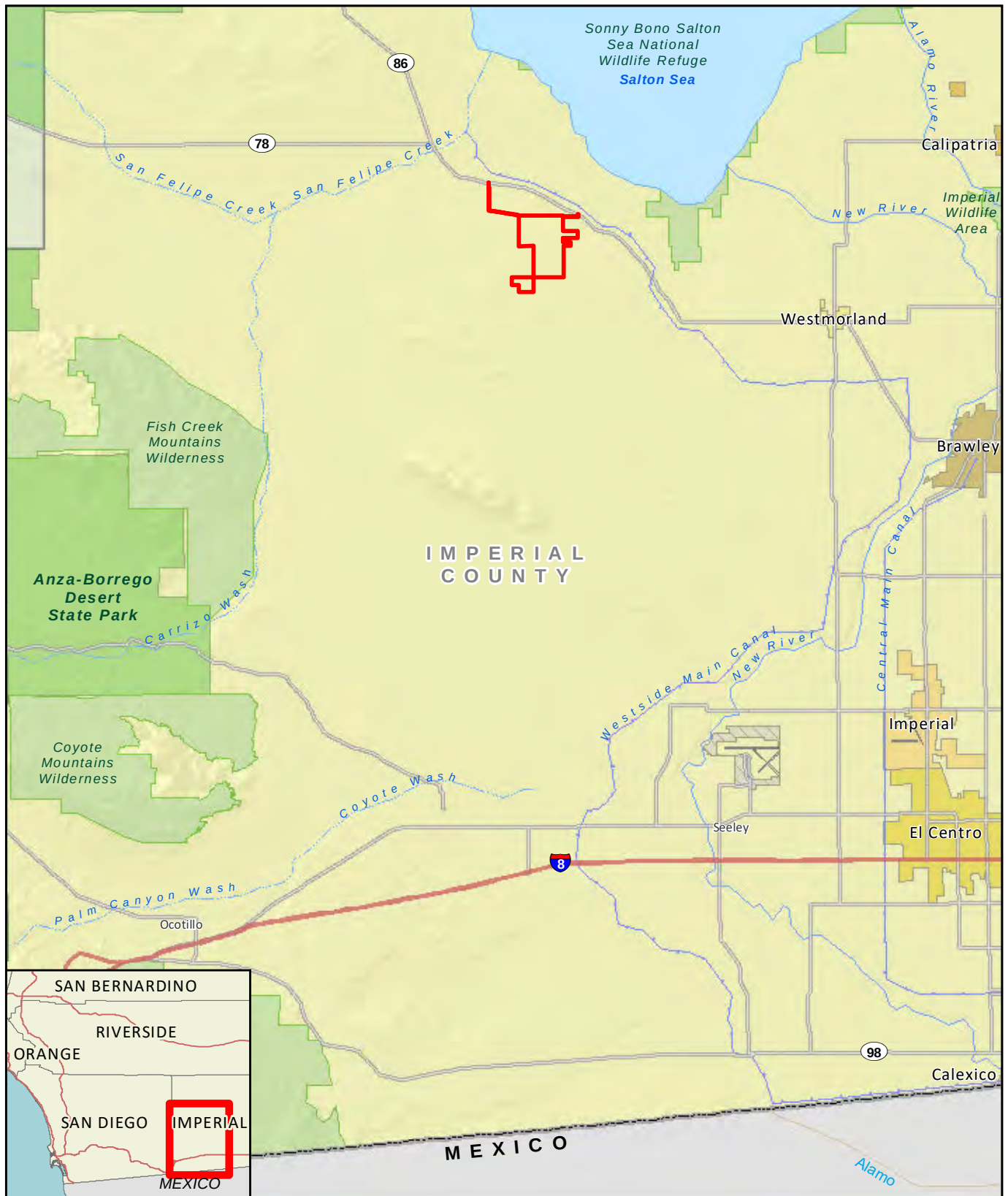
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83843&inline>.

California Native Plant Society (CNPS)

2023 *A Manual of California Vegetation*. Accessed May 19, 2023. <http://www.cnps.org/cnps/vegetation/>.

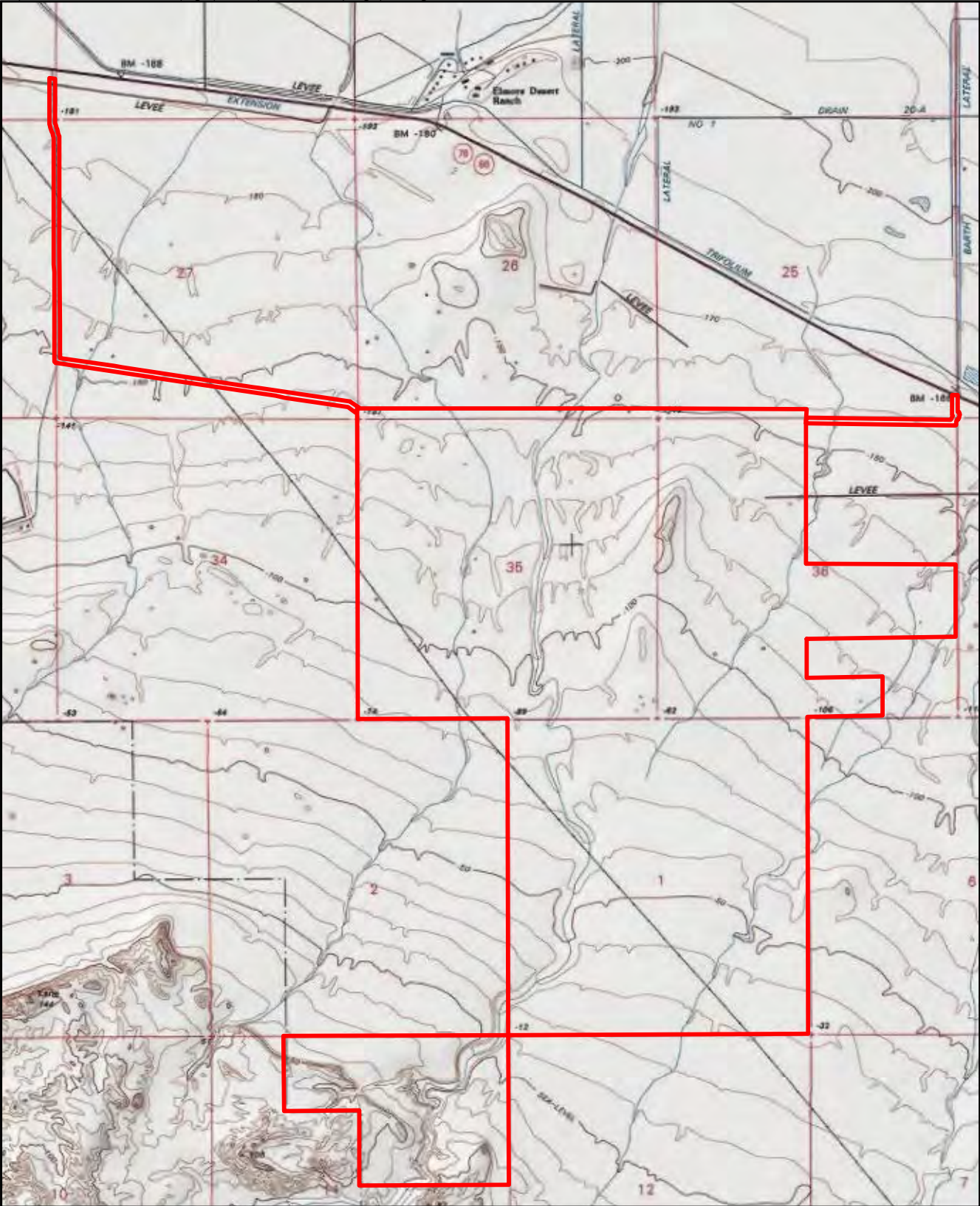
U.S. Geological Survey (USGS)

1992 Kane Spring quadrangle 7.5-minute topographic map.



Project Location

FIGURE 1
Regional Location



 Project Boundary

FIGURE 2
Project Location on USGS Map

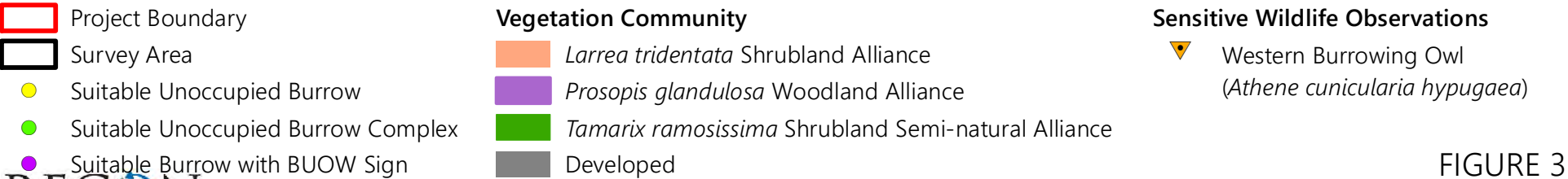
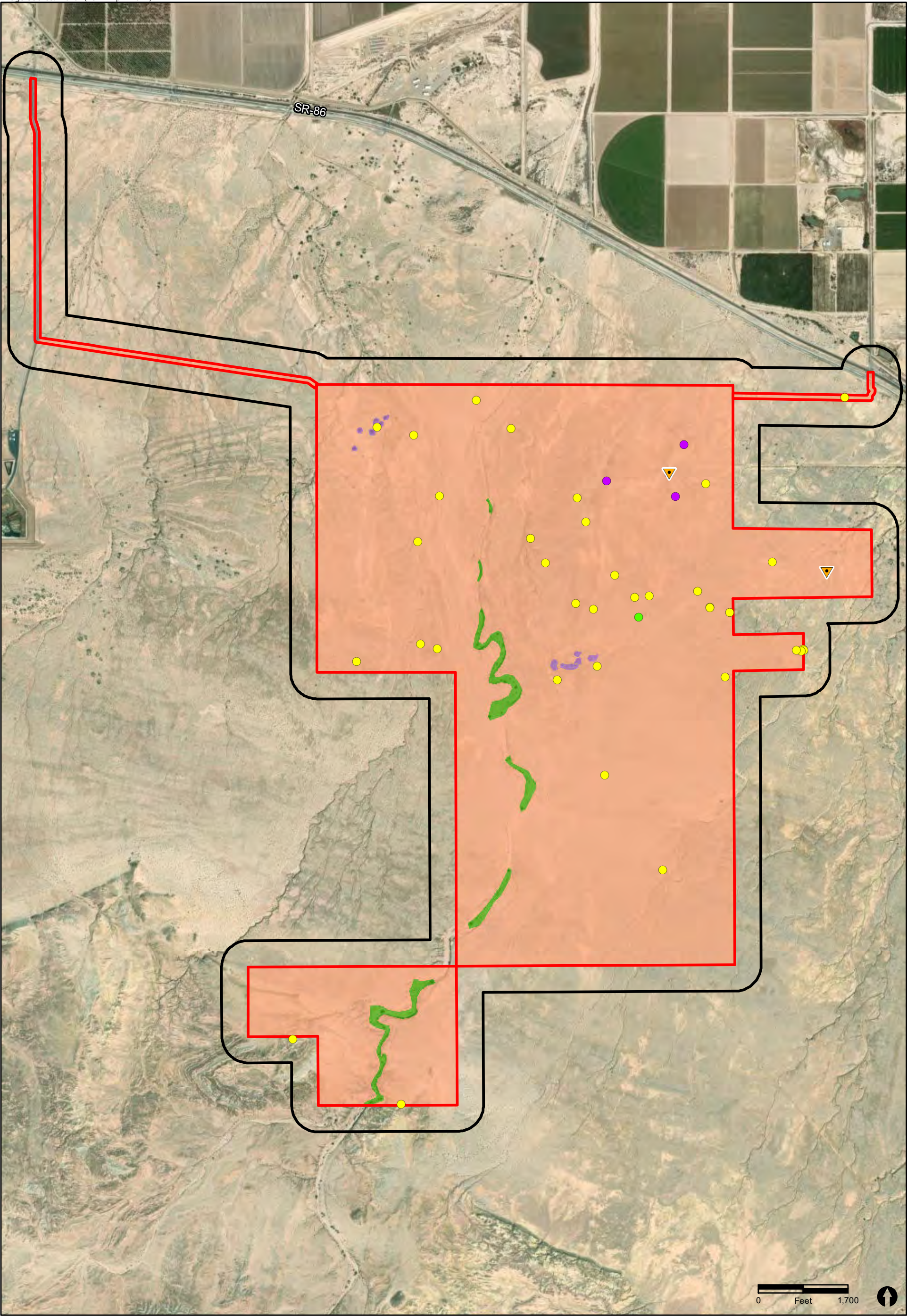


FIGURE 3
Existing Biological Resources



PHOTOGRAPH 1

View of Open *Larrea tridentata* Shrubland Alliance Habitat On-Site with *Prosopis glandulosa* Woodland Alliance Containing Suitable Unoccupied Burrows



PHOTOGRAPH 2

View of Open *Larrea tridentata* Shrubland Alliance Habitat



PHOTOGRAPH 3
View of Open *Larrea tridentata* Shrubland Alliance Habitat



PHOTOGRAPH 4
View of Suitable Unoccupied Burrow Complex



PHOTOGRAPH 5
View of Suitable Unoccupied Burrow



PHOTOGRAPH 6
View of Occupied Burrow Complex in Erosional Feature



PHOTOGRAPH 7

View of Suitable Unoccupied Burrow within *Prosopis glandulosa* Woodland Alliance



PHOTOGRAPH 8

View of Developed Land



PHOTOGRAPH 9

View of Large Suitable Unoccupied Burrow within Drainage Channel



PHOTOGRAPH 10

View of Suitable Unoccupied Burrow (Tablet Displayed for Scale)



An Employee-Owned Company

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HABITAT ASSESSMENT RESULTS

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Potential Burrowing Owl Habitat

The project boundary supports four vegetation community/land cover types: *Larrea tridentata* shrubland alliance, *Prosopis glandulosa* woodland alliance, *Tamarix ramosissima* shrubland semi-natural alliance, and developed land (see Figure 3). *Larrea tridentata* shrubland alliance and *Prosopis glandulosa* woodland alliance have some potential to support burrowing owl due to the presence of suitable unoccupied burrows and areas of low-lying and sparse vegetation. Suitable unoccupied burrows are characterized as unoccupied burrows of appropriate size (e.g., greater than 4 inches diameter) and structure (e.g., unvegetated or sparsely vegetated, ramped tunnel) to support burrowing owl, with no sign or direct observations of burrowing owl within 100 feet. In addition, several suitable unoccupied burrows contained burrowing owl sign but no direct observations of burrowing owl within 100 feet. Two burrowing owl individuals, and their associated occupied burrows, were identified within the survey area (see Figure 3).

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Prosopis glandulosa woodland alliance consists of small, mounded patches of dense screwbean mesquite (*Prosopis glandulosa*). Mounded soils within this vegetation community are generally loose and appropriate for burrowing animals. Suitable unoccupied burrows were observed within this vegetation community at the base of mesquite shrubs (see Photograph 1; Photograph 7). However, no burrowing owl or sign were noted within this vegetation community during the survey.

Tamarix ramosissima shrubland semi-natural alliance consists of patches of saltcedar (*Tamarix ramosissima*) shrubs and trees, with bare sandy soils, within a large drainage channel. Sparse intermixed herbs and shrubs including creosote bush, white bur-sage, and desert plantain (*Plantago ovata*) are also present within this vegetation community. No suitable burrows, burrowing owl, or sign were observed within this vegetation community.

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The 500-foot buffer contains similar *Larrea tridentata* shrubland alliance, *Prosopis glandulosa* woodland alliance, and *Tamarix ramosissima* shrubland semi-natural alliance vegetation as well as developed land primarily consisting of State Route 78/State Route 86. The surrounding undeveloped desert open space to the north, south, east, and west and agricultural fields farther north have some potential to support burrowing owl due to the presence of suitable unoccupied burrows and open, low-lying vegetation. Suitable unoccupied burrows were observed along the edge of the project boundary within the survey buffer during the habitat assessment (Photographs 9 and 10); however, no burrowing owl or sign were noted.

Based on the results of the habitat assessment, burrowing owl surveys in accordance with the guidelines developed by CDFW are recommended. If you have any questions concerning the contents of this letter, please contact me at afromer@reconenvironmental.com or (619) 308-9333 extension 193.

Sincerely,



Alex Fromer

Biologist

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California Department of Fish and Wildlife (CDFW)

2012 Staff Report on Burrowing Owl Mitigation. March 7.

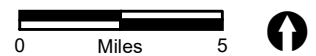
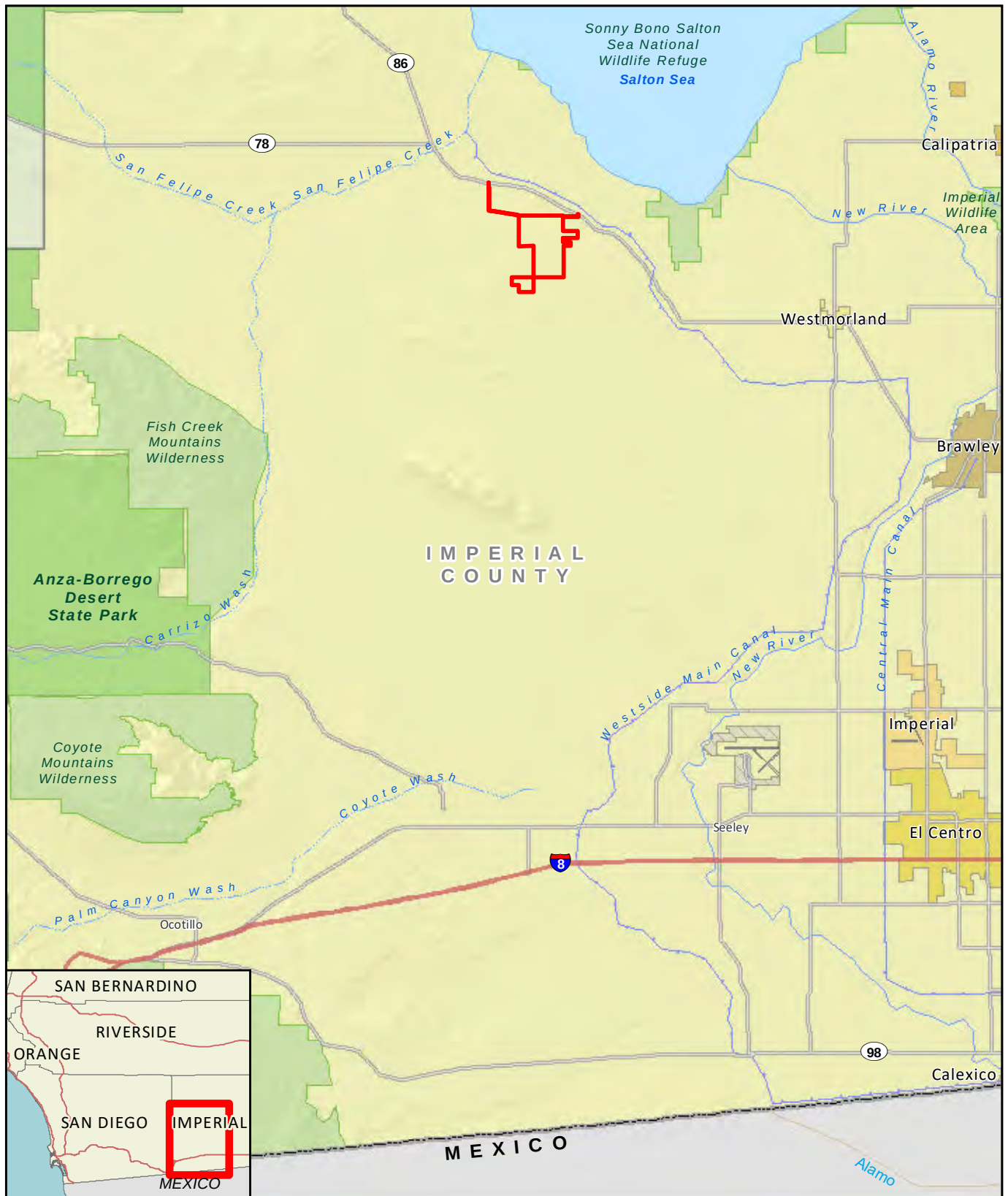
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U.S. Geological Survey (USGS)

1992 Kane Spring quadrangle 7.5-minute topographic map.



Project Location

FIGURE 1
Regional Location

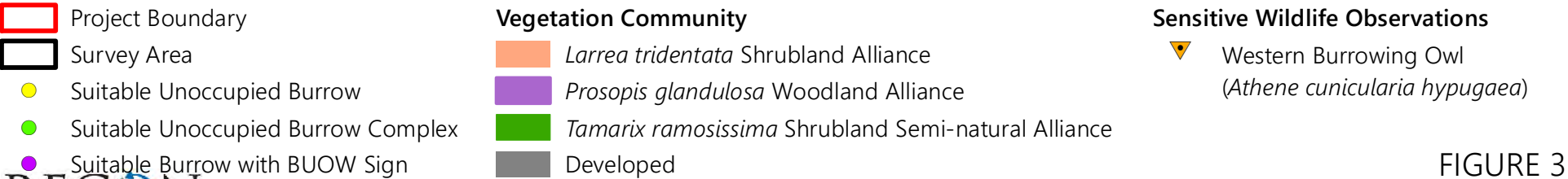
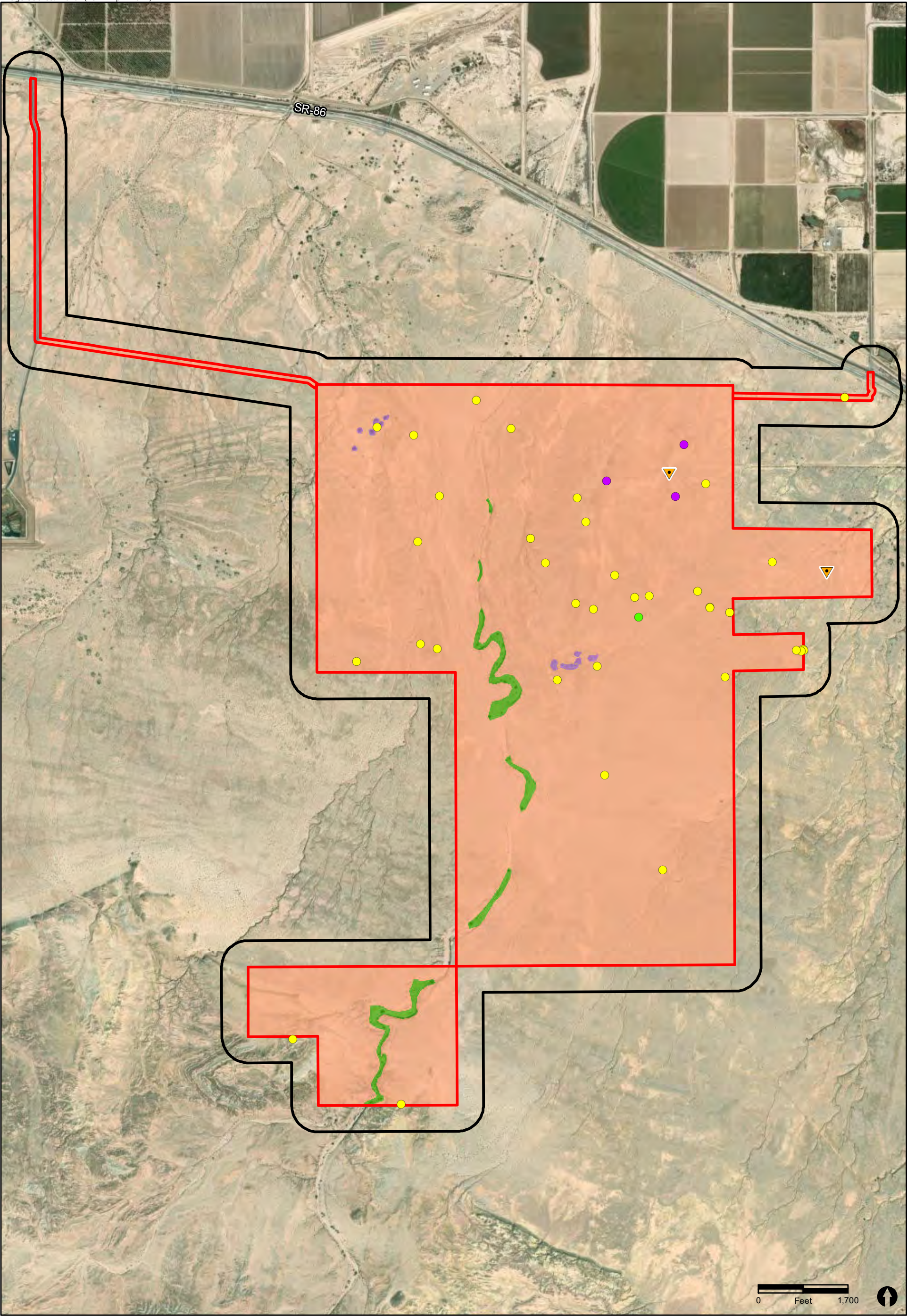


FIGURE 3
Existing Biological Resources



PHOTOGRAPH 1

View of Open *Larrea tridentata* Shrubland Alliance Habitat On-Site with *Prosopis glandulosa* Woodland Alliance Containing Suitable Unoccupied Burrows



PHOTOGRAPH 2

View of Open *Larrea tridentata* Shrubland Alliance Habitat



PHOTOGRAPH 3
View of Open *Larrea tridentata* Shrubland Alliance Habitat



PHOTOGRAPH 4
View of Suitable Unoccupied Burrow Complex



PHOTOGRAPH 5
View of Suitable Unoccupied Burrow



PHOTOGRAPH 6
View of Occupied Burrow Complex in Erosional Feature



PHOTOGRAPH 7

View of Suitable Unoccupied Burrow within *Prosopis glandulosa* Woodland Alliance



PHOTOGRAPH 8

View of Developed Land



PHOTOGRAPH 9

View of Large Suitable Unoccupied Burrow within Drainage Channel



PHOTOGRAPH 10

View of Suitable Unoccupied Burrow (Tablet Displayed for Scale)



**Greenhouse Gas Analysis for the
Virgo Solar PV Project
Imperial County, California**

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A handwritten signature in black ink that reads "Jessica Fleming".

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Acronyms and Abbreviations

2017 Scoping Plan	<i>2017 Climate Change Scoping Plan Update, the Strategy for Achieving California's 2030 Greenhouse Gas Target</i>
2022 Scoping Plan	<i>2022 Scoping Plan Update for Achieving Carbon Neutrality</i>
AB	Assembly Bill
APCD	Air Pollution Control District
AQMD	Air Quality Management District
BAU	business as usual
CalEEMod	California Emissions Estimator Model
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH ₄	methane
CO ₂	carbon dioxide
County	Imperial County
EO	Executive Order
GHG	greenhouse gas
GWP	global warming potential
ICAPCD	Imperial County Air Pollution Control District
IID	Imperial Irrigation District
IPCC	Intergovernmental Panel on Climate Change
MMT CO ₂ E	million metric tons carbon dioxide equivalent
MPO	Metropolitan Planning Organizations
MT CO ₂ E	metric tons of carbon dioxide equivalent
N ₂ O	nitrous oxide
POE	port of entry
project	Cove Apartment Homes and Lake Elsinore Technology Center Project
RPS	Renewables Portfolio Standard
SB	Senate Bill
SCAG	Southern California Association of Governments
SCS	Sustainable Communities Strategy
Scoping Plan	<i>Climate Change Scoping Plan: A Framework for Change</i>
SR-78	State Route 78
U.S. EPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

Executive Summary

This report provides the results of the greenhouse gas (GHG) emissions analysis completed for The Virgo Solar PV Project (project) located within unincorporated Imperial County, California. The project site is currently undeveloped. The project would develop approximately 1,348.77 acres of the project site with photovoltaic solar panels capable of generating up to 370 megawatts of renewable energy. The project would also develop a battery energy storage system capable of storing 800 megawatt hours of energy generated by the project solar panels. The project would also include a substation connection point to connect to an existing Imperial Irrigation District 161-kilovolt line that traverses the project boundary.

This analysis evaluates the significance of potential GHG emissions impacts that may be generated by the project in accordance with the California Environmental Quality Act (CEQA) and guidance from the Imperial County Air Pollution Control District (ICAPCD). This report evaluates the significance of potential impacts in terms of (1) the project's contribution of GHGs to cumulative statewide emissions and (2) whether the project would conflict with local and/or state regulations, plans, and policies adopted to reduce GHG emissions.

GHG emissions would be generated during construction and operation of the project. Construction activities emit GHGs primarily through the combustion of fuels in on- and off-road equipment and vehicles. Operational emissions include mobile, energy (electricity and natural gas), area (landscape maintenance equipment), water and wastewater, and solid waste sources. As calculated in this analysis, the project would result in a total emission of 419 metric tons of carbon dioxide equivalent (MT CO₂E) annually. This is less than the 90,718 MT CO₂E screening threshold. Additionally, these GHG emissions would be offset by the solar energy generated on-site. Therefore, the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and impacts would be less than significant.

Additionally, the project would support the state's goal to increase use of renewable energy. The project would serve as an integral component of the state's overarching renewable energy strategy that would reduce use of fossil fuel and associated GHG emissions by generating renewable energy, as well as by providing necessary energy storage. The project would assist the state's goal of utilizing 100 percent renewable energy by 2045, which would result in a net decrease in use of fossil fuel and GHG emissions. Therefore, the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs, and impacts would be less than significant.

1.0 Introduction

This report evaluates the significance of potential impacts associated with greenhouse gas (GHG) emissions that would be generated during construction and operation of the Virgo Solar PV Project (project).

1.1 Understanding Global Climate Change

To evaluate the incremental effect of the project on statewide GHG emissions and global climate change, it is important to have a basic understanding of the nature of the global climate change problem. Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. The earth's climate is in a state of constant flux with periodic warming and cooling cycles. Extreme periods of cooling are termed "ice ages," which may then be followed by extended periods of warmth. For most of the earth's geologic history, these periods of warming and cooling have been the result of many complicated interacting natural factors that include volcanic eruptions that spew gases and particles (dust) into the atmosphere; the amount of water, vegetation, and ice covering the earth's surface; subtle changes in the earth's orbit; and the amount of energy released by the sun (sun cycles). However, since the beginning of the Industrial Revolution around 1750, the average temperature of the earth has been increasing at a rate that is faster than can be explained by natural climate cycles alone.

With the Industrial Revolution came an increase in the combustion of carbon-based fuels such as wood, coal, oil, natural gas, and biomass. Industrial processes have also created emissions of substances not found in nature. This in turn has led to a marked increase in the emissions of gases shown to influence the world's climate. These gases, termed "greenhouse" gases, influence the amount of heat trapped in the Earth's atmosphere. Recently observed increased concentrations of GHGs in the atmosphere appear to be related to increases in human activity. Therefore, the current cycle of "global warming" is believed to be largely due to human activity. Of late, the issue of global warming, or global climate change, has arguably become the most important and widely debated environmental issue in the United States and the world. Because it is believed that the increased GHG concentrations around the world are related to human activity and the collective of human actions taking place throughout the world, it is quintessentially a global or cumulative issue.

1.2 Greenhouse Gases of Primary Concern

There are numerous GHGs, both naturally occurring and manmade. Each GHG has variable atmospheric lifetime and global warming potential (GWP). The atmospheric lifetime of the gas is the average time a molecule stays stable in the atmosphere. Most GHGs have long atmospheric lifetimes, staying in the atmosphere hundreds or thousands of years. GWP is a measure of the potential for a gas to trap heat and warm the atmosphere. Although GWP is related to its atmospheric lifetime, many other factors including chemical reactivity of the gas also influence GWP. GWP is reported as a unitless factor representing the potential for the gas to affect global climate relative to the potential of carbon dioxide (CO₂). Because CO₂ is the reference gas for establishing GWP, by definition its GWP is 1. Although methane (CH₄) has a shorter atmospheric lifetime than CO₂, it has a 100-year GWP of 28; this means that CH₄ has 28 times more effect on global warming than CO₂.

The GWP is officially defined as (U.S. Environmental Protection Agency [U.S. EPA] 2010):

The cumulative radiative forcing—both direct and indirect effects—integrated over a period of time from the emission of a unit mass of gas relative to some reference gas.

GHG emissions estimates are typically represented in terms of equivalent metric tons of CO₂ (MT CO₂E). CO₂E emissions are the product of the amount of each gas by its GWP. The effects of several GHGs may be discussed in terms of MT CO₂E and can be summed to represent the total potential of these gases to warm the global climate. Table 1 summarizes some of the most common GHGs.

Table 1 Global Warming Potentials and Atmospheric Lifetimes (years)			
Gas	Atmospheric Lifetime (years)	100-year GWP	20-year GWP
Carbon dioxide (CO ₂)	50–200	1	1
Methane (CH ₄)	12.4	25/28*	84
Nitrous oxide (N ₂ O)	121	298/265*	264
HFC-23	222	12,400	10,800
HFC-32	5.2	677	2,430
HFC-125	28.2	3,170	6,090
HFC-134a	13.4	1,300	3,710
HFC-143a	47.1	4,800	6,940
HFC-152a	1.5	138	506
HFC-227ea	38.9	3,350	5,360
HFC-236fa	242	8,060	6,940
HFC-43-10mee	16.1	1,650	4,310
CF ₄	50,000	6,630	4,880
C ₂ F ₆	10,000	11,100	8,210
C ₃ F ₈	2,600	8,900	6,640
C ₄ F ₁₀	2,600	9,200	6,870
c-C ₄ F ₈	3,200	9,540	7,110
C ₅ F ₁₂	4,100	8,550	6,350
C ₆ F ₁₄	3,100	7,910	5,890
SF ₆	3,200	23,500	17,500
SOURCE: Intergovernmental Panel on Climate Change (IPCC) 2007, 2014. *The CH ₄ and N ₂ O 100-year GWPs included in CalEEMod are 25 and 298, respectively, from the IPCC Fourth Assessment Report. All other values are from the current Fifth Assessment Report.			

It should be noted that the U.S. EPA and other organizations update the GWP values they use occasionally. This change can be due to updated scientific estimates of the energy absorption or lifetime of the gases or to changing atmospheric concentrations of GHGs that result in a change in the energy absorption of one additional ton of a gas relative to another. The GWPs shown in Table 1 are the most current. However, it should be noted that in the California Emissions Estimator Model (CalEEMod), which is the model used in this analysis to calculate emission, CH₄ has a GWP of 25 and nitrous oxide (N₂O) has a GWP of 298, consistent with the Scoping Plan.

All of the gases in Table 1 are produced by either biogenic (natural) source or anthropogenic (human) sources or both. These are the GHGs of primary concern in this analysis. CO₂ would be emitted by the project due to the combustion of fossil fuels in vehicles (including construction), from electricity generation and natural gas consumption, from water use, and from solid waste disposal. Smaller amounts of CH₄ and N₂O would be emitted from the same project operations.

2.0 Project Description

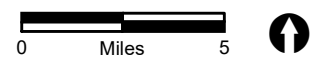
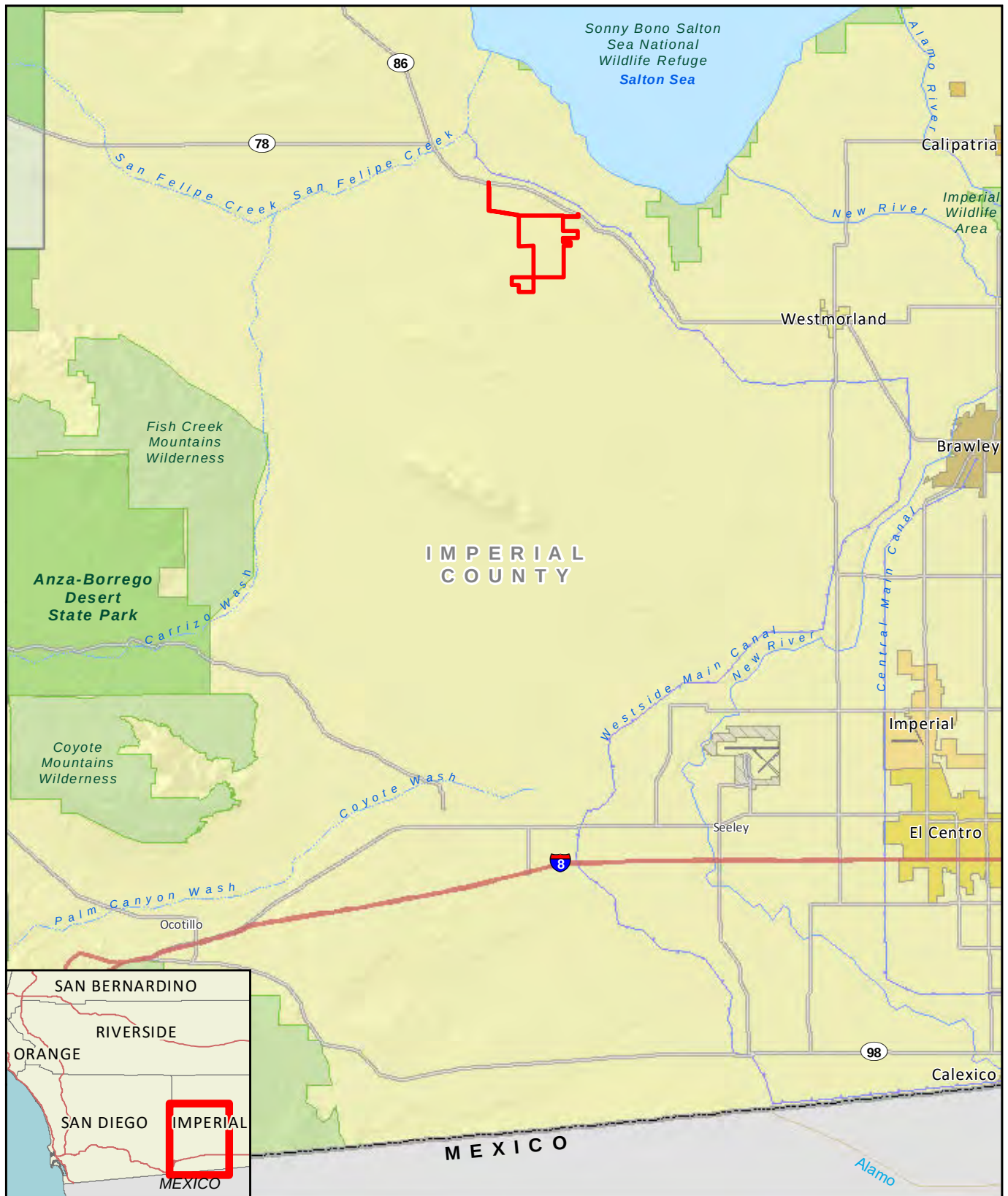
The project is located within unincorporated Imperial County, California, approximately 19 miles east of Ocotillo Wells, 10 miles west of the city of Westmorland, and approximately 5 miles south of the Salton Sea (Figure 1). The project site is approximately 1,500 feet south of State Route 86 (SR-86). The 1,964.47-acre project site consists of the following 11 parcels: assessor parcel numbers 019-110-010, 034-010-006, 034-010-023, 019-120-001, 019-120-004, 019-120-005, 019-120-006, 019-120-007, 019-130-001, 019-130-007, and 019-130-009. All 11 parcels are designated in the Imperial County (County) General Plan Land Use Maps as Recreation/Open Space and zoned as Open Space/Preservation (S-2). The project site is surrounded by undeveloped desert land. Figure 2 shows an aerial photograph of the project site and vicinity.

The project would develop approximately 1,348.77 acres of the project site with photovoltaic solar panels capable of generating up to 370 megawatts of renewable energy. The project would also develop a battery energy storage system capable of storing 800 megawatt hours of energy generated by the project solar panels. The project would also include a substation connection point to connect to an existing Imperial Irrigation District (IID) 161-kilovolt line that traverses the project boundary. The project has been designed to minimize encroachment into an existing flood zone that traverses north to south and dividing the solar panels proposed to the east and west. Access to the project site would be provided via one of the two following options:

- The 1.96-mile western access route would exit south off SR-86, utilizing a 0.94-mile paved access road for an existing CalEnergy Operating Corporation facility, followed by a 1.02-mile dirt road to be constructed heading southeast towards the project site.
- The 0.59-mile eastern access route would exit south off SR-86 at the intersection with Barth Road, followed by a dirt road to be constructed heading west towards the project site.

The alignments of both access routes would have negligible encroachment into land under the jurisdiction of the Bureau of Land Management. Figure 3 shows the proposed site plan.

Construction is anticipated to last 21 months and would consist of the following phases: grading (5 months), electrical infrastructure (5 months), structural construction (6 months), and equipment installation (5 months). Construction of the project would require a maximum of 250 daily construction works and a maximum of 7 daily truck trips.



 Project Location

FIGURE 1
Regional Location

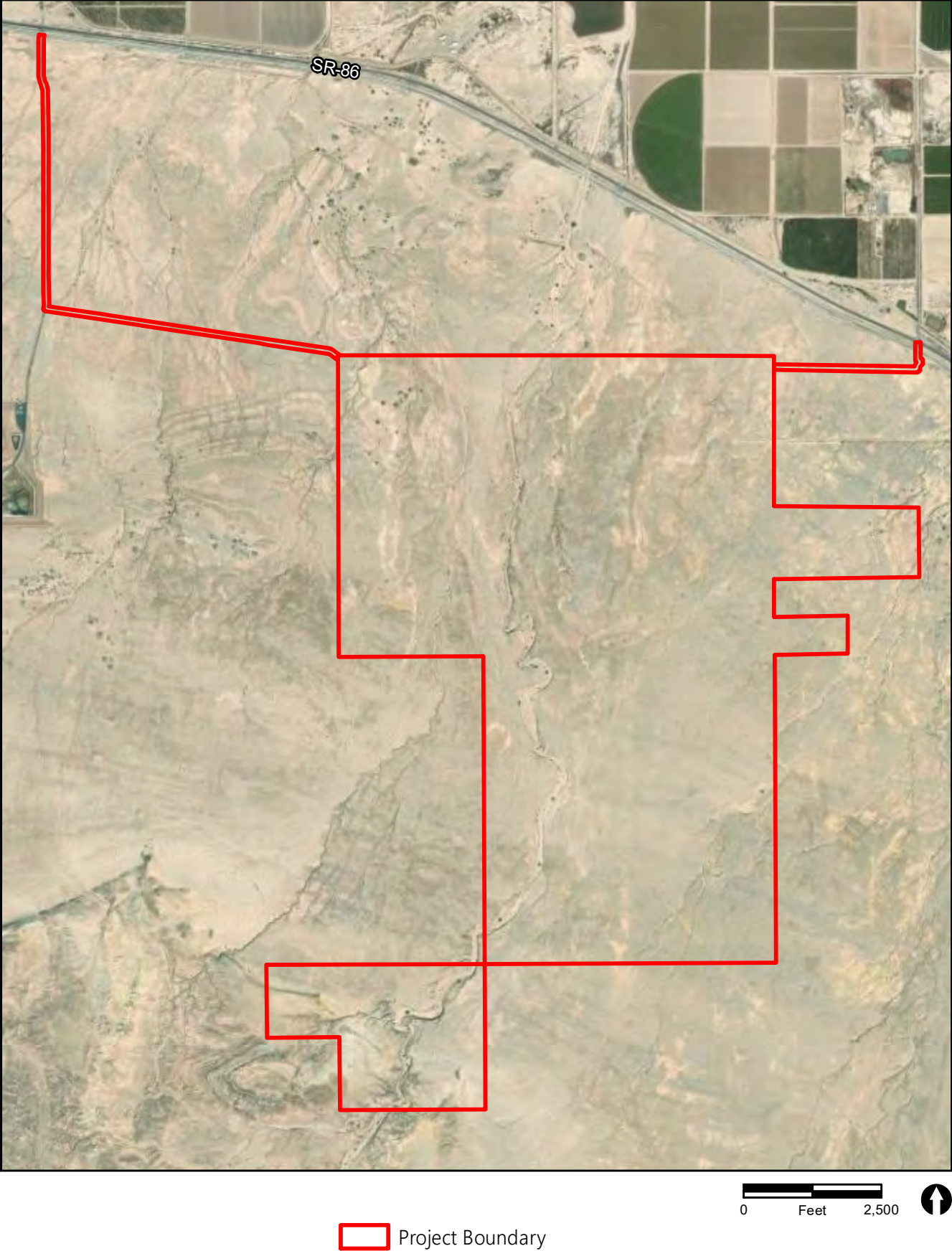
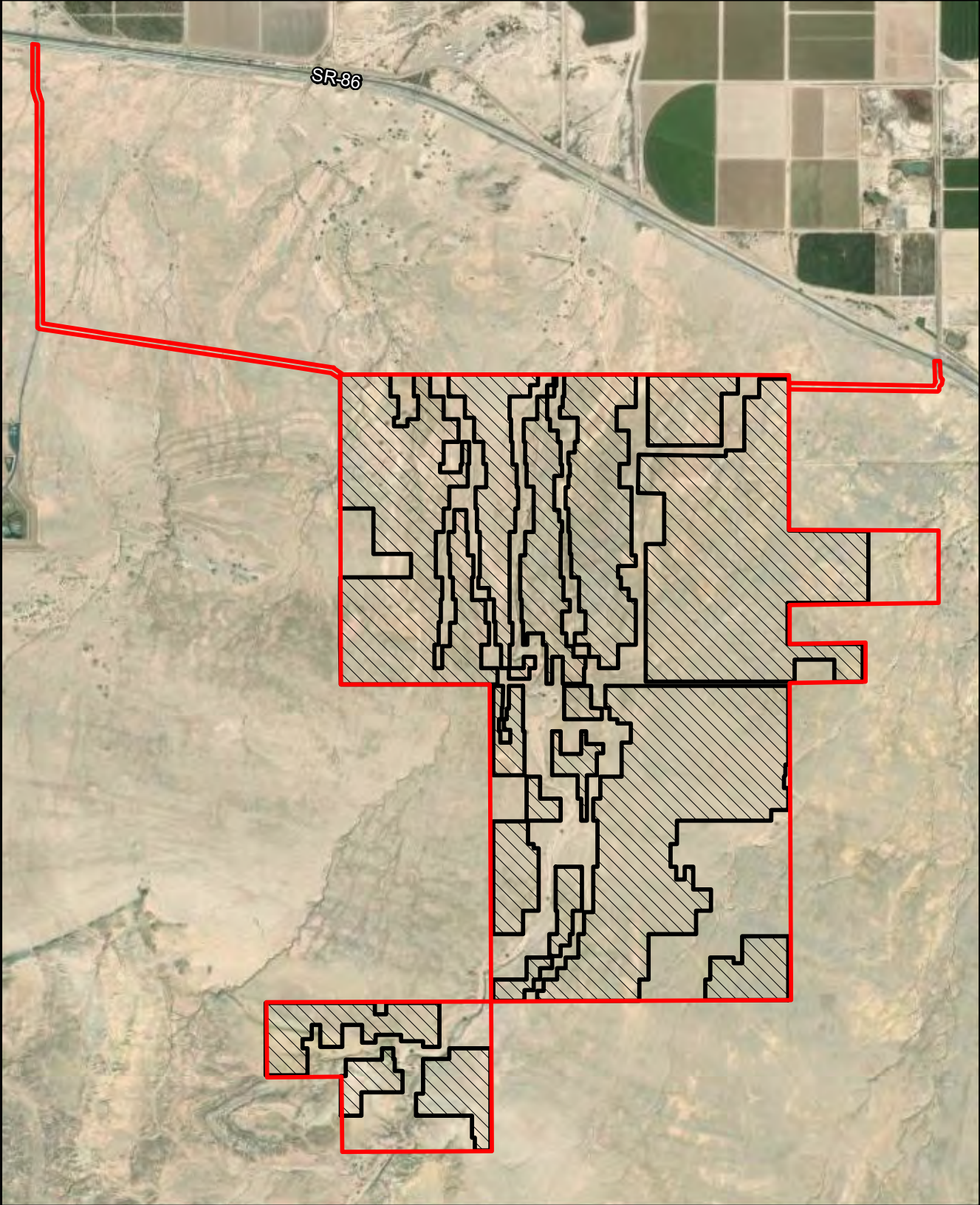


FIGURE 2
Project Location on Aerial Photograph



-  Project Boundary
-  Site Plan

FIGURE 3
Site Plan

3.0 Existing Conditions

3.1 Environmental Setting

3.1.1 State GHG Inventory

The California Air Resources Board (CARB) performs statewide GHG inventories. The inventory is divided into nine broad sectors of economic activity: agriculture, commercial, electricity generation, forestry, high GWP emitters, industrial, recycling and waste, residential, and transportation. Emissions are quantified in million metric tons of CO₂ equivalent (MMT CO₂E). Table 2 shows the estimated statewide GHG emissions for the years 1990, 2005, 2012, and 2018. Although annual GHG inventory data is available for years 2000 through 2020, the years 1990, 2005, 2012, and 2018 are highlighted in Table 2 because 1990 is the baseline year for established reduction targets, and 2005, 2012, and 2018 correspond to the same years for which inventory data for the region is available.

Table 2 California GHG Emissions by Sector				
Sector	1990 ¹ Emissions in MMT CO ₂ E (% total) ²	2005 ³ Emissions in MMT CO ₂ E (% total) ²	2012 ³ Emissions in MMT CO ₂ E (% total) ²	2018 ³ Emissions in MMT CO ₂ E (% total) ²
Electricity Generation	110.5 (25.7%)	108.1 (22.6%)	99.1 (22.8%)	65.1 (15.8%)
Transportation	150.6 (35.0%)	187.6 (39.2%)	161.8 (37.2%)	169.6 (41.3%)
Industrial	105.3 (24.4%)	102.3 (21.4%)	91.0 (20.9%)	93.7 (22.8%)
Commercial	14.4 (3.4%)	16.1 (3.4%)	19.6 (4.5%)	22.3 (5.4%)
Residential	29.7 (6.9%)	30.3 (7.0%)	27.9 (6.4%)	28.1 (6.8%)
Agriculture & Forestry	18.9 (4.4%)	33.7 (7.0%)	35.2 (8.1%)	32.2 (7.8%)
Not Specified	1.3 (0.3%)	--	--	--
Total⁴	430.7	478.1	434.6	411.0
SOURCE: CARB 2007 and 2022a. ¹ 1990 data was obtained from the CARB 2007 source and are based on Intergovernmental Panel on Climate Change (IPCC) fourth assessment report GWPs. ² Percentages may not total 100 due to rounding. ³ 2005, 2012, and 2018 data was retrieved from the CARB 2022a source and are based on IPCC fourth assessment report GWPs. ⁴ Totals may vary due to independent rounding.				

As shown in Table 2, statewide GHG source emissions totaled approximately 431 MMT CO₂E in 1990, 478 MMT CO₂E in 2005, 435 MMT CO₂E in 2012, and 411 MMT CO₂E in 2018. Many factors affect year-to-year changes in GHG emissions, including economic activity, demographic influences, environmental conditions such as drought, and the impact of regulatory efforts to control GHG emissions. As shown in Table 2, transportation-related emissions consistently contribute to the most GHG emissions.

3.1.2 Regional GHG Inventory

The Imperial County (County) Regional Climate Action Plan (Regional CAP) was adopted in June 2021 (Imperial County 2021). The Regional CAP inventoried existing emissions within the County and each of its incorporated cities. The results of the countywide emissions inventories are summarized in Table 3. As shown in Table 3, agricultural-related GHG emissions contributed the most countywide.

Table 3 Imperial Valley Regional GHG Emissions Inventory							
Emissions Sector	2005		2012		2018		
	MT CO ₂ E ¹	% Total	MT CO ₂ E ¹	% Total	MT CO ₂ E ¹	% Total	% Change from 2005
Transportation	656,655	16.3%	650,729	17.3%	748,111	19.7%	+13.9%
Energy	1,006,987	25.1%	757,037	20.2%	484,863	12.8%	-51.9%
Water	28,114	0.7%	30,158	0.8%	34,291	0.9%	+22.0%
Solid Waste	218,847	5.4%	132,773	3.5%	148,337	3.9%	-32.2%
Agriculture	2,081,481	51.8%	2,155,325	57.4%	2,354,168	61.9%	+13.1%
Propane	13,698	0.3%	14,856	0.4%	19,112	0.5%	+39.5%
Calexico POE ²	12,649	0.3%	12,649	0.3%	12,649	0.3%	0.0%
Total³	4,018,430	100%	3,753,527	100%	3,801,531	100%	-5.4%
SOURCE: Imperial County 2021.							
NOTE: Totals may vary due to independent rounding.							
¹ MT CO ₂ E = metric tons of carbon dioxide equivalent.							
² Data for emissions at the ports of entry (POEs) was only available for 2015. For purposes of this inventory, emissions estimates from 2015 were assumed constant for each inventory year. Emissions from POEs are not apportioned to individual jurisdictions.							
³ Electricity consumption associated with potable water treatment and delivery is not included in this total, as data for this activity was not available for unincorporated County.							

3.2 Regulatory Background

In response to rising concern associated with increasing GHG emissions and global climate change impacts, several plans and regulations have been adopted at the international, national, and state levels with the aim of reducing GHG emissions. The following is a discussion of the federal, state, and local plans and regulations most applicable to the project.

3.2.1 Federal

3.2.1.1 U.S. Environmental Protection Agency

In 2009, the U.S. EPA issued its science-based finding that the buildup of heat-trapping GHGs in the atmosphere endangers public health and welfare. The “Endangerment Finding” reflects the overwhelming scientific evidence on the causes and impacts of climate change. It was made after a thorough rulemaking process considering thousands of public comments and was upheld by the federal courts.

The U.S. EPA has many federal level programs and projects to reduce GHG emissions. The U.S. EPA provides technical expertise and encourages voluntary reductions from the private sector. One of the voluntary programs applicable to the project is the Energy Star program. Energy Star products such as appliances, building products, heating and cooling equipment, and other energy-efficient equipment will be utilized by the project.

Energy Star is a joint program of U.S. EPA and the U.S. Department of Energy, which promotes energy-efficient products and practices. Tools and initiatives include the Energy Star Portfolio Manager, which helps track and assess energy and water consumption across an entire portfolio of buildings, and the Energy Star Most Efficient 2020, which provides information on exceptional products which represent the leading edge in energy-efficient products in the year 2020 (U.S. EPA 2020a).

The U.S. EPA also collaborates with the public sector, including states, tribes, localities, and resource managers, to encourage smart growth, sustainability preparation, and renewable energy and climate change preparation. These initiatives include the Clean Energy – Environment State Partnership Program, the Climate Ready Water Utilities Initiative, the Climate Ready Estuaries Program, and the Sustainable Communities Partnership (U.S. EPA 2020b).

3.2.1.2 Corporate Average Fuel Economy Standards

The federal Corporate Average Fuel Economy standards determine the fuel efficiency of certain vehicle classes in the U.S. The National Highway Traffic Safety Administration sets Corporate Average Fuel Economy standards for passenger cars and for light trucks (collectively, light-duty vehicles) and separately sets fuel consumption standards for medium- and heavy-duty trucks and engines. With improved gas mileage, fewer gallons of transportation fuel would be combusted to travel the same distance, thereby reducing nationwide GHG emissions associated with vehicle travel. The most recent standards require an industry-wide fleet average of approximately 49 miles per gallon for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8 percent annually for model years 2024 and 2025 and 10 percent annually for model year 2026.

3.2.2 State

The State of California has adopted a number of plans and regulations aimed at identifying statewide and regional GHG emissions caps, GHG emissions reduction targets, and actions and timelines to achieve the target GHG reductions.

3.2.2.1 Executive Orders and Statewide GHG Emission Targets

Executive Order S-3-05

Executive Order (EO) S-3-05 established the following GHG emission reduction targets for the State of California:

- by 2010, reduce GHG emissions to 2000 levels;
- by 2020, reduce GHG emissions to 1990 levels; and
- by 2050, reduce GHG emissions to 80 percent below 1990 levels.

This EO also directs the secretary of the California Environmental Protection Agency to oversee the efforts made to reach these targets, and to prepare biannual reports on the progress made toward meeting the targets and on the impacts to California related to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. With regard to impacts, the report shall also prepare and document mitigation and adaptation plans to combat the impacts. The first Climate Action Team Assessment Report was produced in March 2006, and has since been updated every two years.

Executive Order B-30-15

EO B-30-15, issued on April 29, 2015, establishes an interim GHG emission reduction goal for the state of California by 2030 of 40 percent below 1990 levels. This EO also directed all state agencies with jurisdiction over GHG emitting sources to implement measures designed to achieve the new interim 2030 goal, as well as the pre-existing, long-term 2050 goal identified in EO S-3-05. Additionally, this EO directed CARB to update its Climate Change Scoping Plan to address the 2030 goal.

Assembly Bill 1279

Assembly Bill (AB) 1279, approved in September 2022, requires the state to achieve net zero GHG emissions as soon as possible, but no later than 2045, and achieve and maintain net negative GHG emissions thereafter, and to ensure that by 2045, statewide anthropogenic GHG emissions are reduced to at least 85 percent below 1990 levels. The bill would require the state board to work with relevant state agencies to ensure that updates to the scoping plan identify and recommend measures to achieve these policy goals and to identify and implement a variety of policies and strategies that enable carbon dioxide removal solutions and carbon capture, utilization, and storage technologies.

3.2.2.2 California Global Warming Solutions Act

In response to EO S-3-05, the California Legislature passed AB 32, the California Global Warming Solutions Act of 2006, and thereby enacted Sections 38500–38599 of the California Health and Safety Code. The heart of AB 32 is its requirement that CARB establish an emissions cap and adopt rules and regulations that would reduce GHG emissions to 1990 levels by 2020. AB 32 also required CARB to adopt a plan by January 1, 2009, indicating how emission reductions would be achieved from significant GHG sources via regulations, market mechanisms, and other actions.

In 2008, CARB estimated that annual statewide GHG emissions were 427 MMT CO₂E in 1990 and would reach 596 MMT CO₂E by 2020 under a business as usual (BAU) condition (CARB 2008). To achieve the mandate of AB 32, CARB determined that a 169 MMT CO₂E (or approximate 28.5 percent) reduction in BAU emissions was needed by 2020. In 2010, CARB prepared an updated 2020 forecast to account for the recession and slower forecasted growth. CARB determined that the economic downturn reduced the 2020 BAU by 55 MMT CO₂E; as a result, achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7 (not 28.5) percent from the 2020 BAU. California has achieved its 2020 goal.

Approved in September 2016, Senate Bill (SB) 32 updates the California Global Warming Solutions Act of 2006 and enacts EO B-30-15. Under SB 32, the state would reduce its GHG emissions to 40 percent below 1990 levels by 2030. This is equivalent to an emissions level of approximately 260 MMT CO₂E for 2030. In implementing the 40 percent reduction goal, CARB is required to prioritize emissions reductions to consider the social costs of the emissions of GHGs; where “social costs” is defined as “an estimate of the economic damages, including, but not limited to, changes in net agricultural productivity; impacts to public health; climate adaptation impacts, such as property damages from increased flood risk; and changes in energy system costs, per metric ton of greenhouse gas emission per year.”

3.2.2.3 Climate Change Scoping Plan

As directed by the California Global Warming Solutions Act of 2006, in 2008, CARB adopted the *Climate Change Scoping Plan: A Framework for Change* (Scoping Plan), which identifies the main strategies California will implement to achieve the GHG reductions necessary to reduce forecasted BAU emissions in 2020 to the state’s historic 1990 emissions level (CARB 2008). In November 2017, CARB released the *2017 Climate Change Scoping Plan Update, the Strategy for Achieving California’s 2030 Greenhouse Gas Target* (2017 Scoping Plan; CARB 2017). The 2017 Scoping Plan identifies state strategies for achieving the state’s 2030 GHG emissions reduction target codified by SB 32. Measures under the 2017 Scoping Plan Scenario build on existing programs such as the Low Carbon Fuel Standard, Advanced Clean Cars Program, Renewables Portfolio Standard (RPS), Sustainable Communities Strategy (SCS), Short-Lived Climate Pollutant Reduction Strategy, and the Cap-and-Trade Program. Additionally, the 2017 Scoping Plan proposes new policies to address GHG emissions from natural and working lands. The *2022 Scoping Plan Update for Achieving Carbon Neutrality* (2022 Scoping Plan; CARB 2022b) was adopted in December 2022. The 2022 Scoping Plan assesses the progress towards the 2030 GHG emissions reduction target identified in the 2017 Scoping Plan and lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045, as directed by AB 1279. The 2022 Scoping Plan identifies strategies related to clean technology, energy development, natural and working lands, and others, and is designed to meet the state’s long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

3.2.2.4 Regional Emissions Targets – Senate Bill 375

SB 375, the 2008 Sustainable Communities and Climate Protection Act, was signed into law in September 2008 and requires CARB to set regional targets for reducing passenger vehicle GHG emissions in accordance with the Scoping Plan. The purpose of SB 375 is to align regional

transportation planning efforts, regional GHG reduction targets, and fair-share housing allocations under state housing law. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a SCS or Alternative Planning Strategy to address GHG reduction targets from cars and light-duty trucks in the context of that MPO's Regional Transportation Plan. Southern California Association of Governments (SCAG) is the region's MPO. In 2018, CARB set targets for the SCAG region of an 8 percent reduction in GHG emissions per capita from automobiles and light-duty trucks compared to 2005 levels by 2020 and a 19 percent reduction by 2035. These targets are periodically reviewed and updated.

3.2.2.5 Renewables Portfolio Standard

The RPS promotes diversification of the state's electricity supply and decreased reliance on fossil fuel energy sources. Renewable energy includes (but is not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas. Originally adopted in 2002 with a goal to achieve a 20 percent renewable energy mix by 2020 (referred to as the "Initial RPS"), the goal has been accelerated and increased by EOs S-14-08 and S-21-09 to a goal of 33 percent by 2020. In April 2011, SB 2 (1X) codified California's 33 percent RPS goal. SB 350 (2015) increased California's renewable energy mix goal to 50 percent by year 2030. SB 100 (2018) further increased the standard set by SB 350 establishing the RPS goal of 44 percent by the end of 2024, 52 percent by the end of 2027, and 60 percent by 2030.

3.2.3 Local

3.2.3.1 Regional Climate Action Plan

The Regional CAP was prepared to address the impacts of climate change and reduce GHG emissions in the Imperial Valley region which includes the County and its seven incorporated cities. The Regional CAP is consistent with statewide legislation and regulatory mandates, and establishes local strategies, measures, and actions aimed at reducing GHG emissions. Reduction targets for the County were established in alignment with SB 32 and EO S-3-05, based on the 2005 GHG inventory and sector-specific targets in the 2017 Scoping Plan. For the County, they include reducing emissions to 24 percent below 2005 levels by 2030 and to 34 percent below 2005 levels by 2050. To meet these targets, the County would need to reduce communitywide emissions to 2,022,285 MT CO₂E by 2030 and 1,771,509 MT CO₂E by 2050 (Imperial County 2021).

3.2.3.2 Imperial County General Plan

The Imperial County General Plan Renewable Energy and Transmission Element was adopted in October 2015. As stated in the element, the benefits of renewable energy development include reduction in potential GHG by displacing fossil-fuel-generated electricity with renewable energy, which does not add to the greenhouse effect; contribution towards meeting the state's RPS mandate; and minimization of impacts to local communities, agriculture, and sensitive resources (Imperial County 2015). Of importance to the project, the General Plan contains the following objectives:

3.3 Encourage the development of services and industrial associated with renewable energy facilities.

5.2 Encourage development of utility-scale distributed generation projects in the County.

4.0 Significance Criteria and Analysis Methodologies

4.1 Determining Significance

Based on the California Environmental Quality Act (CEQA) Guidelines Appendix G, impacts related to GHG emissions would be significant if the project would:

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

As stated in the State CEQA Guidelines, these questions are “intended to encourage thoughtful assessment of impacts and do not necessarily represent thresholds of significance” (Title 14, Division 6, Chapter 3 Guidelines for Implementation of the CEQA, Appendix G, Environmental Checklist Form). The State CEQA Guidelines encourage lead agencies to adopt regionally specific thresholds of significance. When adopting these thresholds, the amended Guidelines allow lead agencies to consider thresholds of significance adopted or recommended by other public agencies, or recommended by experts, provided that the thresholds are supported by substantial evidence.

The project site is in the Salton Sea Air Basin. The Imperial County Air Pollution Control District (ICAPCD) is responsible for regulating air quality within the Imperial County portion of the Salton Sea Air Basin. No GHG emission significance threshold has been adopted by the County or the ICAPCD for land development projects. Thus, in the absence of a threshold of significance for GHG emissions that has been adopted in a public process following environmental review, this analysis considers guidance promulgated by other agencies.

The County is a member of SCAG, which is comprised of several different counties including Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. Air districts responsible for managing air quality within the SCAG boundaries include the South Coast Air Quality Management District (AQMD), the Mojave Desert Air Pollution Control District (APCD), Ventura County APCD, and the Antelope Valley AQMD.

Due to the climate and land use patterns, the Antelope Valley AQMD and Mojave Desert APCD are air districts that are most similar to the ICAPCD’s jurisdiction. The Antelope Valley AQMD is within the northern part of Los Angeles County, and the Mojave Desert APCD contains San Bernardino County’s high desert region and Riverside County’s Palo Verde Valley region. These jurisdictions are in inland desert regions with rural land use patterns; with a substantial number large-scale

agricultural, warehousing/distribution, industrial, and military operations. Additionally, both of these agencies have adopted GHG thresholds for use in CEQA analysis. As outlined in the Antelope Valley AQMD's 2016 *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines and Mojave Desert APCD's 2016 California Environmental Quality Act (CEQA) and Federal Conformity Guidelines*, the two air districts both recommend use of a GHG emissions significance threshold of 100,000 short tons of CO₂E per year (90,718 MT CO₂E). Projects with emissions that exceed this threshold are required to incorporate mitigation sufficient to reduce emissions to less than this significance threshold or must incorporate all feasible mitigation.

This recommended significance threshold is consistent with the federal trigger level for GHG emissions "subject to regulation" under the U.S. EPA's Clean Air Act Title V Permitting requirements (40 Code of Federal Regulations 70.2). Additionally, as ICAPCD Title IX Regulations are based on Clean Air Act Title V Permitting requirements, this recommended significance threshold is also consistent with local ICAPCD Rule 900—Procedures for Issuing Permits to Operate for Sources Subject to Title V of the Federal Clean Air Act Amendments of 1990 and Rule 904—Prevention of Significant Deterioration Permit Program.

In the absence of adopted GHG significance thresholds, the threshold of 90,718 MT CO₂E is an appropriate CEQA significance threshold for the assessment of GHG emissions for the purposes of this project. The project was also evaluated qualitatively for how it will support the state's renewable energy goals.

4.2 Calculation Methodology

Operational GHG emissions associated with a project break down into the following five categories: mobile (on-road vehicles), energy (electricity, natural gas), area (landscape maintenance equipment), water and wastewater, and solid waste sources. GHG emissions also result from construction activities. Emissions were calculated using CalEEMod Version 2022.1 (California Air Pollution Control Officers Association [CAPCOA] 2022). The CalEEMod program is a tool used to estimate emissions resulting from land development projects in the state of California. CalEEMod was developed with the participation of several state air districts.

CalEEMod estimates parameters such as the type and amount of construction equipment required, trip generation, and utility consumption based on the size and type of each specific land use using data collected from surveys performed in South Coast AQMD. Where available, parameters were modified to reflect project-specific data.

4.2.1 Construction Emissions

Construction activities emit GHGs primarily through combustion of fuels (mostly diesel) in the engines of off-road construction equipment and through combustion of diesel and gasoline in on-road construction vehicles and the commute vehicles of the construction workers. Smaller amounts of GHGs are also emitted through the energy use embodied in water use for fugitive dust control.

Every phase of the construction process, including demolition, grading, paving, and building, emits GHGs in volumes directly related to the quantity and type of construction equipment used when

building the project. GHG emissions associated with each phase of project construction are calculated by multiplying the total fuel consumed by the construction equipment and worker trips by applicable emission factors.

Construction activities associated with the project would include grading (5 months), electrical infrastructure construction (5 months), structural construction (6 months), and equipment installation (5 months) for a total construction duration of 21 months. Construction activities were modeled beginning in 2026. Default construction equipment for a light industrial use was modeled, which is conservative since it assumes ground-up construction of buildings. Rather, actual construction of the project would consist of equipment being delivered to the project site and installed, which is less intensive than ground-up construction of buildings.

Construction activities would require up to 250 workers and seven truck deliveries per day. Regional access to the project site would occur over SR-78 and SR-86, which are paved freeways. Access to the project site would be provided via an existing unpaved utility easement and road that follows IID power lines branching off SR-86 north of the project site. As discussed in Section 2.0 above, two different access routes are being considered. This analysis calculates emissions associated with the longer western access road. The 1.96-mile western access route would travel 0.94 mile south along a paved road, followed by 1.02 miles along a dirt road to be constructed heading southeast towards the project site. As a conservative assessment and to account for windblown dust that may accumulate on the paved segment of the western access route, a two-mile unpaved road was modeled.

CalEEMod calculates emissions of all pollutants from construction equipment using emission factors from CARB's off-road diesel equipment emission factors database. All construction equipment required during a phase was modeled over the entire duration of the phase even if it would only be required for a portion of the phase. Additionally, two off-highway trucks and a generator were added to each phase to account for water trucks and a generator needed to power the construction office. The modeled construction equipment is summarized in Table 4.

Table 4 Construction Phases and Equipment		
Equipment	Quantity	Daily Operation Time (hours)
Grading (5 months)		
Excavators	2	8
Grader	1	8
Rubber Tired Dozer	1	8
Scrapers	2	8
Tractors/Loaders/Backhoes	2	8
Water Trucks	2	8
Generator (Office)	1	24
Electrical, Structural, Installation (16 months)		
Crane	1	7
Forklifts	3	8
Generator	1	8
Tractors/Loaders/Backhoes	3	7
Welder	1	8
Water Trucks	2	8
Generator (Office)	1	24
NOTE: Each phase would also include vehicles associated with work commutes, dump trucks for hauling, and trucks for deliveries.		

The ICAPCD requires, regardless of the size of a project, that all feasible standard measures for construction equipment must be implemented at construction sites. Standard measures from the ICAPCD handbook include the following:

Standard Measures for Construction Combustion Equipment

- Use of alternative fueled or catalyst equipped diesel construction equipment, including all off-road and portable diesel powered equipment.
- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes as a maximum.
- Limit, to the extent feasible, the hours of operation of heavy duty equipment and/or the amount of equipment in use.
- Replace fossil fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set).

To help provide a greater degree of reduction of particulate matter emissions from construction combustion equipment, the ICAPCD recommends the following enhanced measures:

Enhanced Mitigation Measures for Construction Combustion Equipment

- a) Curtail construction during periods of high ambient pollutant concentrations; this may include ceasing of construction activity during the peak hour of vehicular traffic on adjacent roadways.
- b) Implement activity management (e.g., rescheduling activities to reduce short-term impacts).

Based on guidance from the South Coast AQMD, total construction GHG emissions resulting from a project should be amortized over 30 years and added to operational GHG emissions to account for their contribution to GHG emissions over the lifetime of a project (South Coast AQMD 2009).

4.2.2 Mobile Emissions

CalEEMod calculates mobile source emissions using emission factors derived from CARB's motor vehicle emission inventory program, EMFAC2021 (CARB 2021). The project would be an unmanned facility that would be operated remotely. Therefore, the project would not generate routine daily trips. Occasional maintenance trips would be required. To account for these trips, a total of one round trip (two one-way trips) was modeled per weekday. The default trip length was increased to 20 miles. CalEEMod default emission factors for the soonest operational year of 2027 were modeled.

4.2.3 Energy Use Emissions

GHGs are emitted as a result of activities in buildings for which electricity and natural gas are used as energy sources. GHGs are emitted during the generation of electricity from fossil fuels off-site in power plants. These emissions are considered indirect but are calculated in association with a building's operation. Combustion of fossil fuel emits criteria pollutants and GHGs directly into the atmosphere. When this occurs in a building, this is considered a direct emissions source associated with that building. Energy source GHG emissions were calculated using the default emission factors for a light industrial land use. This is conservative since the project would not be a source of natural gas emissions.

4.2.4 Area Source Emissions

Area sources include GHG emissions that would occur from the use of landscaping equipment. The use of landscape equipment emits GHGs associated with the equipment's fuel combustion. The project would not include any landscape maintenance. However, as a conservative analysis, area-source emissions were calculated using the default emission factors for a light industrial land use.

4.2.5 Water and Wastewater Emissions

The amount of water used and wastewater generated by a project has indirect GHG emissions associated with it. These emissions are a result of the energy used to supply, distribute, and treat the water and wastewater. In addition to the indirect GHG emissions associated with energy use, wastewater treatment can directly emit both methane and nitrous oxide. As the project would be an

unmanned facility, it would not include any water use. However, as a conservative analysis, water-source emissions were calculated using the default emission factors for a light industrial land use.

4.2.6 Solid Waste Emissions

The disposal of solid waste produces GHG emissions from anaerobic decomposition in landfills, incineration, and transportation of waste. As the project would be an unmanned facility, it would not generate any operational waste. However, as a conservative analysis, solid waste-source emissions were calculated using the default emission factors for a light industrial land use.

4.2.7 Refrigerant Sources

Small amounts of GHG emissions result from refrigerants used in air conditioning and refrigeration equipment. CalEEMod quantifies refrigerant emissions from leaks during regular operation and routine servicing over the equipment lifetime and then derives average annual emissions from the lifetime estimate. Emissions due to refrigerants were calculated using CalEEMod default values for a light industrial land use, which are based on industry data from the U.S. EPA.

5.0 GHG Emission Calculations

Based on the methodology summarized in Section 4.2, the primary sources of direct and indirect GHG emissions have been calculated. Table 5 summarizes the total construction emissions. Table 6 summarizes the total GHG emissions associated with the project. The complete model outputs for the project are included in Attachment 1.

Table 5 Construction GHG Emissions	
Year	Construction GHG Emissions MT CO ₂ E
2026	1,786
2027	1,205
TOTAL GHG EMISSIONS	2,991
Amortized over 30 Years	100

Table 6 Project GHG Emissions	
Source	Project GHG Emissions MT CO ₂ E
Mobile	4
Energy	271
Area	1
Water/Wastewater	22
Solid Waste	19
Refrigerants	2
Construction (Amortized over 30 years)	100
TOTAL	419
<i>Screening Threshold</i>	<i>90,718</i>
Exceeds Threshold?	No

6.0 GHG Impact Analysis

1. *Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?*

As shown in Table 6, the project would result in a total emission of 419 MT CO₂E annually. This is less than the 90,718 MT CO₂E screening threshold. Therefore, the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and impacts would be less than significant.

Additionally, these GHG emissions would be offset by the solar energy generated on-site. The project would develop approximately 1,348.77 acres of the project site with photovoltaic solar panels capable of generating up to 370 megawatts of renewable energy. Using a solar capacity factor of 28.4 percent (U.S. Energy Information Administration 2019), it was calculated that the project would generate 920,501 megawatt hours per year. Based on the GHG intensity factors for the Imperial Irrigation District, production of this amount of electricity through non-renewable sources would have generated approximately 111,945 MT CO₂E per year (Attachment 2). Therefore, the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and impacts would be less than significant.

2. *Would the project conflict with the City's CAP or an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs?*

State GHG emissions reduction policy was established by EOs S-3-05 and B-30-15 and was subsequently codified by AB 32 and SB 32. EO S-3-05 established GHG emission reduction targets of year 2000 GHG emission levels by 2010, year 1990 GHG emission levels by 2020, and 80 percent below year 1990 levels by 2050; and EO B-30-15 established an interim GHG emission reduction target of 40 percent below year 1990 levels by 2030. AB 32 launched the CARB Climate Change Scoping Plan that outlined the reduction measures needed to reach the 2020 target, which has been achieved. As required by SB 32, CARB's 2017 Climate Change Scoping Plan outlines reduction measures needed to achieve the interim 2030 target. AB 1279, the California Climate Crisis Act,

codified the carbon neutrality target as 85 percent below 1990 levels by 2045. The 2022 Scoping Plan was adopted in December 2022. The 2022 Scoping Plan lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045, as directed by AB 1279.

As shown in Table 6 above, the project's annual GHG emissions would be less than the screening threshold of 90,718 MT CO₂E per year. Additionally, the project would support the state's goal to increase use of renewable energy. Production of 920,501 megawatt hours per year of electricity through non-renewable sources would have generated approximately 111,945 MT CO₂E per year. In September 2018, the California Legislature passed SB 100, which set a goal that "renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045."

As California procures increasing amounts of renewable energy to meet the goals of SB 100, the state will need to deploy a significant amount of energy generation and storage capability. Renewable energy resources such as wind and solar generate electricity intermittently. Energy storage allows utilities and system operators to manage the effect of intermittent renewable generation on the grid and create reliable, dispatchable generation upon demand. Energy storage also allows excess solar energy produced during the day to be stored and dispatched optimally during peak evening hours or other periods of high demand. The project would, therefore, serve as an integral component of the state's overarching renewable energy strategy that would reduce use of fossil fuel and associated GHG emissions by generating renewable energy as well as by providing necessary energy storage. The project would assist the state's goal of utilizing 100 percent renewable energy by 2045, which would result in a net decrease in use of fossil fuel and GHG emissions. Therefore, the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs, and impacts would be less than significant.

7.0 Conclusions

GHG emissions would be generated during construction and operation of the project. Construction activities emit GHGs primarily through the combustion of fuels in on- and off-road equipment and vehicles. Operational emissions include mobile, energy (electricity and natural gas), area (landscape maintenance equipment), water and wastewater, and solid waste sources. As shown in Table 6, the project would result in a total emission of 419 MT CO₂E annually. This is less than the 90,718 MT CO₂E screening threshold. Additionally, these GHG emissions would be offset by the solar energy generated on-site. Therefore, the project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and impacts would be less than significant.

Additionally, the project would support the state's goal to increase use of renewable energy. The project would serve as an integral component of the state's overarching renewable energy strategy that would reduce use of fossil fuel and associated GHG emissions by generating renewable energy, as well as by providing necessary energy storage. The project would assist the state's goal of utilizing 100 percent renewable energy by 2045, which would result in a net decrease in use of fossil fuel and GHG emissions. Therefore, the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs, and impacts would be less than significant.

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ATTACHMENTS

ATTACHMENT 1

CalEEMod Output

Virgo Solar Detailed Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Virgo Solar
Construction Start Date	1/1/2026
Operational Year	2027
Lead Agency	Imperial County
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.30
Precipitation (days)	4.80
Location	33.095934460855275, -115.80150902918521
County	Imperial
City	Unincorporated
Air District	Imperial County APCD
Air Basin	Salton Sea
TAZ	5615
EDFZ	19
Electric Utility	Imperial Irrigation District
Gas Utility	Southern California Gas
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
General Light Industry	50.0	1000sqft	5.00	50,000	0.00	0.00	—	—

Other Non-Asphalt Surfaces	1,959	Acre	1,959	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	8.43	7.36	37.7	93.1	0.09	1.40	1,520	1,520	1.28	153	153	—	17,737	17,737	0.70	0.42	28.9	17,883
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.79	6.71	38.2	67.6	0.09	1.40	1,520	1,520	1.28	153	153	—	16,471	16,471	0.72	0.42	0.75	16,592
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.70	4.09	20.2	48.4	0.05	0.69	1,057	1,058	0.63	107	107	—	10,684	10,684	0.44	0.28	8.62	10,786
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.86	0.75	3.70	8.83	0.01	0.13	193	193	0.12	19.4	19.6	—	1,769	1,769	0.07	0.05	1.43	1,786
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	75.0	100	550	—	—	—	150	—	—	—	—	—	—	—	—	—	—
Unmit.	—	No	No	No	—	—	—	Yes	—	—	—	—	—	—	—	—	—	—

Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	75.0	100	550	—	—	—	150	—	—	—	—	—	—	—	—	—	—
Unmit.	—	No	No	No	—	—	—	Yes	—	—	—	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	8.43	7.36	37.7	93.1	0.09	1.40	1,520	1,520	1.28	153	153	—	17,737	17,737	0.70	0.42	28.9	17,883
2027	5.90	5.20	20.2	73.3	0.06	0.62	1,520	1,520	0.57	153	153	—	14,206	14,206	0.54	0.42	26.2	14,372
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	7.79	6.71	38.2	67.6	0.09	1.40	1,520	1,520	1.28	153	153	—	16,471	16,471	0.72	0.42	0.75	16,592
2027	5.09	4.40	20.7	49.9	0.06	0.62	1,520	1,520	0.57	153	153	—	12,966	12,966	0.56	0.42	0.68	13,107
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	4.70	4.09	20.2	48.4	0.05	0.69	1,057	1,058	0.63	107	107	—	10,684	10,684	0.44	0.28	8.62	10,786
2027	2.93	2.56	10.9	31.0	0.03	0.33	801	802	0.30	80.4	80.7	—	7,199	7,199	0.29	0.22	6.05	7,277
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.86	0.75	3.70	8.83	0.01	0.13	193	193	0.12	19.4	19.6	—	1,769	1,769	0.07	0.05	1.43	1,786
2027	0.54	0.47	1.99	5.65	0.01	0.06	146	146	0.06	14.7	14.7	—	1,192	1,192	0.05	0.04	1.00	1,205

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	18.2	18.1	0.47	2.69	< 0.005	0.04	3.00	3.04	0.04	0.30	0.34	55.6	1,711	1,767	5.80	0.07	13.1	1,947
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	17.8	17.8	0.45	0.46	< 0.005	0.03	3.00	3.04	0.03	0.30	0.34	55.6	1,698	1,753	5.80	0.07	13.0	1,933
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	18.0	17.9	0.46	1.52	< 0.005	0.04	2.12	2.15	0.03	0.21	0.25	55.6	1,695	1,751	5.80	0.07	13.0	1,930
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.28	3.27	0.08	0.28	< 0.005	0.01	0.39	0.39	0.01	0.04	0.05	9.20	281	290	0.96	0.01	2.16	320
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	137	137	550	150	—	—	150	—	—	550	—	—	—	—	—	—	—
Unmit.	—	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	137	137	550	150	—	—	150	—	—	550	—	—	—	—	—	—	—
Unmit.	—	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	0.01	0.01	0.01	0.14	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	34.3	34.3	< 0.005	< 0.005	0.10	34.8
Area	18.1	18.1	0.02	2.17	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.94	8.94	< 0.005	< 0.005	—	8.97
Energy	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	1,628	1,628	0.18	0.02	—	1,638
Water	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Waste	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Total	18.2	18.1	0.47	2.69	< 0.005	0.04	3.00	3.04	0.04	0.30	0.34	55.6	1,711	1,767	5.80	0.07	13.1	1,947
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.01	0.01	0.01	0.09	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	30.1	30.1	< 0.005	< 0.005	< 0.005	30.5
Area	17.7	17.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	1,628	1,628	0.18	0.02	—	1,638
Water	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Waste	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Total	17.8	17.8	0.45	0.46	< 0.005	0.03	3.00	3.04	0.03	0.30	0.34	55.6	1,698	1,753	5.80	0.07	13.0	1,933
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.01	0.01	0.01	0.08	< 0.005	< 0.005	2.12	2.12	< 0.005	0.21	0.21	—	22.7	22.7	< 0.005	< 0.005	0.03	23.1
Area	17.9	17.9	0.01	1.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.41	4.41	< 0.005	< 0.005	—	4.43
Energy	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	1,628	1,628	0.18	0.02	—	1,638
Water	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Waste	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Total	18.0	17.9	0.46	1.52	< 0.005	0.04	2.12	2.15	0.03	0.21	0.25	55.6	1,695	1,751	5.80	0.07	13.0	1,930
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	0.39	0.39	< 0.005	0.04	0.04	—	3.76	3.76	< 0.005	< 0.005	0.01	3.82
Area	3.27	3.27	< 0.005	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.73	0.73	< 0.005	< 0.005	—	0.73

Energy	0.01	< 0.005	0.08	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	270	270	0.03	< 0.005	—	271
Water	—	—	—	—	—	—	—	—	—	—	—	3.67	6.61	10.3	0.38	0.01	—	22.4
Waste	—	—	—	—	—	—	—	—	—	—	—	5.53	0.00	5.53	0.55	0.00	—	19.4
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.15	2.15
Total	3.28	3.27	0.08	0.28	< 0.005	0.01	0.39	0.39	0.01	0.04	0.05	9.20	281	290	0.96	0.01	2.16	320

3. Construction Emissions Details

3.1. Grading (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.04	4.23	34.7	35.1	0.09	1.40	—	1.40	1.28	—	1.28	—	9,577	9,577	0.39	0.08	—	9,610
Dust From Material Movement	—	—	—	—	—	—	4.60	4.60	—	1.83	1.83	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.04	4.23	34.7	35.1	0.09	1.40	—	1.40	1.28	—	1.28	—	9,577	9,577	0.39	0.08	—	9,610

Dust From Material Movement	—	—	—	—	—	—	4.60	4.60	—	1.83	1.83	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.48	1.24	10.2	10.3	0.03	0.41	—	0.41	0.38	—	0.38	—	2,808	2,808	0.11	0.02	—	2,817
Dust From Material Movement	—	—	—	—	—	—	1.35	1.35	—	0.54	0.54	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.27	0.23	1.86	1.88	< 0.005	0.07	—	0.07	0.07	—	0.07	—	465	465	0.02	< 0.005	—	466
Dust From Material Movement	—	—	—	—	—	—	0.25	0.25	—	0.10	0.10	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.40	3.13	3.05	58.0	0.00	0.00	1,478	1,478	0.00	148	148	—	8,160	8,160	0.31	0.26	26.8	8,273
Vendor	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	0.00
Hauling	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	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.76	2.48	3.49	32.5	0.00	0.00	1,478	1,478	0.00	148	148	—	6,894	6,894	0.33	0.26	0.69	6,982
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.86	0.78	1.02	12.1	0.00	0.00	428	428	0.00	42.9	42.9	—	2,173	2,173	0.09	0.08	3.39	2,202
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.16	0.14	0.19	2.21	0.00	0.00	78.0	78.0	0.00	7.83	7.83	—	360	360	0.02	0.01	0.56	365
Vendor	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	0.00
Hauling	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	0.00

3.3. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.69	2.25	17.3	20.5	0.05	0.65	—	0.65	0.60	—	0.60	—	5,376	5,376	0.22	0.04	—	5,394
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	2.69	2.25	17.3	20.5	0.05	0.65	—	0.65	0.60	—	0.60	—	5,376	5,376	0.22	0.04	—	5,394
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	0.94	7.25	8.57	0.02	0.27	—	0.27	0.25	—	0.25	—	2,251	2,251	0.09	0.02	—	2,259
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.17	1.32	1.56	< 0.005	0.05	—	0.05	0.05	—	0.05	—	373	373	0.02	< 0.005	—	374
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.40	3.13	3.05	58.0	0.00	0.00	1,478	1,478	0.00	148	148	—	8,160	8,160	0.31	0.26	26.8	8,273
Vendor	0.03	0.02	0.77	0.29	0.01	0.01	41.4	41.4	0.01	4.17	4.18	—	831	831	0.01	0.11	2.13	867
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.76	2.48	3.49	32.5	0.00	0.00	1,478	1,478	0.00	148	148	—	6,894	6,894	0.33	0.26	0.69	6,982
Vendor	0.03	0.02	0.86	0.29	0.01	0.01	41.4	41.4	0.01	4.17	4.18	—	831	831	0.01	0.11	0.06	866
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	1.23	1.12	1.45	17.3	0.00	0.00	611	611	0.00	61.3	61.3	—	3,104	3,104	0.13	0.11	4.85	3,146
Vendor	0.01	0.01	0.35	0.12	< 0.005	0.01	17.1	17.1	0.01	1.72	1.73	—	348	348	< 0.005	0.05	0.38	363
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.20	0.27	3.16	0.00	0.00	111	111	0.00	11.2	11.2	—	514	514	0.02	0.02	0.80	521
Vendor	< 0.005	< 0.005	0.06	0.02	< 0.005	< 0.005	3.12	3.13	< 0.005	0.31	0.32	—	57.6	57.6	< 0.005	0.01	0.06	60.1
Hauling	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	0.00

3.5. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.65	2.21	16.6	20.4	0.05	0.60	—	0.60	0.55	—	0.55	—	5,375	5,375	0.22	0.04	—	5,393
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.65	2.21	16.6	20.4	0.05	0.60	—	0.60	0.55	—	0.55	—	5,375	5,375	0.22	0.04	—	5,393
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road	1.41	1.18	8.88	10.9	0.03	0.32	—	0.32	0.30	—	0.30	—	2,871	2,871	0.12	0.02	—	2,881
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	0.22	1.62	1.99	0.01	0.06	—	0.06	0.05	—	0.05	—	475	475	0.02	< 0.005	—	477
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	3.22	2.97	2.81	52.6	0.00	0.00	1,478	1,478	0.00	148	148	—	8,017	8,017	0.31	0.26	24.4	8,128
Vendor	0.03	0.02	0.73	0.26	0.01	0.01	41.4	41.4	0.01	4.17	4.18	—	814	814	0.01	0.11	1.85	850
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	2.43	2.16	3.25	29.2	0.00	0.00	1,478	1,478	0.00	148	148	—	6,777	6,777	0.33	0.26	0.63	6,865
Vendor	0.02	0.02	0.81	0.26	0.01	0.01	41.4	41.4	0.01	4.17	4.18	—	814	814	0.01	0.11	0.05	849
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.50	1.36	1.61	19.9	0.00	0.00	779	779	0.00	78.2	78.2	—	3,892	3,892	0.16	0.14	5.63	3,942
Vendor	0.02	0.01	0.43	0.14	< 0.005	0.01	21.8	21.8	0.01	2.20	2.21	—	435	435	< 0.005	0.06	0.43	454
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.25	0.29	3.63	0.00	0.00	142	142	0.00	14.3	14.3	—	644	644	0.03	0.02	0.93	653
Vendor	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	3.99	3.99	< 0.005	0.40	0.40	—	72.0	72.0	< 0.005	0.01	0.07	75.1

Hauling	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	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.01	0.01	0.01	0.14	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	34.3	34.3	< 0.005	< 0.005	0.10	34.8
Other Non-Asphalt Surfaces	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	0.00
Total	0.01	0.01	0.01	0.14	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	34.3	34.3	< 0.005	< 0.005	0.10	34.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.01	0.01	0.01	0.09	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	30.1	30.1	< 0.005	< 0.005	< 0.005	30.5
Other Non-Asphalt Surfaces	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	0.00
Total	0.01	0.01	0.01	0.09	< 0.005	< 0.005	3.00	3.00	< 0.005	0.30	0.30	—	30.1	30.1	< 0.005	< 0.005	< 0.005	30.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	0.39	0.39	< 0.005	0.04	0.04	—	3.76	3.76	< 0.005	< 0.005	0.01	3.82

Other Non-Asphalt Surfaces	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	0.00
Total	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	0.39	0.39	< 0.005	0.04	0.04	—	3.76	3.76	< 0.005	< 0.005	0.01	3.82

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	1,107	1,107	0.14	0.02	—	1,116
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,107	1,107	0.14	0.02	—	1,116
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	1,107	1,107	0.14	0.02	—	1,116
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,107	1,107	0.14	0.02	—	1,116
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	183	183	0.02	< 0.005	—	185

Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	183	183	0.02	< 0.005	—	185

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	521	521	0.05	< 0.005	—	522
Other Non-Asphalt Surfaces	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
Total	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	521	521	0.05	< 0.005	—	522
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	521	521	0.05	< 0.005	—	522
Other Non-Asphalt Surfaces	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
Total	0.05	0.02	0.44	0.37	< 0.005	0.03	—	0.03	0.03	—	0.03	—	521	521	0.05	< 0.005	—	522
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	0.01	< 0.005	0.08	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	86.2	86.2	0.01	< 0.005	—	86.4

Other Non-Asphalt Surfaces	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
Total	0.01	< 0.005	0.08	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	86.2	86.2	0.01	< 0.005	—	86.4

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	7.78	7.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	9.95	9.95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.39	0.36	0.02	2.17	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.94	8.94	< 0.005	< 0.005	—	8.97
Total	18.1	18.1	0.02	2.17	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.94	8.94	< 0.005	< 0.005	—	8.97
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	7.78	7.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural Coatings	9.95	9.95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	17.7	17.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	1.42	1.42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.82	1.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.03	0.03	< 0.005	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.73	0.73	< 0.005	< 0.005	—	0.73
Total	3.27	3.27	< 0.005	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.73	0.73	< 0.005	< 0.005	—	0.73

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	22.2	39.9	62.1	2.28	0.05	—	135
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	3.67	6.61	10.3	0.38	0.01	—	22.4
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	3.67	6.61	10.3	0.38	0.01	—	22.4

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	33.4	0.00	33.4	3.34	0.00	—	117
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	5.53	0.00	5.53	0.55	0.00	—	19.4
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	5.53	0.00	5.53	0.55	0.00	—	19.4

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13.0	13.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Light Industry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.15	2.15
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.15	2.15

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipm ent Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Grading	Grading	1/1/2026	5/31/2026	5.00	107	—
Building Construction	Building Construction	6/1/2026	9/30/2027	5.00	349	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Back hoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Off-Highway Trucks	Diesel	Average	2.00	8.00	376	0.38
Grading	Generator Sets	Diesel	Average	1.00	24.0	14.0	0.74
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29

Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Back hoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Off-Highway Trucks	Diesel	Average	2.00	8.00	376	0.38
Building Construction	Generator Sets	Diesel	Average	1.00	24.0	14.0	0.74

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Grading	—	—	—	—
Grading	Worker	500	20.0	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	500	20.0	LDA,LDT1,LDT2
Building Construction	Vendor	14.0	20.0	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Apply dust suppressants to unpaved roads	84%	84%

Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Grading	0.00	0.00	192	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	Other	50%	50%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
General Light Industry	0.00	0%
Other Non-Asphalt Surfaces	1,959	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00	457	0.03	< 0.005
2027	0.00	457	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VM/Weekday	VM/Saturday	VM/Sunday	VM/Year
General Light Industry	2.00	0.00	0.00	521	40.0	0.00	0.00	10,429
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	75,000	25,000	5,121,271

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO₂ and CH₄ and N₂O and Natural Gas (kBtu/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBtu/yr)
General Light Industry	1,518,721	266	0.0330	0.0040	1,624,230
Other Non-Asphalt Surfaces	0.00	266	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
General Light Industry	11,562,500	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
General Light Industry	62.0	—
Other Non-Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Light Industry	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	31.3	annual days of extreme heat
Extreme Precipitation	0.00	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	1.40	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about $\frac{3}{4}$ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	0	0	0	N/A

Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	1	1	1	2
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	55.4
AQ-PM	19.3
AQ-DPM	3.04
Drinking Water	25.7
Lead Risk Housing	17.5
Pesticides	61.6
Toxic Releases	9.45
Traffic	9.11
Effect Indicators	—
CleanUp Sites	85.6
Groundwater	30.9
Haz Waste Facilities/Generators	16.6
Impaired Water Bodies	100.0
Solid Waste	9.67
Sensitive Population	—
Asthma	25.4
Cardio-vascular	17.1
Low Birth Weights	20.3
Socioeconomic Factor Indicators	—
Education	91.6
Housing	—
Linguistic	69.5
Poverty	48.0
Unemployment	80.4

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	—
Employed	—
Median HI	—
Education	—
Bachelor's or higher	—
High school enrollment	—
Preschool enrollment	—
Transportation	—
Auto Access	—
Active commuting	—
Social	—
2-parent households	—
Voting	—
Neighborhood	—
Alcohol availability	—
Park access	—
Retail density	—
Supermarket access	—
Tree canopy	—
Housing	—
Homeownership	—
Housing habitability	—
Low-inc homeowner severe housing cost burden	—
Low-inc renter severe housing cost burden	—
Uncrowded housing	—
Health Outcomes	—

Insured adults	—
Arthritis	0.0
Asthma ER Admissions	57.9
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	0.0
Cognitively Disabled	4.9
Physically Disabled	4.1
Heart Attack ER Admissions	44.2
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	0.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	98.0
Elderly	98.1

English Speaking	0.0
Foreign-born	0.0
Outdoor Workers	4.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	97.4
Traffic Density	0.0
Traffic Access	23.0
Other Indices	—
Hardship	0.0
Other Decision Support	—
2016 Voting	0.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	36.0
Healthy Places Index Score for Project Location (b)	—
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Grading - 5 months Building Construction - 5 months electrical, 6 months structural, 5 months installation
Construction: Trips and VMT	Up to 250 workers and 7 deliveries per day
Construction: On-Road Fugitive Dust	ICAPCD recommends modeling 90% unpaved roads.
Operations: Vehicle Data	Assumes one work round trip per weekday for maintenance
Operations: Road Dust	ICAPCD recommends modeling 90% unpaved roads.
Operations: Consumer Products	—
Construction: Off-Road Equipment	2 off-highway trucks added to account for water trucks, and generator added to account for construction office power
Construction: Dust From Material Movement	Based on discussions with ICAPCD staff, watering during ground disturbing activities would achieve a 50 percent reduction in fugitive dust.
Land Use	1,964.47 acre project site

ATTACHMENT 2

GHG Offset Calculations

On-Site Renewable Energy

Size	370	MW
Solar Capacity Factor	28.4%	U.S. Energy Information Administration - EIA - Independent Statistics and Analysis
Hours per Year	8,760	hours
Solar PV Electricity Generation	920,501	MWh per Year
GHG Intensity Factors		
CO2	266.1263765	lb/MWh
CH4	0.033	lb/MWh
N2O	0.004	lb/MWh
GWP		
CO2	1	
CH4	28	
N2O	265	
GHG Emissions		
CO2	111,116.45	MT/Year
CH4	13.78	MT/Year
N2O	1.67	MT/Year
CO2E	111,944.83	MT/Year



Noise Analysis for the
Virgo Solar PV Project
Imperial County, California

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RECON Number 10317
February 12, 2025

A handwritten signature in black ink that reads "Jessica Fleming". The signature is fluid and cursive.

Jessica Fleming, Senior Environmental Specialist
Noise, Air Quality, and Greenhouse Gas

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1:	Noise Measurement Data
2:	SoundPLAN Data – Construction Noise
3:	FHWA RD-77-108 – Vehicle Traffic Noise
4:	SoundPLAN Data – Operational Noise

Acronyms and Abbreviations

BESS	battery energy storage system
Caltrans	California Department of Transportation
CNEL	community noise equivalent level
dB	decibel
dB(A)	A-weighted decibel
FTA	Federal Transit Administration
Hz	hertz
IID	Imperial Irrigation District
L _{dn}	day-night noise level
L _{eq}	one-hour equivalent noise level
L _{eq(8)}	eight-hour equivalent noise level
L _{pw}	sound power level
project	Virgo Solar PV Project
SR-86	State Route 86

Executive Summary

This report provides the results of the noise analysis completed for the Virgo Solar PV Project (project) located within unincorporated Imperial County, California. The project site is currently undeveloped. The project would develop approximately 1,348.77 acres of the project site with photovoltaic solar panels capable of generating up to 370 megawatts of renewable energy. The project would also develop a battery energy storage system (BESS) capable of storing 800 megawatt hours of energy generated by the project solar panels. The project would also include a substation connection point to connect to an existing Imperial Irrigation District (IID) 161-kilovolt line that traverses the project boundary.

This report discusses potential noise impacts from construction and operation of the project. The potential for noise to impact adjacent receivers from future on-site sources and construction activity was assessed in order to determine if the project would comply with noise standards established in the Imperial County Noise Element and Municipal Code. A summary of the findings is provided below.

Construction Noise

Construction activities associated with the project would include grading, electrical infrastructure construction, structural construction, and equipment installation. Project construction noise would be generated by diesel engine-driven construction equipment. The County General Plan Noise Element establishes construction time of day restrictions and noise level limits. Construction activities may only occur Monday through Friday between the hours of 7:00 a.m. and 7:00 p.m. or Saturday between the hours of 9:00 a.m. and 5:00 p.m., excluding holidays. Additionally, construction noise may not exceed 75 A-weighted decibels eight-hour equivalent noise level [dB(A) $L_{eq(8h)}$] at the nearest sensitive receptor.

There are no sensitive receptors located in the vicinity of the project site. The nearest sensitive receptors are the residential uses located on Barth Road northeast of SR-86, more than 3,000 feet northeast of the project site, and on Allen Road north of SR-86, more than 6,000 feet north of the project site. Due to the size of the project site, construction noise levels would not exceed 75 dB(A) $L_{eq(8h)}$ beyond the project boundary. Construction noise at the nearest sensitive receptors likely would not be audible over vehicle traffic on SR-86. Therefore, project construction would not exceed noise level limits established in the County's Municipal Code and would only occur during the daytime hours, and temporary impacts would be less than significant.

Additionally, project construction would include up to 430 worker trips (215 round trips) and 14 truck delivery trips (7 round trips) per day. However, as calculated in this analysis, construction traffic would result in a 0.1 dB increase in noise which is not an audible change in noise. Therefore, construction traffic would not exceed noise level limits established in the County's Municipal Code, and impacts would be less than significant.

Operational Noise

The primary noise sources on-site would be the inverters, BESS containers, and substation. County Code of Ordinances Title 9, Division 7: Noise Abatement and Control specifies property line noise level limits. The noise level limit for the adjacent agricultural uses is 70 dB(A) L_{eq} . The most restrictive noise level limit for residential uses, which are located north and northeast of the project site, is 45 A-weighted decibels one-hour equivalent noise level [dB(A) L_{eq}]. As calculated in this analysis, noise levels are not projected to exceed 70 dB(A) L_{eq} beyond the project boundaries and would not exceed 45 dB(A) L_{eq} at the nearest residential uses. Therefore, project operation would not result in noise levels that exceed County standards, and impacts would be less than significant. Project operation would result in minimal additional traffic on adjacent roadways associated with periodic maintenance. Operational trips would be well less than the worker trips generated during project construction activities. Therefore, operational trips would not result in a change in off-site vehicle traffic noise, and impacts would be less than significant.

1.0 Introduction

1.1 Project Description

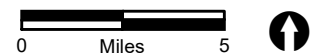
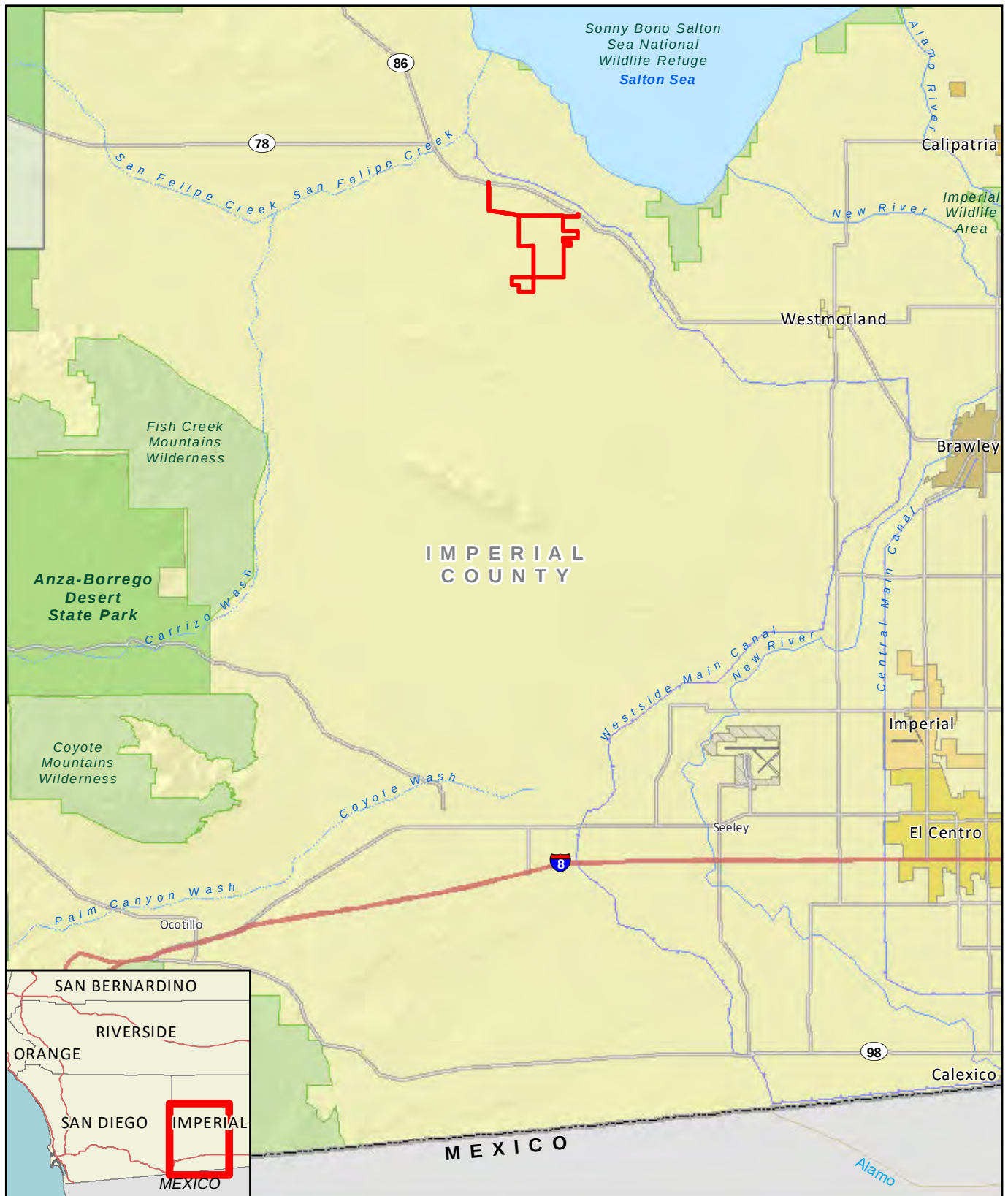
The Virgo Solar PV Project (project) is located within unincorporated Imperial County, California, approximately 19 miles east of Ocotillo Wells, 10 miles west of the city of Westmorland, and approximately 5 miles south of the Salton Sea (Figure 1). The project site is approximately 1,500 feet south of State Route 86 (SR-86). The 1,964.47-acre project site consists of the following 11 parcels: assessor parcel numbers 019-110-010, 034-010-006, 034-010-023, 019-120-001, 019-120-004, 019-120-005, 019-120-006, 019-120-007, 019-130-001, 019-130-007, and 019-130-009. All 11 parcels are designated in the County of Imperial General Plan Land Use Maps as Recreation/Open Space and zoned as Open Space/Preservation (S-2). The project site is surrounded by undeveloped desert land. Figure 2 shows an aerial photograph of the project site and vicinity.

The project would develop approximately 1,348.77 acres of the project site with photovoltaic solar panels capable of generating up to 370 megawatts of renewable energy. The project would also develop a battery energy storage system (BESS) capable of storing 800-megawatt hours of energy generated by the project solar panels. The project would also include a substation connection point to connect to an existing Imperial Irrigation District (IID) 161-kilovolt line that traverses the project boundary. The project has been designed to minimize encroachment into an existing flood zone that traverses north to south and dividing the solar panels proposed to the east and west. Access to the project site would be provided via one of the two following options:

- The 1.96-mile western access route would exit south off SR-86, utilizing a 0.94-mile paved access road for an existing CalEnergy Operating Corporation facility, followed by a 1.02-mile dirt road to be constructed heading southeast towards the project site.
- The 0.59-mile eastern access route would exit south off SR-86 at the intersection with Barth Road, followed by a dirt road to be constructed heading west towards the project site.

The alignments of both access routes would have negligible encroachment into land under the jurisdiction of the Bureau of Land Management (BLM). Figure 3 shows the proposed site plan.

Construction is anticipated to last 21 months and would consist of the following phases: grading (5 months), electrical infrastructure (5 months), structural construction (6 months), and equipment installation (5 months). Construction of the project would require a maximum of 250 daily construction works and a maximum of 7 daily truck trips.



 Project Location

FIGURE 1
Regional Location

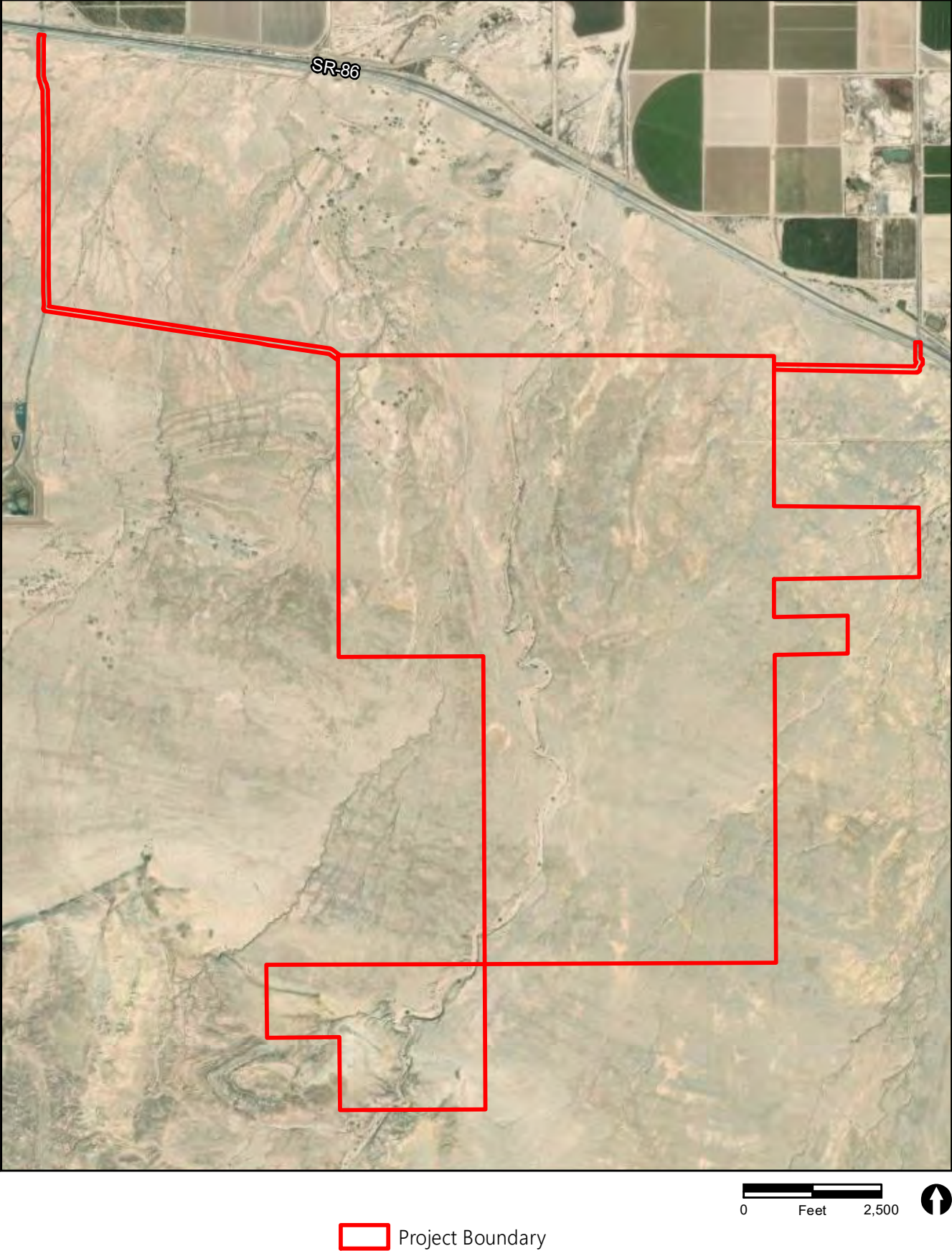
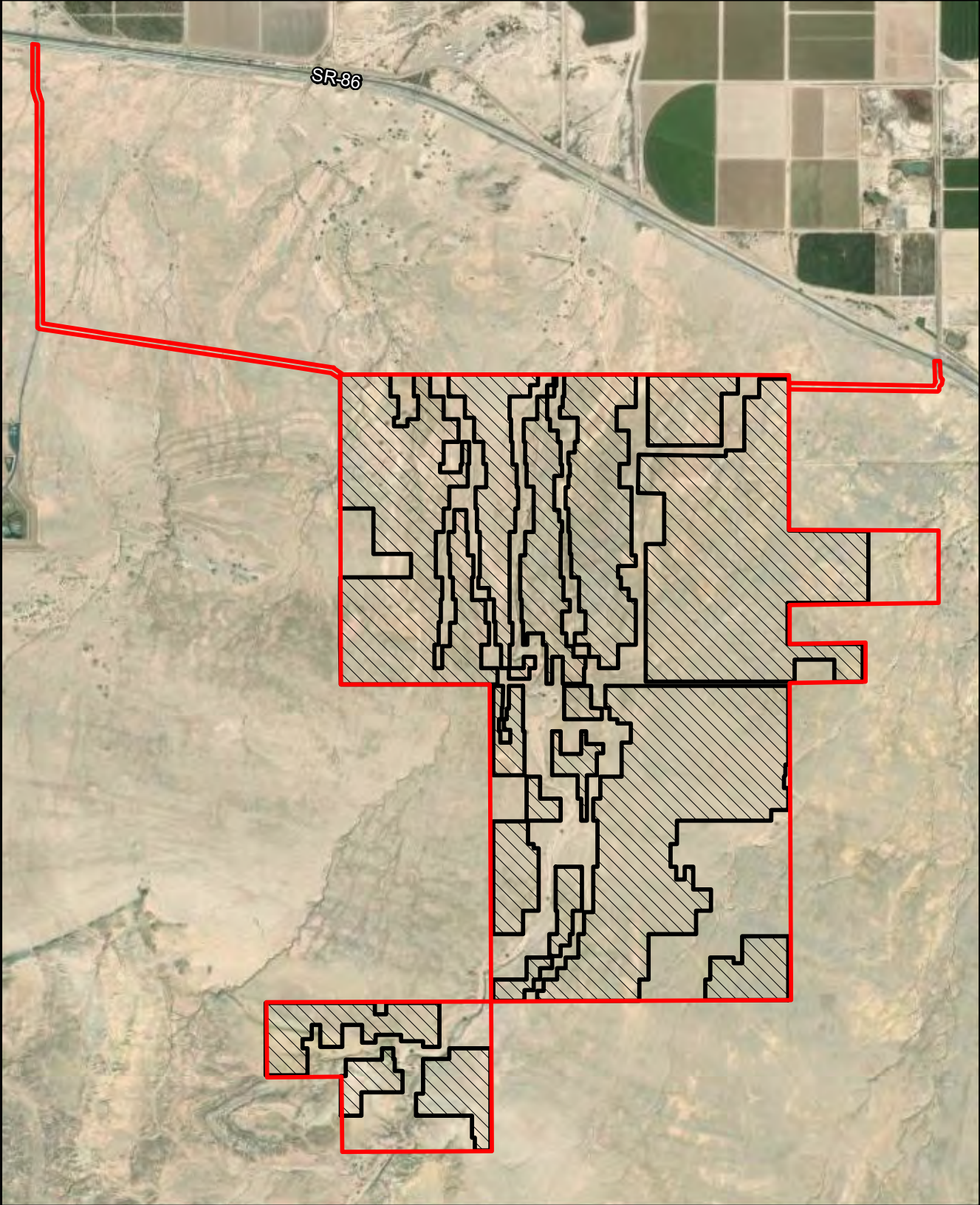


FIGURE 2
Project Location on Aerial Photograph



 Project Boundary
 Site Plan



FIGURE 3
Site Plan

1.2 Fundamentals of Noise and Vibration

1.2.1 Definition and Measurement of Noise

Sound levels are described in units called the decibel (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease.

Additionally, in technical terms, sound levels are described as either a “sound power level” or a “sound pressure level,” which while commonly confused, are two distinct characteristics of sound. Both share the same unit of measure, the dB. However, sound power, expressed as L_{pw} , is the energy converted into sound by the source. The L_{pw} is used to estimate how far a noise will travel and to predict the sound levels at various distances from the source. As sound energy travels through the air, it creates a sound wave that exerts pressure on receivers such as an eardrum or microphone and is the sound pressure level. Noise measurement instruments only measure sound pressure, and noise level limits used in standards are generally sound pressure levels.

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the “A-weighted” noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A-weighted measurements are designated with the notation dB(A).

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. The noise descriptors used for this study are the one-hour equivalent noise level (L_{eq}), the community noise equivalent level (CNEL), and the sound exposure level. The CNEL is a 24-hour equivalent sound level. The CNEL calculation applies an additional 5 dB(A) penalty to noise occurring during evening hours, between 7:00 p.m. and 10:00 p.m., and an additional 10 dB(A) penalty is added to noise occurring during the night, between 10:00 p.m. and 7:00 a.m. These increases for certain times are intended to account for the added sensitivity of humans to noise during the evening and night. Similar to the CNEL, the day-night noise level (L_{dn}) adds a 10 dB(A) penalty to nighttime noise but does not add a penalty to evening noise. By definition, L_{dn} is always less than or equal to CNEL, and the two descriptors usually agree within one decibel. In the context of noise sources discussed in this analysis, L_{dn} and CNEL can be considered synonymous and functionally interchangeable. The sound exposure level is a noise level over a stated period of time or event and normalized to one second. Sound from a small, localized source (approximating a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level decreases or drops off at a rate of 6 dB(A) for each doubling of the distance.

Traffic noise is not a single, stationary point source of sound. The movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The drop-off rate for a line source is 3 dB(A) for each doubling of distance.

The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site (such as parking lots or smooth bodies of water) receives no additional ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. A soft site (such as soft dirt, grass, or scattered bushes and trees) receives an additional ground attenuation value of 1.5 dB(A) per doubling of distance. Thus, a point source over a soft site would attenuate at 7.5 dB(A) per doubling of distance.

Human perception of noise has no simple correlation with acoustical energy. A change in noise levels is generally perceived as follows: 3 dB(A) barely perceptible, 5 dB(A) readily perceptible, and 10 dB(A) perceived as a doubling or halving of noise (California Department of Transportation 2013).

1.2.2 Definition and Measurement of Vibration

Vibration consists of energy waves transmitted through solid material. Groundborne vibration propagates from the source through the ground to adjacent buildings by surface waves. Vibration may be composed of a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating, measured in hertz (Hz). The normal frequency range of most groundborne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz (Federal Transit Administration 2018).

Vibration energy spreads out as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. Instantaneous groundborne vibration is measured by its peak particle velocity. The peak particle velocity is normally described in inches per second. Excessive groundborne vibration has the potential to result in structural damage.

Continued vibration of building components can also take the form of an audible, low-frequency, rumbling noise, which is referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when foundations or utilities, such as sewer and water pipes, connect the structure and the vibration source.

2.0 Applicable Standards

2.1 Imperial County General Plan Noise Element

2.1.1 Property Line Noise Level Limits

The County General Plan Noise Element (County of Imperial 2015) identifies property line noise level limits that apply to noise generation from one property to an adjacent property (excluding construction noise). As stated in the Noise Element, the property line noise level limits 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. The property line noise standards are codified in the County Code or Ordinances and thus are enumerated in the subsequent section (see Section 2.2).

2.1.2 Construction Noise Standards

County General Plan Noise Element Section IV.C.3 addresses noise generated by construction activities. It states:

- 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 operation shall be limited to the hours of 7 a.m. to 7 p.m., Monday through Friday, and 9 a.m. to 5 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 a.m. and 5 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.

Based on these standards, the applicable limit for project construction activities is 75 dB(A) L_{eq} at the nearest sensitive receptor.

2.2 Imperial County Noise Abatement and Control

County Code of Ordinances Title 9, Division 7: Noise Abatement and Control, specifies noise level limits. Noise level limits are summarized in Table 1. Noise level limits do not apply to construction equipment.

Table 1 Imperial County Property Line Noise Limits		
Zone	Time	One-Hour Average Sound Level [dB(A) L_{eq}]
Low-Density Residential Zones	7:00 a.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
Medium to High-Density Residential Zones	7:00 a.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50
Commercial Zones	7:00 a.m. to 10:00 p.m.	60
	10:00 p.m. to 7:00 a.m.	55
Manufacturing/Light Industrial/ Industrial Park Zones including agriculture	(anytime)	70
General Industrial Zones	(anytime)	75
SOURCE: Imperial County Noise Abatement and Control Ordinance, Tit. 9, Div. 7, § 90702.00(A).		

The project site is zoned S-2 (Open Space/Preservation). The surrounding parcels are zoned A-2 (General Agricultural) to the north and S-2 (Open Space/Preservation) to the east. BLM land use located to the southeast, south, and west, and military land is located to the southwest.

3.0 Existing Conditions

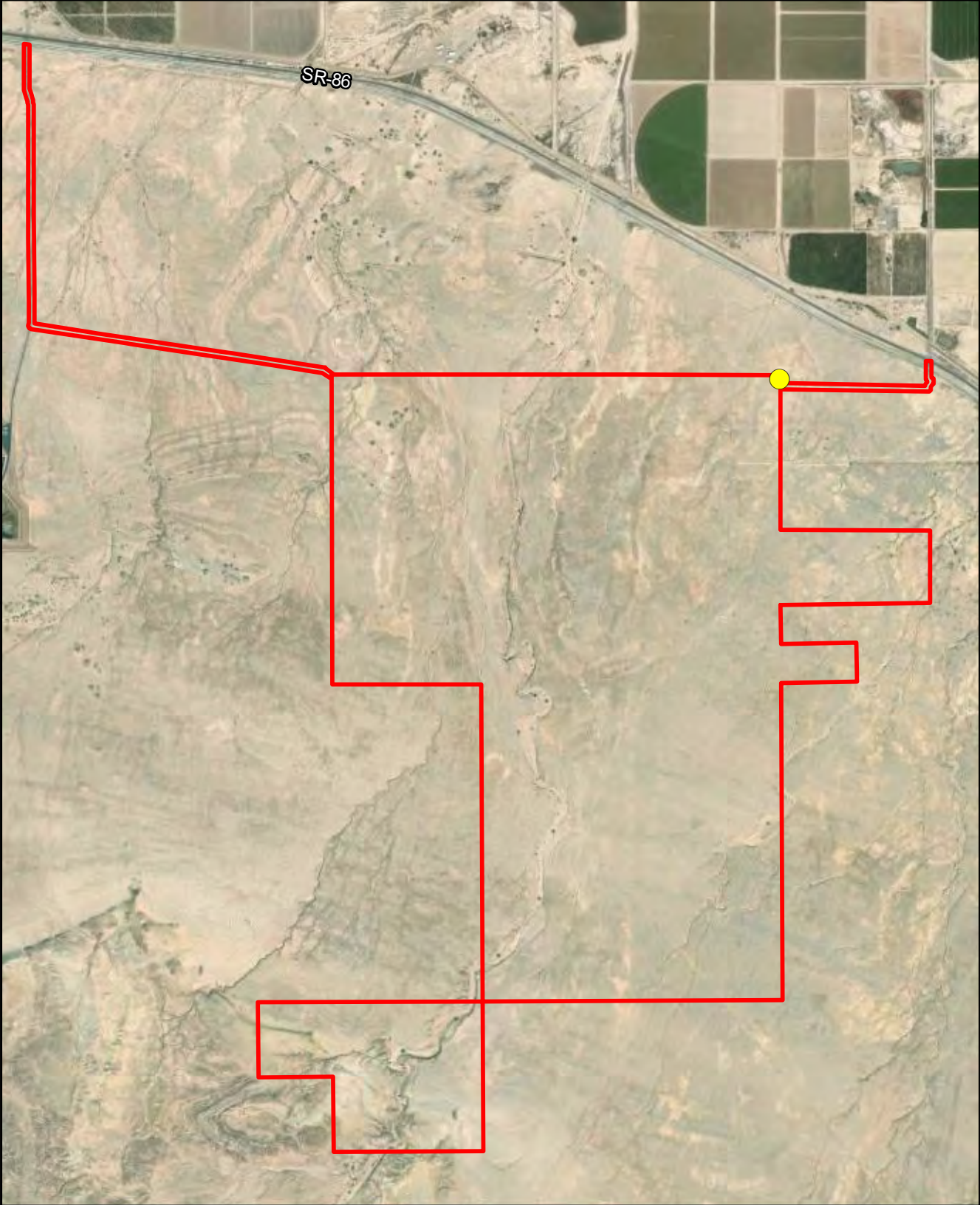
The project site is located in a rural environment away from major sources of ambient noise. The nearest roadway is SR-86 which is located approximately 1,500 feet from the nearest project boundary and 17,000 feet from the furthest project boundary. Based on Federal Highway Administration (FHWA) traffic noise algorithms and the existing traffic parameters (see Section 4.1.2), the vehicle traffic noise levels on the project site range from approximately 50 to 61 CNEL. This calculation does not account for any noise attenuation due to topography or site conditions.

Other sources of noise in the vicinity of the project site include military jet activity, however, the project site is not located within the airport influence area or airport noise contours of any nearby airport.

Existing noise levels at the project site were measured on December 4, 2024, using one Larson-Davis LxT Sound Expert Sound Level Meter, serial number 3896. The following parameters were used:

Filter:	A-weighted
Response:	Slow
Time History Period:	5 seconds

The meter was calibrated before and after the measurement. The measurement was located at the northeastern project boundary at the point closest to SR-86. The meter was set 5 feet above the ground level. Noise measurements were taken to obtain typical ambient noise levels at the project site and in the vicinity. Noise levels were measured for one hour. The main source of noise was vehicle traffic on SR-86 and secondary sources of noise included aircraft. The average measured noise level was 44.5 dB(A) L_{eq} . The measurement location is shown on Figure 4, and detailed data is presented in Attachment 1.



-  Project Boundary
-  Noise Measurement

FIGURE 4
Noise Measurement Location

4.0 Analysis Methodology

Noise level predictions and contour mapping were developed using noise modeling software, SoundPlan Essential, version 4.1 (Navcon Engineering 2018). SoundPLAN calculates noise propagation based on the International Organization for Standardization method (ISO 9613-2 – Acoustics, Attenuation of Sound during Propagation Outdoors). The model calculates noise levels at selected receiver locations using input parameter estimates such as total noise generated by each noise source; distances between sources, barriers, and receivers; and shielding provided by intervening terrain, barriers, and structures. The model outputs can be developed as noise level contour maps or noise levels at specific receivers. In all cases, receivers were modeled at five feet above ground elevation, which represents the average height of the human ear.

4.1 Construction Noise Analysis

4.1.1 Construction Equipment

Construction activities associated with the project would include grading (3 months), electrical infrastructure construction (3 months), structural construction (4 months), and equipment installation (3 months). Project construction noise would be generated by diesel engine-driven construction equipment. Noise impacts from construction are a function of the noise generated by equipment, the location and sensitivity of nearby land uses, and the timing and duration of the noise-generating activities. Table 2 presents a list of noise generation levels for various types of construction equipment. The duty cycle is the amount of time that equipment generates the reported noise level during typical, standard equipment operation. The noise levels and duty cycles summarized in Table 2 are based on measurements and studies conducted by Federal Highway Administration and the Federal Transit Authority.

Equipment	Maximum Noise Level at 50 Feet [dB(A) L_{eq}]	Typical Duty Cycle	Average Hourly Noise Level at 50 Feet [dB(A) L_{eq}]
Auger Drill Rig	85	20%	77
Backhoe	80	40%	76
Blasting	94	1%	74
Chain Saw	85	20%	78
Clam Shovel	93	20%	86
Compactor (ground)	80	20%	73
Compressor (air)	80	40%	76
Concrete Mixer Truck	85	40%	81
Concrete Pump	82	20%	75
Concrete Saw	90	20%	83
Crane (mobile or stationary)	85	20%	73
Dozer	85	40%	81
Dump Truck	84	40%	80
Excavator	85	40%	81

Table 2 Typical Construction Equipment Noise Levels			
Equipment	Maximum Noise Level at 50 Feet [dB(A) L_{eq}]	Typical Duty Cycle	Average Hourly Noise Level at 50 Feet [dB(A) L_{eq}]
Front End Loader	80	40%	76
Generator (25 kilovolt amps or less)	70	50%	67
Generator (more than 25 kilovolt amps)	82	50%	79
Grader	85	40%	81
Hydra Break Ram	90	10%	80
Impact Pile Driver (diesel or drop)	95	20%	88
Insitu Soil Sampling Rig	84	20%	77
Jackhammer	85	20%	78
Mounted Impact Hammer (hoe ram)	90	20%	83
Paver	85	50%	82
Pneumatic Tools	85	50%	82
Pumps	77	50%	74
Rock Drill	85	20%	78
Roller	74	40%	70
Scraper	85	40%	81
Tractor	84	40%	80
Vacuum Excavator (vac-truck)	85	40%	81
Vibratory Concrete Mixer	80	20%	73
Vibratory Pile Driver	95	20%	88
SOURCE: FHWA 2006.			

The loudest construction activities would be those associated with grading. Construction noise levels were calculated assuming the simultaneous use of two graders, scrapers, dozers, loaders, and water trucks. Water truck noise levels were assumed to be equivalent to a dump truck. Although more construction equipment would be present on-site, not all would be used at the same time. Simultaneous use of this equipment would generate an average hourly noise level of 90 dB(A) L_{eq} at 50 feet, which is equivalent to a sound power level of approximately 122 dB(A) L_{pw} . This noise level was modeled as an area source distributed over the footprint of the development area.

4.1.2 Construction Traffic

Project construction would result in additional traffic on adjacent roadways over the time period that construction occurs. A Transportation Analysis was prepared for the project (Linscott, Law & Greenspan, Engineers 2025). Based on this analysis, the project would include up to 500 worker trips (250 round trips) and 14 truck delivery trips (7 round trips) per day. These trips are anticipated to be accommodated on SR-86. A vehicle classification mix of 87.4 percent automobiles, 6.2 percent medium trucks, and 6.4 percent heavy trucks was obtained from California Department of Transportation (Caltrans) truck counts (Caltrans 2021).

Off-site traffic noise was modeled using the FHWA Traffic Noise Prediction Model algorithms and reference levels. Traffic noise levels were calculated at 50 feet from the centerline of the affected roadways to determine the noise level increase associated with the project. The model uses various input parameters, such as traffic volumes, vehicle mix, distribution, and speed. Traffic noise levels

were calculated based on the total average daily traffic volume on each roadway segment. For modeling purposes, “hard” ground conditions were used for the analysis of future conditions since a majority of the project area is paved and the hard site provides the most conservative impact assessment. Noise levels were modeled at 50 feet from roadway centerlines. Modeled noise levels do not account for shielding provided by intervening barriers and structures. Table 3 summarizes the modeled traffic parameters.

Table 3 Roadway Traffic Volumes						
Roadway Segment	Construction Year without Project ADT	Construction Year with Project ADT	Speed (mph)	Vehicle Classification (percent)		
				Auto- mobiles	Medium Trucks	Heavy Trucks
SR-86						
North of CalEnergy Road	13,890	14,101	65	87.4	6.2	6.4
South of Barth Road	13,890	14,207	65	87.4	6.2	6.4

SOURCE: Linscott, Law & Greenspan, Engineers 2025; Caltrans 2021.

4.2 Operational Noise Analysis

Once construction is complete, the primary noise sources would be the inverters and the BESS containers and the substation.

The project would include the construction of a substation located south of the BESS at the western project boundary. The substation would include equipment such as switches, circuit breakers, and transformers. Switches and circuit breakers do not typically generate substantial noise. The power rating for substation transformers would be several times higher than the power rating for transformers distributed throughout the facility at each solar array block. Based on National Electrical Manufacturers Association standards for oil-immersed transformers, a sound level of 67 dB(A) at 5 feet would be representative of the substation (National Electrical Manufacturers Association 2013). This equates to a sound power level of 97 dB(A).

The battery energy storage portion of the project would include 10 Sungrow Model SC5000UD-MV-US inverters surrounded by 152 Sungrow Model ST2752UX-US BESS containers, each consisting of 48 battery units. It was assumed that noise levels generated by the inverters would be similar to Sungrow Model SG3600-UD-MV, which generate a sound power level of 92 dB(A) L_{pw} (TRC Companies, Inc. 2022). Manufacturer specifications for the battery energy storage containers indicate that three facades of the containers generate a noise level of 54 dB(A) L_{eq} at five meters and one façade generates a noise level of 53 dB(A) L_{eq} at five meters (Assured Environmental 2022). The louder noise level, which equates to a sound power level of 76 dB(A) L_{pw} , was modeled. All inverters and battery energy storage containers were modeled with a 100 percent usage factor. The sound power levels for on-site equipment are summarized in Table 4.

Table 4 Sound Power Levels of Proposed Mechanical Equipment	
Equipment	Sound Power Level
Substation	97 dB(A) L_{pw}
Sungrow Inverters	92 dB(A) L_{pw}
Sungrow Battery Energy Storage Containers	76 dB(A) L_{pw}
SOURCES: National Electrical Manufacturers Association 2013; TRC Companies, Inc. 2022; Assured Environmental 2022.	

5.0 Future Acoustical Environment and Impacts

5.1 Construction Noise

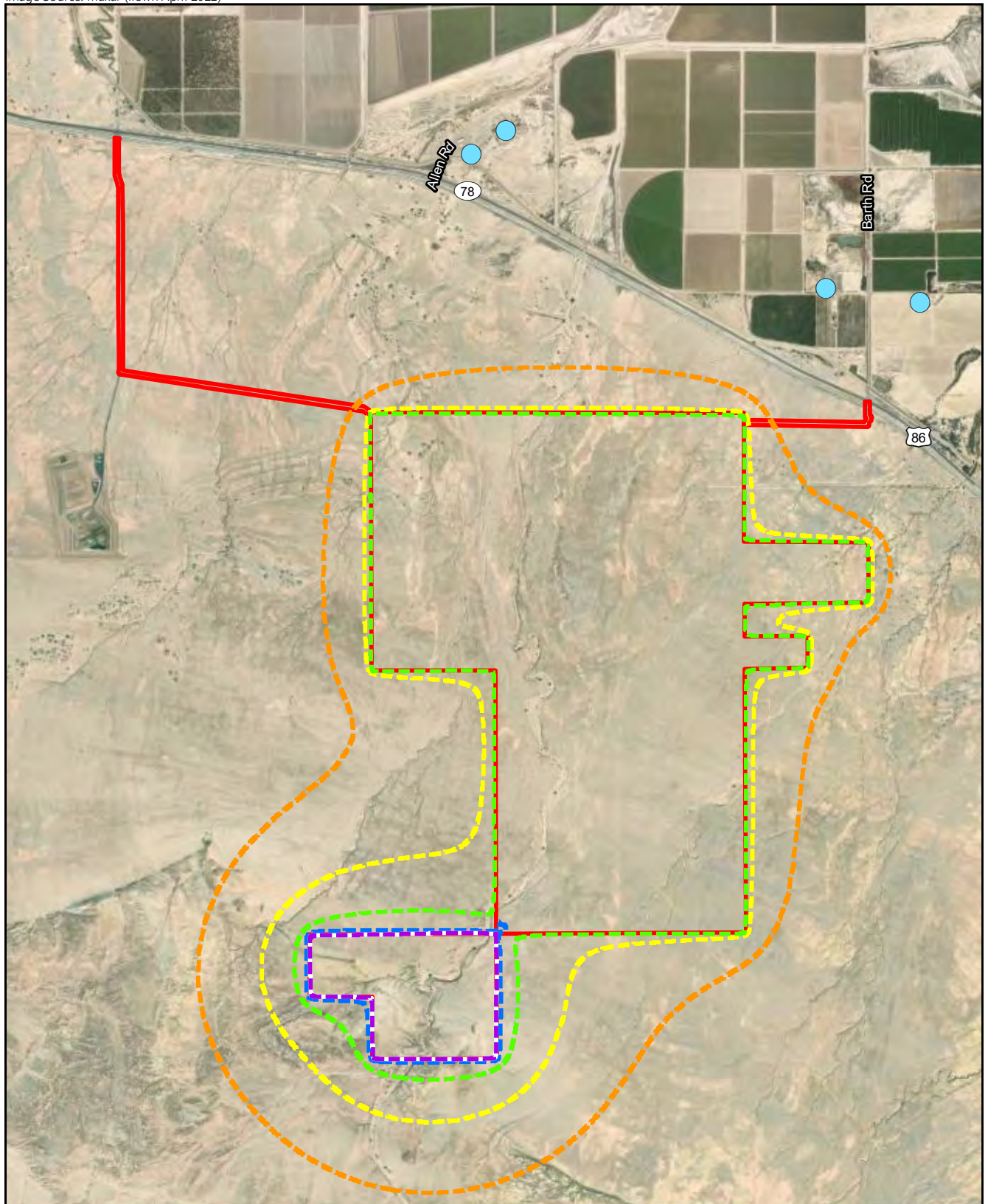
5.1.1 Construction Equipment

Construction activities associated with the project would include grading, electrical infrastructure construction, structural construction, and equipment installation. Noise would be generated by equipment required for these activities. Construction noise contours were developed calculated assuming the simultaneous use of two graders, scrapers, dozers, loaders, and water trucks. Construction contours are shown in Figure 5. Calculations are provided in Attachment 2.

As discussed in Section 2.1, the County General Plan Noise Element establishes construction time of day restrictions and noise level limits. Construction activities may only occur Monday through Friday between the hours of 7:00 a.m. and 7:00 p.m. or Saturday between the hours of 9:00 a.m. and 5:00 p.m., excluding holidays. Additionally, construction noise may not exceed 75 dB(A) $L_{eq(8h)}$ at the nearest sensitive receptor. There are no sensitive receptors located in the vicinity of the project site. The nearest sensitive receptors are the residential uses located on Barth Road northeast of SR-86, more than 3,000 feet northeast of the project site, and on Allen Road north of SR-86, more than 6,000 feet north of the project site. Construction noise levels at these distances likely would not be audible over vehicle traffic on SR-86. As shown in Figure 5, the closest residential uses are located more than 2,800 feet north of the 45 dB(A) L_{eq} construction noise contours. Due to the size of the project site, construction noise levels would not exceed 75 dB(A) $L_{eq(8h)}$ beyond the project boundary. Therefore, project construction would not exceed noise level limits established in the County's Municipal Code and would only occur during the daytime hours, and temporary impacts would be less than significant.

5.1.2 Construction Traffic

As discussed in Section 4.1.2, the project would include up to 430 worker trips (215 round trips) and 14 truck delivery trips (7 round trips) per day during construction. These trips would access the site via SR-86. Noise impacts due to construction traffic would be significant if the project results in an increase of 3 dB at off-site sensitive receivers. A 3 dB increase in noise is barely perceptible to the human ear.



 Project Boundary

 Nearest Sensitive Receptors

Construction Noise

 45 dB(A) L_{eq}

 50 dB(A) L_{eq}

 55 dB(A) L_{eq}

 60 dB(A) L_{eq}

 65 dB(A) L_{eq}

 0 Feet 3,000



FIGURE 5
Construction Noise Contours

Table 5 presents a conservative assessment of traffic noise levels based on the existing without project construction traffic and the existing plus project construction traffic conditions. Noise levels shown in Table 5 are at 50 feet from SR-86. Calculations are provided in Attachment 3.

Table 5 Off-Site Vehicle Traffic Noise Levels (CNEL)			
Roadway Segment	Construction Year without Project Noise Level	Construction Year with Project Noise Level	Increase in Noise
SR-86			
North of CalEnergy Road	76.1	76.2	0.1
South of Barth Road	76.1	76.2	0.1
SOURCE: Linscott, Law & Greenspan, Engineers 2025; Caltrans 2021.			

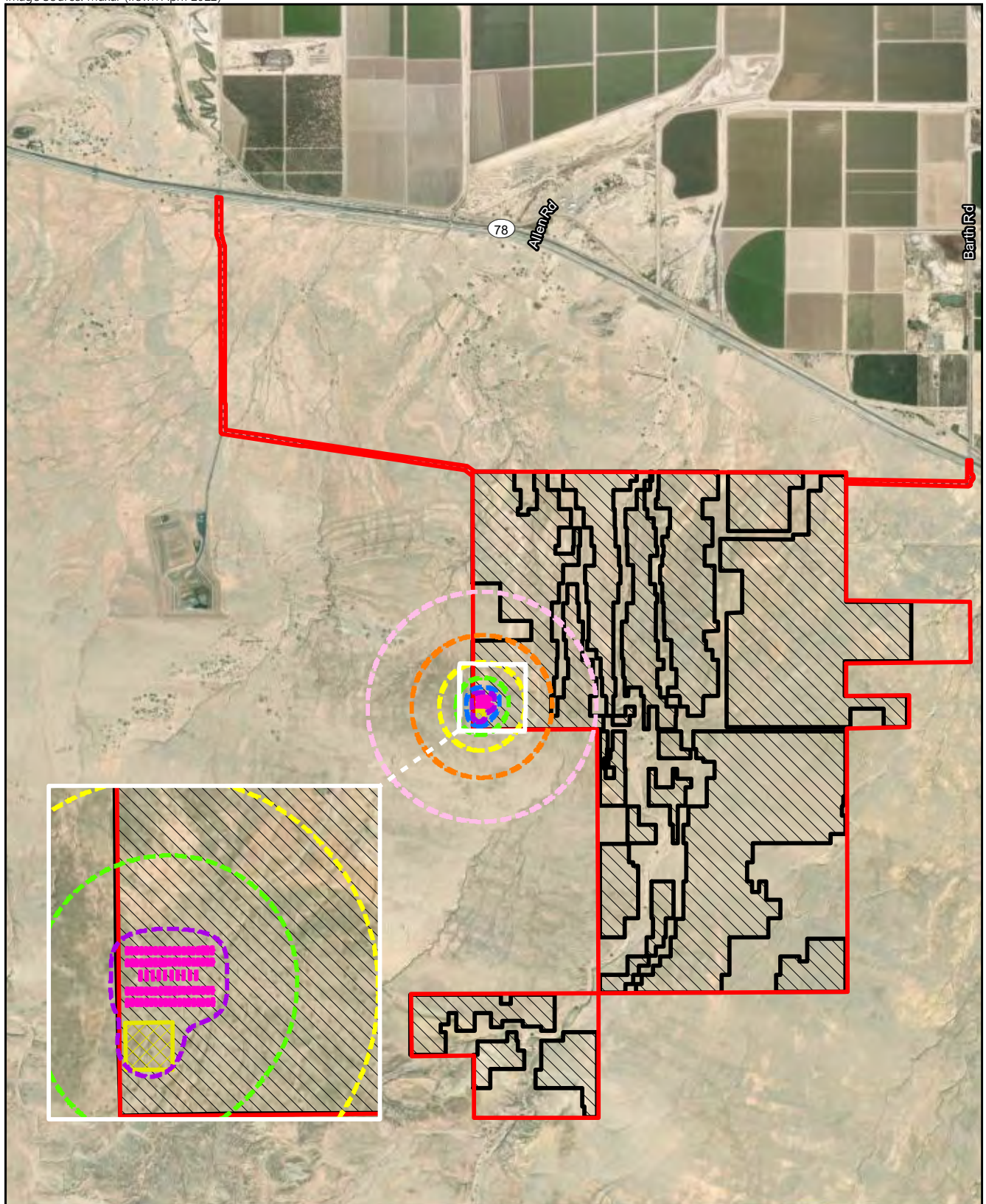
As shown in Table 5 above, construction traffic would result in a 0.1 dB increase in noise, which is not an audible change in noise. Therefore, construction traffic would not exceed noise level limits established in the County's Municipal Code, and impacts would be less than significant.

5.2 Operational Noise

The primary noise sources on-site would be the inverters, battery energy storage containers, and substation. Using the on-site noise source parameters discussed in Section 4.2, operational noise contours were developed. Operational noise contours are shown in Figure 6. Modeled data is included in Attachment 4.

County Code of Ordinances Title 9, Division 7: Noise Abatement and Control specifies property line noise level limits (see Table 1). As discussed, there are no sensitive receptors in the vicinity of the project site. The surrounding parcels are zoned A-2 (General Agricultural) to the north and S-2 (Open Space/Preservation) to the east. BLM land use located to the southeast, south, and west, and military land is located to the southwest. As shown in Table 1, the noise level limit for agricultural uses is 70 dB(A) L_{eq} . The most restrictive noise level limit for residential uses, which are located north and northeast of the project site, is 45 dB(A) L_{eq} .

As shown in Figure 6, noise levels are not projected to exceed 70 dB(A) L_{eq} beyond the project boundaries and would not exceed 45 dB(A) L_{eq} at the nearest residential uses. Operational noise levels would not exceed the agricultural noise level limits at the adjacent properties or the residential noise level limits at the nearest residential uses. Therefore, project operation would not result in noise levels that exceed County standards, and impacts would be less than significant. It should be noted that as the project design is finalized, the location of the substation and BESS may adjust. The 45 dB(A) L_{eq} noise contour is located approximately 520 feet from the center of the BESS. The nearest residential receiver is located more than 3,000 feet from the project boundary; thus, even if the substation and BESS were to be located closer to the north project boundary, operational noise levels at the nearest residential uses would remain well below 45 dB(A) L_{eq} .



Project Boundary

Access Road

Site Plan

BESS Site Plan

Substation

Operational Noise

30 dB(A) L_{eq}

35 dB(A) L_{eq}

40 dB(A) L_{eq}

45 dB(A) L_{eq}

50 dB(A) L_{eq}

55 dB(A) L_{eq}

0 Feet 3,000



RECON

M:\JOBS6\10317\common_gis\MXD\fig6_nos.mxd 01/28/2025 bma

FIGURE 6
Operational Noise Contours

Project operation would result in minimal additional traffic on adjacent roadways associated with periodic maintenance. The only visitors to the site would be that of repair or maintenance workers, whose presence at the site would only be necessary infrequently and inconsistently. Operational trips would be well less than the worker trips generated during project construction activities. Therefore, operational trips would not result in a change in off-site vehicle traffic noise, and impacts would be less than significant.

6.0 Conclusions

6.1 Construction Noise

Construction activities associated with the project would include grading, electrical infrastructure construction, structural construction, and equipment installation. Project construction noise would be generated by diesel engine-driven construction equipment. The County General Plan Noise Element establishes construction time of day restrictions and noise level limits. Construction activities may only occur Monday through Friday between the hours of 7:00 a.m. and 7:00 p.m. or Saturday between the hours of 9:00 a.m. and 5:00 p.m., excluding holidays. Additionally, construction noise may not exceed 75 dB(A) $L_{eq(8h)}$ at the nearest sensitive receptor.

There are no sensitive receptors located in the vicinity of the project site. Due to the size of the project site, construction noise levels would not exceed 75 dB(A) $L_{eq(8h)}$ beyond the project boundary. Construction noise at the nearest sensitive receptors, which are located on Barth Road and Allen Road north and northeast of SR-86 and the project site, likely would not be audible over vehicle traffic on SR-86. Therefore, project construction would not exceed noise level limits established in the County's Municipal Code and would only occur during the daytime hours, and temporary impacts would be less than significant.

Additionally, project construction would include up to 500 worker trips (250 round trips) and 14 truck delivery trips (7 round trips) per day. However, as calculated in this analysis, construction traffic would result in a 0.1 dB increase in noise which is not an audible change in noise. Therefore, construction traffic would not exceed noise level limits established in the County's Municipal Code, and impacts would be less than significant.

6.2 Operational Noise

The primary noise sources on-site would be the inverters, battery energy storage containers, and substation. County Code of Ordinances Title 9, Division 7: Noise Abatement and Control specifies property line noise level limits. The noise level limit for the adjacent agricultural uses is 70 dB(A) L_{eq} . The most restrictive noise level limit for residential uses, which are located north and northeast of the project site, is 45 dB(A) L_{eq} . As calculated in this analysis, noise levels are not projected to exceed 70 dB(A) L_{eq} beyond the project boundaries and would not exceed 45 dB(A) L_{eq} at the nearest residential uses. Therefore, project operation would not result in noise levels that exceed County standards, and impacts would be less than significant. Project operation would result in minimal additional traffic on adjacent roadways associated with periodic maintenance. Operational trips

would be well less than the worker trips generated during project construction activities. Therefore, operational trips would not result in a change in off-site vehicle traffic noise, and impacts would be less than significant.

7.0 References Cited

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Navcon Engineering, Inc.

- 2018 SoundPLAN Essential version 4.1.

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- 2022 Brookside Solar Project. Application for a Permit Pursuant to §94-c of the New York State Executive Law for Construction of a Major Solar Electrical Generating Facility. Exhibit 7 Noise and Vibration. Matter No. 21-00917. Prepared for AES Clean Energy. February 2022.

U.S. Geological Survey

- 1992 Kane Spring, California quadrangle.

ATTACHMENTS

ATTACHMENT 1

Noise Measurement Data

10317 Virgo Solar
Noise Measurement Data

Summary				
File Name on Meter	LxT_Data.024.s			
File Name on PC	LxT_0003896-20241204 121233-LxT_Data.024.ldbin			
Serial Number	0003896			
Model	SoundTrack LxT®			
Firmware Version	2.404			
User				
Location				
Job Description				
Note				

Measurement				
Description				
Start	2024-12-04	12:12:33		
Stop	2024-12-04	13:12:59		
Duration		01:00:25.8		
Run Time		01:00:01.4		
Pause		00:00:24.4		
Pre-Calibration	2024-12-04	11:50:48		
Post-Calibration		None		
Calibration Deviation		---		

Overall Settings				
RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamplifier	Unknown			
Microphone Correction	Off			
Integration Method	Linear			
Overload	144.3 dB			
	A	C	Z	
Under Range Peak	100.6	97.6	102.6 dB	
Under Range Limit	38.9	38.5	45.3 dB	
Noise Floor	29.8	29.3	36.1 dB	

Results

LAeq	44.5					
LAE	80.1					
EA	11.391 μPa²h					
EA8	91.091 μPa²h					
EA40	455.454 μPa²h					
LApeak (max)	2024-12-04	13:00:08			80.1 dB	
LASmax	2024-12-04	12:15:49			58.7 dB	
LASmin	2024-12-04	12:14:06			35.7 dB	
SEA	-99.9 dB					
LAS > 60.0 dB (Exceedance Counts / Duration)	0				0.0 s	
LAS > 70.0 dB (Exceedance Counts / Duration)	0				0.0 s	
LApeak > 135.0 dB (Exceedance Counts / Duration)	0				0.0 s	
LApeak > 137.0 dB (Exceedance Counts / Duration)	0				0.0 s	
LApeak > 140.0 dB (Exceedance Counts / Duration)	0				0.0 s	
LCeq	59.3 dB					
LAeq	44.5 dB					
LCeq - LAeq	14.7 dB					
LAlaq	45.8 dB					
LAeq	44.5 dB					
LAlaq - LAeq	1.2 dB					
	A		C		Z	
	dB Time Stamp		dB Time Stamp		dB Time Stamp	
Leq	44.5		59.3			
LS(max)	58.7 2024/12/04 12:15:49					
LS(min)	35.7 2024/12/04 12:14:06					
LPeak(max)	80.1 2024/12/04 13:00:08					
Overload Count	0					
Overload Duration	0.0 s					

Dose Settings		
Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB
Threshold	90	80 dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results		
Dose	-99.94	-99.94 %
Projected Dose	-99.94	-99.94 %
TWA (Projected)	-99.9	-99.9 dB
TWA (t)	-99.9	-99.9 dB
Lep (t)	35.5	35.5 dB

Statistics	
LA5.00	48.0 dB
LA10.00	46.7 dB
LA33.30	44.3 dB
LA50.00	43.0 dB
LA66.60	41.9 dB
LA90.00	39.5 dB

ATTACHMENT 2

SoundPLAN Data – Construction Noise

10317 Virgo Solar
SoundPLAN Data - Construction

Source name	Reference	Level	Corrections		
		Leq1 dB(A)	Cwall dB(A)	CI dB(A)	CT dB(A)
Construction	Lw/unit	122	-	-	-
Construction	Lw/unit	122	-	-	-

ATTACHMENT 3

FHWA RD-77-108 – Vehicle Traffic Noise

FHWA RD-77-108
Traffic Noise Prediction Model

Data Input Sheet

Project Name : Virgo Solar
Project Number : 10317
Modeled Condition : Construction Year without and with Project

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.0
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
Construction Year without Project												
1	SR-86	North of CalEnergy Road	13,890	65	50	87.40	6.20	6.40	77.00	10.00	13.00	
2	SR-86	South of Barth Road	13,890	65	50	87.40	6.20	6.40	77.00	10.00	13.00	
Construction Year with Project												
1	SR-86	North of CalEnergy Road	14,101	65	50	87.40	6.20	6.40	77.00	10.00	13.00	
2	SR-86	South of Barth Road	14,207	65	50	87.40	6.20	6.40	77.00	10.00	13.00	

FHWA RD-77-108
Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : Virgo Solar
Project Number : 10317
Modeled Condition : Construction Year without and with Project
Assessment Metric: Hard

Segment	Roadway	Segment	Noise Levels, dBA Hard					Distance to Traffic Noise Level Contours, Feet				
			Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
Construction Year without Project												
1	SR-86	North of CalEnergy Road	73.2	67.8	71.4	76.1	64	204	644	2,037	6,441	20,369
2	SR-86	South of Barth Road	73.2	67.8	71.4	76.1	64	204	644	2,037	6,441	20,369
Construction Year with Project												
1	SR-86	North of CalEnergy Road	73.2	67.9	71.5	76.2	66	208	659	2,084	6,591	20,843
2	SR-86	South of Barth Road	73.3	67.9	71.5	76.2	66	208	659	2,084	6,591	20,843

FHWA RD-77-108
Traffic Noise Prediction Model

Data Input Sheet

Project Name : Virgo Solar
Project Number : 10317
Modeled Condition : Existing Ambient Noise

Surface Refelction: CNEL
Assessment Metric: Hard
Peak ratio to ADT: 10.0
Traffic Desc. (Peak or ADT) : ADT

Segment	Roadway	Segment	Traffic Vol.	Speed (Mph)	Distance to CL	% Autos	%MT	% HT	Day %	Eve %	Night %	K-Factor
Construction Year without Project												
1	SR-86	Nearest project boundary	12,630	65	1,500	87.40	6.20	6.40	77.00	10.00	13.00	
2	SR-86	Furtherst project boundary	12,630	65	17,000	87.40	6.20	6.40	77.00	10.00	13.00	

FHWA RD-77-108
Traffic Noise Prediction Model

Predicted Noise Levels

Project Name : Virgo Solar
Project Number : 10317
Modeled Condition : Existing Ambient Noise
Assessment Metric: Hard

Segment	Roadway	Segment	Noise Levels, dBA Hard					Distance to Traffic Noise Level Contours, Feet				
			Auto	MT	HT	Total	75 dB	70 dB	65 dB	60 dB	55 dB	50 dB
Construction Year without Project												
1	SR-86	Nearest project boundary	58.0	52.6	56.3	60.9	58	185	584	1,845	5,836	18,454
2	SR-86	Furtherst project boundary	47.4	42.1	45.7	50.4	59	186	589	1,864	5,895	18,640

ATTACHMENT 4

SoundPLAN Data – Operational Noise

10317 Virgo Solar
SoundPLAN Data - Operation

Source name	Reference	Level	Frequency spectrum [dB(A)]																										Corrections			
		20 Hz	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.3 kHz	1.6 kHz	2 kHz	2.5 kHz	3.2 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	Cwall dB(A)	CI dB(A)	CT dB(A)
BESS1	Lw/unit	76																												-	-	-
BESS2	Lw/unit	76																												-	-	-
BESS3	Lw/unit	76																												-	-	-
BESS4	Lw/unit	76																												-	-	-
BESS5	Lw/unit	76																												-	-	-
BESS6	Lw/unit	76																												-	-	-
BESS7	Lw/unit	76																												-	-	-
BESS8	Lw/unit	76																												-	-	-
BESS9	Lw/unit	76																												-	-	-
BESS10	Lw/unit	76																												-	-	-
BESS11	Lw/unit	76																												-	-	-
BESS12	Lw/unit	76																												-	-	-
BESS13	Lw/unit	76																												-	-	-
BESS14	Lw/unit	76																												-	-	-
BESS15	Lw/unit	76																												-	-	-
BESS16	Lw/unit	76																												-	-	-
BESS17	Lw/unit	76																												-	-	-
BESS18	Lw/unit	76																												-	-	-
BESS19	Lw/unit	76																												-	-	-
BESS20	Lw/unit	76																												-	-	-
BESS21	Lw/unit	76																												-	-	-
BESS22	Lw/unit	76																												-	-	-
BESS23	Lw/unit	76																												-	-	-
BESS24	Lw/unit	76																												-	-	-
BESS25	Lw/unit	76																												-	-	-
BESS26	Lw/unit	76																												-	-	-
BESS27	Lw/unit	76																												-	-	-
BESS28	Lw/unit	76																												-	-	-
BESS29	Lw/unit	76																												-	-	-
BESS30	Lw/unit	76																												-	-	-
BESS31	Lw/unit	76																												-	-	-
BESS32	Lw/unit	76																												-	-	-
BESS33	Lw/unit	76																												-	-	-
BESS34	Lw/unit	76																												-	-	-
BESS35	Lw/unit	76																												-	-	-
BESS36	Lw/unit	76																												-	-	-
BESS37	Lw/unit	76																												-	-	-
BESS38	Lw/unit	76																												-	-	-
BESS39	Lw/unit	76																												-	-	-
BESS40	Lw/unit	76																												-	-	-
BESS41	Lw/unit	76																												-	-	-
BESS42	Lw/unit	76																												-	-	-
BESS43	Lw/unit	76																												-	-	-
BESS44	Lw/unit	76																												-	-	-
BESS45	Lw/unit	76																												-	-	-
BESS46	Lw/unit	76																												-	-	-
BESS47	Lw/unit	76																												-	-	-
BESS48	Lw/unit	76																												-	-	-
BESS49	Lw/unit	76																												-	-	-
BESS50	Lw/unit	76																												-	-	-
BESS51	Lw/unit	76																												-	-	-
BESS52	Lw/unit	76																												-	-	-
BESS53	Lw/unit	76																												-	-	-
BESS54	Lw/unit	76																												-	-	-
BESS55	Lw/unit	76																														

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TRANSPORTATION ANALYSIS
VIRGO SOLAR PV PROJECT
Imperial County, California
February 12, 2025

LLG Ref. 3-23-3738

Prepared by:
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Transportation Planner II

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TRANSPORTATION ANALYSIS
VIRGO SOLAR PV PROJECT
Imperial County, California
February 12, 2025

1.0 PROJECT AND STUDY DESCRIPTION

Linscott, Law and Greenspan, Engineers (LLG) has prepared this Transportation Analysis report to assess the impacts as a result of the Virgo Solar PV project (Project), located in Imperial County.

The traffic analysis presented in this report includes the following:

- Section 1.* Project and Study Description.
- Section 2.* Vehicle Miles Traveled Assessment
- Section 3.* Local Mobility Analysis
- Section 4.* Existing Conditions
- Section 5.* Project Traffic
- Section 6.* Cumulative Traffic Volumes
- Section 7.* Capacity Analysis
- Section 8.* Conclusions

1.1 Project Location and Vicinity Map

The approximately 1,944 acre site is located in the area south of State Route 86 (SR-86) in the unincorporated County of Imperial.

Figure 1-1 is the Vicinity Map depicting the Project location. **Figure 1-2** depicts a more detailed Project Area Map.

1.2 Project Size and Description

The Virgo Solar PV Project (project) is located within unincorporated Imperial County, California, approximately 19 miles east of Ocotillo Wells, 10 miles west of the city of Westmorland, and approximately 5 miles south of the Salton Sea. The project site is located approximately 1,500 feet south of State Route 86 (SR-86). The 1,964.47-acre project site consists of the following eleven parcels: Assessor Parcel Numbers 019-110-010, 034-010-006, 034 010 023, 019-120-001, 019-120-004, 019-120-005, 019-120-006, 019-120-007, 019-130-001, 019-130-007, and 019-130-009. All eleven parcels are designated in the County of Imperial General Plan Land Use Maps as Recreation/Open Space and zoned as Open Space/Preservation (S-2). The project site is surrounded by undeveloped desert land.

The project would develop approximately 1,348.77 acres of the project site with photovoltaic solar panels capable of generating up to 370 megawatts of renewable energy. The project would also develop a battery energy storage system capable of storing 800 megawatt hours of energy generated

by the project solar panels. The project would also include a substation connection point to connect to an existing Imperial Irrigation District (IID) 161-kilovolt line that traverses the project boundary. The project has been designed to minimize encroachment into an existing flood zone that traverses north to south and dividing the solar panels proposed to the east and west. Access to the project site would be provided via one of the two following options:

- The western access route would exit south off SR-86, utilizing a paved access road for an existing CalEnergy Operating Corporation facility, followed by a dirt road to be constructed heading southeast towards the project site.
-
- The eastern access route would exit south off SR-86 at the intersection with Barth Road, followed by a dirt road to be constructed heading west towards the project site.

The alignments of both access routes would have negligible encroachment into land under the jurisdiction of the Bureau of Land Management.

1.3 Project Access Alternatives

Access to the site will be provided via SR-86 with two alternative access point options. One access point will be located north of the project site and would utilize the CalEnergy Road intersection with SR-86. The second alternative would be located east of the project site and would utilize the Barth Road intersection with SR-86.

For the purposes of this report, each alternative was analyzed independently.

1.4 Proposed Construction Year and Analysis Scenarios

The Project's construction year is projected to be 2026. The following analysis scenarios are analyzed in this study.

- Existing
- Construction Year (Existing + Cumulative Growth) without Project
- Construction Year + Project

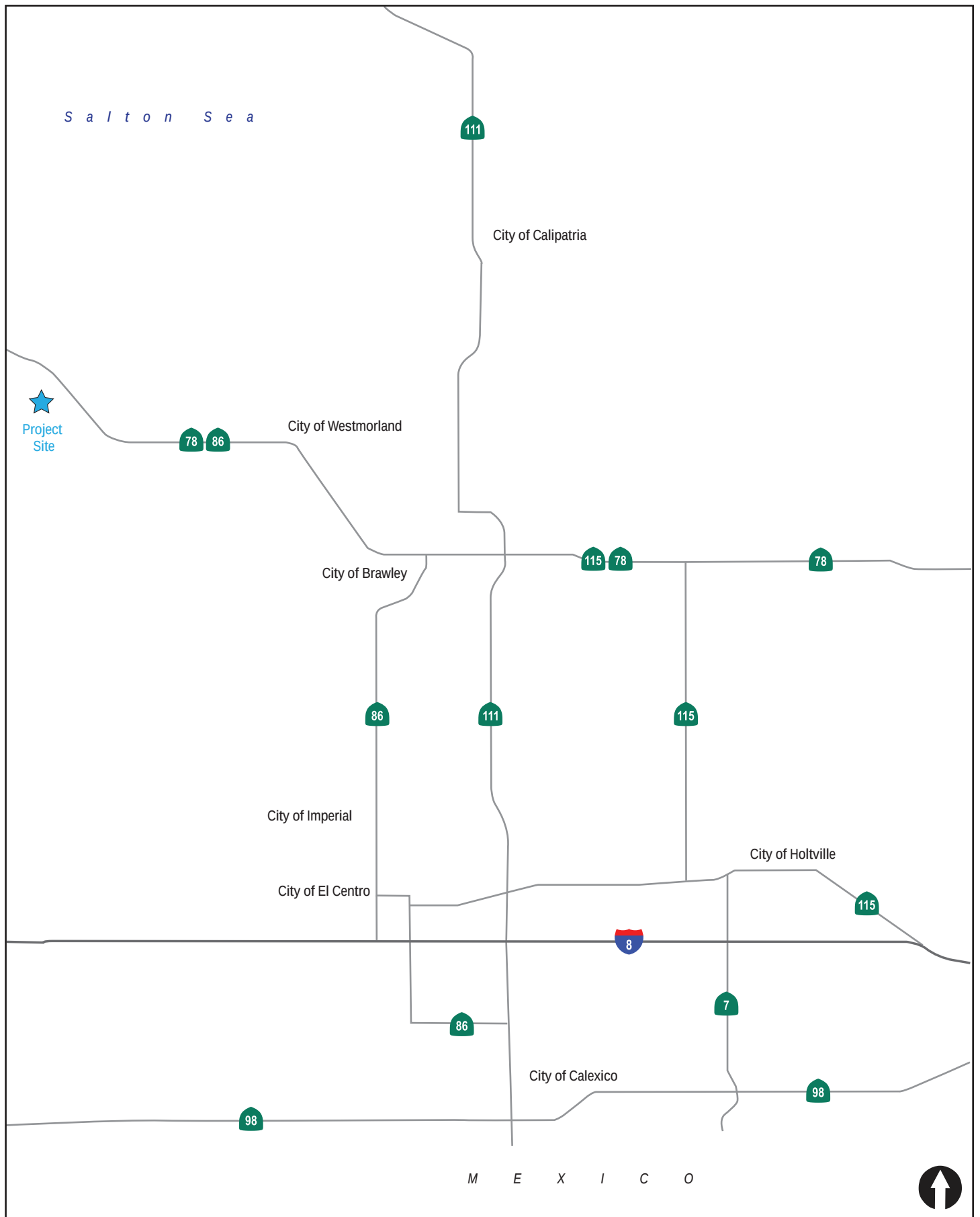
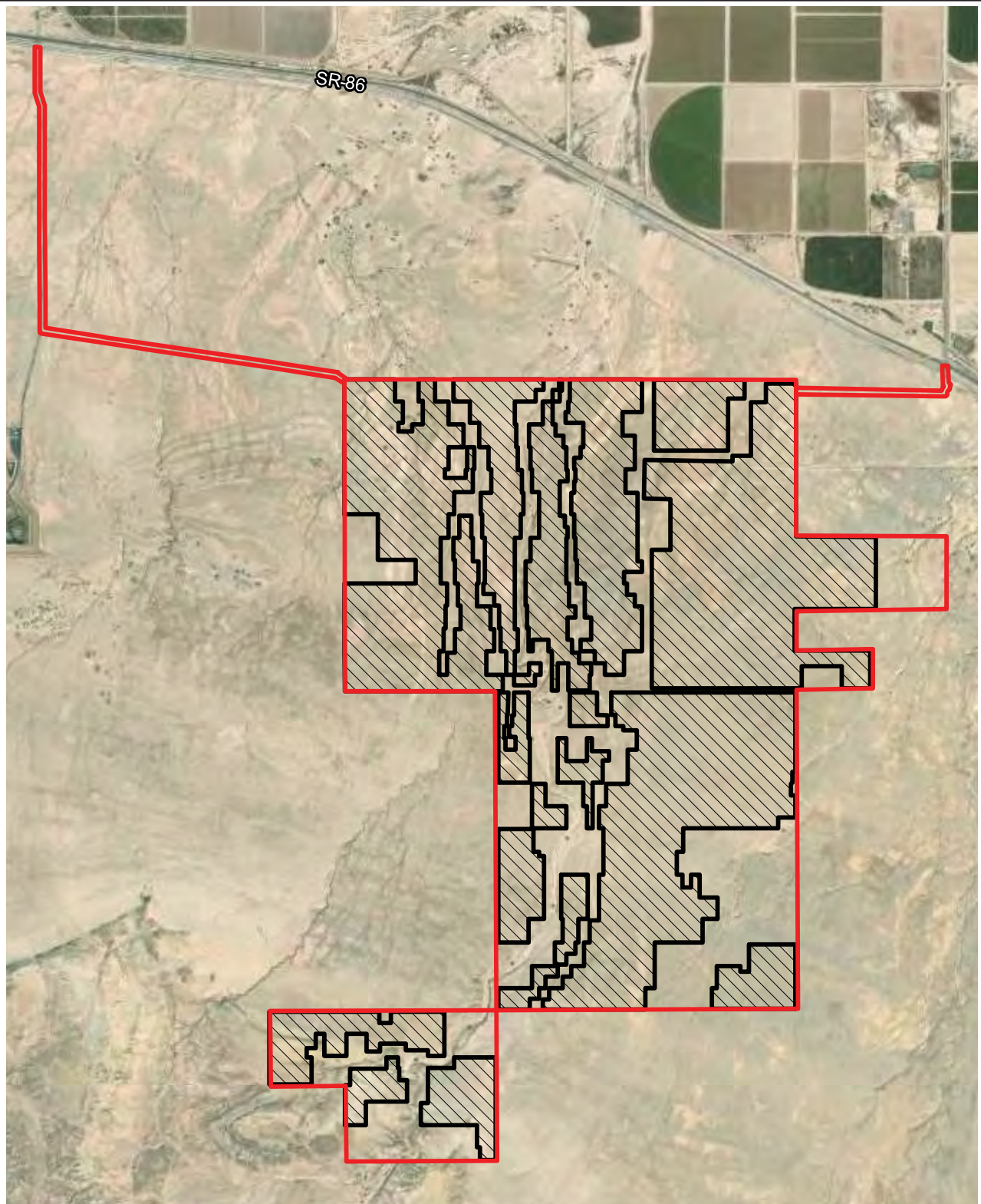


Figure 1

Vicinity Map

VIRGO SOLAR PV

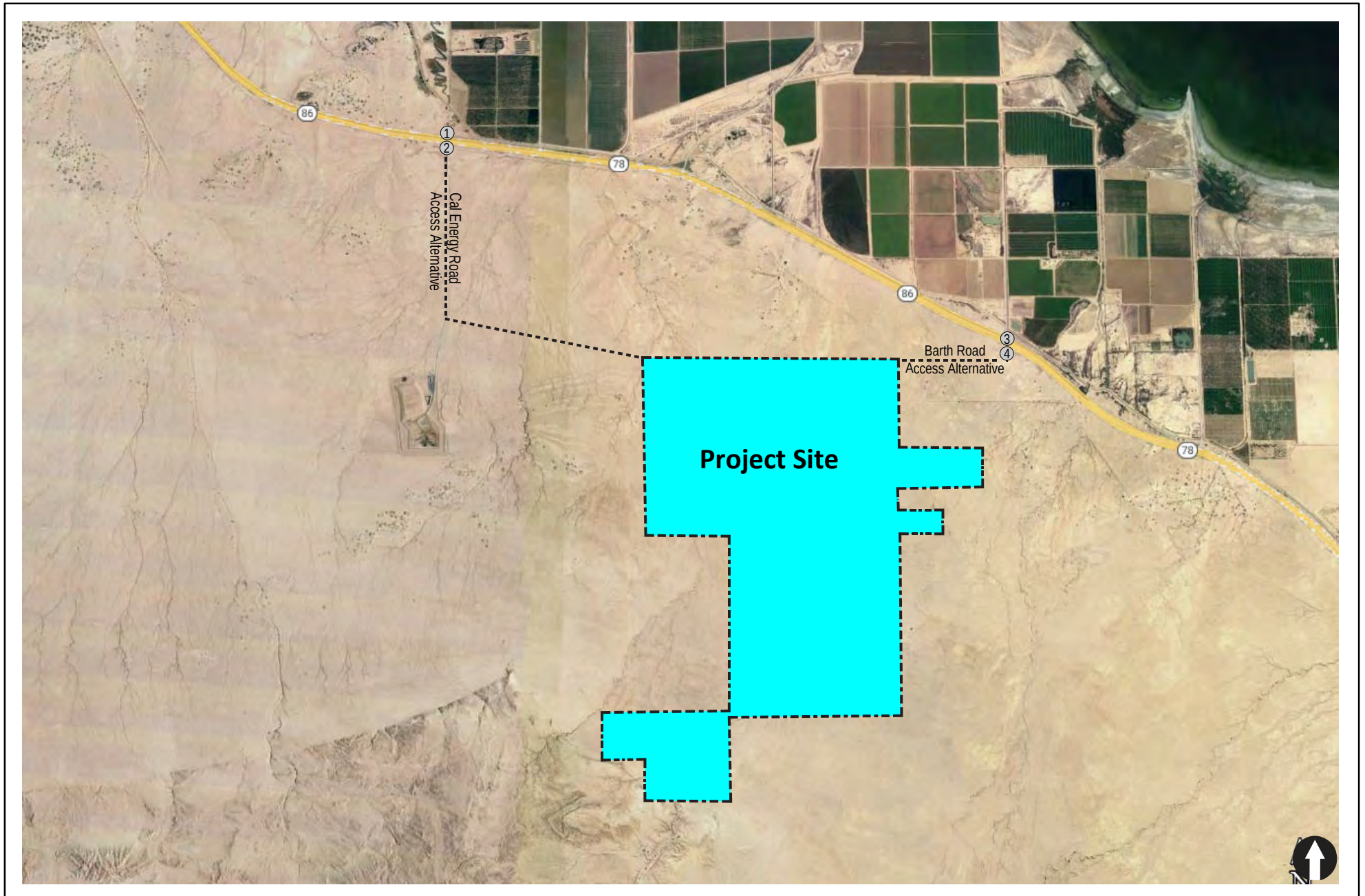




0 Feet 2,500

Project Boundary
Site Plan





2.0 VEHICLE MILES TRAVELED ASSESSMENT

2.1 Background

In September 2013, the Governor’s Office signed SB 743 into law, starting a process that fundamentally changes the way transportation impact analysis is conducted under CEQA. These changes include the elimination of auto delay, level of service (LOS), and similar measurements of vehicular roadway capacity and traffic congestion as the basis for determining significant impacts. The justification for this paradigm shift is that Auto Delay/LOS impacts lead to improvements that increase roadway capacity and therefore induce more traffic and greenhouse gas emissions. The VMT standard for evaluating transportation impacts under CEQA became mandatory statewide on July 1, 2020.

Vehicle Miles Traveled (VMT) is defined as a measurement of miles traveled by vehicles within a specified region and for a specified time period. VMT is a measure of the use and efficiency of the transportation network. VMT’s are calculated based on individual vehicle trips generated and their associated trip lengths. VMT accounts for two-way (round trip) travel and is typically estimated on a weekday for the purpose of measuring potential transportation impacts.

2.2 Methodology

Imperial County has not yet formally developed guidelines or adopted significance criteria for VMT analysis. Therefore, LLG utilized the Governor’s Office of Planning and Research (OPR) guidelines from the *Technical Advisory on Evaluating Transportation Impacts in CEQA*, December 2018, to develop technical methodologies for this Project.

The Project will generate trips from two distinct types of vehicles: heavy vehicles, which consist of the Project’s delivery trucks, and employee passenger vehicles. Heavy vehicles and passenger vehicles are classified as different vehicle types in the OPR guidelines and are considered differently in regards to VMT analysis.

2.2.1 Delivery Vehicles

Per OPR guidelines, “vehicle miles traveled” refers to the amount and distance of *automobile* travel attributable to a project. Here the term “automobile” refers to on-road passenger vehicles, specifically cars and light trucks. VMT does not include trips from heavy-duty trucks. Therefore, the trips generated by the Project’s truck deliveries are excluded from VMT analysis.

2.2.2 Employee Passenger Vehicles

Many agencies use “screening thresholds” to quickly identify when a project should be expected to cause a less-than-significant impact. OPR contains a screening threshold for small projects which states that, “absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact.”

The employee construction trips will be temporary in nature and therefore a VMT analysis is not necessary. The operational trips will be less than 110 ADT and based on OPR Guidelines, a VMT analysis is not necessary.

3.0 LOCAL MOBILITY ANALYSIS

3.1 Analysis Approach and Methodology

In addition to the VMT analysis presented above, a Local Mobility Analysis (LMA) was also prepared that focuses on automobile delay and Level of Service (LOS). The LOS analysis was conducted to identify Project effects on the roadway operations in the Project study area and recommend Project improvements to address noted deficiencies.

3.1.1 Level of Service

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections.

3.1.2 Intersections

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and LOS was determined based upon the procedures found in Chapters 20 and 21 of the *HCM 6* with the assistance of the *Synchro* (version 11) computer software. **Appendix B** contains the analysis worksheets.

3.1.3 Street Segments

Street segments were analyzed based upon the comparison of ADT to the County of Imperial *Roadway Classifications, Levels of Service (LOS) and Average Daily Traffic (ADT)* table (see **Table 3-2** below).

3.2 Substantial Effect Criteria

Imperial County does not have published substantial effect criteria. However, the County General Plan states that the level of service (LOS) goal for intersections is to operate at LOS C or better. Therefore, if a segment degrades from LOS C or better to LOS D or worse with the addition of project traffic, the Project has a substantial effect. If the location operates at LOS D or worse with and without project traffic, the project has a substantial effect if the project causes the intersection delta to increase by more than two (2) seconds, or the V/C ratio to increase by more than 0.02.

**TABLE 3-1
TRAFFIC IMPACT SUBSTANTIAL EFFECT CRITERIA**

Level of Service with Project ^a	Allowable Increase Due to Project Impacts ^b					
	Freeways		Roadway Segments		Intersections	Ramp Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
D, E & F	0.01	1	0.02	1	2	2 ^c

Footnotes:

- All level of service measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume. The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.
- If a proposed project's traffic causes the values shown in the table to be exceeded, the Project has a substantial effect. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigations (within the Traffic Impact Study [TIS] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note a above), or if the project adds a significant amount of peak hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating Project's substantial effect.
- The allowable increase in delay at a ramp meter with more than 15 minutes of delay and freeway LOS E is 2 minutes and at LOS F is 1 minute.

General Notes:

- V/C = Volume to Capacity Ratio
- Speed = Arterial speed measured in miles per hour
- Delay = Average stopped delay per vehicle measured in seconds for intersections, or minutes for ramp meters.
- LOS = Level of Service

**TABLE 3-2
IMPERIAL COUNTY STANDARD STREET CLASSIFICATION AVERAGE DAILY VEHICLE TRIPS**

Road		Level of Service W/ADT*				
Class	X-Section	A	B	C	D	E
Expressway (6-lane)	128 / 210	30,000	42,000	60,000	70,000	80,000
Prime Arterial	106 / 136	22,200	37,000	44,600	50,000	57,000
Minor Arterial	82 / 102	14,800	24,700	29,600	33,400	37,000
Major Collector (Collector)	64 / 84	13,700	22,800	27,400	30,800	34,200
Minor Collector (Local Collector)	40 / 70	1,900	4,100	7,100	10,900	16,200
Residential Street	40 / 60	*	*	< 1,500	*	*
Residential Cul-de-Sac / Loop Street	40/60	*	*	< 1,500	*	*
Industrial Collector	76 / 96	5,000	10,000	14,000	17,000	20,000
Industrial Local Street	44 / 64	2,500	5,000	7,000	8,500	10,000

* Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

4.0 EXISTING CONDITIONS

Effective evaluation of the traffic impacts associated with the proposed project requires an understanding of the existing transportation system within the project area. *Figure 4-1* shows an existing conditions diagram, including signalized/unsignalized intersections and lane configurations.

4.1 Study Area

The study area includes the following intersections and street segments based on the anticipated distribution of the Project traffic and areas of potential effect.

Intersections:

1. Westbound SR-86 / CalEnergy Road
2. Eastbound SR-86 / CalEnergy Road
3. Westbound SR-86 / Barth Road
4. Eastbound SR-86 / Barth Road

Street Segments:

1. SR-86: North of CalEnergy Road
2. SR-86 South of Barth Road

The facilities analyzed in this report fall under the jurisdiction of the Imperial County. The following is a brief description of the streets in the project area:

State Route 86 (SR-86) is classified as a two-lane undivided Local Collector on the Imperial County Circulation Element. It is currently built as a north-south two-lane undivided roadway. The posted speed limit is 55 mph. There is no bus stops provided, and on-street parking is prohibited.

4.2 Existing Traffic Volumes

Peak hour (6AM to 8AM and 3PM to 5PM) intersection turning movement counts were conducted at the study area intersections in January 2025.

In addition, average daily traffic (ADT) volumes are analyzed as part of this traffic report. Two segments along SR-86 were identified based on the project trip distribution. Counts were conducted on July 12, 2023.

Figure 4-2 shows the Existing Traffic Volumes. *Appendix A* contains the manual count sheets.

4.3 Peak Hour Intersection Operations

Table 4-1 summarizes the Existing intersection level of service. As seen in *Table 4-1*, the study intersections are calculated to currently operate acceptably at LOS B or better during both the AM and PM peak hours.

**TABLE 4-1
EXISTING INTERSECTION OPERATIONS**

Intersection	Control Type	Movement / Approach	Peak Hour	Delay ^a	LOS ^b
CalEnergy Road Access Alternative					
1. Westbound SR-86 / CalEnergy Road	TWSC ^c	NB L	AM	9.4	A
			PM	9.9	A
2. Eastbound SR86 / CalEnergy Road	TWSC	SB L	AM	9.5	A
			PM	10.0	B
Barth Road Access Alternative					
3. Westbound SR-86 / Barth Road	TWSC	NB L	AM	9.9	A
			PM	9.5	A
4. Eastbound SR-86 / Barth Road	TWSC	SB L	AM	9.5	A
			PM	10.2	B

Footnotes:

- a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two Way Stop controlled intersection.
Minor street delay reported.

UNSIGNALIZED

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

4.4 Street Segment Operations

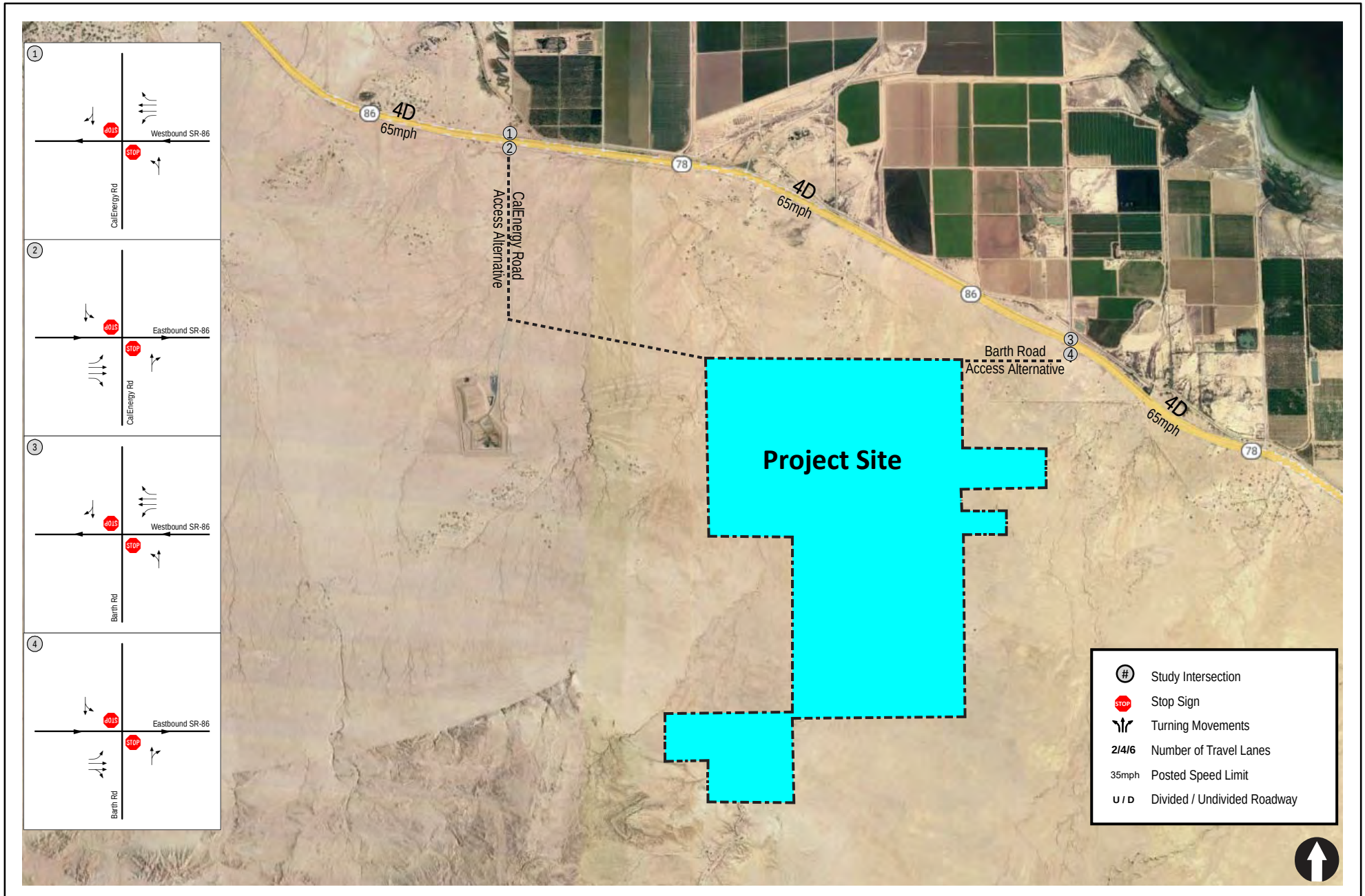
Table 4-2 summarizes the Existing, street segment operations under along the study area roadways. As shown in *Table 4-2*, the street segments are calculated to currently operate acceptably at LOS B on a daily basis.

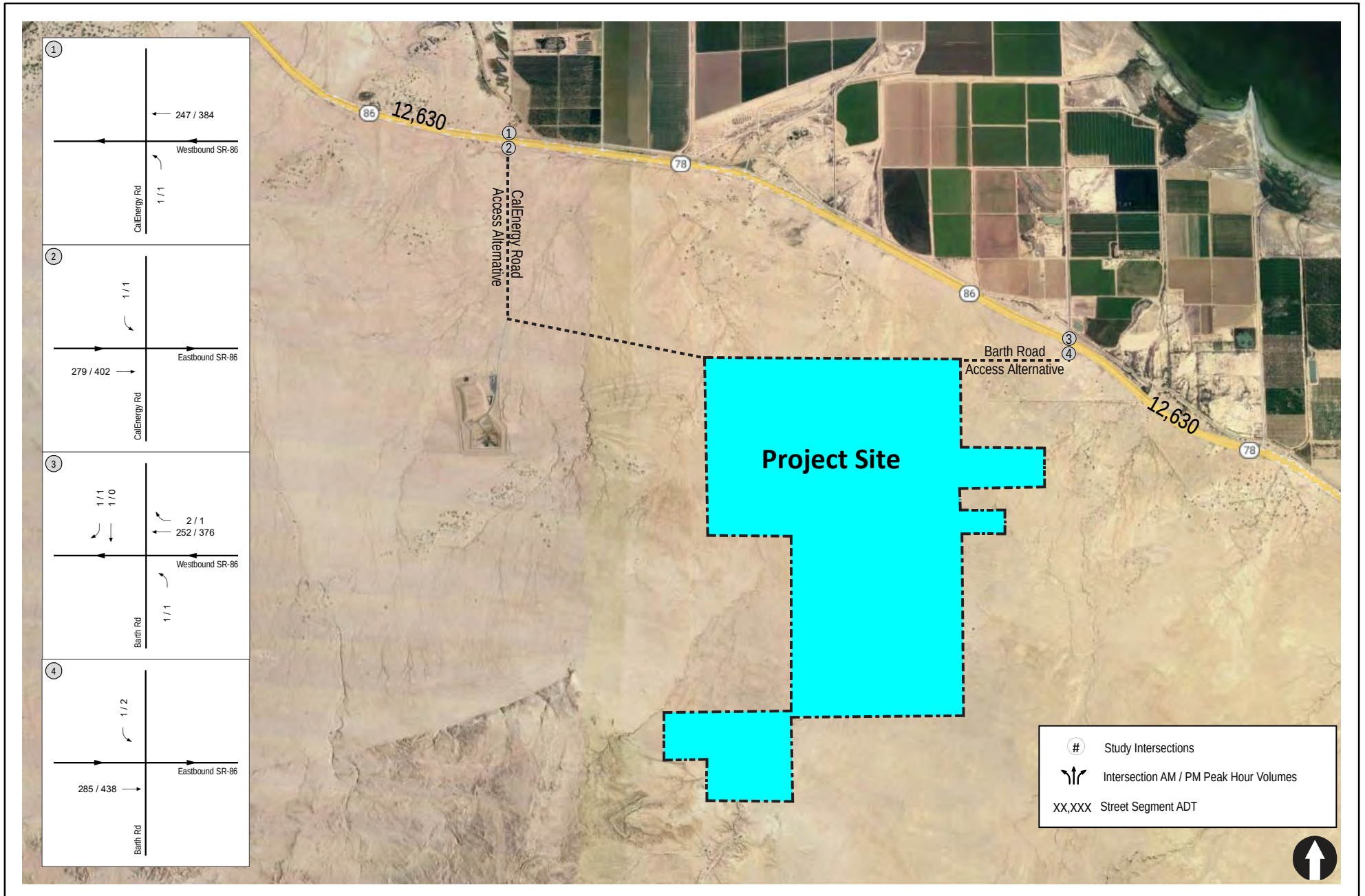
TABLE 4-2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Functional Capacity	Capacity (LOS E) ^a	ADT ^b	LOS ^c	V/C ^d
SR-86					
North of CalEnergy Road	State Highway	37,000	12,630	B	0.34
South of Barth Road	State Highway	37,000	12,630	B	0.34

Footnotes:

- a. Capacity at which the roadway currently functions and based on County of Imperial Roadway Classification Tables.
- b. Average Daily Traffic Volumes.
- c. Level of Service
- d. Volume to Capacity ratio.





5.0 PROJECT TRAFFIC

5.1 Trip Generation

Trip generation estimates for the Project are based on information provided by the applicant. Based on these discussions, it was determined that the construction phase of the project would generate more trips than when the project is built and operational. The operational trips will be nominal.

Project traffic generation was calculated as shown in *Table 5-1*. As seen in *Table 5-1*, the peak construction phase includes employee trips and truck delivery trips. The maximum number of construction workers will be 250 and the number of daily trucks during that construction phase will be 7. A total of 528 ADT, with 216 inbound / 21 outbound trips during the AM peak hour, and 21 inbound / 221 outbound trips during the PM peak hour is calculated. The volumes include a passenger car equivalence factor (PCE), as discussed below.

5.2 PCE Factor

A Passenger Car Equivalence (PCE) of 2.0 was applied to the truck trips to account for the diminished performance characteristics of heavy trucks in traffic flow (as compared to passenger vehicles) based on data contained in the Highway Capacity Manual (HCM).

5.3 Trip Distribution and Assignment

5.3.1 CalEnergy Road Access Alternative

Access to the site will be provided to the Project Access Road via SR-86 / CalEnergy Road interchange. Project trip distribution was developed based on discussion with the Client. Based on these discussions the majority of construction traffic would be coming from the south via the El Centro and Brawley area with the remaining traffic coming from the Coachella area to the north. A 60/40 south/north split was assumed.

5.3.2 Barth Road Access Alternative

Access to the project site would utilize the SR-86 / Barth Road interchange.

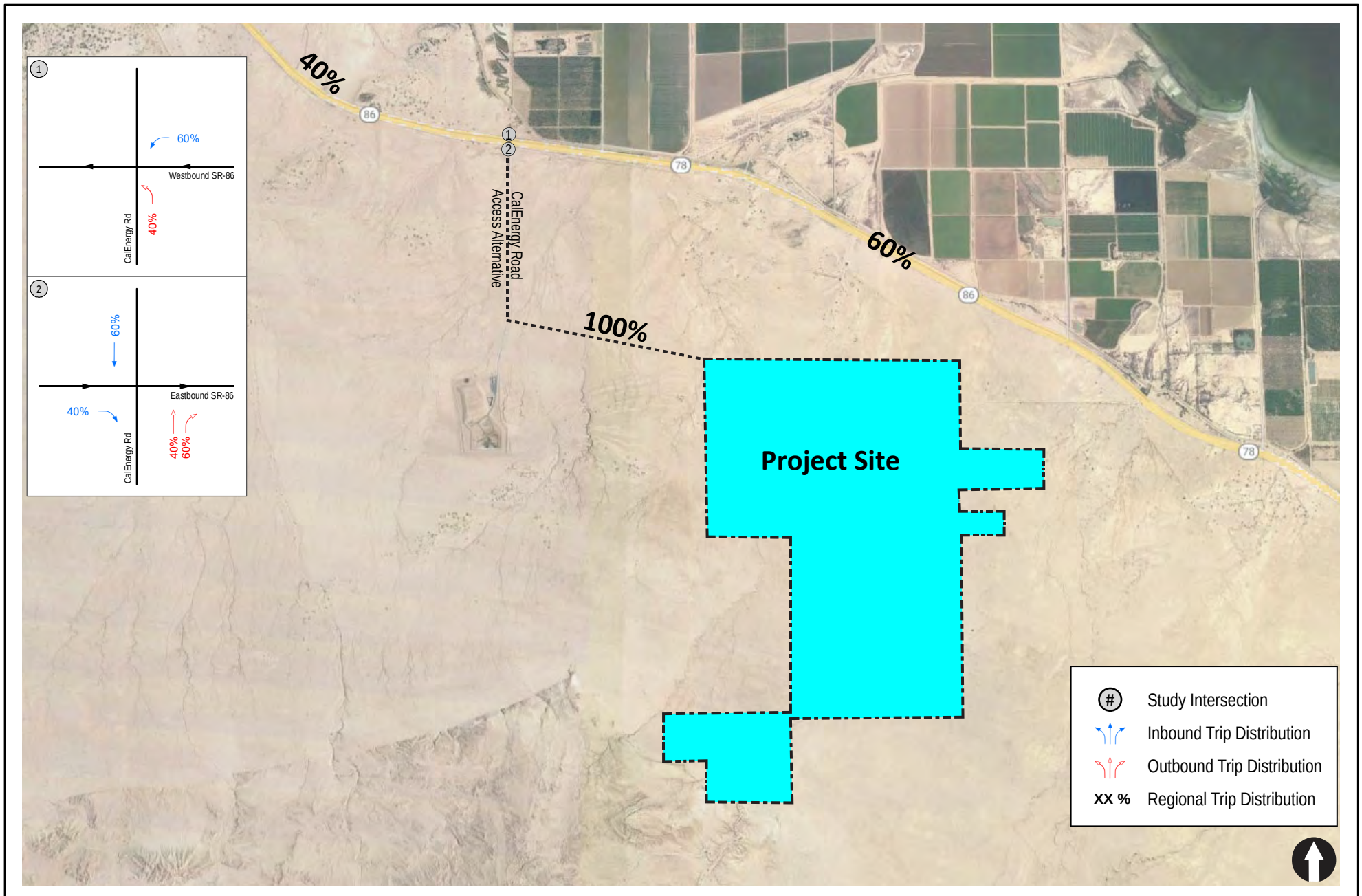
Figure 5-1a depicts the Project trip distribution for the CalEnergy Road Access Alternative. *Figure 5-1b* depicts the Project trip distribution for the Barth Road Access Alternative. *Figure 5-2a* depicts the Project trip assignment for the CalEnergy Road Access Alternative. *Figure 5-2b* depicts the Project trip assignment for the Barth Road Access Alternative.

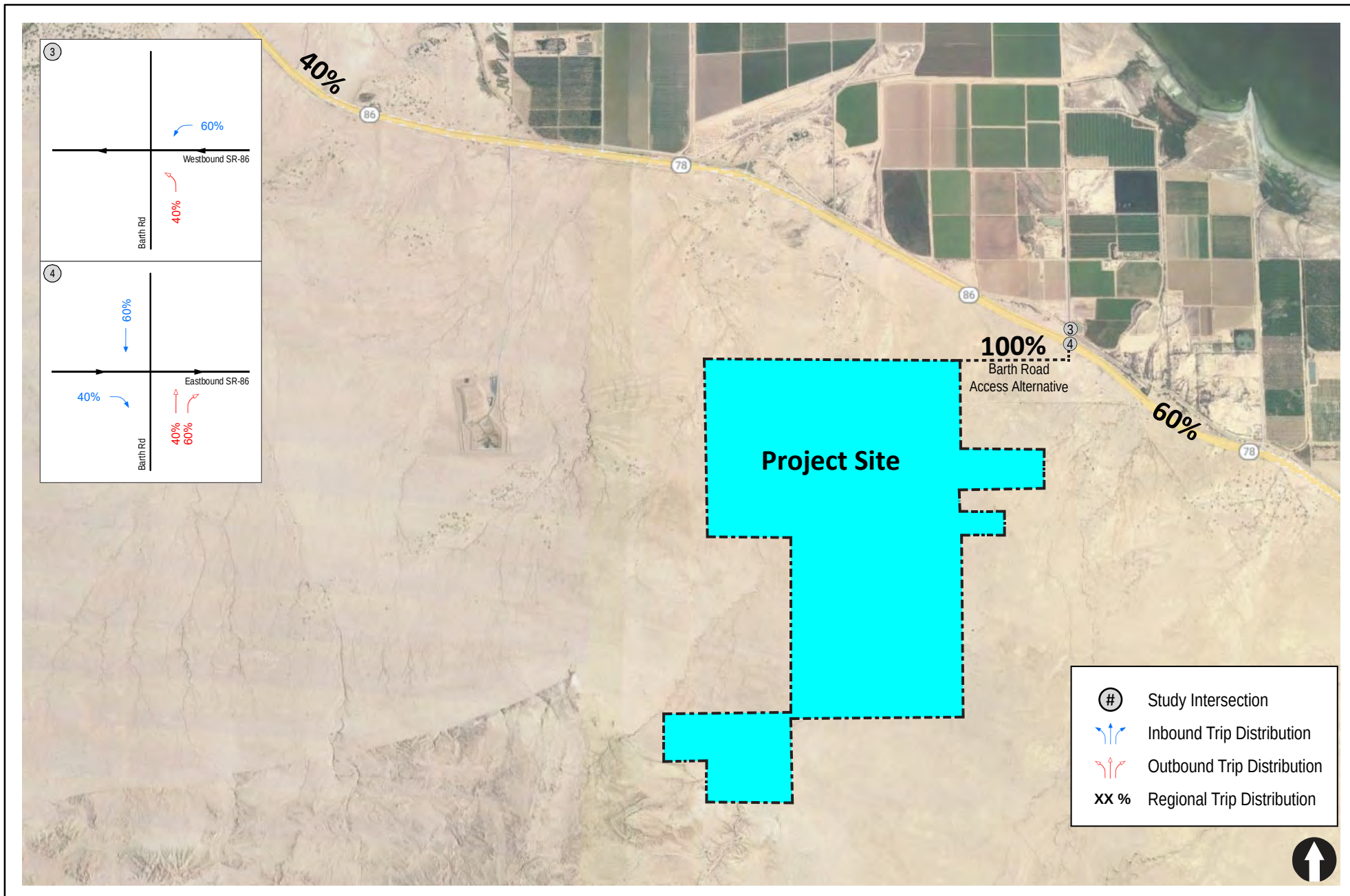
TABLE 5-1
PROJECT CONSTRUCTION TRIP GENERATION

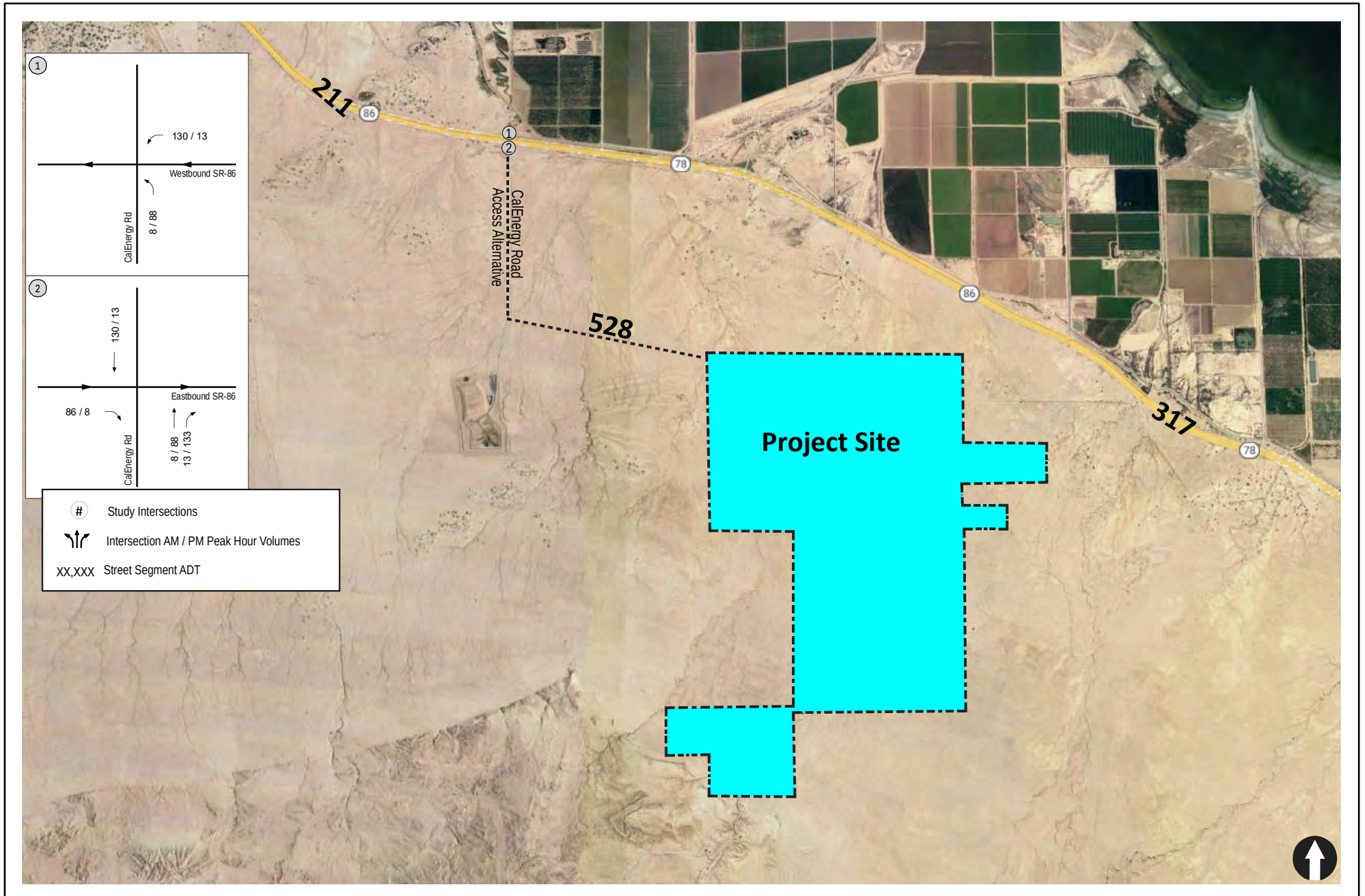
Number and Type of Trips	Daily Trips			AM Peak Hour (w/PCE)			PM Peak Hour (w/PCE)		
	ADT ^a	PCE ^c	PCE Adjusted ADT	In	Out	Total	In	Out	Total
Construction Phase									
250 Worker Vehicles ^b	500	1.0	500	210	15	225	15	215	225
Truck Deliveries ^c (7)	14	2.0	28	6	6	12	6	6	12
Total Trips:	514	-	528	216	21	237	21	221	237

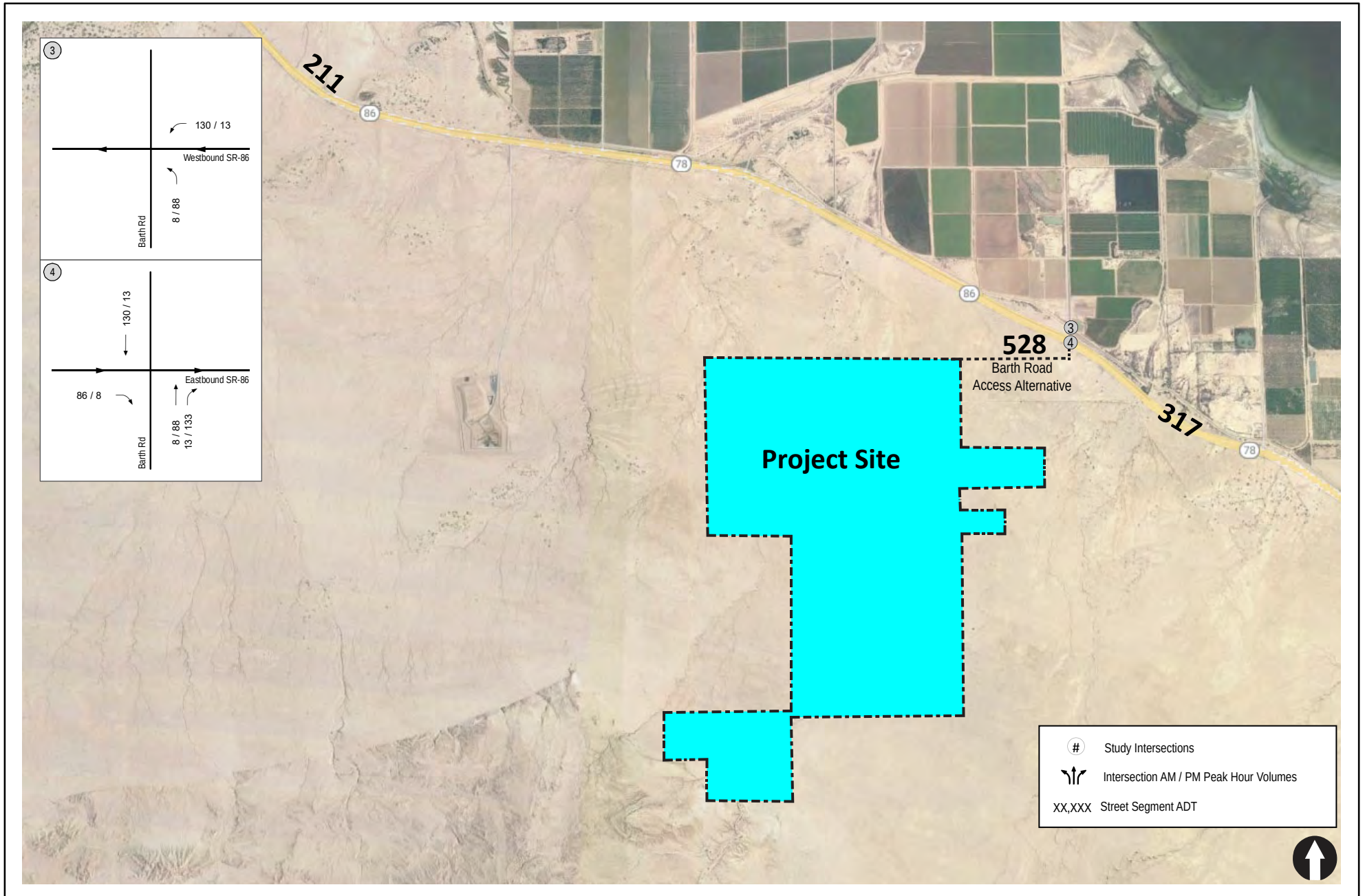
Footnotes:

- a. Average Daily Trips
- b. Passenger Car Equivalents. Based on the *Highway Capacity Manual*, a Passenger Car Equivalent (PCE) factor of 2.0 was applied to the Project's heavy-truck trips.





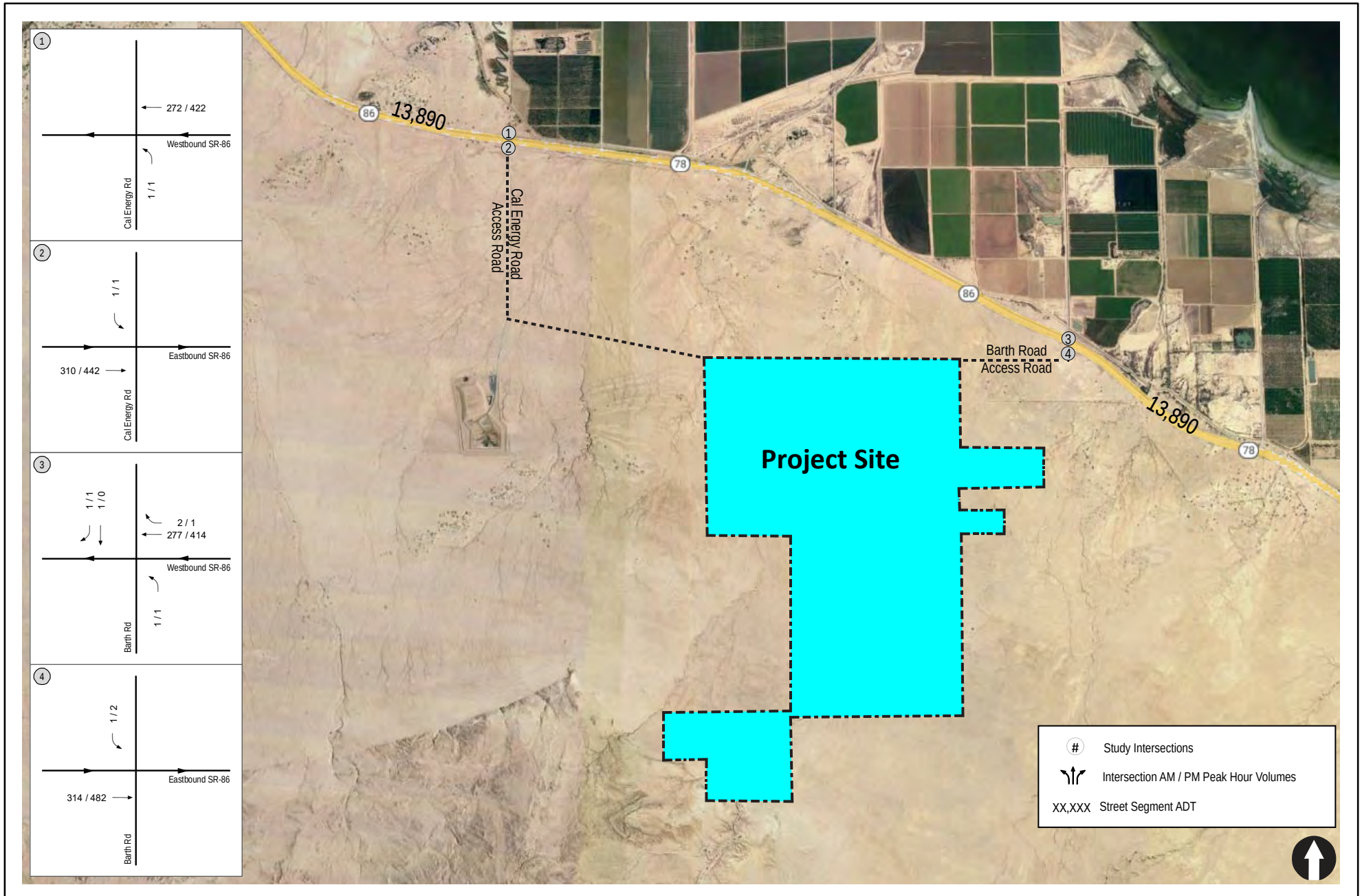


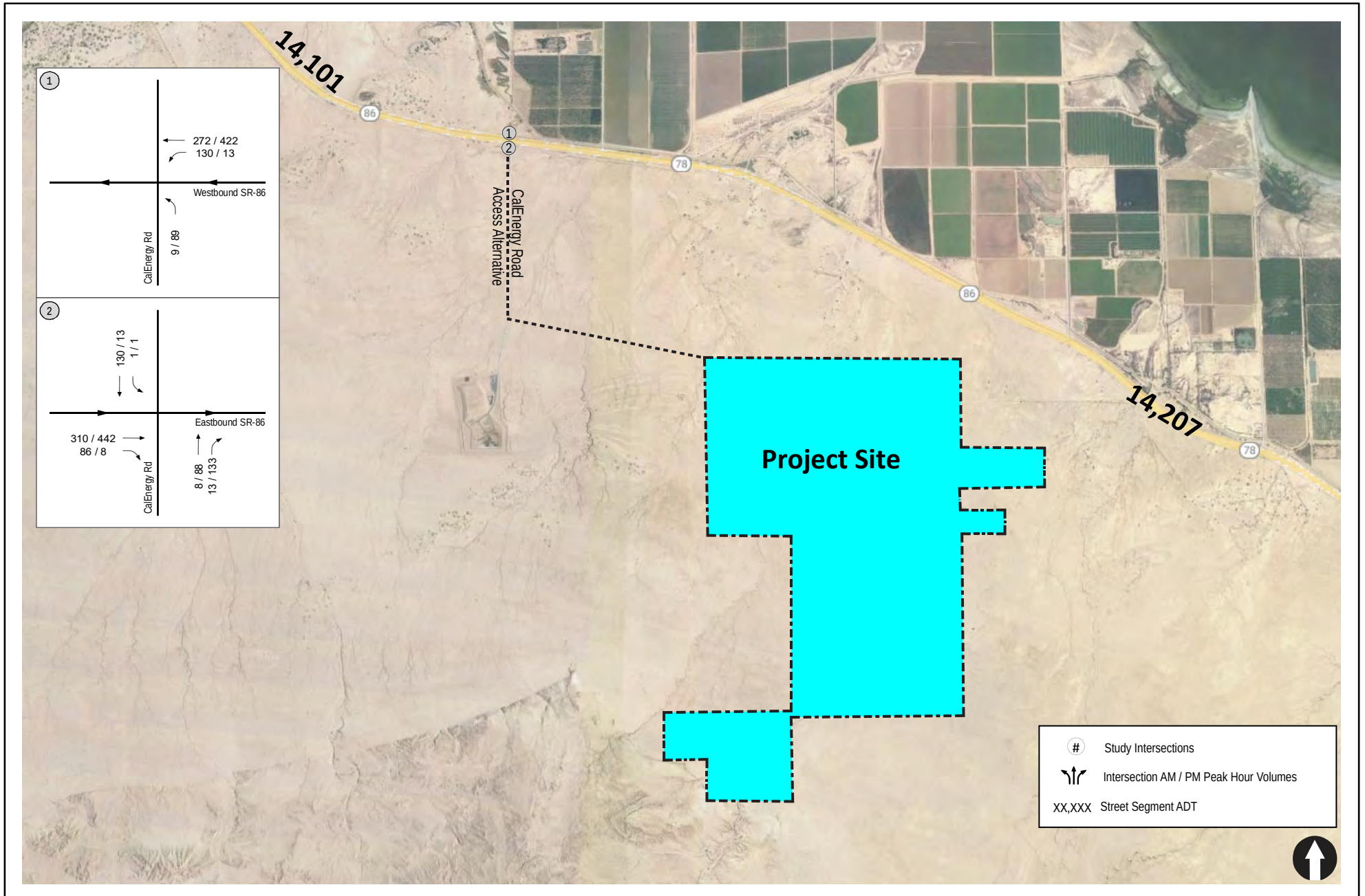


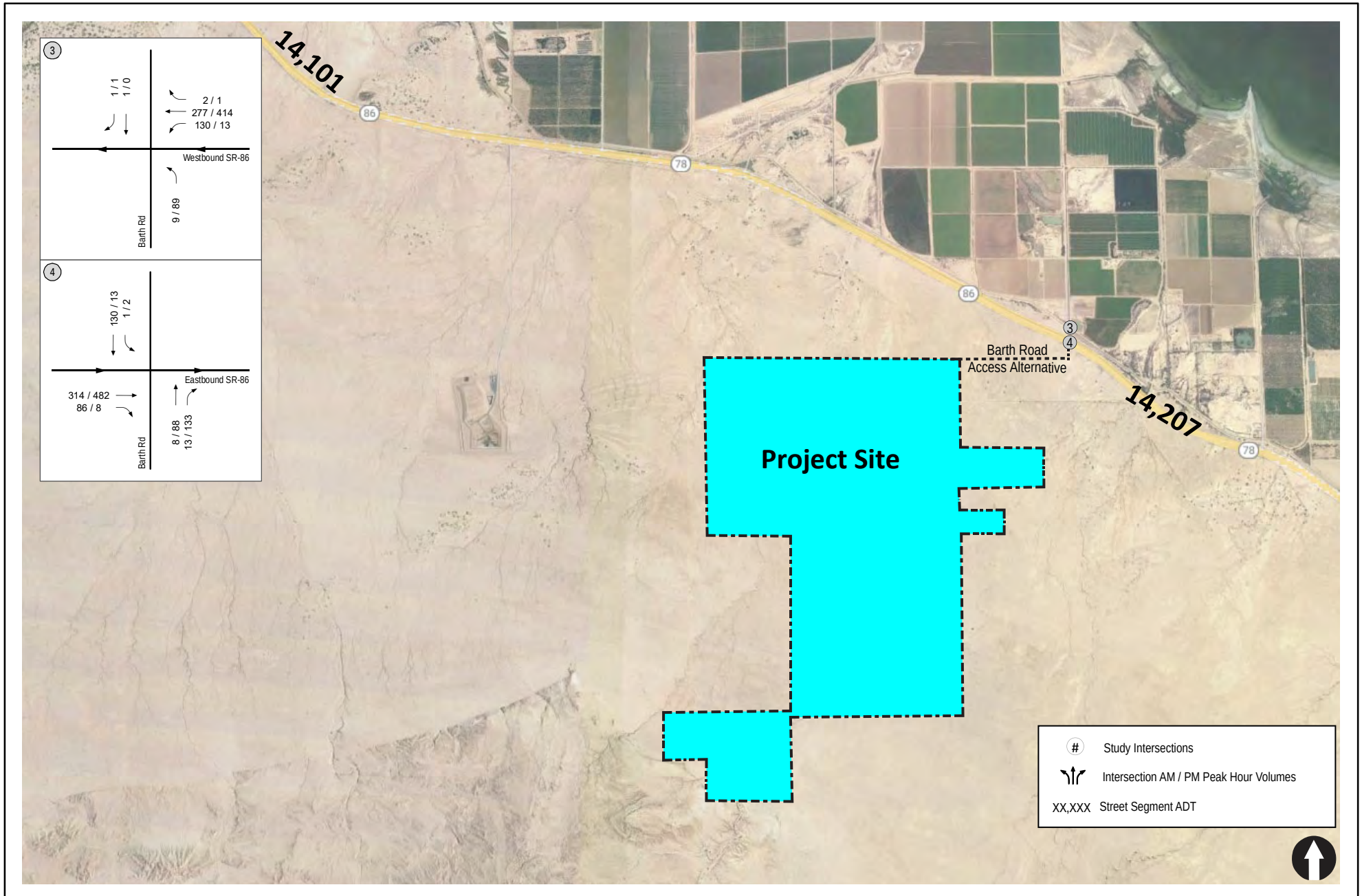
6.0 CONSTRUCTION YEAR WITHOUT PROJECT TRAFFIC VOLUMES

With the construction phase anticipated to be completed within a year, no cumulative projects were identified for inclusion in the analysis. A 10% growth factor was applied to existing traffic volumes to account for near-term cumulative traffic within the project area.

Figure 6-1 depicts the Construction Year (Existing + Cumulative Projects) without Project traffic volumes, **Figure 6-2a** depicts the Construction Year + Project traffic volumes with the CalEnergy Road Access Alternative. **Figure 6-2b** depicts the Construction Year + Project traffic volumes with the Barth Road Access Alternative.







7.0 CALENERGY ROAD ACCESS ALTERNATIVE CAPACITY ANALYSIS

The following section presents the analysis of the study area intersections under Construction Year conditions.

7.1 Construction Year without Project Conditions

7.1.1 Peak Hour Intersection Operations

Table 7-1 summarizes the Opening Year without Project intersection operations. As shown in *Table 7-1*, the study intersections are calculated to operate acceptably at LOS B or better during both the AM and PM peak hours.

7.1.2 Street Segment Operations

Table 7-2 summarizes the Construction Year without Project street segment operations. As shown in *Table 7-2*, the SR-86 segments are calculated to operate acceptably at LOS B on a daily basis.

7.2 Construction Year + Project Conditions

7.2.1 Peak Hour Intersection Operations

Table 7-1 summarizes the Construction Year + Project intersection operations. As shown in *Table 7-1*, the study intersections are calculated to operate acceptably at LOS B during both the AM and PM peak hours.

7.3 Street Segment Operations

Table 7-2 summarizes the Construction Year + Project street segment operations. As shown in *Table 7-2*, the SR-86 segments are calculated to continue to operate acceptably at LOS B on a daily basis.

TABLE 7-1
CONSTRUCTION YEAR INTERSECTION OPERATIONS - CALENERGY ROAD ACCESS ALTERNATIVE

Intersection	Control Type	Movement/ Approach	Peak Hour	Construction Year without Project		Construction Year + Project		Δ ^e
				Delay ^a	LOS ^b	Delay ^a	LOS ^b	
CalEnergy Road Project Access Alternative								
1. Westbound SR-86 / CalEnergy Road	TWSC ^c	NB L	AM	9.5	A	12.2	B	2.7
			PM	10.1	B	11.2	B	1.1
2. Eastbound SR-86 / CalEnergy Road	TWSC	SB L	AM	9.6	A	14.6	B	5.0
			PM	10.2	B	12.8	B	2.6

Footnotes:

a. Average delay expressed in seconds per vehicle.

b. Level of Service.

c. TWSC – Minor-Street Stop Controlled intersection. Worst case LOS and delay reported.

UNSIGNALIZED

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

TABLE 7-2
CONSTRUCTION YEAR STREET SEGMENT OPERATIONS - CALENERGY ROAD ACCESS ALTERNATIVE

Street Segment	Functional Capacity	Capacity (LOS E) ^a	Construction Year Without Project			Construction Year + Project			Δ V/C ^e	Impact?
			ADT ^b	LOS ^c	V/C ^d	ADT ^b	LOS ^c	V/C ^d		
SR-86										
North of CalEnergy Road	State Highway	37,000	13,890	B	0.37	14,101	B	0.38	0.1	No
South of Barth Road	State Highway	37,000	13,890	B	0.37	14,207	B	0.38	0.1	No

c. Footnotes:

- a. Capacity at which the roadway currently functions and based on County of Imperial Roadway Classification Table.
- b. Average Daily Traffic Volumes.
- c. Level of Service
- d. Volume to Capacity ratio.
- e. Δ denotes the increase in V/C due to Project.

8.0 BARTH ROAD ACCESS ALTERNATIVE CAPACITY ANALYSIS

The following section presents the analysis of the study area intersections under Construction Year conditions.

8.1 Construction Year without Project Conditions

8.1.1 Peak Hour Intersection Operations

Table 8-1 summarizes the Opening Year without Project intersection operations. As shown in *Table 8-1*, the study intersections are calculated to operate acceptably at LOS B or better during both the AM and PM peak hours.

8.1.2 Street Segment Operations

Table 8-2 summarizes the Construction Year without Project street segment operations. As shown in *Table 8-2*, the SR-86 segments are calculated to operate acceptably at LOS B on a daily basis.

8.2 Construction Year + Project Conditions

8.2.1 Peak Hour Intersection Operations

Table 8-1 summarizes the Construction Year + Project intersection operations. As shown in *Table 8-1*, the study intersections are calculated to operate acceptably at LOS B or better during both the AM and PM peak hours.

8.3 Street Segment Operations

Table 8-2 summarizes the Construction Year + Project street segment operations. As shown in *Table 8-2*, the SR-86 segments are calculated to continue to operate acceptably at LOS B on a daily basis.

TABLE 8-1
CONSTRUCTION YEAR INTERSECTION OPERATIONS – BARTH ROAD ACCESS ALTERNATIVE

Intersection	Control Type	Movement/ Approach	Peak Hour	Construction Year without Project		Construction Year + Project		Δ^c
				Delay ^a	LOS ^b	Delay ^a	LOS ^b	
3. Westbound SR-86 / Barth Road	TWSC	NB L	AM	9.5	A	11.4	A	1.9
			PM	9.6	A	11.2	B	1.6
4. Eastbound SR-86 / Barth Road	TWSC	SB L	AM	9.6	A	14.6	B	4.8
			PM	10.4	B	13.4	B	3.0

Footnotes:

- a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Minor-Street Stop Controlled intersection. Worst case LOS and delay reported.

UNSIGNALIZED

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

TABLE 8-2
CONSTRUCTION YEAR STREET SEGMENT OPERATIONS – BARTH ROAD ACCESS ALTERNATIVE

Street Segment	Functional Capacity	Capacity (LOS E) ^a	Construction Year Without Project			Construction Year + Project			Δ V/C ^e	Impact?
			ADT ^b	LOS ^c	V/C ^d	ADT ^b	LOS ^c	V/C ^d		
SR-86										
North of CalEnergy Road	State Highway	37,000	13,890	B	0.37	14,101	B	0.38	0.1	No
South of Barth Road	State Highway	37,000	13,890	B	0.37	14,207	B	0.38	0.1	No

Footnotes:

- a. Capacity at which the roadway currently functions and based on County of Imperial Roadway Classification Table.
- b. Average Daily Traffic Volumes.
- c. Level of Service
- d. Volume to Capacity ratio.
- e. Δ denotes the increase in V/C due to Project.

9.0 CONCLUSIONS

9.1 LOS Assessment

Based on County of Imperial criteria, the Project will result in no detrimental transportation effects to either of the study area alternative intersections during the Existing, Construction Year without Project, and Construction Year + Project scenarios analyzed.

Therefore, no capacity-related improvements are required for either of the project's two alternatives.

9.2 VMT Assessment

Per OPR guidelines, "vehicle miles traveled" refers to the amount and distance of automobile travel attributable to a project. Here the term "automobile" refers to on-road passenger vehicles, specifically cars and light trucks. VMT does not include trips from heavy trucks. The construction employee trips will be temporary in nature and therefore a VMT analysis is not necessary. The operational trips will be significantly less than 110 ADT and therefore, based on OPR Guidelines, a VMT analysis is not necessary.

TECHNICAL APPENDICES
VIRGO SOLAR PV PROJECT
Imperial County, California
February 12, 2025

LLG Ref. 3-23-3738

APPENDIX A

INTERSECTION COUNT SHEETS & PROJECT ACCESS RAMPS

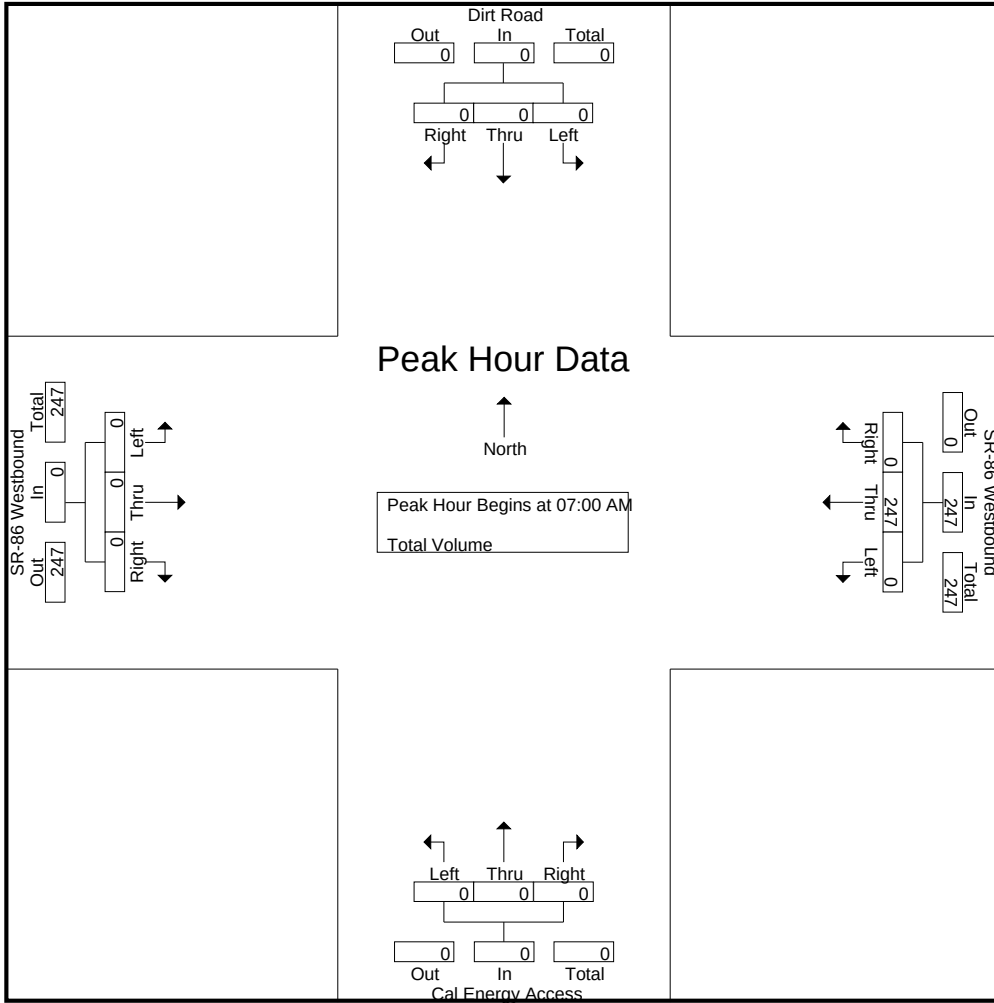
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Site Code : 05725009
Start Date : 1/8/2025
Page No : 1

[illegible]

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

County of Imperial
N/S: Cal Energy Access
E/W: SR-86 Westbound
Weather: Clear

File Name : 01_CIM_CEA_86W AM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 2



Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

[illegible]

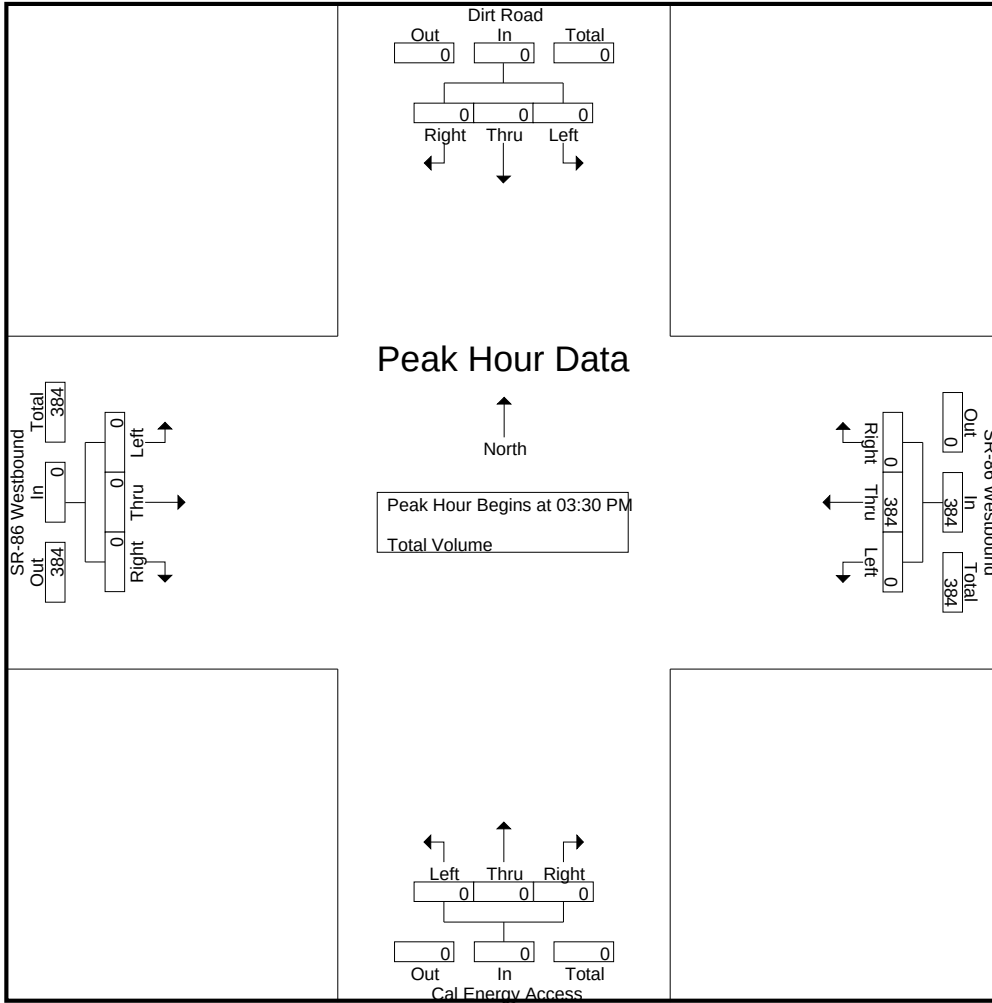
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Site Code : 05725009
Start Date : 1/8/2025
Page No : 1

[illegible]

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

County of Imperial
N/S: Cal Energy Access
E/W: SR-86 Westbound
Weather: Clear

File Name : 01_CIM_CEA_86W PM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 2



Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at: _____

Countdown to	Approach Begins At:															
	03:00 PM				03:30 PM				03:00 PM				03:00 PM			
+0 mins.	0	0	0	0	0	90	0	90	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	94	0	94	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	99	0	99	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	101	0	101	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	384	0	384	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.950	.000	.950	.000	.000	.000	.000	.000	.000	.000	.000

County of Imperial
N/S: Cal Energy Access
E/W: SR-86 Eastbound
Weather: Clear

File Name : 02_CIM_CEA_86E AM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 1

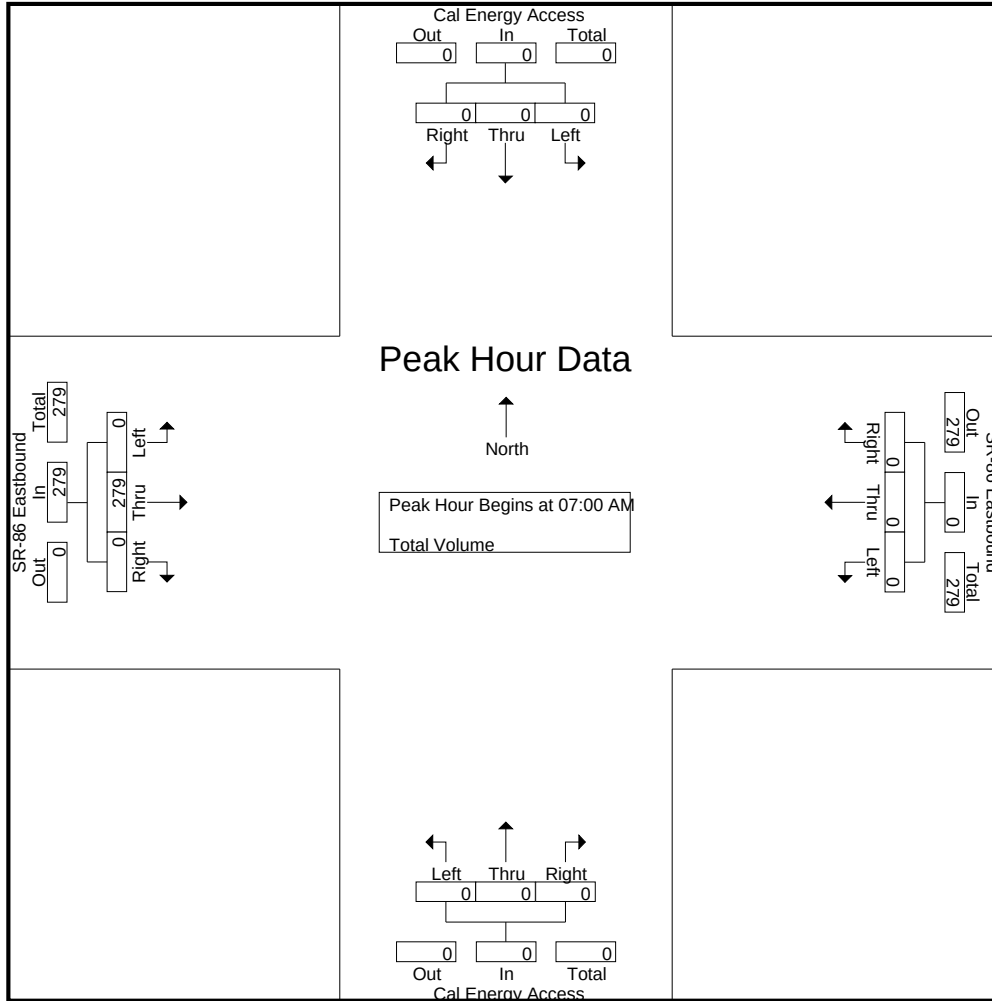
Groups Printed- Total Volume

	Cal Energy Access Southbound				SR-86 Eastbound Westbound				Cal Energy Access Northbound				SR-86 Eastbound Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	55	0	55	55
06:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	46	0	46	47
06:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	60	0	60	61
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	70	0	70	70
Total	0	1	0	1	0	0	0	0	0	1	0	1	0	231	0	231	233
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	59	59
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	60	60
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	69	0	69	69
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	91	0	91	91
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	279	0	279	279
Grand Total	0	1	0	1	0	0	0	0	0	1	0	1	0	510	0	510	512
Apprch %	0	100	0		0	0	0		0	100	0		0	100	0		
Total %	0	0.2	0	0.2	0	0	0	0	0	0.2	0	0.2	0	99.6	0	99.6	

	Cal Energy Access Southbound				SR-86 Eastbound Westbound				Cal Energy Access Northbound				SR-86 Eastbound Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	59	59
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	60	60
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	69	0	69	69
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	91	0	91	91
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	279	0	279	279
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.766	.000	.766	.766

County of Imperial
N/S: Cal Energy Access
E/W: SR-86 Eastbound
Weather: Clear

File Name : 02_CIM_CEA_86E AM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 2



Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:00 AM				06:00 AM				06:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	59
+15 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	60	0	60
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	69	0	69
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	91	0	91
Total Volume	0	1	0	1	0	0	0	0	0	1	0	1	0	279	0	279
% App. Total	0	100	0		0	0	0		0	100	0		0	100	0	
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.766	.000	.766

County of Imperial
N/S: Cal Energy Access
E/W: SR-86 Eastbound
Weather: Clear

File Name : 02_CIM_CEA_86E PM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 1

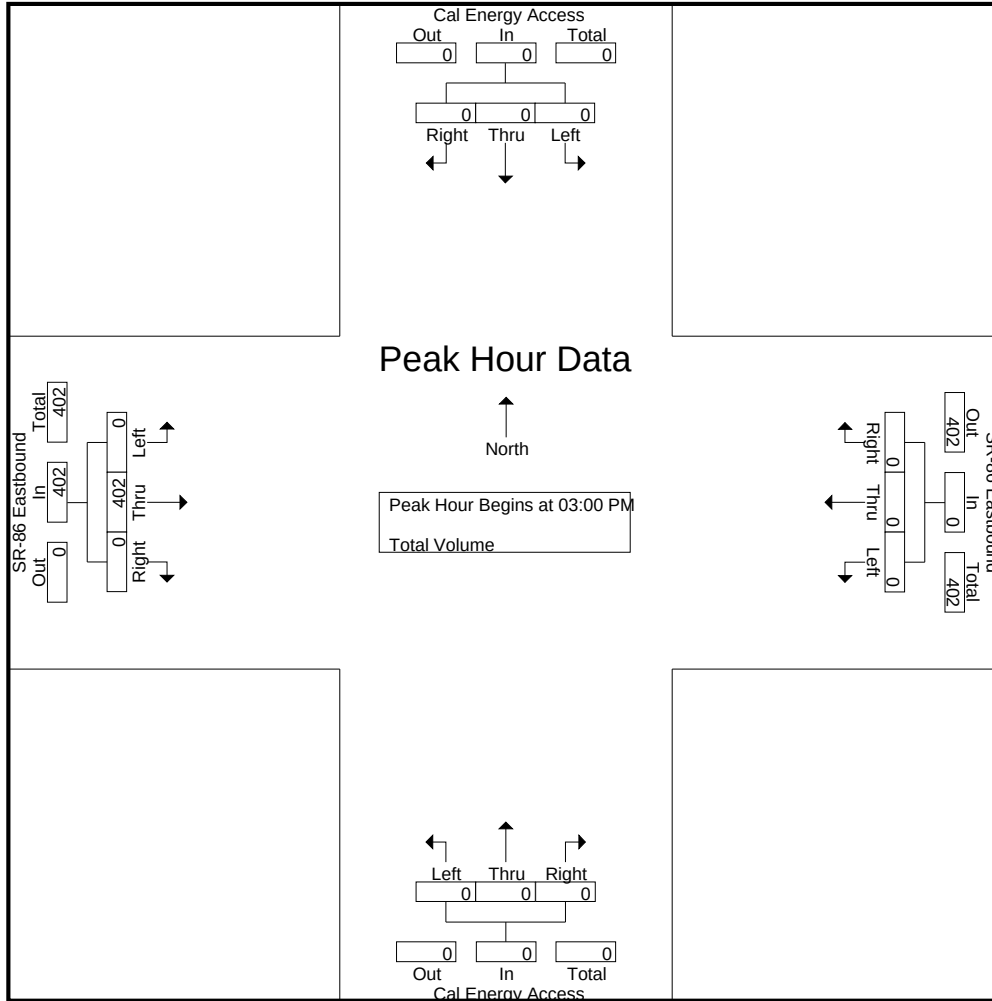
Groups Printed- Total Volume

	Cal Energy Access Southbound				SR-86 Eastbound Westbound				Cal Energy Access Northbound				SR-86 Eastbound Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	95	0	95	95
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	117	0	117	117
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	109	0	109	109
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	81	0	81	81
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	402	0	402	402
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	81	0	81	81
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	103	0	103	103
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	110	0	110	110
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	76	0	76	76
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	370	0	370	370
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	772	0	772	772
Apprch %	0	0	0		0	0	0		0	0	0		0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100	

	Cal Energy Access Southbound				SR-86 Eastbound Westbound				Cal Energy Access Northbound				SR-86 Eastbound Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:00 PM																	
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	95	0	95	95
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	117	0	117	117
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	109	0	109	109
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	81	0	81	81
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	402	0	402	402
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.859	.000	.859	.859

County of Imperial
N/S: Cal Energy Access
E/W: SR-86 Eastbound
Weather: Clear

File Name : 02_CIM_CEA_86E PM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 2



Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM				03:00 PM				03:00 PM				03:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	95	0	95
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	117	0	117
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	109	0	109
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	81	0	81
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	402	0	402
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.859	.000	.859

File Name : 03_CIM_Barth_86W AM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 1

[illegible]

File Name : 03_CIM_Barth_86W PM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 1

[illegible]

County of Imperial
N/S: Barth Road
E/W: SR-86 Eastbound
Weather: Clear

File Name : 04_CIM_Barth_86E AM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 1

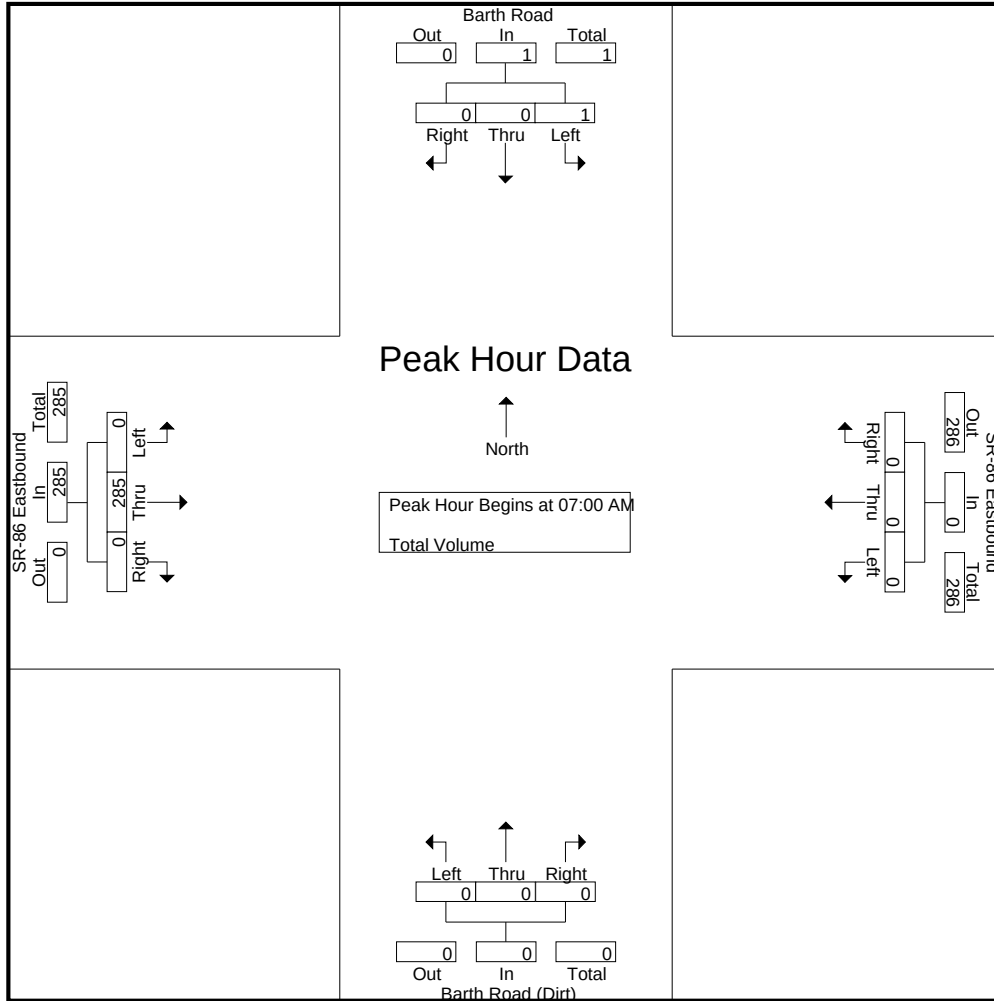
Groups Printed- Total Volume

	Barth Road Southbound				SR-86 Eastbound Westbound				Barth Road (Dirt) Northbound				SR-86 Eastbound Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	56	0	56	56
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	49	0	49	49
06:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	64	0	64	65
06:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	61	0	61	62
Total	2	0	0	2	0	0	0	0	0	0	0	0	0	230	0	230	232
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0	65	65
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0	61	61
07:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	66	0	66	67
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	93	0	93	93
Total	1	0	0	1	0	0	0	0	0	0	0	0	0	285	0	285	286
Grand Total	3	0	0	3	0	0	0	0	0	0	0	0	0	515	0	515	518
Apprch %	100	0	0		0	0	0		0	0	0		0	100	0		
Total %	0.6	0	0	0.6	0	0	0	0	0	0	0	0	0	99.4	0	99.4	

	Barth Road Southbound				SR-86 Eastbound Westbound				Barth Road (Dirt) Northbound				SR-86 Eastbound Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0	65	65
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0	61	61
07:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	66	0	66	67
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	93	0	93	93
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	0	285	0	285	286
% App. Total	100	0	0		0	0	0		0	0	0		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.766	.000	.766	.769

County of Imperial
N/S: Barth Road
E/W: SR-86 Eastbound
Weather: Clear

File Name : 04_CIM_Barth_86E AM
Site Code : 05725009
Start Date : 1/8/2025
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Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:00 AM				06:00 AM				06:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0	65
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0	61
+30 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	66	0	66
+45 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	93	0	93
Total Volume	2	0	0	2	0	0	0	0	0	0	0	0	0	285	0	285
% App. Total	100	0	0		0	0	0		0	0	0		0	100	0	
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.766	.000	.766

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

County of Imperial
N/S: Barth Road
E/W: SR-86 Eastbound
Weather: Clear

File Name : 04_CIM_Barth_86E PM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 1

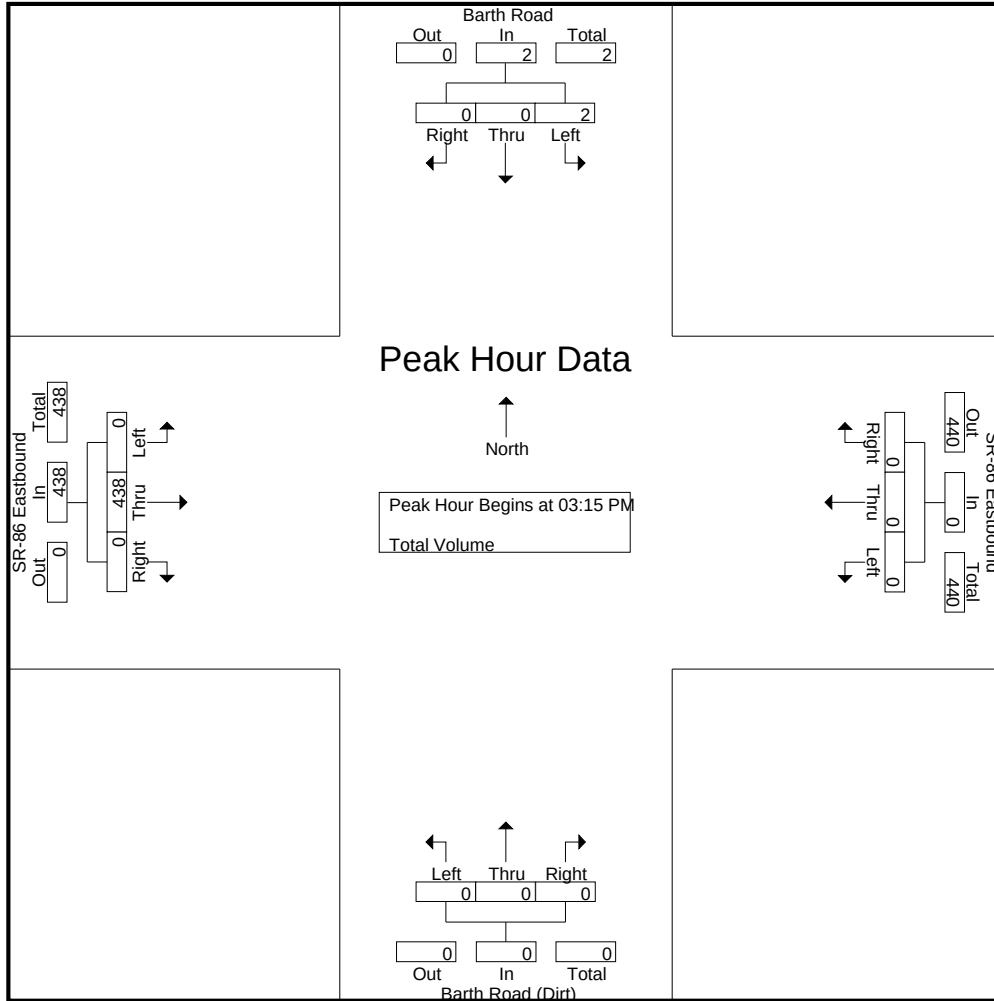
Groups Printed- Total Volume

	Barth Road Southbound				SR-86 Eastbound Westbound				Barth Road (Dirt) Northbound				SR-86 Eastbound Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
03:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	1	96	0	97	99
03:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	115	0	115	116
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	117	0	117	117
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	105	0	105	105
Total	3	0	0	3	0	0	0	0	0	0	0	0	1	433	0	434	437
04:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	101	0	101	102
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	99	0	99	99
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	124	0	124	124
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	78	0	78	78
Total	1	0	0	1	0	0	0	0	0	0	0	0	0	402	0	402	403
Grand Total	4	0	0	4	0	0	0	0	0	0	0	0	1	835	0	836	840
Apprch %	100	0	0		0	0	0		0	0	0		0.1	99.9	0		
Total %	0.5	0	0	0.5	0	0	0	0	0	0	0	0	0.1	99.4	0	99.5	

	Barth Road Southbound				SR-86 Eastbound Westbound				Barth Road (Dirt) Northbound				SR-86 Eastbound Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:15 PM																	
03:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	115	0	115	116
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	117	0	117	117
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	105	0	105	105
04:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	101	0	101	102
Total Volume	2	0	0	2	0	0	0	0	0	0	0	0	0	438	0	438	440
% App. Total	100	0	0		0	0	0		0	0	0		0	100	0		
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.936	.000	.936	.940

County of Imperial
N/S: Barth Road
E/W: SR-86 Eastbound
Weather: Clear

File Name : 04_CIM_Barth_86E PM
Site Code : 05725009
Start Date : 1/8/2025
Page No : 2



Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM				03:00 PM				03:00 PM				03:15 PM			
+0 mins.	2	0	0	2	0	0	0	0	0	0	0	0	0	115	0	115
+15 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	117	0	117
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	105	0	105
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	101	0	101
Total Volume	3	0	0	3	0	0	0	0	0	0	0	0	0	438	0	438
% App. Total	100	0	0		0	0	0		0	0	0		0	100	0	
PHF	.375	.000	.000	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.936	.000	.936

APPENDIX B

INTERSECTION PEAK HOUR ANALYSIS WORKSHEETS

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	247	0	1	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	247	0	1	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	268	0	1	0	0	0	0	0

Major/Minor	Major2		Minor1		Minor2	
Conflicting Flow All	0	0	0	134	268	-
Stage 1	-	-	-	0	0	-
Stage 2	-	-	-	134	268	-
Critical Hdwy	4.14	-	-	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	824	637	0
Stage 1	-	-	-	-	-	0
Stage 2	-	-	-	855	686	0
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	824	637	-
Mov Cap-2 Maneuver	-	-	-	824	637	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	855	686	-

Approach	WB	NB	SB
HCM Control Delay, s	0	9.4	0
HCM LOS		A	A

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	824	-	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-
HCM Control Delay (s)	9.4	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	279	0	0	0	0	0	0	0	1	0	0
Future Vol, veh/h	0	279	0	0	0	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	303	0	0	0	0	0	0	0	1	0	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	303	152	152	303	-
Stage 1	-	-	-	-	303	-	0	0	-
Stage 2	-	-	-	-	0	-	152	303	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	609	867	801	609	0
Stage 1	-	-	-	0	662	-	-	-	0
Stage 2	-	-	-	0	-	-	835	662	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	609	867	801	609	-
Mov Cap-2 Maneuver	-	-	-	-	609	-	801	609	-
Stage 1	-	-	-	-	662	-	-	-	-
Stage 2	-	-	-	-	-	-	835	662	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	9.5
HCM LOS		A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	-	-	-	-	801
HCM Lane V/C Ratio	-	-	-	-	0.001
HCM Control Delay (s)	0	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-	0

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	252	2	1	0	0	0	1	1
Future Vol, veh/h	0	0	0	0	252	2	1	0	0	0	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	65536	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	274	2	1	0	0	0	1	1
Major/Minor	Major2			Minor1			Minor2					
Conflicting Flow All	0			0	0	138	276	-	-	274	137	
Stage 1	-			-	-	0	0	-	-	274	-	
Stage 2	-			-	-	138	276	-	-	0	-	
Critical Hdwy	4.14			-	-	7.54	6.54	-	-	6.54	6.94	
Critical Hdwy Stg 1	-			-	-	-	-	-	-	5.54	-	
Critical Hdwy Stg 2	-			-	-	6.54	5.54	-	-	-	-	
Follow-up Hdwy	2.22			-	-	3.52	4.02	-	-	4.02	3.32	
Pot Cap-1 Maneuver	-			-	-	819	630	0	0	632	886	
Stage 1	-			-	-	-	-	0	0	682	-	
Stage 2	-			-	-	851	680	0	0	-	-	
Platoon blocked, %				-	-							
Mov Cap-1 Maneuver	-			-	-	817	630	-	-	632	886	
Mov Cap-2 Maneuver	-			-	-	817	630	-	-	632	-	
Stage 1	-			-	-	-	-	-	-	682	-	
Stage 2	-			-	-	849	680	-	-	-	-	
Approach	WB			NB			SB					
HCM Control Delay, s	0			9.4			9.9					
HCM LOS				A			A					
Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1							
Capacity (veh/h)	817	-	-	-	738							
HCM Lane V/C Ratio	0.001	-	-	-	0.003							
HCM Control Delay (s)	9.4	0	-	-	9.9							
HCM Lane LOS	A	A	-	-	A							
HCM 95th %tile Q(veh)	0	-	-	-	0							

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	285	0	0	0	0	0	0	0	1	0	0
Future Vol, veh/h	0	285	0	0	0	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	310	0	0	0	0	0	0	0	1	0	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	310	155	155	310	-
Stage 1	-	-	-	-	310	-	0	0	-
Stage 2	-	-	-	-	0	-	155	310	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	603	863	797	603	0
Stage 1	-	-	-	0	658	-	-	-	0
Stage 2	-	-	-	0	-	-	832	658	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	603	863	797	603	-
Mov Cap-2 Maneuver	-	-	-	-	603	-	797	603	-
Stage 1	-	-	-	-	658	-	-	-	-
Stage 2	-	-	-	-	-	-	832	658	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	9.5
HCM LOS		A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	-	-	-	-	797
HCM Lane V/C Ratio	-	-	-	-	0.001
HCM Control Delay (s)	0	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-	0

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	384	0	1	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	384	0	1	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	417	0	1	0	0	0	0	0
Major/Minor				Major2		Minor1		Minor2				
Conflicting Flow All				0	0	0	209	417	-	-	417	209
Stage 1				-	-	-	0	0	-	-	417	-
Stage 2				-	-	-	209	417	-	-	0	-
Critical Hdwy				4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1				-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2				-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy				2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver				-	-	-	730	525	0	0	525	797
Stage 1				-	-	-	-	-	0	0	590	-
Stage 2				-	-	-	774	590	0	0	-	-
Platoon blocked, %						-	-					
Mov Cap-1 Maneuver				-	-	-	730	525	-	-	525	797
Mov Cap-2 Maneuver				-	-	-	730	525	-	-	525	-
Stage 1				-	-	-	-	-	-	-	590	-
Stage 2				-	-	-	774	590	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				0		9.9		0				
HCM LOS						A		A				
Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1							
Capacity (veh/h)	730	-	-	-	-							
HCM Lane V/C Ratio	0.001	-	-	-	-							
HCM Control Delay (s)	9.9	0	-	-	0							
HCM Lane LOS	A	A	-	-	A							
HCM 95th %tile Q(veh)	0	-	-	-	-							

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	402	0	0	0	0	0	0	0	1	0	0
Future Vol, veh/h	0	402	0	0	0	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	437	0	0	0	0	0	0	0	1	0	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	437	219	219	437	-
Stage 1	-	-	-	-	437	-	0	0	-
Stage 2	-	-	-	-	0	-	219	437	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	512	785	718	512	0
Stage 1	-	-	-	0	578	-	-	-	0
Stage 2	-	-	-	0	-	-	763	578	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	512	785	718	512	-
Mov Cap-2 Maneuver	-	-	-	-	512	-	718	512	-
Stage 1	-	-	-	-	578	-	-	-	-
Stage 2	-	-	-	-	-	-	763	578	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	10
HCM LOS		A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	-	-	-	-	718
HCM Lane V/C Ratio	-	-	-	-	0.002
HCM Control Delay (s)	0	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	-	-	-	-	0

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	376	1	1	0	0	0	0	1
Future Vol, veh/h	0	0	0	0	376	1	1	0	0	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	409	1	1	0	0	0	0	1

Major/Minor	Major2	Minor1	Minor2
Conflicting Flow All	0	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	-
Pot Cap-1 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	9.9	9.5
HCM LOS		A	A

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	734	-	-	-	802
HCM Lane V/C Ratio	0.001	-	-	-	0.001
HCM Control Delay (s)	9.9	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	436	0	0	0	0	0	0	0	2	0	0
Future Vol, veh/h	0	436	0	0	0	0	0	0	0	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	474	0	0	0	0	0	0	0	2	0	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	474	237	237	474	-
Stage 1	-	-	-	-	474	-	0	0	-
Stage 2	-	-	-	-	0	-	237	474	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	488	764	697	488	0
Stage 1	-	-	-	0	556	-	-	-	0
Stage 2	-	-	-	0	-	-	745	556	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	488	764	697	488	-
Mov Cap-2 Maneuver	-	-	-	-	488	-	697	488	-
Stage 1	-	-	-	-	556	-	-	-	-
Stage 2	-	-	-	-	-	-	745	556	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	10.2
HCM LOS		A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	-	-	-	-	697
HCM Lane V/C Ratio	-	-	-	-	0.003
HCM Control Delay (s)	0	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	-	-	-	-	0

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	272	0	1	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	272	0	1	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	296	0	1	0	0	0	0	0
Major/Minor				Major2		Minor1		Minor2				
Conflicting Flow All				0	0	0	148	296	-	-	296	148
Stage 1				-	-	-	0	0	-	-	296	-
Stage 2				-	-	-	148	296	-	-	0	-
Critical Hdwy				4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1				-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2				-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy				2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver				-	-	-	806	614	0	0	614	872
Stage 1				-	-	-	-	-	0	0	667	-
Stage 2				-	-	-	840	667	0	0	-	-
Platoon blocked, %					-	-						
Mov Cap-1 Maneuver				-	-	-	806	614	-	-	614	872
Mov Cap-2 Maneuver				-	-	-	806	614	-	-	614	-
Stage 1				-	-	-	-	-	-	-	667	-
Stage 2				-	-	-	840	667	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				0		9.5		0				
HCM LOS						A		A				
Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1							
Capacity (veh/h)	806	-	-	-	-							
HCM Lane V/C Ratio	0.001	-	-	-	-							
HCM Control Delay (s)	9.5	0	-	-	0							
HCM Lane LOS	A	A	-	-	A							
HCM 95th %tile Q(veh)	0	-	-	-	-							

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	310	0	0	0	0	0	0	0	1	0	0
Future Vol, veh/h	0	310	0	0	0	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	337	0	0	0	0	0	0	0	1	0	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	337	169	169	337	-
Stage 1	-	-	-	-	337	-	0	0	-
Stage 2	-	-	-	-	0	-	169	337	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	583	845	779	583	0
Stage 1	-	-	-	0	640	-	-	-	0
Stage 2	-	-	-	0	-	-	816	640	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	583	845	779	583	-
Mov Cap-2 Maneuver	-	-	-	-	583	-	779	583	-
Stage 1	-	-	-	-	640	-	-	-	-
Stage 2	-	-	-	-	-	-	816	640	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	9.6
HCM LOS		A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	-	-	-	-	779
HCM Lane V/C Ratio	-	-	-	-	0.001
HCM Control Delay (s)	0	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-	0

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	277	2	1	0	0	0	1	1
Future Vol, veh/h	0	0	0	0	277	2	1	0	0	0	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	301	2	1	0	0	0	1	1
Major/Minor				Major2		Minor1		Minor2				
Conflicting Flow All				0	0	0	151	303	-	-	301	151
Stage 1				-	-	-	0	0	-	-	301	-
Stage 2				-	-	-	151	303	-	-	0	-
Critical Hdwy				4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1				-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2				-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy				2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver				-	-	-	802	609	0	0	610	868
Stage 1				-	-	-	-	-	0	0	664	-
Stage 2				-	-	-	836	662	0	0	-	-
Platoon blocked, %					-	-						
Mov Cap-1 Maneuver				-	-	-	800	609	-	-	610	868
Mov Cap-2 Maneuver				-	-	-	800	609	-	-	610	-
Stage 1				-	-	-	-	-	-	-	664	-
Stage 2				-	-	-	834	662	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				0		9.5		10				
HCM LOS						A		B				
Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1							
Capacity (veh/h)	800	-	-	-	716							
HCM Lane V/C Ratio	0.001	-	-	-	0.003							
HCM Control Delay (s)	9.5	0	-	-	10							
HCM Lane LOS	A	A	-	-	B							
HCM 95th %tile Q(veh)	0	-	-	-	0							

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	314	0	0	0	0	0	0	0	1	0	0
Future Vol, veh/h	0	314	0	0	0	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	341	0	0	0	0	0	0	0	1	0	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	341	171	171	341	-
Stage 1	-	-	-	-	341	-	0	0	-
Stage 2	-	-	-	-	0	-	171	341	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	580	843	776	580	0
Stage 1	-	-	-	0	637	-	-	-	0
Stage 2	-	-	-	0	-	-	814	637	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	580	843	776	580	-
Mov Cap-2 Maneuver	-	-	-	-	580	-	776	580	-
Stage 1	-	-	-	-	637	-	-	-	-
Stage 2	-	-	-	-	-	-	814	637	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	9.6
HCM LOS		A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	-	-	-	-	776
HCM Lane V/C Ratio	-	-	-	-	0.001
HCM Control Delay (s)	0	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-	0

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	422	0	1	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	422	0	1	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	459	0	1	0	0	0	0	0

Major/Minor	Major2			Minor1		Minor2	
Conflicting Flow All	0	0	0	230	459	-	-
Stage 1	-	-	-	0	0	-	-
Stage 2	-	-	-	230	459	-	-
Critical Hdwy	4.14	-	-	7.54	6.54	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-
Pot Cap-1 Maneuver	-	-	-	705	497	0	0
Stage 1	-	-	-	-	-	0	0
Stage 2	-	-	-	752	565	0	0
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	705	497	-	-
Mov Cap-2 Maneuver	-	-	-	705	497	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	752	565	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	10.1	0
HCM LOS		B	A

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	705	-	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-	-
HCM Control Delay (s)	10.1	0	-	-	0
HCM Lane LOS	B	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	442	0	0	0	0	0	0	0	1	0	0
Future Vol, veh/h	0	442	0	0	0	0	0	0	0	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	480	0	0	0	0	0	0	0	1	0	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	480	240	240	480	-
Stage 1	-	-	-	-	480	-	0	0	-
Stage 2	-	-	-	-	0	-	240	480	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	484	761	694	484	0
Stage 1	-	-	-	0	553	-	-	-	0
Stage 2	-	-	-	0	-	-	742	553	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	484	761	694	484	-
Mov Cap-2 Maneuver	-	-	-	-	484	-	694	484	-
Stage 1	-	-	-	-	553	-	-	-	-
Stage 2	-	-	-	-	-	-	742	553	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	10.2
HCM LOS		A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	-	-	-	-	694
HCM Lane V/C Ratio	-	-	-	-	0.002
HCM Control Delay (s)	0	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	-	-	-	-	0

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	414	1	0	0	0	0	0	1
Future Vol, veh/h	0	0	0	0	414	1	0	0	0	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	450	1	0	0	0	0	0	1
Major/Minor				Major2		Minor1		Minor2				
Conflicting Flow All				0	0	0	225	451	-	-	450	225
Stage 1				-	-	-	0	0	-	-	450	-
Stage 2				-	-	-	225	451	-	-	0	-
Critical Hdwy				4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1				-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2				-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy				2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver				-	-	-	711	502	0	0	503	778
Stage 1				-	-	-	-	-	0	0	570	-
Stage 2				-	-	-	757	569	0	0	-	-
Platoon blocked, %						-	-					
Mov Cap-1 Maneuver				-	-	-	710	502	-	-	503	778
Mov Cap-2 Maneuver				-	-	-	710	502	-	-	503	-
Stage 1				-	-	-	-	-	-	-	570	-
Stage 2				-	-	-	756	569	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				0		0		9.6				
HCM LOS						A		A				
Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1							
Capacity (veh/h)	-	-	-	-	778							
HCM Lane V/C Ratio	-	-	-	-	0.001							
HCM Control Delay (s)	0	0	-	-	9.6							
HCM Lane LOS	A	A	-	-	A							
HCM 95th %tile Q(veh)	-	-	-	-	0							

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	482	0	0	0	0	0	0	0	2	0	0
Future Vol, veh/h	0	482	0	0	0	0	0	0	0	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	524	0	0	0	0	0	0	0	2	0	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	524	262	262	524	-
Stage 1	-	-	-	-	524	-	0	0	-
Stage 2	-	-	-	-	0	-	262	524	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	457	737	670	457	0
Stage 1	-	-	-	0	528	-	-	-	0
Stage 2	-	-	-	0	-	-	720	528	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	457	737	670	457	-
Mov Cap-2 Maneuver	-	-	-	-	457	-	670	457	-
Stage 1	-	-	-	-	528	-	-	-	-
Stage 2	-	-	-	-	-	-	720	528	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	10.4
HCM LOS		A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	-	-	-	-	670
HCM Lane V/C Ratio	-	-	-	-	0.003
HCM Control Delay (s)	0	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	-	-	-	-	0

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱↱	↱		↰			↱	
Traffic Vol, veh/h	0	0	0	130	272	0	9	0	0	0	0	1
Future Vol, veh/h	0	0	0	130	272	0	9	0	0	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	141	296	0	10	0	0	0	0	1
Major/Minor				Major2		Minor1		Minor2				
Conflicting Flow All				0	0	0	430	578	-	-	578	148
Stage 1				-	-	-	0	0	-	-	578	-
Stage 2				-	-	-	430	578	-	-	0	-
Critical Hdwy				4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1				-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2				-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy				2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver				-	-	-	509	425	0	0	425	872
Stage 1				-	-	-	-	-	0	0	499	-
Stage 2				-	-	-	574	499	0	0	-	-
Platoon blocked, %					-	-						
Mov Cap-1 Maneuver				-	-	-	508	425	-	-	425	872
Mov Cap-2 Maneuver				-	-	-	508	425	-	-	425	-
Stage 1				-	-	-	-	-	-	-	499	-
Stage 2				-	-	-	573	499	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s						12.2		9.1				
HCM LOS						B		A				
Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1							
Capacity (veh/h)	508	-	-	-	872							
HCM Lane V/C Ratio	0.019	-	-	-	0.001							
HCM Control Delay (s)	12.2	-	-	-	9.1							
HCM Lane LOS	B	-	-	-	A							
HCM 95th %tile Q(veh)	0.1	-	-	-	0							

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	310	86	0	0	0	0	8	13	1	130	0
Future Vol, veh/h	0	310	86	0	0	0	0	8	13	1	130	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	337	93	0	0	0	0	9	14	1	141	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	337	169	173	430	-
Stage 1	-	-	-	-	337	-	0	0	-
Stage 2	-	-	-	-	0	-	173	430	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	583	845	774	516	0
Stage 1	-	-	-	0	640	-	-	-	0
Stage 2	-	-	-	0	-	-	812	582	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	583	845	752	516	-
Mov Cap-2 Maneuver	-	-	-	-	583	-	752	516	-
Stage 1	-	-	-	-	640	-	-	-	-
Stage 2	-	-	-	-	-	-	788	582	-

Approach	EB	NB	SB
HCM Control Delay, s	0	10.2	14.6
HCM LOS		B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	721	-	-	-	517
HCM Lane V/C Ratio	0.032	-	-	-	0.275
HCM Control Delay (s)	10.2	0	-	-	14.6
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	130	277	2	9	0	0	0	1	1
Future Vol, veh/h	0	0	0	130	277	2	9	0	0	0	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	65536	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	141	301	2	10	0	0	0	1	1

Major/Minor	Major2		Minor1		Minor2	
Conflicting Flow All	0	0	0	433	585	-
Stage 1	-	-	-	0	0	-
Stage 2	-	-	-	433	585	-
Critical Hdwy	4.14	-	-	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	507	421	0
Stage 1	-	-	-	-	-	0
Stage 2	-	-	-	571	496	0
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	505	421	-
Mov Cap-2 Maneuver	-	-	-	505	421	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	569	496	-

Approach	WB	NB	SB
HCM Control Delay, s		12.3	11.4
HCM LOS		B	B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	505	-	-	-	569
HCM Lane V/C Ratio	0.019	-	-	-	0.004
HCM Control Delay (s)	12.3	-	-	-	11.4
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	314	86	0	0	0	0	8	13	1	130	0
Future Vol, veh/h	0	314	86	0	0	0	0	8	13	1	130	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	341	93	0	0	0	0	9	14	1	141	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	388	217	175	434	-
Stage 1	-	-	-	-	388	-	0	0	-
Stage 2	-	-	-	-	0	-	175	434	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	545	787	771	514	0
Stage 1	-	-	-	0	607	-	-	-	0
Stage 2	-	-	-	0	-	-	810	579	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	545	787	748	514	-
Mov Cap-2 Maneuver	-	-	-	-	545	-	748	514	-
Stage 1	-	-	-	-	607	-	-	-	-
Stage 2	-	-	-	-	-	-	784	579	-

Approach	EB	NB	SB
HCM Control Delay, s	0	10.5	14.6
HCM LOS		B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	673	-	-	-	515
HCM Lane V/C Ratio	0.034	-	-	-	0.276
HCM Control Delay (s)	10.5	0	-	-	14.6
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	13	422	0	89	0	0	0	0	0
Future Vol, veh/h	0	0	0	13	422	0	89	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	14	459	0	97	0	0	0	0	0

Major/Minor	Major2	Minor1	Minor2
Conflicting Flow All	0	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	-
Pot Cap-1 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		11.2	0
HCM LOS		B	A

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	674	-	-	-	-
HCM Lane V/C Ratio	0.144	-	-	-	-
HCM Control Delay (s)	11.2	-	-	-	0
HCM Lane LOS	B	-	-	-	A
HCM 95th %tile Q(veh)	0.5	-	-	-	-

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	442	8	0	0	0	0	88	133	1	13	0
Future Vol, veh/h	0	442	8	0	0	0	0	88	133	1	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	480	9	0	0	0	0	96	145	1	14	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	480	240	288	489	-
Stage 1	-	-	-	-	480	-	0	0	-
Stage 2	-	-	-	-	0	-	288	489	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	484	761	642	478	0
Stage 1	-	-	-	0	553	-	-	-	0
Stage 2	-	-	-	0	-	-	695	548	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	484	761	441	478	-
Mov Cap-2 Maneuver	-	-	-	-	484	-	441	478	-
Stage 1	-	-	-	-	553	-	-	-	-
Stage 2	-	-	-	-	-	-	466	548	-

Approach	EB	NB	SB
HCM Control Delay, s	0	14.4	12.8
HCM LOS		B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	620	-	-	-	475
HCM Lane V/C Ratio	0.387	-	-	-	0.032
HCM Control Delay (s)	14.4	0	-	-	12.8
HCM Lane LOS	B	A	-	-	B
HCM 95th %tile Q(veh)	1.8	-	-	-	0.1

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	13	414	1	89	0	0	0	0	1
Future Vol, veh/h	0	0	0	13	414	1	89	0	0	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	14	450	1	97	0	0	0	0	1

Major/Minor	Major2	Minor1	Minor2
Conflicting Flow All	0	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	-
Pot Cap-1 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		11.2	9.6
HCM LOS		B	A

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	679	-	-	-	778
HCM Lane V/C Ratio	0.142	-	-	-	0.001
HCM Control Delay (s)	11.2	-	-	-	9.6
HCM Lane LOS	B	-	-	-	A
HCM 95th %tile Q(veh)	0.5	-	-	-	0

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	482	8	0	0	0	0	88	133	2	13	0
Future Vol, veh/h	0	482	8	0	0	0	0	88	133	2	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	524	9	0	0	0	0	96	145	2	14	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	529	267	310	533	-
Stage 1	-	-	-	-	529	-	0	0	-
Stage 2	-	-	-	-	0	-	310	533	-
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	-	-	-	0	454	731	619	451	0
Stage 1	-	-	-	0	525	-	-	-	0
Stage 2	-	-	-	0	-	-	675	523	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	454	731	416	451	-
Mov Cap-2 Maneuver	-	-	-	-	454	-	416	451	-
Stage 1	-	-	-	-	525	-	-	-	-
Stage 2	-	-	-	-	-	-	443	523	-

Approach	EB	NB	SB
HCM Control Delay, s	0	15.3	13.4
HCM LOS		C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	588	-	-	-	446
HCM Lane V/C Ratio	0.409	-	-	-	0.037
HCM Control Delay (s)	15.3	0	-	-	13.4
HCM Lane LOS	C	A	-	-	B
HCM 95th %tile Q(veh)	2	-	-	-	0.1



VISUAL IMPACT ANALYSIS

VIRGO SOLAR PV PROJECT

S P U R L O C K

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1.0 INTRODUCTION

This visual impact analysis has been prepared to assess the impacts on the construction of the Virgo Solar PV (project) in the unincorporated Imperial County, California.

The purpose of this visual impact analysis is to evaluate and document the potential visual impacts resulting from the implementation of the Virgo Solar PV project. This technical memorandum addresses the maximum impact of 563,181 photovoltaic solar panels for the area. The analysis discusses the existing visual environment, key observation points, viewer types, and anticipated viewer response. Potential visual impacts are assessed based on a hypothetical change to the visual environment through project implantation consistent with approved plans.

Section 1.0, Introduction, describes the project location that guides project in the unincorporated Imperial County. Section 2.0, Visual Environment, documents the existing visual resources and types of viewers in the unincorporated area viewshed and describes the visual impact analysis methodology. The degree of visual change that is expected to result from development of these solar fields and the maximum height limit and an analysis of potential impacts are provided in Section 3.0, Visual Impacts. A summary of visual effects is presented in Section 4.0, Visual Impact Analysis Summary.

1.1 PROJECT LOCATION

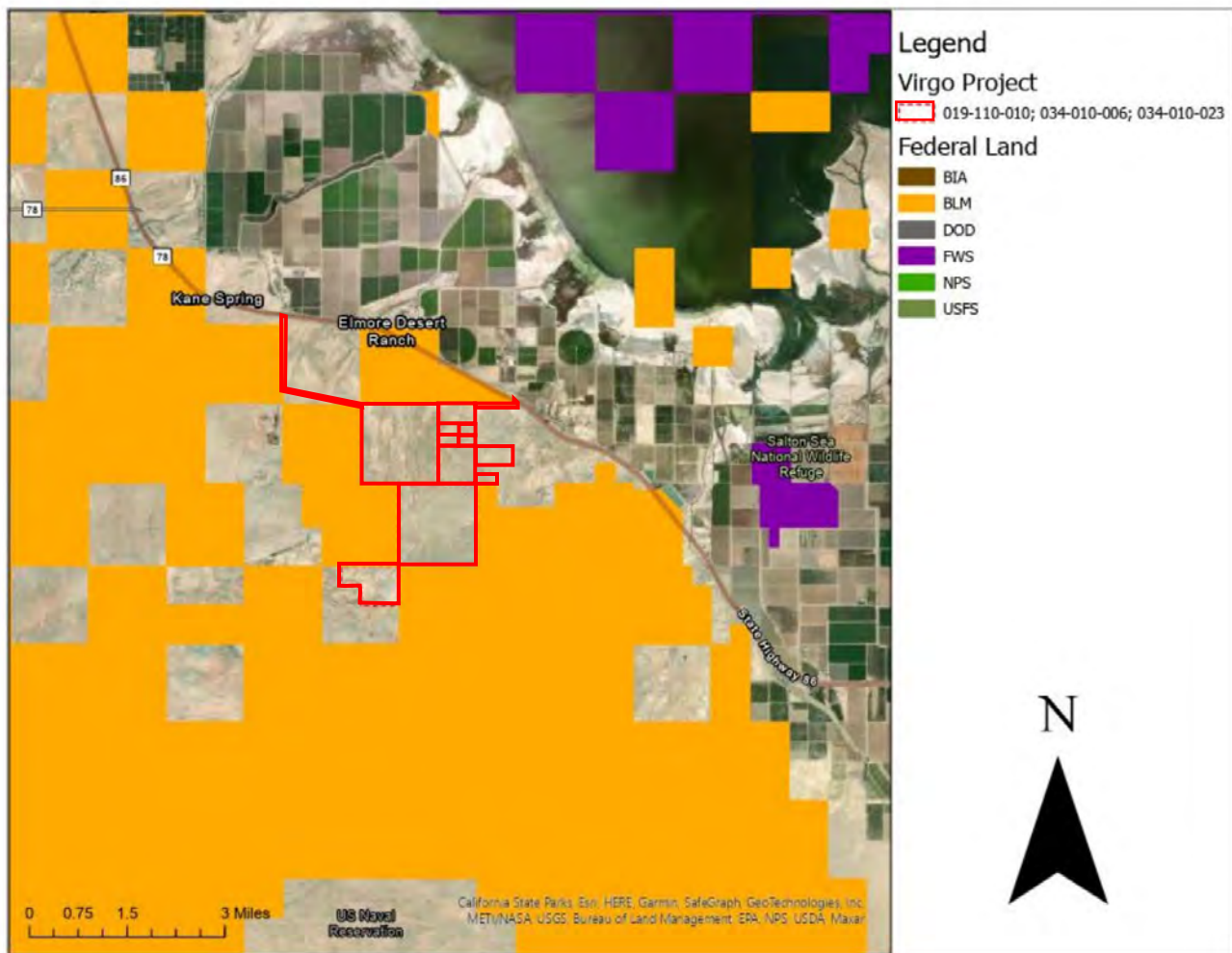
The Virgo Solar PV Project (project) is located within unincorporated Imperial County, California, approximately 19 miles east of Ocotillo Wells, 10 miles west of the city of Westmorland, and approximately 5 miles south of the Salton Sea. The project site is located approximately 1,500 feet south of State Route 86 (SR-86). The 1,964.47-acre project site consists of the following eleven parcels: Assessor Parcel Numbers 019-110-010, 034-010-006, 034-010-023, 019-120-001, 019-120-004, 019-120-005, 019-120-006, 019-120-007, 019-130-001, 019-130-007, and 019-130-009. All eleven parcels are designated in the County of Imperial General Plan Land Use Maps as Recreation/Open Space and zoned as Open Space/Preservation (S-2). The project site is surrounded by undeveloped desert land.

The project would develop approximately 1,348.77 acres of the project site with photovoltaic solar panels capable of generating up to 370 megawatts of renewable energy. The project would also develop a battery energy storage system capable of storing 800 megawatt hours of energy generated by the project solar panels. The project would also include a substation connection point to connect to an existing Imperial Irrigation District (IID) 161-kilovolt line that traverses the project boundary. The project has been designed to minimize encroachment into an existing flood zone that traverses north to south and dividing the solar panels proposed to the east and west. Access to the project site would be provided via one of the two following options:

- The western access route would exit south off SR-86, utilizing a paved access road for an existing CalEnergy Operating Corporation facility, followed by a dirt road to be constructed heading southeast towards the project site.
- The eastern access route would exit south off SR-86 at the intersection with Barth Road, followed by a dirt road to be constructed heading west towards the project site.

The alignments of both access routes would have negligible encroachment into land under the jurisdiction of the Bureau of Land Management.

Figure 1. Project Location



1.2 Assessment Method

The methodology used to prepare this visual impact analysis is described below:

1. The visual environment and existing landscape characteristic in the unincorporated area were visually documented through geo-located photographs in the field. Cameras utilized an aperture setting that provides a 77 degree and 180 degree field of view which was then matched in the models. Photographs were taken at a typical eye height of five feet, six inches above ground.
2. Key observation points for the visual impact analysis were selected based on public viewing locations, private access view locations and typical viewing conditions outside the unincorporated area.

The geographic limits for the visual impact analysis consist of the viewshed boundary, or the area from which the project can be viewed. The viewshed boundary was determined through analysis of county and Bureau of Land Management aerial maps. The character of the existing visual environment was then documented through field visits, photographic records, and aerial photograph interpretation. Viewer groups within the viewshed boundary were determined through field visits and recreation/trail maps.

VISUAL IMPACT ANALYSIS

For the purposes of this analysis, several key views were selected to represent public views from both public highways and publicly accessible Bureau of Land Management property based on viewer groups potentially affected by the project. Key views were determined through analysis of site visits, aerial maps, geo-located photographs, and topographic modeling to show perspectives toward the project area. A total of 5 key views were selected for analysis.

A three-dimensional model of the project scenario was created using computer-aided software for the two-dimensional project layouts of the site. Terrain modeling was created using geo-located contours and topography within the modeling software. Geographic coordinates from photographs taken were used to align the computer model to the site photographs. The computer model views were then superimposed over photographs from each key view, and minor camera alignment changes were made to all known reference points within the view.

The computer-generated perspectives were used to analyze visual impacts from the 5 key views. Visual impacts resulting from development of the unincorporated area were evaluated by viewing the existing visual character of the landscape from each key view and assessing the degree to which the construction of the solar panels at maximum height limits would change those views.

2.0 VISUAL ENVIRONMENT

2.1 Project Viewshed

A public viewshed is defined as the area visible from an observer's viewpoint, including the screening effects of intermediate vegetation and structures. Viewshed components include the underlying landform/topography (e.g., foothills, mountains, and flatlands) and the overlaying land cover (e.g., water features, vegetation, cultural sites, and buildings). For purposes of this visual impact analysis, the project viewshed generally includes project site and parts of the adjacent Bureau of Land Management properties.

The topography varies slightly throughout the viewshed with elevated terrains in the southeastern plats of the unincorporated area but is primarily level. All these areas are comprised of open desert areas, with the exception of power poles and transmission lines that currently run through the project area. The project is also located roughly 1 mile east of the Desert Valley Company Monofill Cell 4 project, which includes a paved roadway, leachate ponds, above ground storage tanks and Administrative and Storage Buildings.

The quality of views from surrounding areas toward the project site varies slightly from one location to another within the viewshed do to undulating terrain and some small pockets of mature vegetation growth. Views from much of State Road 86/78 are not impacted since the project site is not visible because of road elevation and landscape mounding along the road edge.

2.2 Viewers

Viewers are people whose views of the landscape may be altered by the project. For this visual impact analysis, viewers consisting of visitors, including recreational users and motorists, to the areas in the project viewshed. The most sensitive viewers are those using Bureau of Land Management trails directly adjacent to the project site. The highest percentage of viewers would be motorists on State Road 86/78 passing by daily, but considered less sensitive due to the shorter length of exposure to the views, higher speeds passing by and being a further distance away.

3.0 VISUAL IMPACTS

Visual impacts are associated with changes in either the human-made or natural environment, can be short or long term in duration, and can be beneficial or detrimental. Changes to views during construction of the project is considered a short-term visual impact. Long-term changes are associated with altering the natural topography; building permanent structures (e.g., buildings, bridges, walls); and removing vegetation, including mature trees. The focus of this analysis is on long-term physical changes that are permanent in nature.

The evaluation of visual effects is largely subjective and depends on the degree of alteration, scenic quality of the area disturbed, and sensitivity of the viewers:

- The degree of alteration refers to the extent of change to the natural landform and the introduction of urban elements into an existing natural environment while acknowledging any unique topographical formations or natural landmarks.
- Sensitive viewers are those who use the outdoor environment or value a scenic viewpoint to enhance their daily activity and are typically residents, recreational users, or motorists in scenic areas.

For the purposes of this analysis, sight distance is defined as foreground (0-0.25 mile), midground (0.25-3 miles), and background (3 miles and farther).

3.1 Key Views

Four representative views were selected that demonstrate the change in views from surrounding areas adjacent to the project site. For each of the 5 key views, the visual impact evaluates the existing view and the hypothetical view resulting from the buildout of the project area at maximum panel height limits. The representative key views are shown in Figure 2, Key Views, and described in Table 1, Key Views. The views were taken from locations accessible to the public, including highways and trails, and in consideration of the various types of viewers. These key views also represent the viewer groups that have the highest potential to be affected by the project.

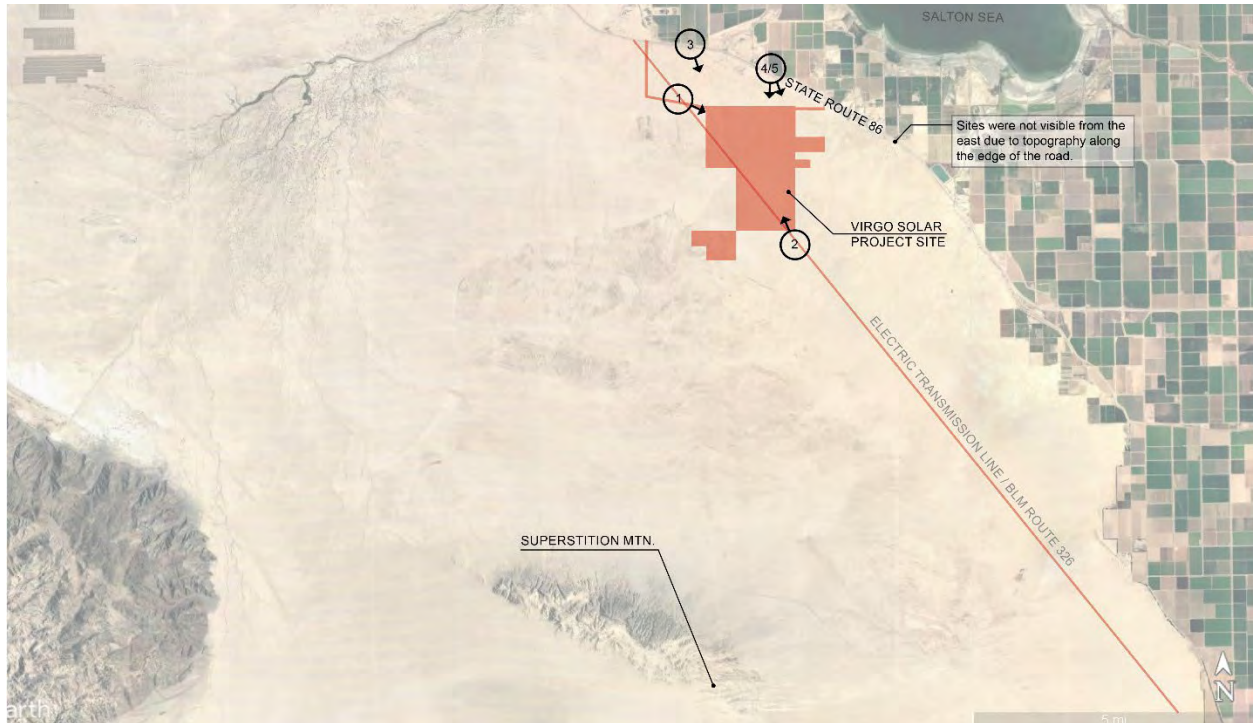
3.2 Impacts to Viewers

The visual impacts of the project to viewers were determined based on the degree of change to the existing setting based on the height of solar panels that would be viewed as a result of the project; the degree to which these features would obstruct, diminish, or dominate existing view qualities; and the sensitivity of the viewer.

The 5 key views were assessed using the following criteria:

- **Low:** Minor adverse change in visual quality caused by the project only slightly affecting the resource. Viewers are not sensitive to change, or the viewers are at a great distance from the change.
- **Moderate:** Major change in visual quality caused by the project. Existing landscaping provides some coverage to help maintain visual quality. Viewers are not highly sensitive to change, and distant views are minimally affected.
- **High:** Major adverse change in visual quality caused by the project. Viewers are sensitive to change, and the scenic quality and distant views would be drastically changed or obstructed.

The final determination of significance considered the existing visual quality and anticipated viewer response. The following analyses discuss the visual impacts that would occur at each key view as a result of the project.

Figure 2. Key Views**Table 1. Key Views**

KEY VIEW	LOCATION & DIRECTION	VIEWER	VISIBLE FEATURES
1	View south from Bureau of Land Management Route 326	Recreational User, Offroad Motorists	Vegetation, Electric Poles, Solar Panels, Battery Stations, Mountains
2	View north from Bureau of Land Management Route 326	Recreational User, Offroad Motorists	Vegetation, Electric Poles, Solar Panels, Mountains
3	View southeast from State Route 86/78	Motorists	Vegetation, Electric Poles, Mountains
4	View south from State Route 86/78	Motorists	Vegetation, Electric Poles, Mountains
5	View southeast from State Route 86/78	Motorists	Vegetation, Electric Poles

KEY VIEW 1: VIEW SOUTH FROM BUREAU OF LAND MANAGEMENT ROUTE 326

Key View 1 represents the scene that is viewed looking south from BLM Route 326. Views mainly consist of the existing landscape adjacent to the solar panels, the solar panel field and battery stations. Some mountains are visible to the southeast; however, the horizon is generally level.

Resource Change

Visual changes are generally in the middle ground views. Foreground and background views would not change. Battery stations and solar fields are visible just below the horizon, spanning the entire view, with the development of the project area at maximum solar panel height.

Viewer Sensitivity

Key View 1 represents a typical view from the adjacent BLM property recreational user which are low in frequency. Viewers will notice a change in the view with middle ground all replaced with a continuous line of panels and battery stations instead of vast desert landscape that stretches beyond the visible distance; however, the level of impact on view quality to the background mountains would depend on distance from

VISUAL IMPACT ANALYSIS

their vantage point. Given existing power poles and transmission lines already existing in the vicinity the overall viewer impact would be low to moderate.

Significance Determination

Low to moderate level of change. This impact is less than significant.



Existing Condition



Buildout Scenario

KEY VIEW 2: VIEW NORTHWEST FROM BUREAU OF LAND MANAGEMENT ROUTE 326

Key View 2 represents the scene that is viewed looking south from BLM Route 326. Views mainly consist of the existing landscape adjacent to the solar panels and existing power poles. Some mountains are visible to the southeast; however, the horizon is generally level.

Resource Change

Visual changes are generally in the middle ground views. Foreground and background views would not change. Solar fields are visible at the horizon, spanning the entire view, with the development of the project site at maximum solar panel height.

Viewer Sensitivity

Key View 2 represents a typical view from the northwest traveling recreational user or offroad motorists which are low in frequency. Viewers will notice a change in the view with middle ground all replaced with a continuous line of panels instead of vast desert landscape that stretches beyond the visible distance. Despite the change in horizon, the development would not obstruct views beyond the project area due to the distance of the vantage point. Given existing power poles and transmission lines already existing in the vicinity the overall viewer impact would be low to moderate. The near views in the immediate vicinity would be slightly impacted by the visibility of the solar panels.

Significance Determination

Low to moderate level of change. This impact is less than significant.



Existing Condition

VISUAL IMPACT ANALYSIS



Buildout Scenario

KEY VIEW 3: VIEW SOUTHEAST FROM STATE ROUTE 86/78

Key View 3 represents the scene that is viewed looking south from State Route 86/78. Views mainly consist of the existing landscape adjacent to the solar panels and existing power poles. A berm runs along the highway that partially obstructs views in most motorist's vehicles. Superstition Mountain can be seen at a distance in the background.

Resource Change

Visual changes in the background show a minor glimpse of the solar panels. The combination of undulating terrain and existing shrubs work to cover most of the solar field and show slight impacts to the distant view for a portion of the solar field. No impact is made to the distant view of Superstition Mountain.

Viewer Sensitivity

Key View 3 represents a typical view from motorists on State Route 86/78. Views in the immediate vicinity will not change, and due to the distance of the view and natural landscaping partially blocking the solar fields, the development will not be noticeable. Overall viewer response would be low.

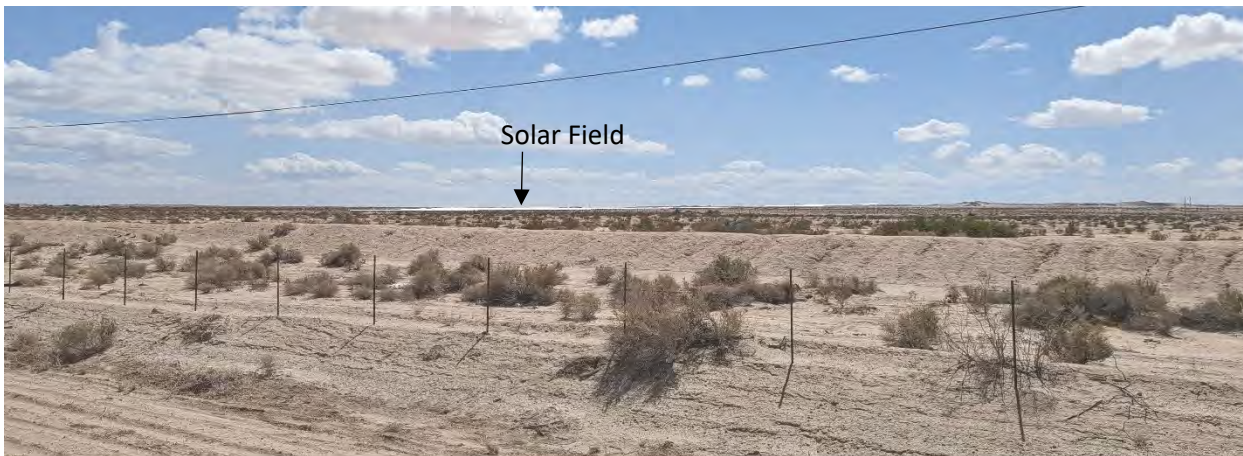
Significance Determination

Low level of change. This impact is less than significant.



Existing Condition

VISUAL IMPACT ANALYSIS



Buildout Scenario

KEY VIEW 4: VIEW SOUTHWEST FROM ROUTE 86/78

Key View 4 represents the scene that is viewed looking south from Highway Route 86/78. Views mainly consist of the existing landscape adjacent to the solar panels. A berm runs along the highway that partially obstructs views, even some motorist's vehicles. Superstition Mountain can be seen at a distance in the background.

Resource Change

Visual changes in the background show a minor glimpse of the solar panels at 15 feet in height. The combination of undulating terrain and existing shrubs work to cover most of the solar field and show nearly no impact to the view.

Viewer Sensitivity

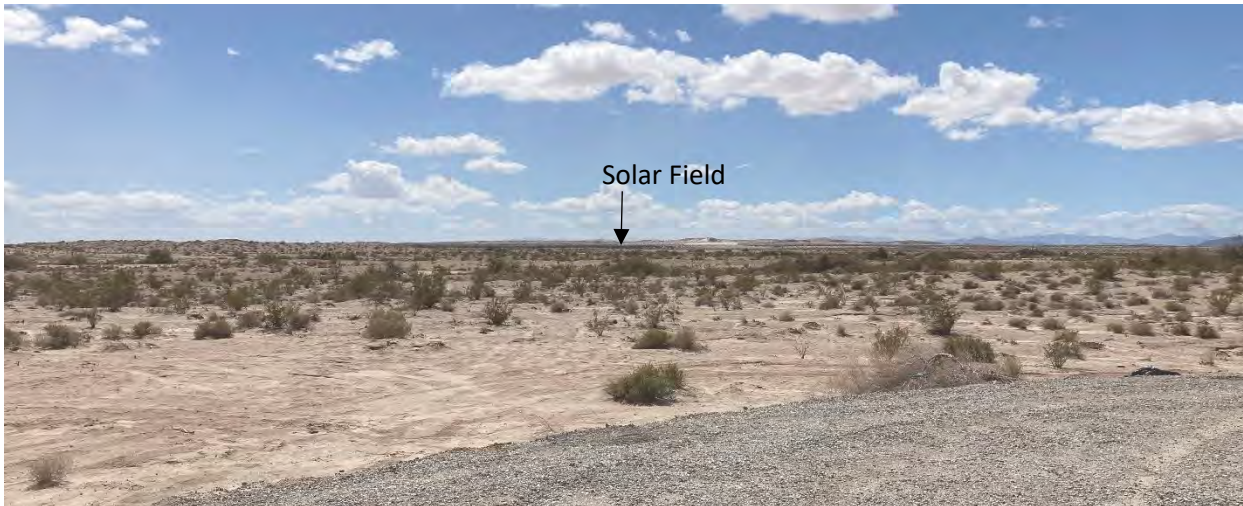
Key View 4 represents a typical view from motorists on Route 78/86. Views in the immediate vicinity will not change, and due to the distance of the view and natural landscaping partially blocking the solar fields, the development will not be noticeable. Overall viewer response would be low.

Significance Determination

Low level of change. This impact is less than significant.



Existing Condition



Buildout Scenario

KEY VIEW 5: VIEW SOUTHEAST FROM ROUTE 86/78

Key View 5 represents the scene that is viewed looking southeast from Highway Route 86/78. Solar fields are visible at the horizon, spanning a port of the view, with the development of the project site at maximum solar panel height. Views mainly consist of the existing landscape adjacent to the solar panels. A natural berm runs along the highway that partially obstructs views, even some motorist's vehicles.

Resource Change

Visual changes in the background show a minor glimpse of the solar panels at 15 feet in height. The combination of undulating terrain and existing shrubs work to cover most of the solar field and show nearly no impact to the view.

Viewer Sensitivity

Key View 5 represents a typical view from motorists on Route 78/86. Views in the immediate vicinity will not change, and due to the distance of the view and natural landscaping partially blocking the solar fields, the development will not be noticeable. Overall viewer response would be low.

VISUAL IMPACT ANALYSIS

Significance Determination

Low level of change. This impact is less than significant.



Existing Condition



Buildout Scenario

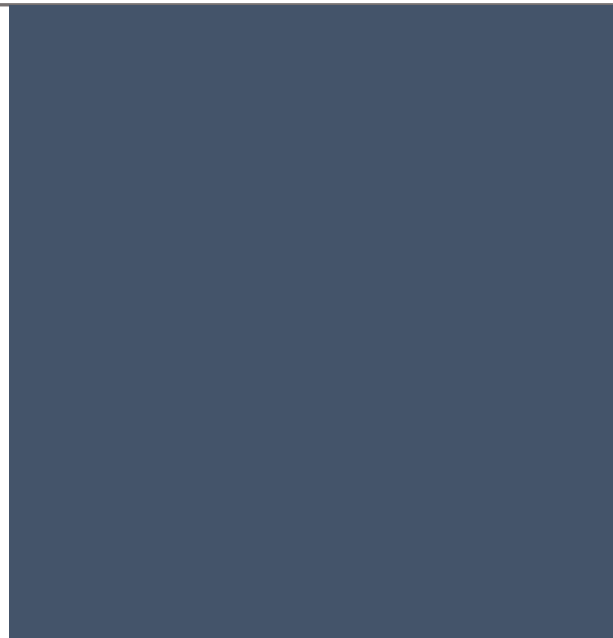
4.0 VISUAL IMPACT ANALYSIS SUMMARY

The visual impact analysis analyzes the project under a hypothetical scenario in which the unincorporated area would be built out to the maximum solar panel height limit at the largest reflection angle per manufacturers' specifications. These eleven parcels will be built out at the highest capacity identified under Virgo Solar PV design documents. As noted above, the potential impacts of the future Virgo Solar PV development are addressed in this visual impact analysis.

The visual impact of these solar fields and battery stations are built relatively low to the ground and therefore will have minor effects on the scenic quality for views behind the immediate area. Given the presence of the existing transmission lines and visibility of the adjacent Desert Valley Company Monofill Cell 4 project, and adjacent State Route 78/86 the immediate area already includes manmade structures with higher visibility and is not impacting a pristine view. Table 2, Summary of Visual Impacts, summarizes the visual impact analysis findings based on resources changes, viewer sensitivity, and significance of changes for all five key views.

Table 2. Summary of Visual Impacts

KEY VIEW	RESOURCE CHANGE	VIEWER SENSIVITY	SIGNIFICANCE DETERMINATION
1	Low to Moderate	Low to Moderate	Less than Significant
2	Low to Moderate	Low to Moderate	Less than Significant
3	Low	Low	Less than Significant
4	Low	Low	Less than Significant
5	Low	Low	Less than Significant



SB 610

Virgo Solar PV Project

DRAFT

Perpard by Dubose Design Group
For The County of Imperial (Lead Agency)
February 14, 2025



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PURPOSE OF WATER SUPPLY ASSESSMENT & APPLICABILITY

This Water-Supply Assessment (WSA), SB 610 was prepared for the Imperial County Planning and Development Services (ICPDS) and (The “Applicant”) by water supply experts at DuBose Design Group, Inc (DDG) for the proposed Virgo Solar Project (“The Project”). The proposed project consists of an approximately 1,964.47-acre project of which 1,348.77 acres will be photovoltaic solar panels capable of generating 370 megawatts of renewable energy on site. The proposed project consists of eleven parcels owned by the project proponent, Assessor Parcel Numbers 019-110-010, 034-010-006, 034 010 023, 019-120-001, 019-120-004, 019-120-005, 019-120-006, 019-120-007, 019-130-001, 019-130-007, and 019-130-009. All eleven parcels are designated in the County of Imperial General Plan Land Use Maps as Recreation/Open Space and zoned as Open Space/Preservation (S-2). The project would construct approximately 571,900 photovoltaic solar panels on the site for generation of renewable energy. The project would also develop a battery energy storage area capable of storing 800 MW of energy generated by the project solar panels. The project would also include a substation connection point to connect to an existing Imperial Irrigation District (IID) 161-kilovolt line that traverses the project boundary. The project has been designed to minimize encroachment into an existing flood zone that traverses north to south and dividing the solar panels proposed to the east and west. Access to the project site would be provided via one of the two following options: The western access route would exit south off SR-86, utilizing a paved access road for an existing CalEnergy Operating Corporation facility, followed by a dirt road to be constructed heading southeast towards the project site. The eastern access route would exit south off SR-86 at the intersection with Barth Road, followed by a dirt road to be constructed heading west towards the project site. The alignments of both access routes would have negligible encroachment into land under the jurisdiction of the Bureau of Land Management.

Per California Water Code section 10912. For the purposes of this part, the following terms have the following meanings: (a) "Project" means any of the following: (5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area. This study is a requirement of California law, specifically Senate Bill 610 (referred to as SB 610).¹ SB 610 is an act that amended Section 21151.9 of the Public Resources Code, and Sections 10631, 10656, 10910, 10911, 10912, and 10915 of the California Water Code (CWC). SB 221 is an act that amended Section 11010 of the Business and Professions Code, while amending Section 65867.5 and adding Sections 66455.3 and 66473.7 to the Government Code. SB 610, which was approved by the Governor and filed with the Secretary of State on October 9, 2001, and became effective January 1, 2002, requires a lead agency, to determine that a project (as defined in CWC Section 10912) subject to California Environmental Quality Act (CEQA), to identify any public water system, or groundwater that may supply water for the project and to request the applicants to prepare a specified water supply assessment.

PREPARATION OF SB 610 ASSESSMENTS – GROUNDWATER

Introduction

The Colorado River Basin Region covers approximately 13 million acres (20,000 square miles) in the southeastern portion of California (Figure 1). It includes all of Imperial County and portions of San Bernardino, Riverside, and San Diego Counties. It is bounded for forty miles on the northeast by the State of Nevada, on the north by the New York, Providence, Granite, Old Dad, Bristol, Rodman, and Ord Mountain ranges, on the west by the San Bernardino, San

Jacinto, and Laguna Mountain ranges, on the south by the Republic of Mexico, and on the east by the Colorado River and State of Arizona. Geographically, the Region represents only a small portion of the total Colorado River drainage area, which includes portions of Arizona, Nevada, Utah, Wyoming, Colorado, New Mexico, and Mexico. A significant geographical feature of the Region is the Salton Trough, which contains the Salton Sea and the Coachella and Imperial Valleys. The Salton Trough is a landward extension of the Gulf of California structural depression. In prehistoric times, it contained the Ancient Lake Cahuilla (not to be confused with the present Lake Cahuilla, located at the terminus of the Coachella Branch of the All-American Canal). Much of the agricultural economy and industry of the Region is located in the Salton Trough. The Salton Trough contains the Salton Sea Known Geothermal Resource Area, which as of 2017, consisted of 10 generating geothermal plants. Developments along California's 230-mile reach of the Colorado River, which flows along the eastern boundary of the Region, include agricultural areas in Palo Verde Valley and Bard Valley, urban centers at Needles, Blythe, and Winterhaven, several transcontinental gas compressor stations, and numerous small recreational communities. Some mining operations are located in the surrounding mountains. Also situated along the Colorado River are the Fort Mojave, Chemehuevi, Colorado River, and Yuma Indian Reservations.¹

GEOLOGY

The mountains of the Region consist mainly of metamorphic and igneous rocks of pre-Cambrian to Tertiary age, and the sediments in the intervening valleys are generally weakly consolidated to unconsolidated sediments of late Cenozoic age. Northwest-trending faults are extensive and are a major factor in determining the configuration of the land. The well known San Andreas Fault Zone cuts diagonally across the southwesterly portion of the Region and borders the highlands on the northeast side of the Salton Trough. Borrego Valley is a typical valley formed by the San Jacinto Fault. The valleys, mountains, and dry lakes generally trend toward the northwest as oriented by the major fault systems. The Coachella and Imperial Valleys were created when the Colorado River formed a delta that isolated the Salton Trough from the Gulf of California. Subsequently, under desert conditions, the inland sea dried up. Later, the trough was occupied by lakes for various periods, and deposition into these lakes gives the valleys their characteristic flat lands and fertile soils. The Anza-Borrego planning area is made up of the Old California batholith that has been weathered and eroded. Today only low dissected hills remain. The East Colorado River Basin planning area consists of a sediment-filled structural trough. Deep alluvial deposits composed of silt, clay, and sand were laid down by ancestral streams of the present Colorado River system.²

MAJOR HYDROLOGIC FEATURES

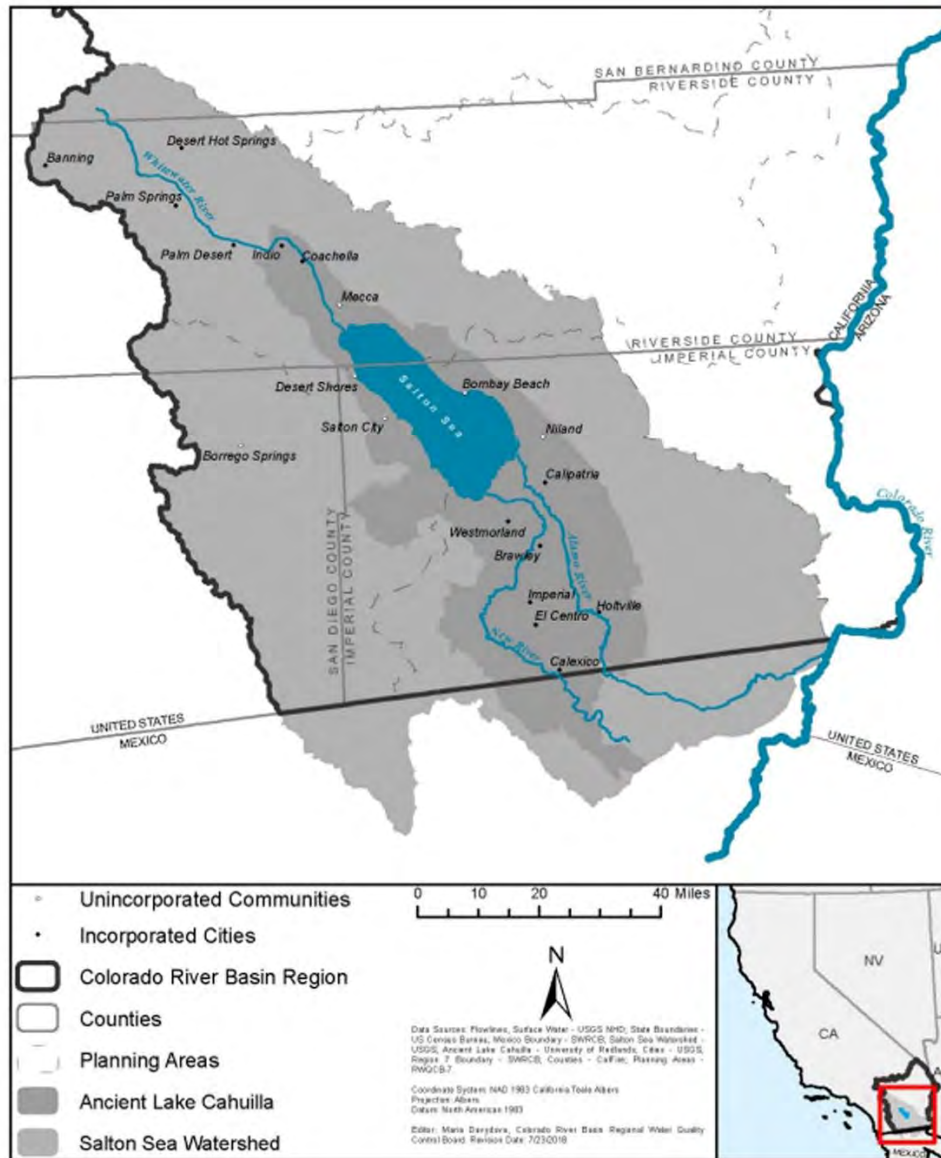
The Colorado River is the most important waterway in the Region. The River supplies water for use within the Region and elsewhere. Regional drainage to the River is from a strip about 200 miles long, with a watershed which (in California) ranges from 7 to 40 miles in width. This watershed strip is referred to as the East Colorado River Basin. Near Parker Dam, water is diverted by the Metropolitan Water District for export through the Colorado River Aqueduct to coastal counties. The dam forms Lake Havasu, a major recreational development. At Palo Verde Diversion Dam, water is diverted for irrigation in Palo Verde Valley. At Imperial Dam, water is diverted to the All-American Canal, which conveys water in California to the Bard Valley, and to the agricultural areas of the Imperial

¹ [Water Quality Control Plan for the Colorado River Basin Region \(ca.gov\)](#)

² [Water Quality Control Plan for the Colorado River Basin Region \(ca.gov\)](#)

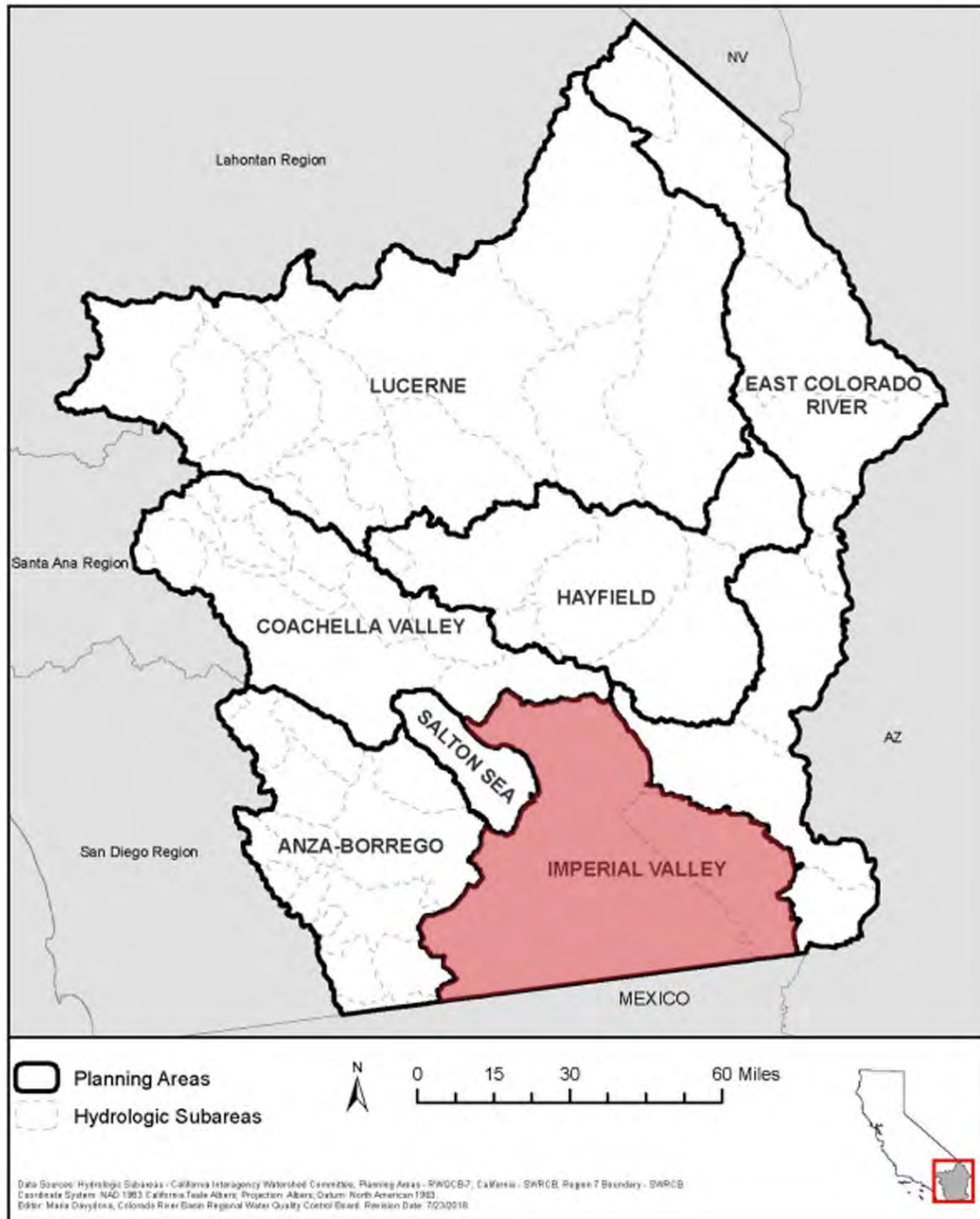
and Coachella Valleys. Apportionment of water available for diversion from the River is made in accordance with a number of documents collectively referred to as the Law of the River. These include interstate compacts, federal legislation, water delivery contracts, state legislation, a treaty with Mexico, United States Supreme Court decrees, and federal administrative actions. Presently, California is receiving waters unused by other states. When Arizona is diverting its full apportionment, it is anticipated that there will be only infrequent periods of surplus, and California's diversions will be limited to its basic apportionment of 4.4 million acre-feet per year. Regional drainage waters resulting from Colorado River diversions and use, and which do not return to the Colorado River, drain into the Salton Sea. That portion of the Region that does not drain into the Colorado River is referred to as the Colorado River Basin (West) or West Basin. Much of the northern portion of the West Basin drains to several individual internal sinks or playas, while the southern portion generally drains to the Salton Sea. The Imperial and Coachella Valleys contain numerous drains that transport irrigation return flows and stormwater, as well as canals for importation and distribution of Colorado River water. The Salton Sea, which is replenished principally by irrigation drainage and stormwater, is the largest body of water in the West Basin. The Sea serves as a reservoir to receive and store agricultural drainage and seepage waters, but also provides important wildlife habitat and is used for recreational purposes which include boating and fishing. Several smaller constructed recreational lakes are located in the Imperial Valley. In addition, Lake Cahuilla in Coachella Valley is used to store Colorado River water for irrigation and recreational purposes.³

Figure 1 : Colorado River Groundwater Basin



Source: Water Quality Control Plan for the Colorado River Basin Region, pg I-16, 2023

Figure 2: Colorado River Groundwater Basin Planning Areas – Imperial Valley Region



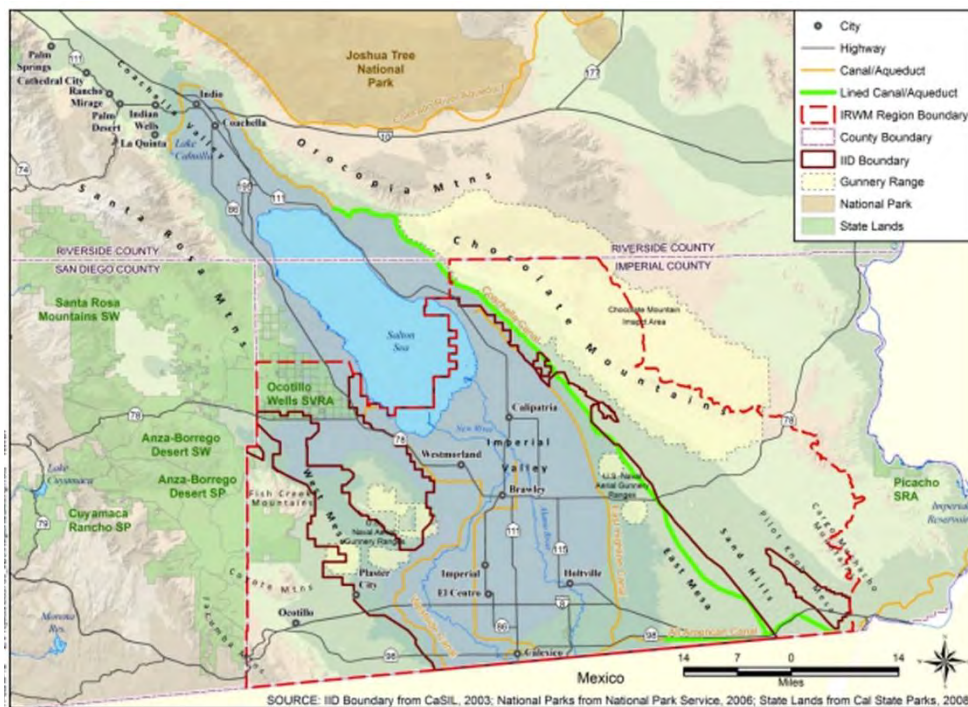
Project Site is in the Imperial Valley Region of the Colorado River Groundwater Basin in Red

Source: Water Quality Control Plan for the Colorado River Basin Region, pg I-18, 2023

Imperial County has an Integrated Regional Water Management Plan (IRWMP) which was adopted in October of 2012, As stated in the IRWMP, "...The Imperial IRWMP area lies within the Salton Trough of southern California as shown on Figure 1. The Salton Trough is the dominant feature of the Colorado Desert geomorphic province of

California. The trough is about 130 miles long and up to 70 miles wide, and is generally considered the northwesterly landward extension of the Gulf of California (Loeltz et al., 1975). The term Salton Basin (Basin) applies to the broad region draining directly into the Salton Sea. The Imperial Valley lies in the central part of the Basin south of the Salton Sea. Most of the IID service area overlies the area defined as the Imperial Valley. The Salton Sea is a critical component of the Pacific Flyway migratory corridor as it is an essential overwintering site for thousands of migratory waterfowl. Its marsh areas provide significant habitat for the endangered Yuma clapper rail.

Figure 3: IRWM Regional Boundary



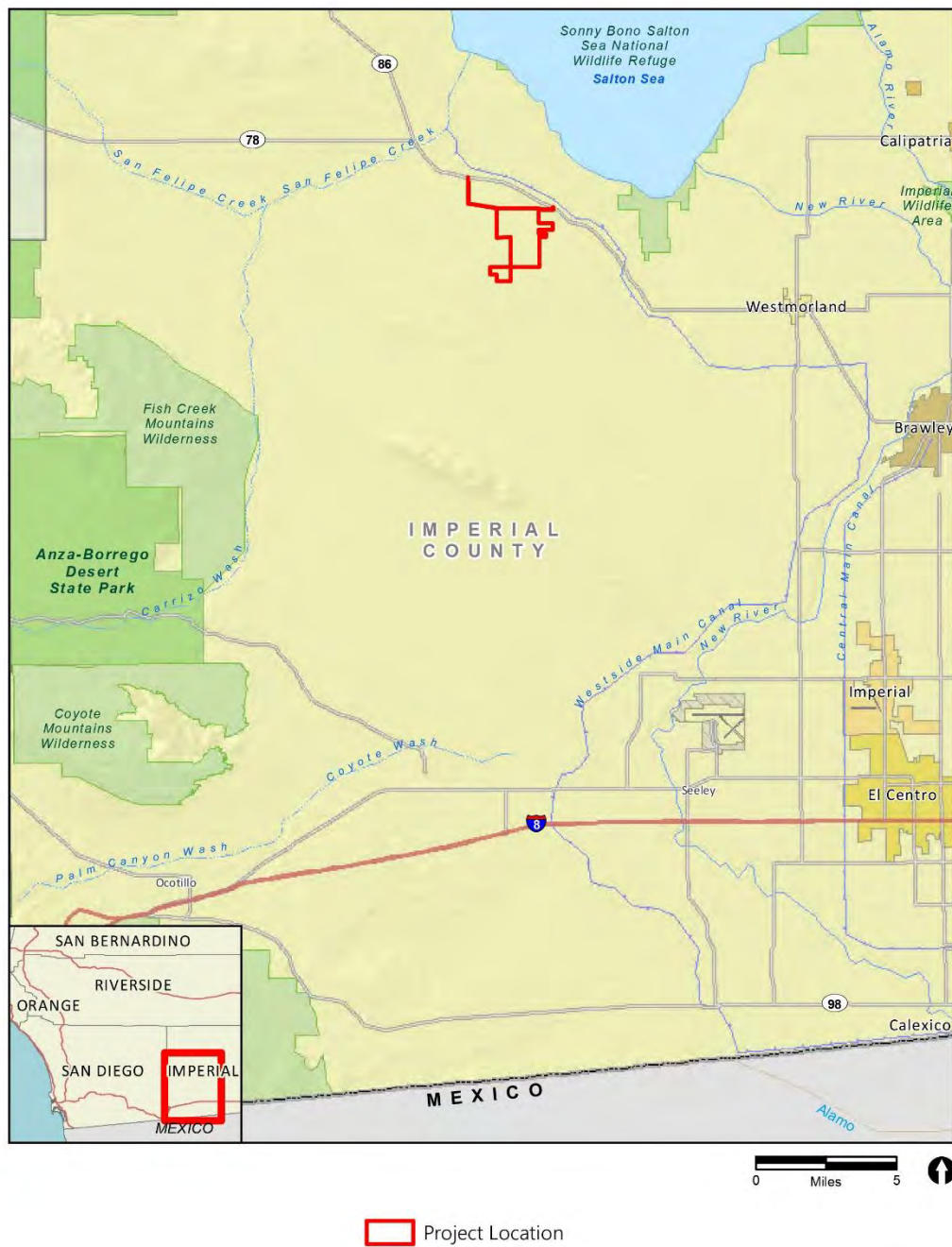
The IRWMP encompasses three principal physiographic and hydrologic areas: (1) the Imperial Valley which lies within the valley floor generally inside the boundaries of the Westside Main and East Highline Canals and north of the Mexico; (2) the East Mesa which is generally east of the East Highline Canal; and (3) the West Mesa generally west of the Westside Main canal. The proposed Project is in the West Mesa more specifically within the Ocotillo-Clark Valley Groundwater Basin.

VIRGO ENERGY PROJECT DESCRIPTION

The Virgo Solar PV Project (project) is located within unincorporated Imperial County, California, approximately 19 miles east of Ocotillo Wells, 10 miles west of the city of Westmorland, and approximately 5 miles south of the Salton Sea. The project site is about two miles south of State Route 78 (SR-78). The approximately 1,964.47-acre project site consists of the following eleven parcels owned by the project proponent, Assessor Parcel Numbers 019-110-010, 034-010-006, 034 010 023, 019-120-001, 019-120-004, 019-120-005, 019-120-006, 019-120-007, 019-130-001, 019-130-007, and 019-130-009. All eleven parcels are designated in the County of Imperial General Plan Land Use Maps as Recreation/Open Space and zoned as Open Space/Preservation (S-2). The project site is surrounded by undeveloped desert land. The project site is located within Sections 1, 11, 35, and 36 of Townships 12 and 13 South, Range 11 East on the U.S. Geological Survey (USGS) Kane Spring, California quadrangle (USGS 1992). Figure 4 shows the regional location. Figure 5 shows an aerial photograph of the project site and vicinity.

The project would construct approximately 571,900 photovoltaic solar panels on the site for generation of renewable energy. The project would also develop a battery energy storage area capable of storing 800 MW hours of energy generated by the project solar panels. The project would also include a substation connection point to connect to an existing Imperial Irrigation District (IID) 161-kilovolt line that traverses the project boundary. The project has been designed to minimize encroachment into an existing flood zone that traverses north to south and dividing the solar panels proposed to the east and west. Access to the project site would be provided via an existing utility easement and road that follows IID power lines branching off State Route 86 (SR-86) north of the project site. Use of this existing utility road would avoid impacts on land directly between the project site and SR-86 under the jurisdiction of the Bureau of Land Management. Figure 6 shows the proposed site plan.

Figure 4: Regional Location

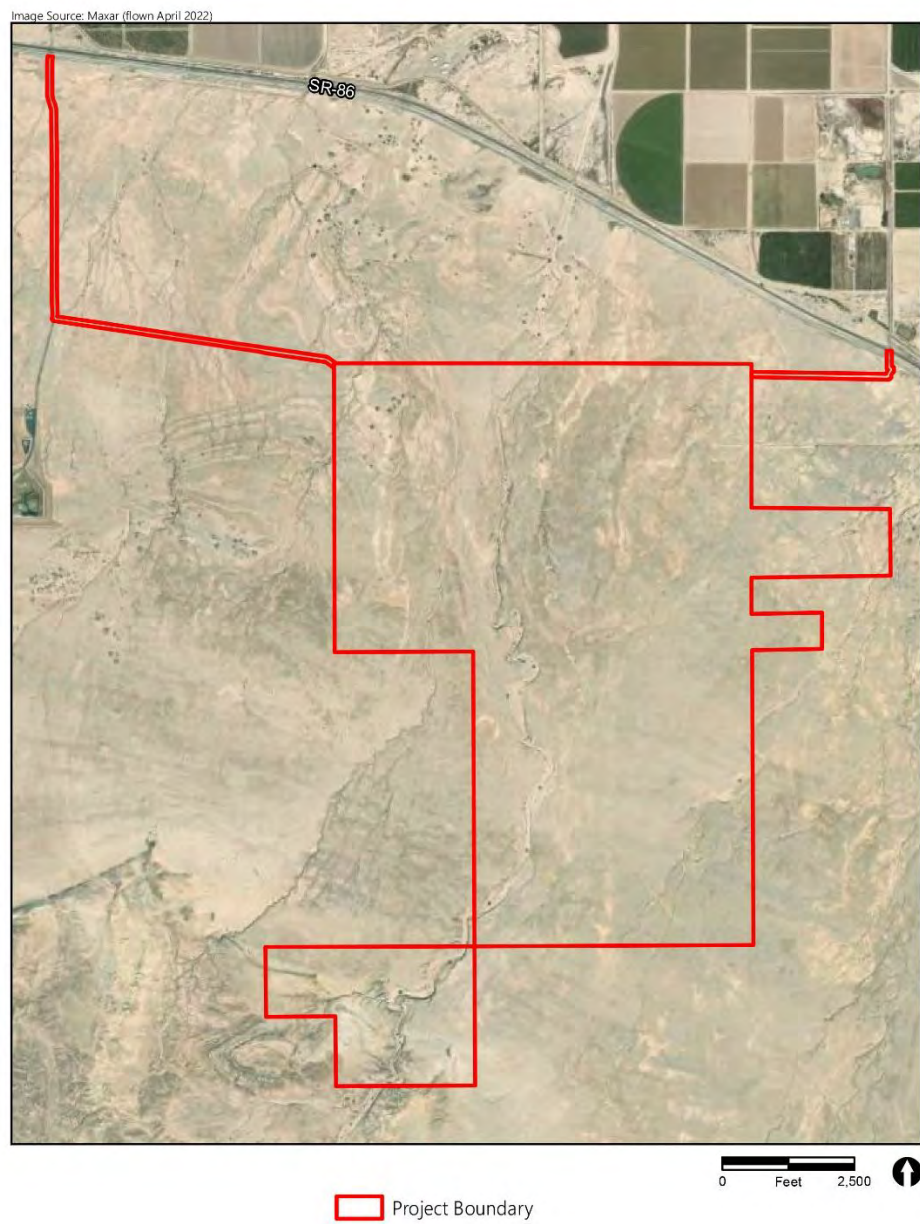


RECON
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Regional Location

Source: RECON

Figure 5: Project Location – Aerial

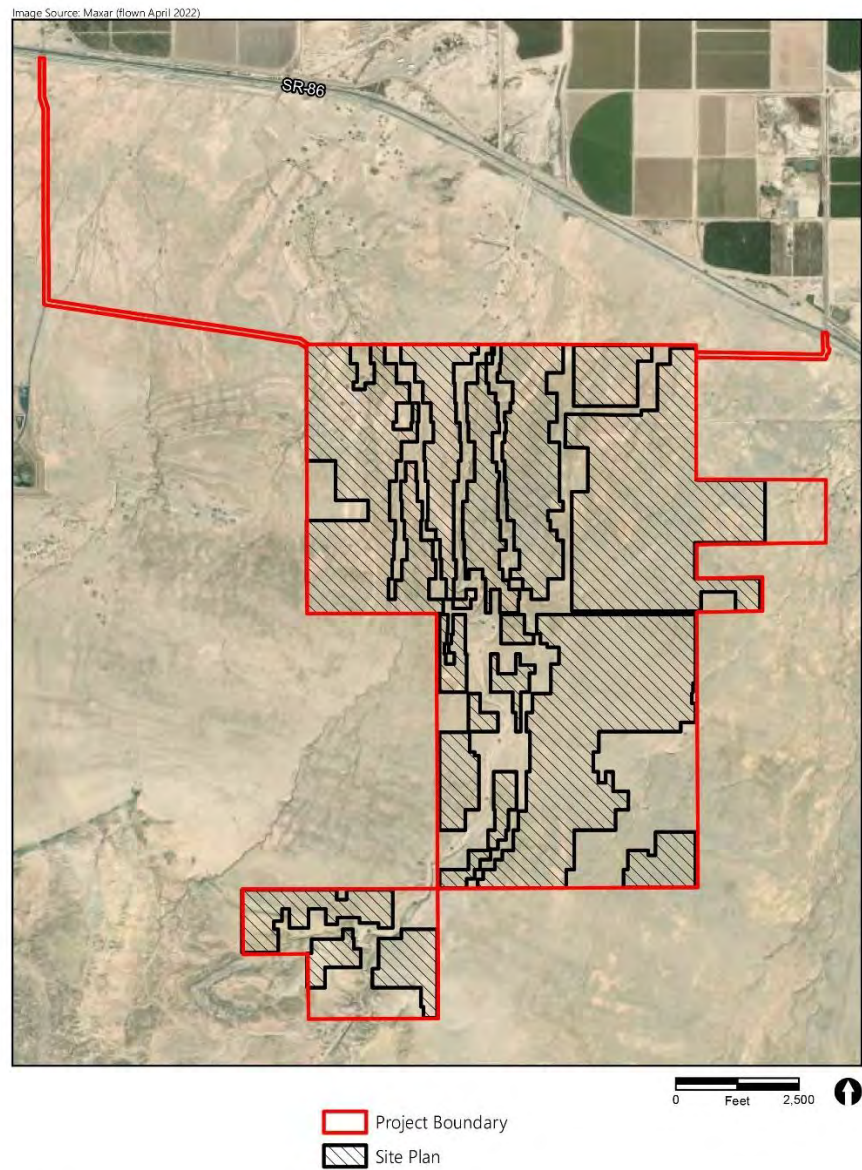


RECON
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Project Location on Aerial Photograph

Source: RECON

Figure 6 :- Site Plan



RECON

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Site Plan

Source: RECON

POPULATION TRENDS⁴

According to the DOF, the total population of Imperial County was 188,777 in 2020, an increase of 8.2 percent since 2010. The population of the unincorporated county increased 4.3 percent over the same period, from 37,778 to 39,420. According to the ACS, Salton City saw the greatest growth, surpassing Heber as the most populated townsite in the unincorporated county, with a population of 6,250 in 2019, a 346-percent increase from 1,400 in 2010. Salton City, Desert Shores, and Seeley were the only unincorporated townsites that experienced growth, all others saw decreases in population ranging from a 1-percent decrease (Bombay Beach) to a 78-percent decrease (Winterhaven). Refer to Table A-2 for population trends in the unincorporated county and Imperial County as a whole.

POPULATION TRENDS

Townsite	2010	2020	Change	
			Number	Percentage
Brawley	24,953	27,349	2,396	9.6%
Calexico	38,572	40,896	2,324	6.0%
Calipatria	7,705	6,843	-862	-11.2%
El Centro	42,598	45,657	3,059	7.2%
Holtville	5,939	6,359	420	7.1%
Imperial	14,758	19,907	5,149	34.9%
Westmorland	2,225	2,346	121	5.4%
Total Incorporated County	136,750	149,357	12,607	9.2%
Total Unincorporated County *	37,778	39,420	1,642	4.3%
Total County	174,528	188,777	14,249	8.2%

Source: California DOF, City/County Population and Housing Estimates

* Includes all unincorporated areas, beyond just census-designated places.

2022, Imperial County Housing Element, Pg. 61, Retrieved, November 2023⁵

CLIMATE FACTORS

Imperial Valley is located in the Northern Sonoran Desert, which has a subtropical desert climate characterized by hot, dry summers and mild winters. Clear and sunny conditions typically prevail, and frost is rare. The region receives 85 to 90 percent of possible sunshine each year, the highest in the United States. Winter temperatures are mild rarely dropping below 32°F, but summer temperatures are very hot, with more than 100 days over 100°F each year. The remainder of the year has a relatively mild climate with temperatures averaging in the mid-70s. The 100-year average climate characteristics are provided in Table below. Rainfall contributes around 50,000 AF of effective agricultural water per inch of rain. Most rainfall occurs from November through March; however, summer storms can be significant in some years. Annual areawide rainfall is shown in Tables below

⁴ [IMPERIALCO_Housing-Element_Adopted-2.8.22.pdf \(icpds.com\)](#)

⁵ [IMPERIALCO_Housing-Element_Adopted-2.8.22.pdf \(icpds.com\)](#)

Total recharge to the groundwater system from precipitation within the valley was estimated to be somewhat less than 10,000 acre-feet per year (Loeltz et al., 1975). Evaporation averages over 98 inches per year in Imperial Valley, while plant evapotranspiration is as high as 60 to 72 inches per year.⁶

Climate Characteristics, Imperial Ca 1923-2022

Climate Characteristic	Annual Value
Average Precipitation (100-year record, 1923-2022)	2.75 inches (In)
Minimum Temperature, Jan 1937	16 °F
Maximum Temperature, July 1995	121 °F
Average Minimum Temperature, 1923-2022	48.4 °F
Average Maximum Temperature, 1923-2022	98.4 °F
Average Temperature, 1923-2022	73.1 °F

Source: IID Imperial Weather Station Record

AREAWIDE ANNUAL PRECIPITATION (IN), (1990-2022)

1990	1991	1992	1993	1994	1995	1996
1.646	3.347	4.939	2.784	1.775	1.251	0.685
1997	1998	1999	2000	2001	2002	2003
1.328	2.604	1.399	0.612	0.516	0.266	2.402
2004	2005	2006	2007	2008	2009	2010
4.116	4.140	0.410	1.331	1.301	0.619	3.907
2011	2012	2013	2014	2015	2016	2017
2.261	2.752	2.772	1.103	2.000	1.867	2.183
2018	2019	2020	2021	2022		
1.305	3.017	2.685	1.688	1.265		

Source: Computation based on polygon average of CIMIS as station came online in the WIS.⁷ & IID

⁶ [635648001335730000 \(iid.com\)](https://www.iid.com/635648001335730000)

⁷ From 1/1/1990-3/23/2004, 3 CIMIS stations: Seeley, Calipatria/Mulberry, Meloland; 3/24/2004-7/5/2009, 4 CIMIS stations (added Westmorland N.); 7/6/2009-12/1/2009, 3 CIMIS stations: Westmorland N. offline; 12/2/2009-2/31/2009, 4 CIMIS stations, Westmorland N. back online; 1/1/2010-9/20/2010.

MONTHLY MEAN TEMPERATURE (°F) – IMPERIAL, CA 10-YEAR, 30-YEAR & 100-YEAR (2013-2022, 1993-2022, 1923-2022)

	Jan			Feb			Mar			Apr		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
10-year	81	33	57	87	37	62	94	43	68	101	49	7
30-year	81	34	57	84	36	60	93	41	66	99	47	7
100-year	80	31	56	84	35	59	91	40	65	99	46	7
	May			Jun			Jul			Aug		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
10-year	105	55	77	116	62	89	115	72	94	114	72	9
30-year	106	54	78	113	60	87	115	69	92	114	70	9
100-year	105	53	78	113	59	86	114	68	92	113	68	9
	Sep			Oct			Nov			Dec		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
10-year	111	64	88	100	53	77	91	40	65	81	34	5
30-year	111	62	87	102	50	76	90	39	64	80	33	5
100-year	110	61	86	101	49	75	89	38	63	80	32	5

Source: IID Imperial Headquarters Station Record (Data provided by IID staff)

Geologic and Groundwater Settings ⁸

Imperial Valley and Coachella Valley are located in the Colorado Desert geomorphic province. The Colorado Desert is a low-lying barren desert basin, with portions of the area below mean sea level and runoff flowing to the Salton Sea. The province is a depressed block between active branches of alluvium-covered San Andreas Fault with the southern extension of the Mojave Desert to the east. It is characterized by the ancient beach lines and silt deposits of extinct Lake Cahuilla (CGS 2002). The Region is bounded to the west by the Jacumba Mountains and on the east by the Chocolate Mountains. Beyond the mountains to the west lies San Diego, California, and to the east beyond the Colorado River is southwestern Arizona. Much of the central portion of the Region is below sea level, reaching nearly 230 feet below mean sea level (msl) at the Salton Sea. Groundwater basins within the Imperial Region, displayed in Figure 4-11, and include portions of the Coyote Wells Valley Basin, Borrego Valley Basin, Ocotillo-Clark Valley Basin, West Salton Sea Basin, and Ogilby Valley Basin, and all of the Imperial Valley Basin, East Salton Basin, and East Amos Valley Basin, which total approximately 2,800 square miles (CDWR 1975). The major surface water body within the Region is the Salton Sea, and the drainage is to the Salton Sea via the New River and Alamo River and various washes. Groundwater-bearing materials are generally younger than older alluvial sediments derived from the erosion of the surrounding mountain ranges. The Region is situated on and near extensive fault systems, generally trending northwest to southeast. Large nearby faults include the San Andreas, Superstition Hills, and San Jacinto Faults (Hart and Bryant 1999). The faulting influences groundwater movement. More small to moderate earthquakes have occurred in the Region than along any other section of the San Andreas Fault system. Typically, some part of Imperial County is affected by a minor earthquake (less than magnitude 3.5) every few months. Every five years, the County might experience a moderately damaging event (magnitude of 5.5 or greater). At least once every 50 years, there is likely to be a major earthquake (magnitude of 6.8 or greater). Microseismicity (magnitude of less than 2.0) occurs almost continuously in the County, often with dozens and sometimes hundreds of events per day (County of Imperial 2006)

⁸ [CH04-Region-Description-and-Baseline-Conditions 20121012 Proof-21.pdf \(imperialirwmp.org\)](#)

West Mesa⁹

West Mesa is a somewhat loosely defined region of gently sloping desert land that lies south of the Salton Sea, west of the Westside Main Canal, and east of the Coyote and Jacumba Mountains. The area includes portions of several small groundwater subbasins for which little information is known.

The exception being the Ocotillo/Coyote Wells Subbasin, for which a study by USGS for IC/USGS and two groundwater studies by Bookman Edmonston (Bookman-Edmonston 1996; Bookman-Edmonston 2004) for US Gypsum provide information on both the quality and quantity of available groundwater that exists and which was designated a sole source aquifer by USEPA in 1996. ¹⁰ Underlying geology is a critical issue for both water levels and water quality in the Ocotillo-Coyote Wells basin, with some domestic wells having non-potable water. This area of West Mesa also includes the area around the town of Plaster City where the U.S. Gypsum plant operates. The groundwater aquifer in the Ocotillo/Coyote Wells Subbasin is unconfined, with a saturated thickness of approximately 400 feet and an average depth-to-groundwater of approximately 100 feet. The aquifer is generally homogenous and more coarse-grained than the Imperial Valley. The data do not indicate separate water-bearing zones or intervening aquitards of any regional significance. Groundwater and surface water flows east toward discharge areas in the Imperial Valley and Salton Sea.

Figure 7: Project Location in Relation to the Ocotillo Clark Valley Groundwater Basin



Ocotillo-Clark Valley Groundwater Basin¹⁰

⁹ [CH04-Region-Description-and-Baseline-Conditions_20121012_Proof-21.pdf \(imperialirwmp.org\)](#)

¹⁰ [Ocotillo-Clark Valley Groundwater Basin \(ca.gov\)](#)

The Ocotillo-Clark Valley Groundwater Basin is categorized as groundwater basin number 7-25, its surface area covers approximately 223,000 acres and is located within Imperial and San Diego County.

This basin underlies Clark and Ocotillo Valleys in eastern Imperial and western San Diego Counties. The basin is bounded by the Santa Rosa Mountains on the north and northeast, the Coyote Creek and Superstition Mountain faults on the west and south, and the Salton Sea and surface drainage divides on the east. Clark Valley drains internally toward Clark (dry) Lake and the remainder of the valley drains to the Salton Sea (Strand 1962; Rogers 1965; Jennings 1967). Average annual precipitation is about 5 inches. In Bulletin 118-75, groundwater beneath Clark Valley and Ocotillo Valley were treated as belonging to separate groundwater basins. This bulletin combines the Clark Valley Groundwater Basin (7-23) with a large portion of Ocotillo Valley Groundwater Basin (7-25) to form the Ocotillo-Clark Valley Groundwater Basin. Instead of using surface water divides, this report mostly uses groundwater divides and barriers (Moyle 1974; 1982) to define the boundaries of this basin.

Hydrogeologic Information

Water Bearing Formation

The groundwater basin is an alluvium-filled valley and is underlain by nonwater-bearing crystalline bedrock. The valley fill in Clark Valley and upper Ocotillo Valley is likely similar to that of Borrego Valley, which is more thoroughly studied. The water-bearing sediments are likely Pliocene to Holocene stream, alluvial fan, lake and eolian deposits. In the adjacent Borrego Valley Groundwater Basin, these deposits form three aquifers that can reach more than 1,800 feet thick, with specific yield ranging to 25 percent (DWR 1984).

Restrictive Structures & Recharge Areas

The northwest-trending Coyote Creek and Superstition Mountain faults bound the basin on the south. Water level differences of 100 feet on opposite sides of the Coyote Creek fault indicate the fault is a barrier to groundwater flow (Moyle 1974; 1982). The San Jacinto and San Felipe Hills faults also displace rocks in the basin; however, it is not known whether or not these faults are barriers to groundwater movement. Groundwater recharge to the basin is likely by percolation of runoff from mountains north and east of the valley.

Groundwater Level Trends, Storage and Groundwater Budget (Type C)

Groundwater levels near Clark Lake did not change appreciably from 1952 through 1980; however, water levels south of Coyote Mountain declined about 30 feet during the same period (Moyle 1982). Groundwater generally flows southeastward through the basin (Moyle 1974); however, water levels suggest that some groundwater may flow southwestward out of Clark Valley and spill over the Coyote Creek fault into the Borrego Valley Groundwater Basin (Moyle 1982). The storage capacity estimated for Clark Valley is about 450,000 af and the capacity estimated for Ocotillo Valley is about 5,800,000 af (DWR 1975). These estimates add to about 6,250,000 af. However the exact amount of groundwater storage is unknown. Annual recharge to the basin is estimated to be about 1,200 af/yr for the Clark Valley portion of the basin and about 1,100 af/yr for the Ocotillo Valley portion (DWR 1975).

Groundwater Quality

In the groundwater near Clark Lake, in the northern part of the basin, the dominant cation is sodium or calcium and the dominant anions are sulfate and chloride. TDS content ranges from 560 to 1,983 mg/L and averages about 950

mg/L. Groundwater in the southern part of the basin has sodium chloride-sulfate or sodium chloride character. Measured TDS content ranges from 955 to 4,656 mg/L and averages about 2,500 mg/L. TDS content often increases though time for wells with multiple measurements and increases from northwest to southeast in the basin. Impairments include, In the groundwater near Clark Lake, in the northern part of the basin, the dominant cation is sodium or calcium and the dominant anions are sulfate and chloride. TDS content ranges from 560 to 1,983 mg/L and averages about 950 mg/L. Groundwater in the southern part of the basin has sodium chloride-sulfate or sodium chloride character. Measured TDS content ranges from 955 to 4,656 mg/L and averages about 2,500 mg/L. TDS content often increases though time for wells with multiple measurements and increases from northwest to southeast in the basin.

Currently there are a total of 3 active monitoring data wells, US Geological Survey (USGS) actively measures groundwater levels with one well in operation. The Department of Health Services and cooperators monitor water quality (Title 22) with 2 wells in operation, see Figure 8. Figure 9 & 10 depict the most current monitoring data.

Figure 8: Testing Well Locations Near Project Site

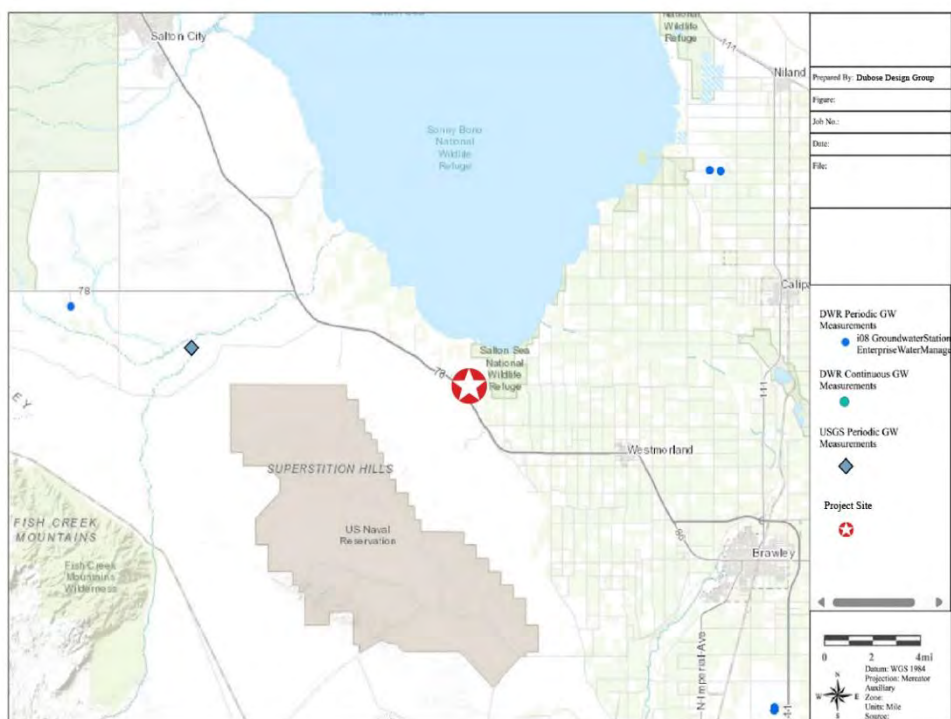
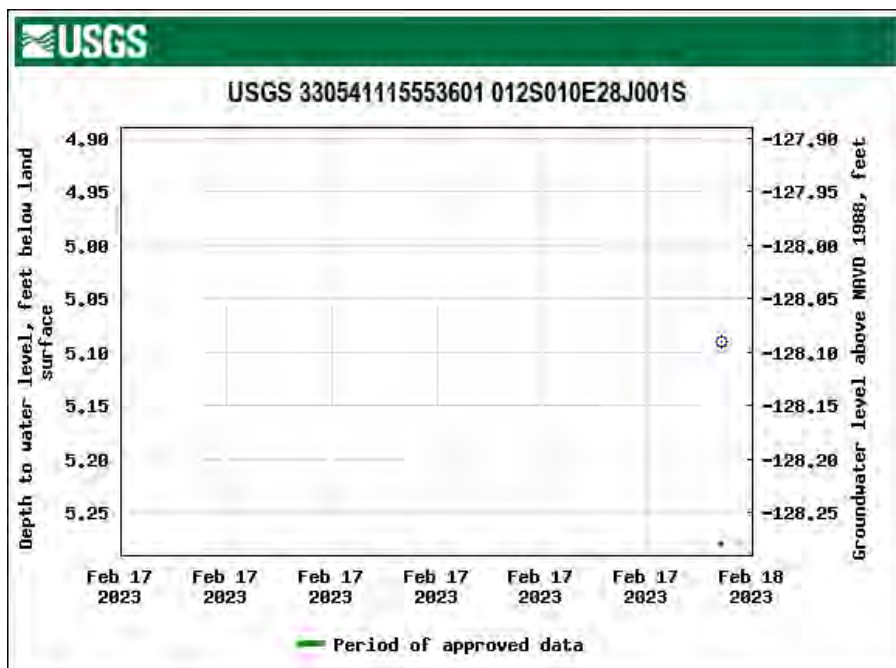
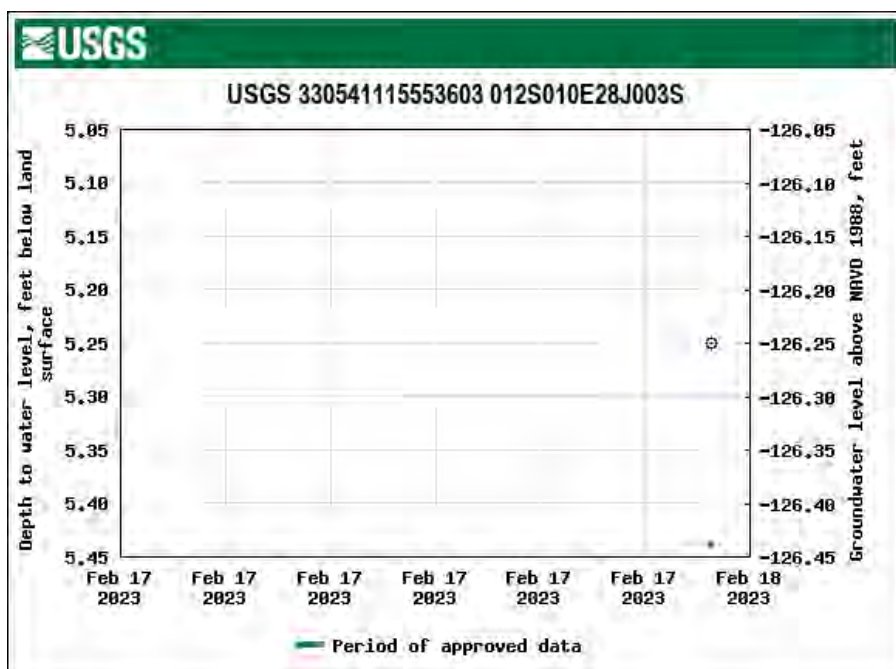


Figure 9: Monitoring Well Date From USGS.330541115553601



Date retrieved 12.5.2023

Figure 10: Monitoring Well Date From USGS.330541115553603



Date retrieved 12.5.2023

Local, Regional, State and Federal Regulations – Groundwater Wells

Local Groundwater Regulations

TITLE 9, DIVISION 21, WATER WELL REGULATION [DIVISION 21 ADOPTED NOVEMBER 24, 1998 (AMENDED OCTOBER 31, 2006)]¹¹

TITLE 9, DIVISION 21, WATER WELL REGULATION, DIVISION 21, § 92102.00 PERMIT(S) REQUIRED Imperial County Ordinance states, in relevant part, that “No person shall (1) drill a new well, (2) activate a previously drilled but unused well, (unused shall mean a well or wells that have not been used for a 12 month) period by installing pumps, motors, pressure tanks, piping, or other equipment necessary or intended to make the well operational, (3) increase the pumping capacity of a well, or (4) change the use of a well, without first obtaining a Conditional Use Permit (CUP) through the County Planning & Development Services Department. The pumping capacity shall mean the “permitted amount” or in the absence of a permit the annual acreage, over 3-year period.” Therefore, the Applicant would need to obtain a Conditional Use Permit from the County for the onsite well. Additionally, Imperial County Ordinance states that: “(B) Well Construction Permit. No person shall dig, bore, drill, deepen, enlarge, refurbish, or destroy a water well, cathodic protection well, observation well, monitoring wells or any other excavation that intersects ground water without first obtaining a well construction permit through the Planning & Development Services Department...” The Applicant would also have to obtain a Well Construction Permit from the County.

6.3.1 TITLE 9, DIVISION 21, WATER WELL REGULATION, DIVISION 21, § 92102.05 SUSPENSION AND REVOCATION A. Circumstances for such action: Enforcement agency may suspend or revoke any permit issued pursuant to this Ordinance, whenever it finds that the permittee has violated any of the provisions of this Ordinance, or has misrepresented any material fact in his/her application or any supporting documents for such a permit. Prior to ordering any such suspension or revocation, the enforcement agency shall give permittee an opportunity for a hearing thereon, after reasonable notice. The hearing shall be before the enforcement agency, the director, or his designated representative. B. Consequences: No person whose permit has been suspended or revoked shall continue to perform the work for which the permit was granted until, in case of suspension, such permit has been reinstated by the enforcement agency. C. Additional Work: Upon suspending or revoking any permit, the enforcement agency may order permittee to perform any work reasonably necessary to protect the ground water from pollution or contamination, if any work already done by permittee has left a well in such a condition as to constitute a hazard to the quality of the ground water. No permittee or person who has obtained a permit issued pursuant to this Ordinance shall fail to comply with such order

In the event the applicant be denied the Conditional Use Permit for the groundwater well, the applicant will need to find another legal water source per California Water Code. The applicant will then need to submit a revised Water Supply Assessment to the Lead Agency. This project is outside the IID's service area, and therefore the IID cannot service the project with water. 6.3.2 TITLE 9, DIVISION 21, WATER WELL REGULATION, DIVISION 21, § 92103.01 REPORTS Completion Reports: The driller shall provide the enforcement agency a completion report within 30 days of the completion of any well construction, reconstruction, or destruction job. A. Submittal of State "Report of Completion": A copy of the "Report of Completion" (Driller's well log) required by California Water Code, Section

¹¹ [title-9-div-21-2015.pdf \(icpds.com\)](http://title-9-div-21-2015.pdf(icpds.com))

13751, shall be submitted by the well driller to the enforcement agency within 30 days of construction or destruction of any well (except driven wells). This report shall document that the work was completed in accordance with all applicable standards and additional permit conditions. This section shall not be deemed to release any person from the requirement to file said report with the State Department of Water Resources. B. Confidentiality of Report: With the exception of the well driller's name, the date the well was drilled and the well yield, all information contained in this report shall remain "Confidential". C. Other Agency's Requirements: Nothing in this Ordinance shall be deemed to excuse any person from compliance with the provisions of California Water Code, Section 13752, relating to notices and reports of completion or any other federal, state, or local reporting regulations. 6.3.3 TITLE 9, DIVISION 21, WATER WELL REGULATION, DIVISION 21, § 92103.00 REGISTRATION OF WELL Any person who uses a new or existing well shall first register said well with the Imperial County Planning & Development Services Department. If a well is under an active conditional use permit, the well shall be deemed to be registered. Any well that is not under an Imperial County CUP shall be registered with the Planning & Development Services Department and the State pursuant to California Water Code, Section 13750. An application to register any well shall be filed with the Planning & Development Services Department and said application shall contain all information required upon said form.

6.3.4 TITLE 9, DIVISION 21, WATER WELL REGULATION, DIVISION 21, § 92103.02 WELL STANDARDS Except as otherwise specified, the standards for the construction, repair, reconstruction, alteration, reactivation, operation, or abandonment of wells shall be as set forth in: A. The California Department of Water Resources Bulletin 74-81 entitled, "Water Well Standards, State of California", except as modified by subsequent supplements or revisions issued by the Department of Water Resources. Division 21 Adopted November 24, 1998 (Amended October 31, 2006) B. The California Department of Water Resources Bulletin 74-90 and any subsequent supplements or revisions issued by the Department of Water Resources. C. The following factors, to the extent necessary to avoid conditions of overdraft, subsidence, well interference, water quality degradation, or other environmental degradation: 1. The type of use or uses served. 2. The number of users served. 3. Wasteful or inefficient use. 4. Water conservation activities. 5. Reasonable need of the extractor and other affected water users. 6. The quality of groundwater. 7. The affected groundwater basin or sub-basins. 8. Environmental impact as determined through the CEQA review. 9. Any other factors that the Planning & Development Services Department reasonably believes it should consider in order to reach an equitable result within the entire County in accordance with the provisions of this Ordinance, and of California Law.

Regional & State Groundwater Regulations

. COLORADO RIVER BASIN REGION OF CALIFORNIA (BASIN PLAN) (2023)¹²

For water quality planning and protection purposes, the Project is within the Colorado River Basin Region of the California Regional Water Quality Control Board. The Water Quality Control Plan for the Colorado River Basin (Basin Plan) is the Board's master plan for water quality protection. The Basin Plan identifies the waters in the Region, thereof beneficial uses, and water quality objectives to protect those uses. The Basin Plan fulfills state and federal statutory requirements for water quality planning, thereby preserving and protecting ground and surface waters of the Colorado River Basin Region. The proposed Project is in the Imperial Valley Hydrologic Unit.

In accordance with state and federal laws, the Regional Water Board is obligated to keep the Region's Basin Plan current and accurate via periodic review and to update it as appropriate. States are required to review their water

¹² [Water Quality Control Plan for the Colorado River Basin Region \(ca.gov\)](https://www.cdwr.org/Portals/0/ColoradoRiverBasinRegion/ColoradoRiverBasinRegionPlan2023.pdf)

quality standards at least once every three years – a process known as “triennial review” [33 U.S. Code Section 1313(c)]¹³

Federal Groundwater Regulations

Porter-Cologne Water Quality Control Act¹⁴

Division 7 of the Water Code (also known as the Porter-Cologne Water Quality Control Act) requires the Regional Water Board to consider past as well as present and probable future beneficial uses when establishing water quality objectives. Section 13050, subdivision (f), of division 7 describes "beneficial uses" as follows: "Beneficial uses of the waters of the State that may be protected against quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves." Beneficial water uses are of two types - consumptive and nonconsumptive. Consumptive uses are those normally associated with people's activities, primarily municipal, industrial and irrigation uses that consume water and cause corresponding reduction and/or depletion of water supply. Nonconsumptive uses include swimming, boating, waterskiing, fishing, hydropower generation, and other uses that do not significantly deplete water supplies. Maintenance of fish and wildlife may be either a consumptive or a nonconsumptive use. Because each use may be best served by a specific set of water quality conditions, beneficial uses are a controlling factor in establishing water quality objectives for a particular body of water. Section 13263 of the Water Code requires that Waste Discharge Requirements be prescribed for any discharge or proposed discharge that could affect the quality of the waters of the state, other than into a community sewer system. All industrial discharges that meet this definition are regulated with Waste Discharge Requirements.

According to the State of California, in water rights, “beneficial use” refers to the useful purpose to which water is applied. Common beneficial uses include domestic, irrigation, power generation, municipal, and industrial uses. Beneficial uses can also include uses that occur in a stream or reservoir, such as fish and wildlife enhancement, or recreation. Linking water right permits and licenses to beneficial use of the water helps to define the quantity of water that will be consumptively used and avoid wasteful application of this important resource. Groundwater recharge is the augmentation of groundwater, by natural or artificial means, with surface water or recycled water. Groundwater recharge is not a beneficial use of water on its own, but rather is one method of diverting and storing water that takes advantage of the natural storage capacity of groundwater aquifers. To obtain a water right to divert water to underground storage, you must identify the eventual beneficial use of the water just as with above-ground surface water storage projects

The beneficial uses for ground water which are contained in Table below are for each hydrologic unit as an entirety, unless otherwise specified. Some hydrologic units contain multiple aquifers which may each support different beneficial uses.

¹³ [2023 Triennial Review Lsr Prioritization Ranking \(ca.gov\)](#)

¹⁴ [Water Quality Control Plan for the Colorado River Basin Region \(ca.gov\)](#),
https://www.waterboards.ca.gov/coloradoriver/water_issues/programs/basin_planning/docs/2020/rb7bp_e2019.pdf

Beneficial Use Summary Table¹⁵	
Groundwater recharge:	Water can be used to recharge groundwater naturally or artificially for future extraction, to maintain water quality, or to stop saltwater from entering freshwater aquifers.
Municipal and domestic supply:	Groundwater can be used for municipal and domestic water supplies. The State Water Board considers all groundwater to be suitable for this purpose unless otherwise designated.
Industrial water supply:	Groundwater can be used for industrial water supplies.
Agricultural supply:	Groundwater can be used for farming, horticulture, or ranching.
Marine habitats:	Groundwater can be used to support marine ecosystems, such as preserving or enhancing marine habitats, vegetation, fish, shellfish, or wildlife.
Wildlife habitats:	Groundwater can replenish and moderate the temperatures of streams, rivers, and wetlands that support wildlife.
Tribal uses:	Groundwater can be used for cultural, spiritual, ceremonial, or traditional rights or lifeways of California Native American Tribes.

HISTORIC USE IN THE BASIN- RECORDS

The closest historical records of related to groundwater pumping on record belongs to the USG Plaster City (ORDER NO. 78-13)¹⁶ & Seville Solar Farms. The Water Quality Control Plan for the Colorado River Basin Region of California (Basin Plan), which was adopted on November 17, 1993, and amended on November 16, 2012, designates the beneficial uses of ground and surface waters in this Region. According to the IRWMP there is proof that farmers did use groundwater wells at one point to water crops, however there are no records on file at the County of Imperial of such permits. The majority of farmers rely on the Imperial Irrigation Districts water conveyance system for water deliveries. The proposed well would be new and therefore has no other historical use. All water being pumped will from this proposed ground water well will be a net increase.

Seville Solar Project ^{17 18}

Current groundwater uses in the basin include limited agriculture, domestic, and industrial (solar). Groundwater pumping has changed in recent years, as the Allegretti farm, located less than four miles northwest of San

¹⁵https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/docs/purposes_of_use_fact_sheet_final.pdf

¹⁶[78_13.pdf \(ca.gov\)](#)

¹⁷ [USG PLASTER CITY QUARRY EXPANSION AND WELL NO. 3 PROJECT SUBSEQUENT DRAFT EIR VOLUME I \(icpds.com\)](#)

¹⁸ <https://www.icpds.com/assets/planning/final-environmental-impact-reports/seville-solar-farm-complex/20hydrology-water-quality-part2.pdf>

Sebastian Marsh, has since been developed as the Seville Solar Farm (EGI 2014). According to the Draft EIR and associated Water Supply Assessment for the solar project, the historical agricultural use of the area was about 2,800 AFY between 1996 and 2009. The current operation use of the Solar farm is estimated to use 215 AFY of water (EGI 2014). This change is noteworthy, because historical agricultural pumping from deep aquifers may have resulted in irrigation return flows. These return flows, that could represent recharge.

USG – Plaster City

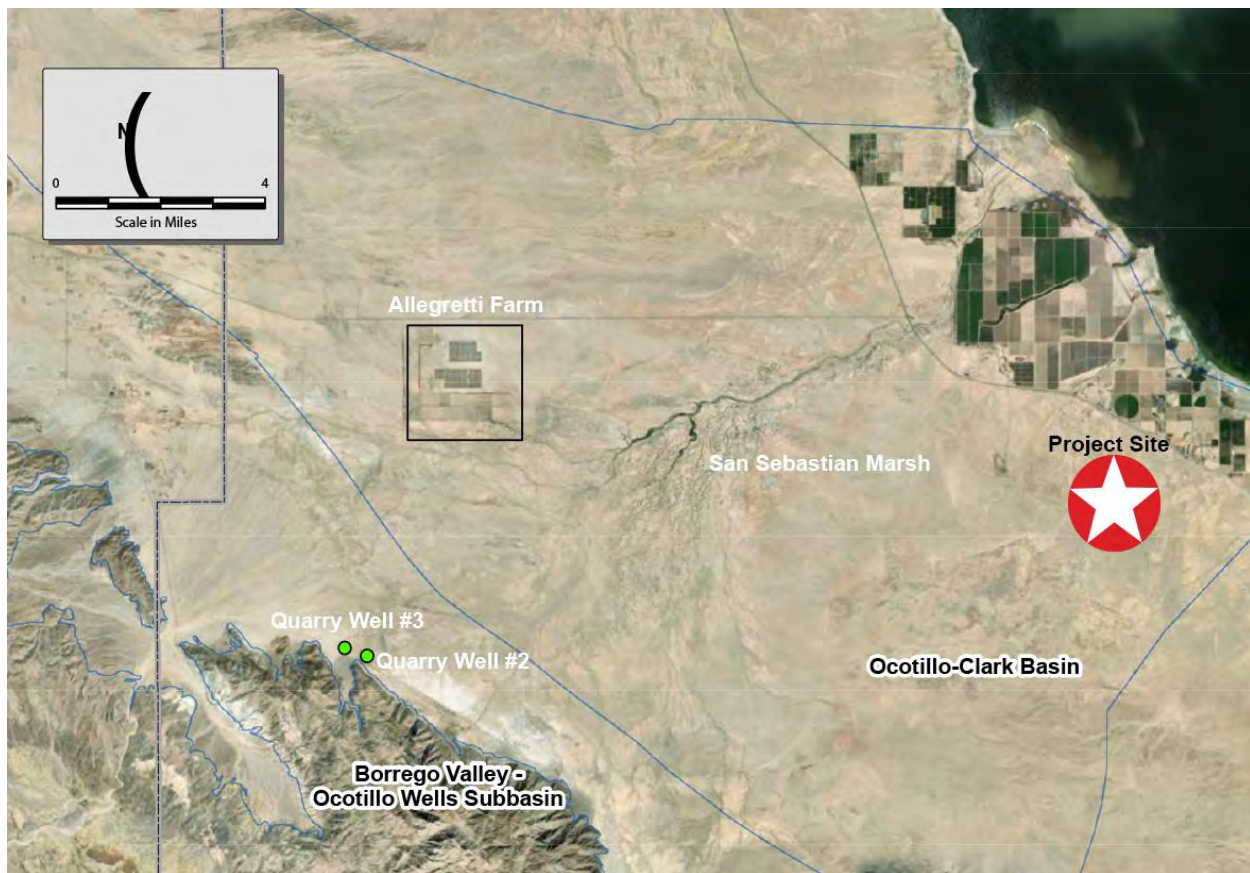
A water well for Quarry operations was permitted in 1983 under CUP No. 635-83 for a maximum withdrawal of 7,000 gallons per day (Quarry Well No. 1). The well was drilled in basin fill on the eastern side of the wash. The water was non-potable (due to high dissolved solids) and was used exclusively for dust suppression. Consequently, the Quarry has historically received potable water for drinking and sanitary uses via a narrowgauge railroad tank car from the Plant. Production from Quarry Well No. 1 declined due to incrustation and became unusable. Therefore, a second well (Quarry Well No. 2) was drilled in 1993 to replace the original well pursuant to CUP No. 635-83, which was re-issued for a new well. However, water production from Quarry Well No. 2 declined steadily over time. Currently, Quarry Well No. 2 produces approximately 4,800 to 5,000 gallons per day (gpd), which is insufficient to meet USG's current need for approximately 15,000 gpd for dust control for Quarry operations. Therefore, USG proposes to replace existing Quarry Well No. 2 with planned Well No. 3 on USG-owned land located approximately 3 miles northeast of the Quarry. Quarry Well No. 3 would also replace an existing test well that was installed in 2001 at the proposed location of Quarry Well No. 3. As described in Chapter 1, "Introduction," proposed Quarry Well No. 3 is part of a larger project involving the expansion and modernization of USG's Plant and Quarry (Quarry Expansion), that was evaluated in the 2008 EIR/EIS, which was certified by the Imperial County Board of Supervisors (Board) on March 18, 2008.

USG Plaster City Quarry submitted a CUP application in 2016, CUP 20-0016 for Well No. 3.¹⁹

Additional Historic Wells

2 Abandoned Wells – Department of Oil and Gas, State of California near the project site.

¹⁹ [USG PLASTER CITY QUARRY EXPANSION AND WELL NO. 3 PROJECT SUBSEQUENT DRAFT EIR VOLUME I \(icpds.com\)](https://www.icpds.com)



WEST MESA GROUNDWATER BASIN

West Mesa. The West Mesa is a somewhat loosely defined region of gently sloping desert land that lies south of the Salton Sea, west of the western shoreline of Lake Cahuilla, and east of the Coyote and Jacumba Mountains. The area includes portions of several relatively small groundwater subbasins for which little direct information is known. The exception to that is the Ocotillo-Coyote Wells Groundwater Basin, for which studies on both the quality and quantity of available groundwater exist (Bookman-Edmonston, 1996; Bookman-Edmonston, 2004). This area of West Mesa includes the area round the towns of Ocotillo and Plaster City where the U.S. Gypsum plant operates. The groundwater aquifer in the Ocotillo-Coyote Wells Groundwater Basin is characterized as unconfined, with a saturated thickness of about 400 feet and an average depth to groundwater of approximately 100 feet. The aquifer is generally homogenous and of a more coarse-grained nature than the central valley area. Thus, the data does not indicate separate water-bearing zones or intervening aquitards of any regional significance. Groundwater and surface water flow mimic the topography, flowing generally east, toward discharge areas in the Imperial Valley and Salton Sea. Faults play a key role in the occurrence and movement of groundwater in all areas of Imperial IRWMP area. Figure B-4, shows the locations of the faults. In the West Mesa area, the Elsinore Fault and its southerly extension the Laguna Salada Fault, transect the Ocotillo-Coyote Wells Groundwater Basin act as partial barriers to the flow of groundwater out of this area toward the Imperial Valley.

AQUIFER RECHARGE AND DISCHARGE & WATER QUALITY

In the Imperial Valley, recharge to the groundwater reservoir by subsurface inflow from tributary areas is small compared with recharge from the imported Colorado River water. Total recharge to the groundwater system from precipitation within the valley was estimated to be somewhat less than 10,000 acre-feet per year (Loeltz et al., 1975). However, Montgomery Watson (1995) cites a more likely recharge rate of 0.02 inch per year for the Ocotillo area, which equates to approximately 800 acre-feet of recharge per year, over the 500,000 acres of un-irrigated land in the West Mesa. Major sources of groundwater discharge from Imperial Valley aquifers include groundwater discharging directly into the New and Alamo Rivers, pumping in Mexicali Valley to the south, intercepted shallow groundwater from the agricultural fields by drains and the extensive tile drain network, and subsurface discharge into the Salton Sea. Phreatophytes also remove groundwater by evapotranspiration in areas where the groundwater table is shallow, especially in the rivers and drains and by wetlands (Tetra Tech, 1999). Artesian groundwater conditions exist in the Imperial Valley, primarily east of the Alamo River in a band extending roughly from Holtville in the south to Calipatria in the north. In the West Mesa area, recharge to the aquifer is from two sources: precipitation falling directly on the area and percolation of stream runoff from the Coyote and Jacumba Mountains to the west. Sources of discharge in the West Mesa include pumpage by U.S. Gypsum, limited urban water use into the town of Ocotillo, and subsurface outflow across the Elsinore/Laguna Salada faults and toward Mexico (Bookman-Edmonston, 1996)

PROJECT WATER DEMAND

Water demand varies depending on the Project phase. During construction, water will be needed for dust control and soil conditioning during installation of the photovoltaic panels, battery storage units, and related infrastructure. During the operational phase of the project, water will be needed for routine maintenance activities, which primarily consists of washing the photovoltaic panels to maintain generation efficiency.

Project Water Use Table

Water Use	Expected Years	Total AF
Construction Water Usage		
Construction	1 Year	680 AF
Operational Water Use		
Processing, Daily Plant Operations & Mitigation ²⁰	1 Year	15.6 AFY
Total Water Usage for Processing Daily Plant Operations & Mitigation (Dust Suppression ²¹ & Fire Mitigation)	29 Years	452.4 AF

²⁰ Applicant must adhere to Imperial County Fire Department's requirements for Fire suppression and mitigation.

²¹ Applicant must adhere to Imperial County Air Pollution Control District's requirements for Fire suppression and mitigation.

Approximately 1,328.28 acres of the 1,943.90-acre project site would be graded during construction. The project would apply a soil stabilizer to the entire 2.2-mile access road during construction, so the access road will not need any watering during construction. The project would construct approximately 571,900 photovoltaic solar panels that would need to be washed during operation.

The estimated storage capacity for Clark Valley is approximately 450,000 af and the estimated storage capacity for Ocotillo Valley is approximately 5,800,000 af (DWR 1975). These estimates add to approximately 6,250,000 af of groundwater storage capacity. However, the exact amount of groundwater storage is unknown. Annual recharge to the basin is estimated to be approximately 1,200 af/yr for the Clark Valley portion of the basin and approximately 1,100 af/yr for the Ocotillo Valley portion of the basin (DWR 1975). Present day groundwater extractions include those made by USG – Plaster City and the Seville Solar Facility. There should be enough groundwater to facilitate the project water demands based on all available data. It will be up to the developer at the time of applying for a groundwater well permit through the County of Imperial to submit documentation and meet all Local, State and Federal Regulations.

SUMMARY AND CONCLUSIONS

- The proposed Project has an estimated total water demand of 680 AF construction water needs, 15.6 AFY water needs to satisfy annual operational water needs.
- Water demand numbers were based on previous solar development numbers on a similar scale.
- Based on the approximately 6,250,000 af of estimated groundwater storage capacity within the basin, and the recharge rate of 1,200 acre-feet/year & 1,100 acre-feet, projected groundwater supply would be able to meet the projected groundwater demand of the project. Based on ground water stored within the Ocotillo Clark Basin, based on best available information.
- Permitting: The applicant is subject to all Local, State and Federal Laws during construction and operations for the Virgo Solar Development Project.
- Approval of Conditional Use Permit – Groundwater Well. Pursuant to Title 9 Division 21: Water Well Regulations, §92102.00, the Applicant will be required to obtain a Conditional Use Permit for the proposed on-site groundwater well. As required by §92102.00, no person shall (1) drill a new well, (2) activate a previously drilled but unused well, (unused shall mean a well or wells that have not been used for a 12 month) period by installing pumps, motors, pressure tanks, piping, or other equipment necessary or intended to make the well operational, (3) increase the pumping capacity of a well, or (4) change the use of a well, without first obtaining a Conditional Use Permit (CUP) through the County Planning & Development Services Department.
- It is suggested that the applicant run water quality analysis for precautionary purposes as well as all appropriate testing.

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¹ From 1/1/1990-3/23/2004, 3 CIMIS stations: Seeley, Calipatria/Mulberry, Meloland; 3/24/2004-7/5/2009, 4 CIMIS stations (added Westmorland N.); 7/6/2009-12/1/2009, 3 CIMIS stations: Westmorland N. offline; 12/2/2009-2/31/2009, 4 CIMIS stations, Westmorland N. back online; 1/1/2010-9/20/2010. Retrieved November 20, 2023

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