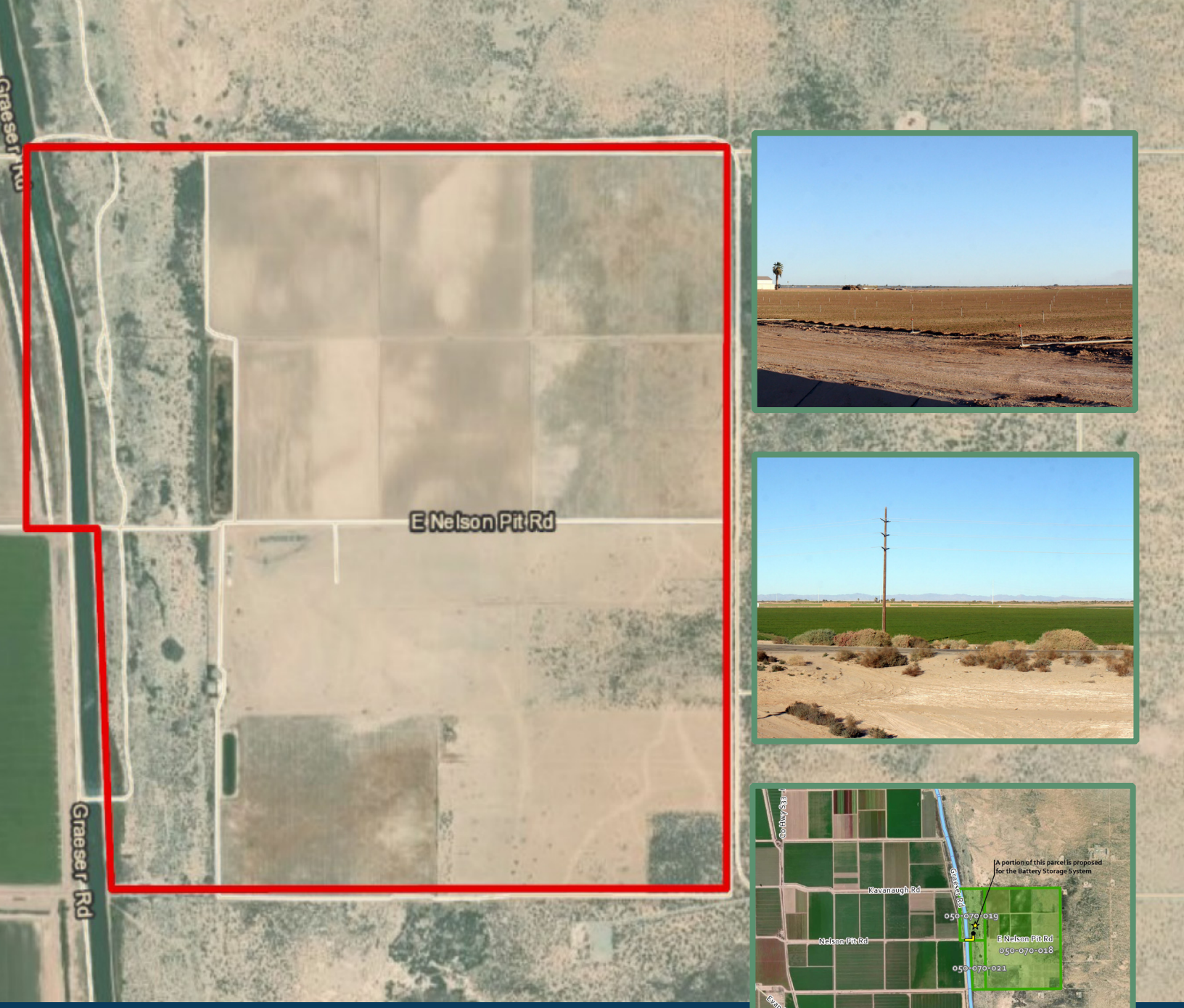

DRAFT
ENVIRONMENTAL IMPACT REPORT
FOR THE
VIKINGS SOLAR ENERGY GENERATION & STORAGE PROJECT
VOLUME II: TECHNICAL APPENDICES

McINTYRE ENVIRONMENTAL

Prepared by:
McIntyre Environmental, LLC
1900 West Desert Highlands Dr
Oro Valley, AZ 85737

SCH #2021050036 | CUP #20-0025
February 2022

Prepared for:
Imperial County
Planning & Development Services
801 Main Street
El Centro, CA 92243

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DRAFT

ENVIRONMENTAL IMPACT REPORT

VOL. 2: TECHNICAL APPENDICES

VIKINGS SOLAR ENERGY GENERATION AND STORAGE PROJECT

SCH No. 2021050036

CUP #20-0025

Prepared for:

IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES
801 MAIN STREET
EL CENTRO, CALIFORNIA 92243

Prepared by
McIntyre Environmental, LLC
1900 West Desert Highlands Dr.
Oro Valley, AZ 85737
Telephone: (520) 775-1490

FEBRUARY 2022

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VOLUME 2: APPENDICES TO THE ENVIRONMENTAL IMPACT REPORT

Appendix A **Notice of Preparation / Initial Study**

A-1 Notice of Preparation / Public Comments Received

A-2 Environmental Initial Study
Prepared by County of Imperial, April 2021

Appendix B **Public Scoping Meeting Materials/Comments**

Appendix C **Conditional Use Permit Amendment Request**
Prepared by Vikings Energy Farm, LLC., December 7, 2020

Appendix D **Visual Resource Assessment**
Prepared by SWCA Environmental Consultants, January 2022

Appendix E **Land Evaluation and Site Assessment**
Prepared by SWCA Environmental Consultants, January 2022

Appendix F **Air Quality & Greenhouse Gas Technical Report**
Prepared by SWCA Environmental Consultants, January 2022

Appendix G **Biological Resource Reports**

G-1 Biological Resources Assessment
Prepared by SWCA Environmental Consultants, January 2022

G-2 Aquatic Resources Delineation Survey
Prepared by SWCA Environmental Consultants, January 2022

Appendix H **Cultural Resources**

H-1 Cultural Resources Technical Report
Prepared by SWCA Environmental Consultants, January 2022

H-2 AB-52 Consultation Letters and Responses

Appendix I **Geotechnical Report**
Prepared by LandMark Consultants, January 2021

Appendix J **Phase I Environmental Site Assessment**
Prepared by GS Lyon Consultants, January 2021 (revised August 2021)

Appendix K **Water Supply Assessment**
Prepared by Dubose Design Group, January 2022

Appendix L **Paleontological Resources Assessment**
Prepared by SWCA Environmental Consultants, January 2022

Appendix M **Transportation Study**
Prepared by Kittelson & Associates, January 12, 2022

Appendix N **Preliminary Drainage Report**
Prepared by RFE Engineering, Inc., October 27, 2021

Appendix O **Noise Technical Report**
Prepared by SWCA Environmental Consultants, January 2022

A Notice of Preparation / Initial Study

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A-1 Notice of Preparation

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Imperial County
Planning & Development Services Department
NOTICE OF PREPARATION OF DRAFT EIR FOR THE
VIKINGS SOLAR ENERGY GENERATION & STORAGE PROJECT
NOTICE OF PUBLIC SCOPING MEETING

The Imperial County Planning & Development Services Department intends to prepare an Environmental Impact Report (EIR) for the proposed Vikings Solar Energy Generation & Storage (Project), as described below. A public scoping meeting for the proposed EIR will be held by the Imperial County Planning & Development Services Department at 6:00 PM on May 12th, 2021. The scoping meeting will be held at the Board of Supervisors Chambers, 2nd Floor, County Administration Center located at 940 Main Street, El Centro, CA 92243. Comments regarding the scope of the EIR will be accepted at this meeting. Additionally, comments may be sent to the Planning & Development Services Department, 801 Main Street, El Centro, California 92243, attention Jim Minnick, Director.

SUBJECT: Vikings Solar Energy Generation & Storage Project

BOARD OF SUPERVISORS CONSIDERATION: Spring 2022.

PROJECT LOCATION: The proposed project would be located on approximately 604 acres of private and Imperial County-owned land located at the intersection of Nelson Pit Road and Graeser Road in the western part of unincorporated Imperial County. It is approximately 5.5 miles east of the City of Holtville in Section 36 within Township 15 S, and Range 16 E of the San Bernardino Base and Meridian (SBB&M) of the "Holtville East" topographic quadrangles 7.5-minute (Assessor's Parcel Numbers [APNs]) 050-070-018, 050-070-019 and 050-070-021.

PROJECT DESCRIPTION: The Project proposes to develop a 150-megawatt (MW) solar photovoltaic (PV) energy generation project with an integrated, not to exceed 300MW battery storage component. The electrical energy produced would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District's (IID) 230 kV KN/KS transmission line via a gen-tie line. The solar energy generation facility, battery storage system, substation switching station and gen-tie are collectively referred to as the "Proposed Project" or "Project."

The Project proposes to utilize either thin film or crystalline PV technology modules mounted either on fixed frames or horizontal single-axis tracker (HSAT) systems. The Project also includes a battery storage system that would consist of either lithium ion (Li-ion) or flow batteries. Depending on the selection of the battery technology, the batteries would either be housed in storage containers or storage buildings. The electrical energy produced by the project would be conducted through a new project substation which would take the delivery of the 34.5 kV power and increase the voltage to 230 kV, where it would feed into the interconnection switching station for metering and delivery to the IID.

DESIGNATED AREA PLAN: Two of the Project parcels are designated as "Agriculture" in the Imperial County General Plan and are zoned A-2-RE (General Agriculture with a Renewable Energy Overlay). The third Project area parcel is designated as "Recreation/Open Space " and is zoned GS-RE (Government/Special Public Zone).

BOARD OF SUPERVISORS DISTRICT: District 5, Supervisor, Raymond Castillo.

ANTICIPATED SIGNIFICANT EFFECTS: The EIR will analyze potential impacts associated with the following: Aesthetics, Agriculture, Air Quality, Biological Resources, Cultural / Tribal Resources, Energy, Geology/Soils, Greenhouse Gas Emissions, Hazards/Hazardous Materials, Hydrology/Water Quality, Public Services, Transportation/Traffic, and Utilities and Service Systems.

COMMENTS REQUESTED: The Imperial County Planning & Development Services Department would like to know your ideas about the effects this project might have on the environment and your suggestions as to alternatives, mitigation or ways the project may be revised to reduce or avoid any significant environmental impacts. Your comments will guide the scope and content of environmental issues to be examined in the EIR. Your comments may be submitted in writing to: Jim Minnick, Director, Imperial County Planning & Development Services Department, 801 Main Street, El Centro, CA 92243. Available project information may be reviewed at ICPDS.com. Due to the limits mandated by State law, your response must be sent at the earliest possible date but no later than 35 days after receipt of this notice.

NOTICE OF PREPARATION REVIEW PERIOD: May 6, 2021 through June 9, 2021.

Imperial County
Planning & Development Services Department
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VIKINGS SOLAR ENERGY GENERATION & STORAGE PROJECT
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BOARD OF SUPERVISORS DISTRICT: District 5, Supervisor, Raymond Castillo.

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NOTICE OF PREPARATION REVIEW PERIOD: May 6, 2021 through June 9, 2021.

PUBLIC NOTICE

Imperial County
Planning & Development Services Department
NOTICE OF PREPARATION OF DRAFT EIR FOR THE VIKINGS SOLAR ENERGY GENERATION & STORAGE PROJECT
NOTICE OF PUBLIC SCOPING MEETING

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BOARD OF SUPERVISORS DISTRICT: District 5, Supervisor, Raymond Castillo.

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NOTICE OF PREPARATION REVIEW PERIOD: May 6, 2021 through June 9, 2021.

Legal 9030 Publish: May 6, 2021

IMPERIAL COUNTY

MEMORANDUM

TO: May 5, 2021

FROM: Memo to File

RE: From: Diana Robinson, Planner III for

SUBJECT: CUP20-0025 VIKINGS; REVISED NOP COMMENTING PERIOD (APN 050-070-018, -019 & -021)

The purpose of this memo is to confirm that the commenting period for the Notice of Preparation of the proposed Conditional Use Permit (CUP) #20-0025 Vikings Solar Energy Generation and Storage Project ("Project") changed to May 6, 2021 through June 9, 2021.

DR\S:\ALLUSERS\APN\050\070\018\CUP20-0025\NOP\MEMO TO FILE 05-05-21.DOCX

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Vikings Solar Energy Generation and Battery Storage Project

Lead Agency: Imperial County Planning & Development Services Department
Contact Person: Diana Robinson
Mailing Address: 801 Main Street
Phone: (442) 265-1736
City: El Centro Zip: 92243
County: Imperial

Project Location: County: Imperial City/Nearest Community: Holtville
Cross Streets: East Nelson Pit Road amd Graeser Road Zip Code: 92250
Longitude/Latitude (degrees, minutes and seconds): 32 ° 48 ' 10 " N / 115 ° 16 ' 31 " W Total Acres: 604
Assessor's Parcel No.: 050-070- 018, -019, -021 Section: 36 Twp.: 15 Range: 16 Base: SBB&M
Within 2 Miles: State Hwy #: 115 Waterways: East Highline Canal
Airports: Holtville Airport Railways: N/A Schools: N/A

Document Type:

CEQA: ☒ NOP ☐ Draft EIR NEPA: ☐ NOI Other: ☐ Joint Document
☐ Early Cons ☐ Supplement/Subsequent EIR ☐ EA ☐ Final Document
☐ Neg Dec (Prior SCH No.) ☐ Draft EIS ☐ Other:
☐ Mit Neg Dec Other: ☐ FONSI

Local Action Type:

☐ General Plan Update ☐ Specific Plan ☐ Rezone ☐ Annexation
☐ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☒ Use Permit ☐ Coastal Permit
☐ Community Plan ☐ Site Plan ☐ Land Division (Subdivision, etc.) ☐ Other:

Development Type:

☐ Residential: Units Acres
☐ Office: Sq.ft. Acres Employees
☐ Commercial: Sq.ft. Acres Employees
☐ Industrial: Sq.ft. Acres Employees
☐ Educational:
☐ Recreational:
☐ Water Facilities: Type MGD

☐ Transportation: Type
☐ Mining: Mineral
☒ Power: Type PV Solar MW 150
☐ Waste Treatment: Type MGD
☐ Hazardous Waste: Type
☒ Other: Battery storage system not to exceed 300MW

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☐ Fiscal ☐ Recreation/Parks ☒ Vegetation
☒ Agricultural Land ☐ Flood Plain/Flooding ☐ Schools/Universities ☒ Water Quality
☒ Air Quality ☒ Forest Land/Fire Hazard ☐ Septic Systems ☒ Water Supply/Groundwater
☒ Archeological/Historical ☒ Geologic/Seismic ☐ Sewer Capacity ☒ Wetland/Riparian
☒ Biological Resources ☒ Minerals ☒ Soil Erosion/Compaction/Grading ☐ Growth Inducement
☐ Coastal Zone ☒ Noise ☒ Solid Waste ☒ Land Use
☐ Drainage/Absorption ☐ Population/Housing Balance ☒ Toxic/Hazardous ☒ Cumulative Effects
☐ Economic/Jobs ☒ Public Services/Facilities ☒ Traffic/Circulation ☒ Other: Non-Wetland Waters of the State

Present Land Use/Zoning/General Plan Designation:

Recreation/Open Space & Agriculture (Imperial County General Plan)/ Zoning A-2-RE General Agriculture with a Renewable Energy Overlay & GS-RE Government/Special Public Zone with a Renewable Energy Overlay)

Project Description: *(please use a separate page if necessary)*

Construction of a 150 MW PV solar energy facility with an integrated, not to exceed 300MW, battery storage system on approximately 604 acres of land located 5.5 miles east of the City of Holtville within the County of Imperial. The Project site is designated and zoned for agricultural and recreation/open space use within the County of Imperial's Renewable Energy Overlay Zone. The Project includes a ground mounted PV solar power generating system, battery storage system, substation, and switching station. The Electrical energy produced would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District's 230 kV "KN & KS" line via a single overhead gen-tie line 120 feet in height. The Project proposes to utilize either thin film or crystalline solar PV technology modules mounted either on fixed frames or horizontal single-axis tracker systems. The proposed battery energy storage system would be constructed on the Project site and consist of either lithium ion or flow batteries. The batteries would either be housed in storage containers or buildings with a maximum height of 10 feet.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

X	Air Resources Board	____	Office of Historic Preservation
____	Boating & Waterways, Department of	____	Office of Public School Construction
____	California Emergency Management Agency	____	Parks & Recreation, Department of
____	California Highway Patrol	____	Pesticide Regulation, Department of
X	Caltrans District # 11	____	Public Utilities Commission
____	Caltrans Division of Aeronautics	X	Regional WQCB # 7
____	Caltrans Planning	____	Resources Agency
____	Central Valley Flood Protection Board	____	Resources Recycling and Recovery, Department of
____	Coachella Valley Mtns. Conservancy	____	S.F. Bay Conservation & Development Comm.
____	Coastal Commission	____	San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
____	Colorado River Board	____	San Joaquin River Conservancy
____	Conservation, Department of	____	Santa Monica Mtns. Conservancy
____	Corrections, Department of	____	State Lands Commission
____	Delta Protection Commission	____	SWRCB: Clean Water Grants
____	Education, Department of	X	SWRCB: Water Quality
____	Energy Commission	____	SWRCB: Water Rights
X	Fish & Game Region # 6	____	Tahoe Regional Planning Agency
____	Food & Agriculture, Department of	____	Toxic Substances Control, Department of
____	Forestry and Fire Protection, Department of	____	Water Resources, Department of
____	General Services, Department of		
____	Health Services, Department of	X	Other: Imperial County PDSD, Imperial County APCD, County DPW
____	Housing & Community Development	X	Other: US Army Corps of Engineers, USFWS and Imperial Irrigation District
X	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date May 6, 2021 Ending Date June 9, 2021

Lead Agency (Complete if applicable):

Consulting Firm: McIntyre Environmental
Address: 1900 W Desert Highlands Drive
City/State/Zip: Tucson/AZ/85737
Contact: David McIntyre
Phone: (520) 775-1490

Applicant: Vikings Energy Farm LLC
Address: 750 W. Main Street
City/State/Zip: El Centro/CA/92243
Phone: (619) 985-9461

Signature of Lead Agency Representative: _____ **Date:** 5-5-21

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Summary Form for Electronic Document Submittal

Form F

Lead agencies may include 15 hardcopies of this document when submitting electronic copies of Environmental Impact Reports, Negative Declarations, Mitigated Negative Declarations, or Notices of Preparation to the State Clearinghouse (SCH). The SCH also accepts other summaries, such as EIR Executive Summaries prepared pursuant to CEQA Guidelines Section 15123. Please include one copy of the Notice of Completion Form (NOC) with your submission and attach the summary to each electronic copy of the document.

SCH #: 2021050036

Project Title: Vikings Solar Energy Generation and Battery Storage Project

Lead Agency: Imperial County Planning & Development Services Department

Contact Name: Diana Robinson

Email: DianaRobinson@co.imperial.ca.us Phone Number: (442) 265-1736

Project Location: Holtville (*City*) Imperial (*County*)

Project Description (Proposed actions, location, and/or consequences).

Construction of a 150 MW PV solar energy facility with an integrated, not to exceed 300MW, battery storage system on approximately 604 acres of land located 5.5 miles east of the City of Holtville within the County of Imperial. The Project site is designated and zoned for agricultural and recreation/open space use within the County of Imperial's Renewable Energy Overlay Zone. The Project includes a ground mounted PV solar power generating system, battery storage system, substation, and switching station. The Electrical energy produced would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District's 230 kV "KN & KS" line via a single overhead gen-tie line 120 feet in height. The Project proposes to utilize either thin film or crystalline solar PV technology modules mounted either on fixed frames or horizontal single-axis tracker systems. The proposed battery energy storage system would be constructed on the Project site and consist of either lithium ion or flow batteries. The batteries would either be housed in storage containers or buildings with a maximum height of 10 feet.

Identify the project's significant or potentially significant effects and briefly describe any proposed mitigation measures that would reduce or avoid that effect.

Aesthetics, Agriculture, Air Quality, Biological Resources, Cultural / Tribal Resources, Energy, Geology/Soils,Greenhouse Gases, Hazards/Hazardous Materials, Hydrology/Water Quality, Public Services, Transportation and Traffic and Utilities.

If applicable, describe any of the project's areas of controversy known to the Lead Agency, including issues raised by agencies and the public.

None.

Provide a list of the responsible or trustee agencies for the project.

U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers
California Air Resources Board
California Department of Transportation
California Dept. of Fish and Wildlife
California Regional Water Quality Control Board, Colorado River Basin, Region 7 (RWQCB)
Native American Heritage Commission
Imperial County Planning and Development Services (ICPDSD)
Imperial County Air Pollution Control District (ICAPCD)
County Department of Public Works (DPW)
Imperial Irrigation District

A-1 Public Comments Received

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STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Gavin Newsom
Governor

Kate Gordon
Director

Memorandum

Date: May 5, 2021

To: All Reviewing Agencies

From: Scott Morgan, Director

Re: SCH # **2021050036**
Viking Solar Energy Generation and Battery Storage Project

The Lead Agency has *changed* the review period for the above referenced project to **May 6, 2021** through **June 9, 2021** to accommodate the review process. Refer to the attachment **CUP20-0025 Memo - Comment Period Change** for more details. All other project information remains the same.

The following attachments have been updated:

- **CUP20-0025 VIKING SOLAR SUMMARY FORM 05.05.21**
- **CUP20-0025 VIKINGS SOLAR NOC 05.05.21**
- **CUP20-0025 VIKINGS SOLAR NOP 05.05.21**

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NATIVE AMERICAN HERITAGE COMMISSION

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nahc@nahc.ca.gov
NAHC.ca.gov

May 5, 2021

Governor's Office of Planning & Research
May 07 2021
STATE CLEARINGHOUSE

Diana Robinson
Imperial County Planning & Development Services Department
801 Main Street
El Centro, CA 92243

Re: 2021050036, Vikings Solar Energy Generation and Battery Storage Project, Imperial County

Dear Ms. Robinson:

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

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

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

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

AB 52

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

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- **a.** A brief description of the project.
- **b.** The lead agency contact information.
- **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

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

- **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- **a.** Alternatives to the project.
- **b.** Recommended mitigation measures.
- **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

- **a.** Type of environmental review necessary.
- **b.** Significance of the tribal cultural resources.
- **c.** Significance of the project's impacts on tribal cultural resources.
- **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

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

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
- **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

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

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

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

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

SB 18

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

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).

2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.

3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).

4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:

- **a.** The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
- **b.** Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

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

NAHC Recommendations for Cultural Resources Assessments

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

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:

- **a.** If part or all of the APE has been previously surveyed for cultural resources.
- **b.** If any known cultural resources have already been recorded on or adjacent to the APE.
- **c.** If the probability is low, moderate, or high that cultural resources are located in the APE.
- **d.** If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- **a.** The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
- **b.** The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

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

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

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

Sincerely,

Andrew Green
Cultural Resources Analyst

cc: State Clearinghouse

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From: Krug, Robert@DTSC <Robert.Krug@dtsc.ca.gov>
Sent: Tuesday, May 4, 2021 1:33 PM
To: Kimberly Noriega <KimberlyNoriega@co.imperial.ca.us>
Subject: RE: Notice of Preparation CUP20-0025

If the facility will generate hazardous waste, or have hazardous materials, an underground storage tank, or an aboveground storage tank they will need to generate a CERS account and be in the CUPA program.
Bob

Robert Krug
Supervisor / Senior Environmental Scientist
DTSC Imperial CUPA
627 Wake Avenue
El Centro, CA 92243
Robert.Krug@dtsc.ca.gov
(760) 336-8919 Work
(760) 457-7376 Cell

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California Department of Transportation

DISTRICT 11
4050 TAYLOR STREET, MS-240
SAN DIEGO, CA 92110
(619) 709-5152 | FAX (619) 688-4299 TTY 711
www.dot.ca.gov

June 8, 2021

11-IMP-115
PM 4.04
Vikings Solar Energy Generation and Storage Project
NOP

Ms. Diana Robinson
Planner III
Imperial County Planning & Development Services Department (ICPDS)
801 Main Street
El Centro, CA 92243

Dear Ms. Robinson:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Vikings Solar Energy Generation and Storage Project for the Notice of Preparation (NOP) located near State Route 115 (SR-115). The mission of Caltrans is to provide a safe and reliable transportation network that serves all people and respects the environment. The Local Development-Intergovernmental Review (LD-IGR) Program reviews land use projects and plans to ensure consistency with Caltrans' mission and state planning priorities.

Caltrans has the following comments:

Traffic Engineering Analysis

- All construction vehicles and heavy truck deliveries shall not use the dirt access road at the Intersection of SR-115/Evan Hewes Highway and Nelson Pit (dirt) Road.
    a. The shoulder structural section would be severely impacted and possibly damaged if the construction site is accessed via this intersection.
    b. The motoring public will not be expecting construction vehicles and heavy trucks to enter and exit from Nelson Pit Road.
    c. There will be heavy soil tracking onto the state facility.
- Access to the project site shall be made via only the paved roads of Kavanaugh Road, Miller Road, and Nelson Pit Road.
- The intersections of SR-115/Evan Hewes Highway at Miller Road, and SR-115/Evan Hewes Highway at Kavanaugh Road will require some type of

notice to motorist on SR-115 of construction vehicles entering/exiting the construction site.
   a. Possible offsite traffic control signs or PCMS's might be required on SR-115.
   b. Possible Encroachment Permit might be required.
- Provide a construction access route exhibit to see how trucks will impact SR-115.
- Any impacts, structures, utilities, or other miscellaneous items related to this project that do encroach within Caltrans right of way will require further review and encroachment permits.

Design

If the intersections between SR-115 and the side streets leading to the entrance of the power generation plant are to be paved, the pavement and intersection should be designed per Caltrans Highway Design Manual (HDM), especially to accommodate the larger turning radius that may be needed for the trucks.

Traffic Control Plan/Hauling

The California Department of Transportation (Caltrans) has discretionary authority with respect to highways under its jurisdiction and may, upon application and if good cause appears, issue a special permit to operate or move a vehicle or combination of vehicles or special mobile equipment of a size or weight of vehicle or load exceeding the maximum limitations specified in the California Vehicle Code. The Caltrans Transportation Permits Issuance Branch is responsible for the issuance of these special transportation permits for oversize/overweight vehicles on the State Highway network. Additional information is provided online at:
http://www.dot.ca.gov/trafficops/permits/index.html

If a Traffic Control Plan is required, it is to be submitted to Caltrans District 11, including the intersections along State Route 115 in the project's vicinity at least 30 days prior to the start of any construction. Traffic shall not be unreasonably delayed. The plan shall also outline suggested detours to use during closures, including routes and signage.

Potential impacts to the highway facilities (State Route 115) and traveling public from the detour, demolition and other construction activities should be discussed and addressed before work begins.

Right-of-Way

- Per Business and Profession Code 8771, perpetuation of survey monuments by a licensed land surveyor is required, if they are being destroyed by any construction.
- Any work performed within Caltrans' R/W will require discretionary review and approval by Caltrans and an encroachment permit will be required for any work within the Caltrans' R/W prior to construction.

Additional information regarding encroachment permits may be obtained by contacting the Caltrans Permits Office at (619) 688-6158 or emailing D11.Permits@dot.ca.gov or by visiting the website at https://dot.ca.gov/programs/traffic-operations/ep. Early coordination with Caltrans is strongly advised for all encroachment permits.

If you have any questions or concerns, please contact Charlie Lecourtois, IGR Coordinator, at (619) 985-4766 or by e-mail sent to charlie.lecourtois@dot.ca.gov.

Sincerely,

Maurice A. Eaton

MAURICE A. EATON
Branch Chief
Local Development and Intergovernmental Review

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Gmail

David McIntyre <david@mcintyre-environmental.com>

RE: Inquiry about NOP Review Period - Vikings Solar Energy Generation and Storage Project (CUP#20-0025) - IMP Cnty

Diana Robinson <DianaRobinson@co.imperial.ca.us> Thu, May 13, 2021 at 2:38 PM
To: "Lecourtois, Charlie@DOT" <Charlie.Lecourtois@dot.ca.gov>
Cc: Michael Abraham <MichaelAbraham@co.imperial.ca.us>, Mariela Moran <MarielaMoran@co.imperial.ca.us>, Rosa Soto <RosaSoto@co.imperial.ca.us>, Carina Gomez <CarinaGomez@co.imperial.ca.us>, David McIntyre <david@mcintyre-environmental.com>, Christina Willis <Christina@brginc.net>

Good afternoon,

The commenting period was originally May 4 through June 7 but we had to change due to match newspaper publication. We sent revised dates to OPR but they later responded that they would had maintain the May 4 starting date and extend the ending date those 2 days so the current NOP period is May 4, 2021 to June 9, 2021.

Please find project on ceqanet on the link below:

https://ceqanet.opr.ca.gov/2021050036

Hope this clarifies.

Thank you,

Diana

From: Lecourtois, Charlie@DOT <Charlie.Lecourtois@dot.ca.gov>
Sent: May 13, 2021 11:54 AM
To: Diana Robinson <DianaRobinson@co.imperial.ca.us>
Subject: Inquiry about NOP Review Period - Vikings Solar Energy Generation and Storage Project (CUP#20-0025) - IMP Cnty

CAUTION: This email originated outside our organization; please use caution.

Hi Diana,

Can you please tell me what the NOP review period is for the Vikings Solar Energy Generation and Storage Project (CUP#20-0025)? Caltrans received two NOP of DEIR for the Vikings Solar Energy Generation and Storage Project notice of public scoping meeting with different review dates (see attached). Is the review period from May 4, 2021 through Jun 7, 2021 or May 6, 2021 through June 9, 2021?

Thank you,

Charlie Lecourtois

Transportation Planner

Caltrans District 11 LD-IGR Branch

4050 Taylor Street., MS 240

San Diego, CA 92110

Charlie.Lecourtois@DOT.ca.gov

Cell: (619) 985-4766

(Currently Teleworking, M-F, 8-5)

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June 7, 2021

RECEIVED

JUN 07 2021

IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Ms. Diana Robinson
Planner III
Planning & Development Services Department
County of Imperial
801 Main Street
El Centro, CA 92243

SUBJECT: NOP of an EIR for the Vikings Solar Energy Generation and Storage Project; CUP Application No. 20-0025

Dear Ms. Robinson:

On May 7, 2021, the Imperial Irrigation District received from the Imperial County Planning & Development Services Department, the Notice of Preparation of an Environmental Impact Report for the Viking Solar Energy Generation & Storage Project; Conditional Use Permit application no. 20-0025. The applicant, Vikings Energy Farm, LLC; proposes to develop a 150MW solar PV energy generation facility with a not to exceed 300MW integrated battery storage component on approximately 604 acres of land located at the intersection of East Nelson Pit Road and Graeser Road, approximately 5.5 miles east of Holtville, California (APNs 050-070-018-000, -019-000, -021-000). The project's electrical output would be conveyed through a proposed gen-tie line interconnection to the IID's 230kV "KN/KS" transmission line.

The IID has reviewed the project information and found that the comments provided in the April 15, 2021 district letter (see attached letter) continue to apply.

The Imperial Irrigation District has reviewed the information and has the following comments:

Should you have any questions, please do not hesitate to contact me at 760-482-3609 or at dvargas@iid.com. Thank you for the opportunity to comment on this matter.

Respectfully,

Donald Vargas
Compliance Administrator II

Enrique B. Martinez – General Manager
Mike Pacheco – Manager, Water Dept.
Marilyn Del Bosque Gilbert – Manager, Energy Dept.
Constance Bergmark – Mgr. of Planning & Eng./Chief Elect. Engineer, Energy Dept.
Enrique De Leon – Asst. Mgr., Energy Dept., Distr., Planning, Eng. & Customer Service
Jamie Asbury – Assoc. General Counsel
Vance Taylor – Asst. General Counsel
Michael P. Kemp – Superintendent, Regulatory & Environmental Compliance
Laura Cervantes – Supervisor, Real Estate

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April 15, 2021

RECEIVED

JUN 07 2021

IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Ms. Diana Robinson
Planner III
Planning & Development Services Department
County of Imperial
801 Main Street
El Centro, CA 92243

SUBJECT: Vikings Solar Energy and Storage Project; CUP Application No. 20-0025

Dear Ms. Robinson:

On April 8, 2021, the Imperial Irrigation District received from the Imperial County Planning & Development Services Department, a request for agency comments on Conditional Use Permit application no. 20-0025 for the Vikings Solar Energy and Storage Project. The applicant, Vikings Energy Farm, LLC; proposes to develop a 100MW solar PV energy generation facility with a 100MW integrated battery storage on approximately 603.61 acres of land located at 2910 and 3000 east Nelson Pit Road, Holtville, California (APNs 050-070-018-000, -019-000, -021-000). The project's electrical output would be conveyed through a proposed gen-tie line interconnection to the IID's 230kV "KN/KS" transmission line.

The Imperial Irrigation District has reviewed the information and has the following comments:

1. If the project requires temporary construction or permanent electrical service at the distribution level, the applicant should be advised to contact Joel Lopez, IID Customer Project Development Planner, at (760) 482-3300, (760) 482-3444 or e-mail Mr. Lopez at jflopez@iid.com to initiate the customer service application process. In addition to submitting a formal application (available for download at the district website http://www.iid.com/home/showdocument?id=12923), the applicant will be required to submit a complete set of plans approved by the County of Imperial (in hardcopy and AutoCad formats), including site plan, plan & profile drawings, one-line diagrams, and electrical loads, panel size, voltage requirements, project schedule, and the estimated in-service date, as well as the applicable fees, permits, easements and environmental compliance documentation pertaining to the provision of electrical service to the project. The applicant shall be responsible for all costs and mitigation measures related to providing electrical service to the project.

2. Distribution-rated electrical service is limited in the area. A circuit study may be required. Any improvements or mitigation identified in the circuit study to enable the provision of electrical service shall be the financial responsibility of the applicant.

3. To insure there are no impacts to IID facilities, applicant should submit project plans, including grading & drainage and fencing plans, to IID Water Department Engineering Services for review and comment prior to final project design and CUP approval. IID WDES can be contacted at (760) 339-9265 for further information on this matter.

4. The project may impact IID drains with project site runoff flows draining into IID drains. To mitigate impacts, the project may require a comprehensive IID hydraulic drainage system analysis. IID's hydraulic drainage system analysis includes an associated drain impact fee.

5. A construction storm water permit from the California Regional Water Quality Control Board is required before commencing construction and an industrial storm water permit from CRWQCB is required for the operation of the proposed facility. The project's Storm Water Pollution Prevention Plan and storm water permits from CRWQCB should be submitted to IID for review.

6. In order to obtain a water supply from IID for a non-agricultural project, the project proponent will be required to comply with all applicable IID policies and regulations and may be required to enter into a water supply agreement. Such policies and regulations require, among other things, that all potential environmental and water supply impacts of the project be adequately assessed, appropriate mitigation developed if warranted, including any necessary approval conditions adopted by the relevant land use and permitting agencies.

7. If IID implements a water allocation or apportionment program pursuant to the IID Equitable Distribution Plan, or any amending or superseding policy for the same or similar purposes, during all or any part of the term of said water supply agreement, IID shall have the right to apportion the project's water as an industrial water user. Information on how to obtain a water supply agreement can be found at the district website https://www.iid.com/water/municipal-industrial-and-commercial-customers or obtained by contacting Justina Gamboa-Arce, Water Resources Planner at (760) 339-9085 or jgamboaarce@iid.com.

8. For information on procuring construction water, the applicant should contact IID South End Division at (760) 482-9800.

9. Any construction or operation on IID property or within its existing and proposed right of way or easements including but not limited to: surface improvements such as proposed new streets, driveways, parking lots, landscape; and all water, sewer, storm water, or any other above ground or underground utilities; will require an encroachment permit, or encroachment agreement (depending on the circumstances). A copy of the IID encroachment permit application and instructions for its completion are available at https://www.iid.com/about-iid/department-directory/real-estate. The IID Real Estate Section should be contacted at (760) 339-9239 for additional information regarding encroachment permits or agreements.

10. In addition to IID's recorded easements, IID claims, at a minimum, a prescriptive right of way to the toe of slope of all existing canals and drains. Where space is limited and depending upon the specifics of adjacent modifications, the IID may claim additional secondary easements/prescriptive rights of ways to ensure operation and maintenance of IID's facilities can be maintained and are not impacted and if impacted mitigated. Thus, IID should be consulted prior to the installation of any facilities adjacent to IID's facilities.

Certain conditions may be placed on adjacent facilities to mitigate or avoid impacts to IID's facilities

11. The applicant may not use IID's canal or drain banks to access the project site. Any abandonment of easements or facilities shall be approved by IID based on systems (Irrigation, Drainage, Power, etc.) needs.

12. An IID encroachment permit is required to utilize existing surface-water drainpipe connections to drains and receive drainage service from the district. Surface-water drainpipe connections are only modified in accordance with IID Water Department Standards.

13. Any new, relocated, modified or reconstructed IID facilities required for and by the project (which can include but is not limited to electrical utility substations, electrical transmission and distribution lines, water deliveries, canals, drains, etc.) need to be included as part of the project's CEQA and/or NEPA documentation, environmental impact analysis and mitigation. Failure to do so will result in postponement of any construction and/or modification of IID facilities until such time as the environmental documentation is amended and environmental impacts are fully analyzed. **Any and all mitigation necessary as a result of the construction, relocation and/or upgrade of IID facilities is the responsibility of the project proponent.**

Should you have any questions, please do not hesitate to contact me at 760-482-3609 or at dvargas@iid.com. Thank you for the opportunity to comment on this matter.

Respectfully,

Donald Vargas
Compliance Administrator II

Enrique B. Martinez – General Manager
Mike Pacheco – Manager, Water Dept.
Marilyn Del Bosque Gilbert – Manager, Energy Dept.
Constance Bergmark – Mgr. of Planning & Eng./Chief Elect. Engineer, Energy Dept.
Enrique De Leon – Asst. Mgr., Energy Dept., Distr., Planning, Eng. & Customer Service
Jamie Asbury – Assoc. General Counsel
Vance Taylor – Asst. General Counsel
Michael P. Kemp – Superintendent, Regulatory & Environmental Compliance
Laura Cervantes – Supervisor, Real Estate

A-2 Environmental Initial Study

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DRAFT
Initial Study & Environmental Analysis

For:

Vikings Solar Energy Generation & Storage Project
Conditional Use Permit (#20-0025)
Initial Study (#20-0035)

Prepared By:

COUNTY OF IMPERIAL

Planning & Development Services Department
801 Main Street
El Centro, CA 92243
(442) 265-1736
www.icpds.com

May 2021

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SECTION I. INTRODUCTION

A. PURPOSE

This document is a ☐ policy-level; ☒ project level Initial Study for evaluation of potential environmental impacts resulting with the proposed Vikings Solar Energy Generation and Storage Project.

B. CEQA REQUIREMENTS AND THE IMPERIAL COUNTY "GUIDELINES AND REGULATIONS TO IMPLEMENT CEQA AS AMENDED"

As defined by Section 15063 of the State California Environmental Quality Act (CEQA) Guidelines and Section 7 of the County's "Guidelines for the Implementation of CEQA as Amended", an Initial Study is prepared primarily to provide the Lead Agency with information to use as the basis for determining whether an Environmental Impact Report (EIR), Mitigated Negative Declaration, Negative Declaration, or other environmental document, would be appropriate for providing the necessary environmental documentation and clearance for any proposed project.

☒ According to Section 15065, an EIR is deemed appropriate for a particular proposal if the following conditions occur:

- The proposal has the potential to substantially degrade quality of the environment.
- The proposal has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.
- The proposal has possible environmental effects that are individually limited but cumulatively considerable.
- The proposal could cause direct or indirect adverse effects on human beings.

☐ According to Section 15070(a), a Negative Declaration is deemed appropriate if the proposal would not result in any significant effect on the environment.

☐ According to Section 15070(b), a Mitigated Negative Declaration is deemed appropriate if it is determined that though a proposal could result in a significant effect, mitigation measures are available to reduce these significant effects to insignificant levels.

This Initial Study is prepared in conformance with the California Environmental Quality Act of 1970, as amended (Public Resources Code, Section 21000 et. seq.); Section 15070 of the State & County of Imperial's Guidelines for Implementation of the California Environmental Quality Act of 1970, as amended (California Code of Regulations, Title 14, Chapter 3, Section 15000, et. seq.); applicable requirements of the County of Imperial; and the regulations, requirements, and procedures of any other responsible public agency or an agency with jurisdiction by law.

Pursuant to the County of Imperial Guidelines for Implementing CEQA, depending on the project scope, the County of Imperial Board of Supervisors, Planning Commission and/or Planning Director is designated the Lead Agency, in accordance with Section 15050 of the CEQA Guidelines. The Lead Agency is the public agency which has the principal responsibility for approving the necessary environmental clearances and analyses for any project in the County.

C. INTENDED USES OF INITIAL STUDY

This Initial Study is an informational document which is intended to inform County of Imperial decision-makers, other responsible or interested agencies, and the general public of potential environmental effects of the proposed applications. The environmental review process has been established to enable public agencies to evaluate environmental consequences and to examine and implement methods of eliminating or reducing any potentially adverse impacts. While CEQA requires that consideration be given to avoiding environmental damage, the Lead Agency and other responsible public agencies must balance adverse environmental effects against other public objectives, including economic and social goals.

The Initial Study prepared for the project will be circulated for a period of 35 days for public and agency review and comments. At the conclusion, if comments are received, the County Planning & Development Services Department will prepare a document entitled "Responses to Comments" which will be forwarded to any commenting entity and be made part of the record within 10-days of any project consideration.

D. CONTENTS OF INITIAL STUDY

This Initial Study is organized as described below to facilitate a basic understanding of the existing setting and environmental implications of the proposed applications.

SECTION 1

I. INTRODUCTION presents an introduction to the entire report. This section discusses the environmental process, scope of environmental review, and incorporation by reference documents.

SECTION 2

II. ENVIRONMENTAL CHECKLIST FORM contains the County's Environmental Checklist Form. The checklist form presents results of the environmental evaluation for the proposed applications and those issue areas that would have either a significant impact, potentially significant impact, or no impact.

PROJECT SUMMARY, LOCATION AND ENVIRONMENTAL SETTINGS describes the proposed project entitlements and required applications. A description of discretionary approvals and permits required for project implementation is also included. It also identifies the location of the project and a general description of the surrounding environmental settings.

ENVIRONMENTAL ANALYSIS evaluates each response provided in the environmental checklist form. Each response checked in the checklist form is discussed and supported with sufficient data and analysis as necessary. As appropriate, each response discussion describes and identifies specific impacts anticipated with project implementation.

SECTION 3

III. MANDATORY FINDINGS presents Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

IV. PERSONS AND ORGANIZATION CONSULTED identifies those persons consulted and involved in preparation of this Initial Study.

V. REFERENCES lists bibliographical materials use in the preparation of this document.

VI. FINDINGS

SECTION 4

VIII. RESPONSE TO COMMENTS (IF ANY)

IX. MITIGATION MONITORING AND REPORTING PROGRAM (IF ANY)

E. SCOPE OF ENVIRONMENTAL ANALYSIS

For evaluation of environmental impacts, each question from the Environmental Checklist Form is summarized and responses are provided according to the analysis undertaken as part of the Initial Study. Impacts and effects will be evaluated and quantified, when appropriate. To each question, there are four possible responses, including:

1. **No Impact**: A "No Impact" response is adequately supported if the impact simply does not apply to the proposed applications.
2. **Less Than Significant Impact**: The proposed applications will have the potential to impact the environment. These impacts, however, will be less than significant; no additional analysis is required.
3. **Potentially Significant Unless Mitigation Incorporated**: This applies where incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact."
4. **Potentially Significant Impact**: The proposed applications could have impacts that are considered significant. Additional analyses and possibly an EIR could be required to identify mitigation measures that could reduce these impacts to less than significant levels.

F. POLICY-LEVEL or PROJECT LEVEL ENVIRONMENTAL ANALYSIS

This Initial Study will be conducted under a ☐ policy-level, ☒ project level analysis. Regarding mitigation measures, it is not the intent of this document to "overlap" or restate conditions of approval that are commonly established for future known projects or the proposed applications. Additionally, those other standard requirements and regulations that any development must comply with, that are outside the County's jurisdiction, are also not considered mitigation measures and therefore, will not be identified in this document.

G. TIERED DOCUMENTS AND INCORPORATION BY REFERENCE

Information, findings, and conclusions contained in this document are based on incorporation by reference of tiered documentation, which are discussed in the following section.

1. Tiered Documents

As permitted in Section 15152(a) of the CEQA Guidelines, information and discussions from other documents can be included into this document. Tiering is defined as follows:

"Tiering refers to using the analysis of general matters contained in a broader EIR (such as the one prepared for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project."

Tiering also allows this document to comply with Section 15152(b) of the CEQA Guidelines, which discourages redundant analyses, as follows:

"Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects including the general plans, zoning changes, and development projects. This approach can eliminate repetitive discussion of the same issues and focus the later EIR or negative declaration on the actual issues ripe for decision at each level of environmental review. Tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy or program to an EIR or negative declaration for another plan, policy, or program of lesser scope, or to a site-specific EIR or negative declaration."

Further, Section 15152(d) of the CEQA Guidelines states:

"Where an EIR has been prepared and certified for a program, plan, policy, or ordinance consistent with the requirements of this section, any lead agency for a later project pursuant to or consistent with the program, plan, policy, or ordinance should limit the EIR or negative declaration on the later project to effects which:

(1) Were not examined as significant effects on the environment in the prior EIR; or

(2) Are susceptible to substantial reduction or avoidance by the choice of specific revisions in the project, by the imposition of conditions, or other means."

2. Incorporation By Reference

Incorporation by reference is a procedure for reducing the size of EIRs/MND and is most appropriate for including long, descriptive, or technical materials that provide general background information, but do not contribute directly to the specific analysis of the project itself. This procedure is particularly useful when an EIR or Negative Declaration relies on a broadly drafted EIR for its evaluation of cumulative impacts of related projects (Las Virgenes Homeowners Federation v. County of Los Angeles [1986, 177 Ca.3d 300]). If an EIR or Negative Declaration relies on information from a supporting study that is available to the public, the EIR or Negative Declaration cannot be deemed unsupported by evidence or analysis (San Francisco Ecology Center v. City and County of San Francisco [1975, 48 Ca.3d 584, 595]).

When an EIR or Negative Declaration incorporates a document by reference, the incorporation must comply with Section 15150 of the CEQA Guidelines as follows:

- The incorporated document must be available to the public or be a matter of public record (CEQA Guidelines, Section 15150[a]). The General Plan EIR is available, along with this document, at the County of Imperial Planning & Development Services Department, 801 Main Street, El Centro, CA 92243, phone (442) 265-1736.
- This document must be available for inspection by the public at an office of the lead agency (CEQA Guidelines Section 15150[b]). These documents are available at the County of Imperial Planning & Development Services Department, 801 Main Street, El Centro, CA 92243; phone (442) 265-1736.
- These documents must summarize the portion of the document being incorporated by reference or briefly describe information that cannot be summarized. Furthermore, these documents must describe the relationship between the incorporated information and the analysis in the tiered documents (CEQA Guidelines Section 15150[c]). As discussed above, the tiered EIRs address the entire project site and provide background and inventory information and data which apply to the project site. Incorporated information and/or data will be cited in the appropriate sections.
- These documents must include the State identification number of the incorporated documents (CEQA Guidelines Section 15150[d]). The State Clearinghouse Number for the 1993 County of Imperial General Plan Final EIR is SCH #93011023.
- The material to be incorporated in this document will include general background information (CEQA Guidelines Section 15150[f]).

SECTION II. ENVIRONMENTAL CHECKLIST

1.	**Project Title:**	Vikings Solar Energy Generation and Storage Project Conditional Use Permit (#20-0025) Initial Study (#20-0035)
2.	**Lead Agency Name and Address:**	Imperial County Planning & Development Services Department
3.	**Contact Person and Phone Number:**	Diana Robinson, Planner III, 442-265-1736
4.	**Address:**	801 Main Street, El Centro CA, 92243
5.	**E-mail:**	DianaRobinson@co.imperial.ca.us

6. Project Location: The proposed Project would be located on approximately 604 acres of private and Imperial County-owned land located at the intersection of Nelson Pit Road and Graeser Road in the western part of unincorporated Imperial County (Figure 1 and 2). The Project site is located approximately 5.5 miles east of the City of Holtville in Section 36 within Township 15 South, and Range 16 East of the San Bernardino Base and Meridian (SBB&M) of the "Holtville East" topographic quadrangles 7.5-minute (Assessor's Parcel Numbers [APNs] 050-070-018, 050-070-019 and 050-070-021).

7. Project Sponsor's Name and Address: Vikings Energy Farm, LLC

8. General Plan Designation: Two of the parcels (APN 050-070-018; 050-070-019) are designated as Agriculture in the Imperial County General Plan. APN 050-070-021 is designated as "Recreation/Open Space". All are located within a Renewable Energy Overlay Zone.

9. Zoning: Project parcels 050-070-019 and 050-070-018 are both zoned A-2-RE (General Agriculture with Renewable Energy Overlay) and parcel 050-070-021 is zoned GS-RE (Government/Special Public Zone with Renewable Energy Overlay) (Figure 3).

10. Description of Project: Vikings Solar Energy Farm, LLC (Project Applicant) proposes to develop a nominal 150-megawatt (MW) solar photovoltaic (PV) energy generation project with an integrated, not to exceed 300MW, battery storage project. The electrical energy produced would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District's (IID) 230 kV KN/KS transmission line via a gen-tie line approximately 120 feet in height. The solar energy generation facility, battery storage system, switching station and gen-tie line are collectively referred to as the "Proposed Project" or "Project."

The Project proposes to utilize either thin film or crystalline solar (PV) technology modules mounted either on fixed frames or horizontal single-axis tracker (HSAT) systems. The fixed frame PV module arrays would be mounted on racks that would be supported by driven piles. The fixed-frame racks would be secured at a fixed tilt of 20 to 30 degrees from horizontal facing a southerly direction. Individual PV modules would be mounted two high on a fixed frame, providing a two-foot ground clearance and resulting in the tops of the panels at approximately 7.5 feet above the ground. The fixed PV modules would be arranged in arrays spaced approximately 15 to 25 feet apart (pile-to-pile) to maximize performance and to allow access for panel cleaning.

If HSAT technology is used, the PV modules would rotate around the north-south HSAT axis so that the PV modules would continue to face the sun as it moves across the sky throughout the day. The PV modules would reach their maximum height (up to nine [9] feet above the ground) at both sunrise and sunset. At noon, or when stowed during high winds, when the HSAT system is rotated so that the PV modules would be horizontal with a nominal height of about six (6) feet above the ground.

The Project includes a battery storage system that would be located on the southern boundary of APN 050-070-019 just north of Nelson Pit Road and would consist of either lithium ion (Li-ion) or flow batteries. Depending on the selection of the battery technology, the batteries would either be housed in storage containers or storage buildings.

The electrical energy produced by the Project would be conducted through a new project substation located on the southern boundary of APN 050-070-019 (See Figure 2). This substation would take the delivery of the up to 34.5 kV power from the project and increase the voltage of the electricity to 230 kV, where it would feed into the interconnection switching station, adjacent to the project substation, for metering and delivery to the IID 230 kV KN/KS Line.

Electricity generated by the facility could be sold under the terms of a power purchase agreement (PPA) with a power purchaser (i.e., utility service provider). At the end of the PPA term, the owner of the facility may choose to enter into a subsequent PPA, update technology and re-commission, or decommission remove the generating facility and its components and restore the property.

11. Surrounding Land Uses and Setting: The Project site is generally located south of Kavanaugh Road, west of Graeser Road, the East Highline Canal and IID's KN/KS 230 kV transmission line, approximately 1.8 miles north of Interstate 8 (I-8). It should be noted however that the northwest portion of the solar energy facility site is bisected by Graeser Road and the East Highline Canal (APN 050-070-019). The solar energy facility site is surrounded by agricultural uses on the west and by open desert on the north, south and east. The Holtville Airport is located 1.6 miles to the north, and the nearest developed or proposed solar PV projects are located approximately 7.25 miles to the south, across State Route 98.

12. Other Public Agencies Whose Approval is Required (e.g., permits, financing approval, or participation agreement): To approve a Conditional Use Permit (CUP), other agency permits and approvals are listed below:

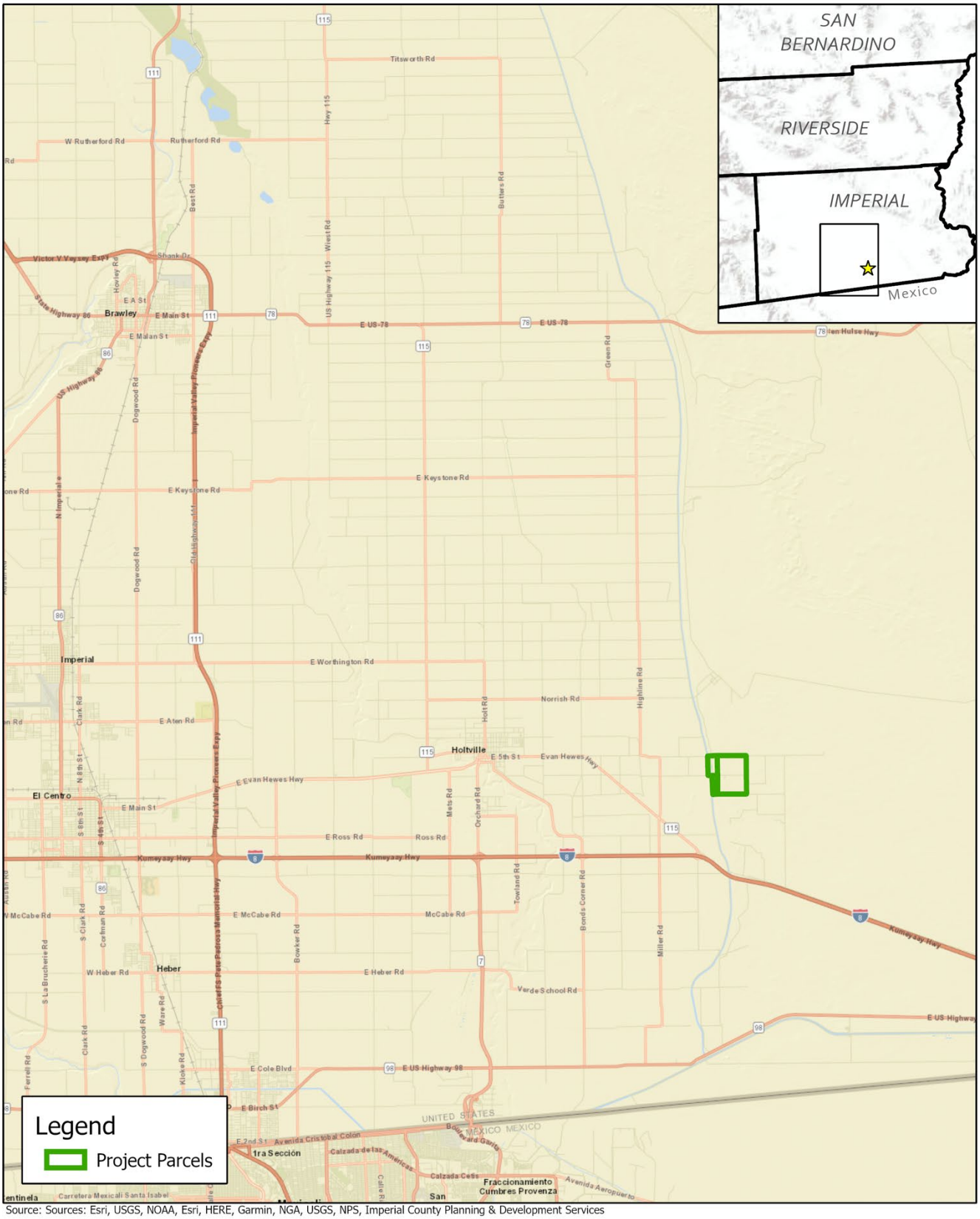
- Section 404 Permit: United States Army Corps of Engineers, Clean Water Act (CWA) Section 404 Permit may be required, as necessary. Section 401 Permit: Colorado Regional Water Quality Control Board CWA Section 401 Permit may be required, as necessary.
- Streambed Alteration Agreement: California Department of Fish and Wildlife Streambed Alteration Agreement under Section 1602 of the California Fish and Game Act may be required, as necessary.
- Transportation Permit for oversized/overweight vehicles: Caltrans
- Encroachment Permit: Imperial Irrigation District.
- Imperial County Air Pollution Control District: Authority to Construct and Permit to Operate.

- State Water Resources Control Board: National Pollutant Discharge Elimination System General Construction Stormwater Permit.
- Regional Water Quality Control Board (Region 7): Waste Discharge Requirements.

13. Native American Consultation: Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1?

In compliance with Assembly Bill 52 (Chapter 532, Statutes 2014), the ICPDSD sent letters to one (1) California Native American Tribe on March 26, 2021, providing notification of the Project and an invitation to participate in consultation. Under AB-52, California Native American Tribes have 30 days from the date of receipt of the notice to request consultation.

On April 8, 2021, the Quechan Tribe Historic Preservation Officer requested consultation with the County and the County is currently trying to arrange a meeting with Tribe.



Source: Sources: Esri, USGS, NOAA, Esri, HERE, Garmin, NGA, USGS, NPS, Imperial County Planning & Development Services

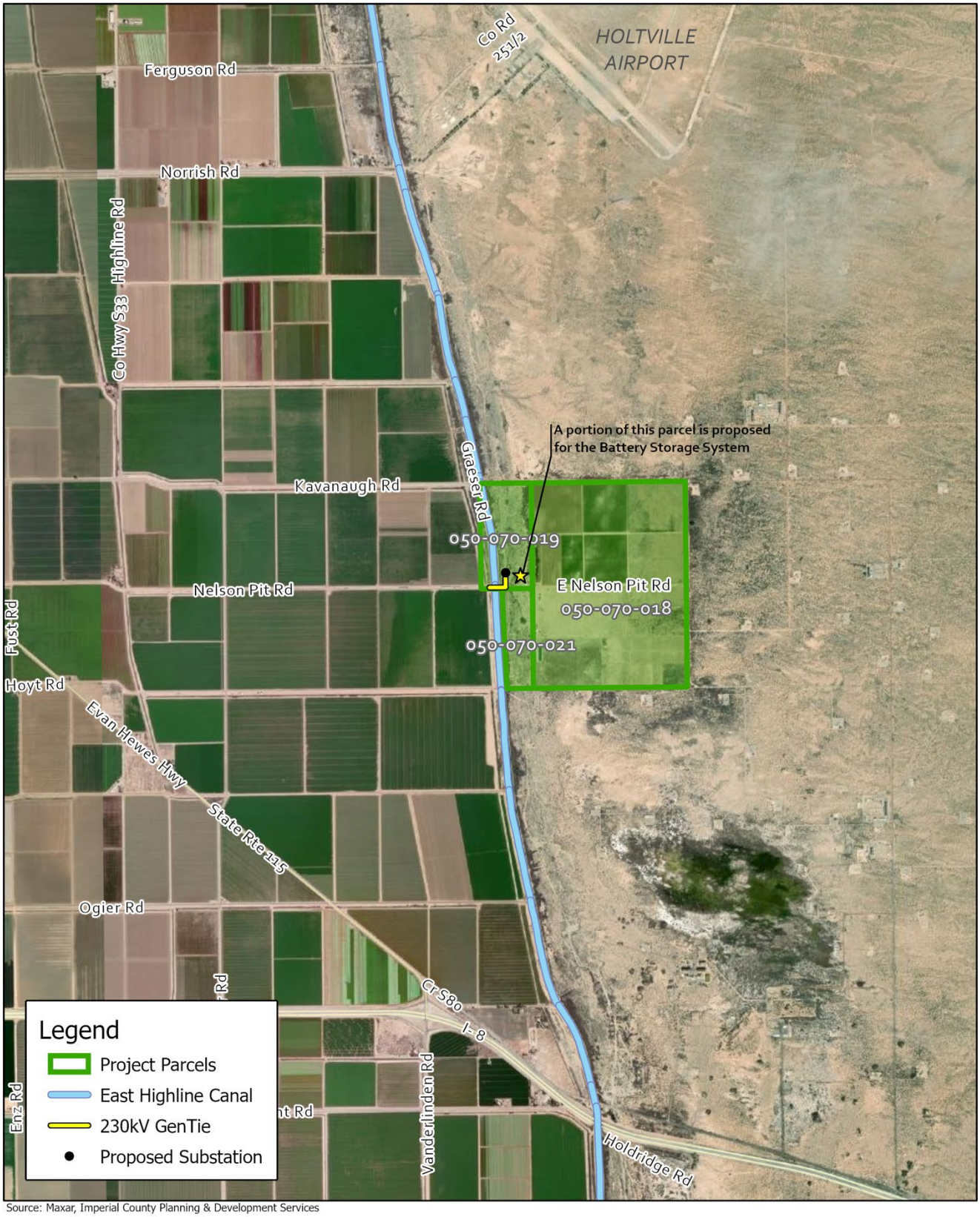
N

0 3.75 7.5 Miles

Regional Location

Vikings Solar Energy Generation and Storage Project

Figure 1

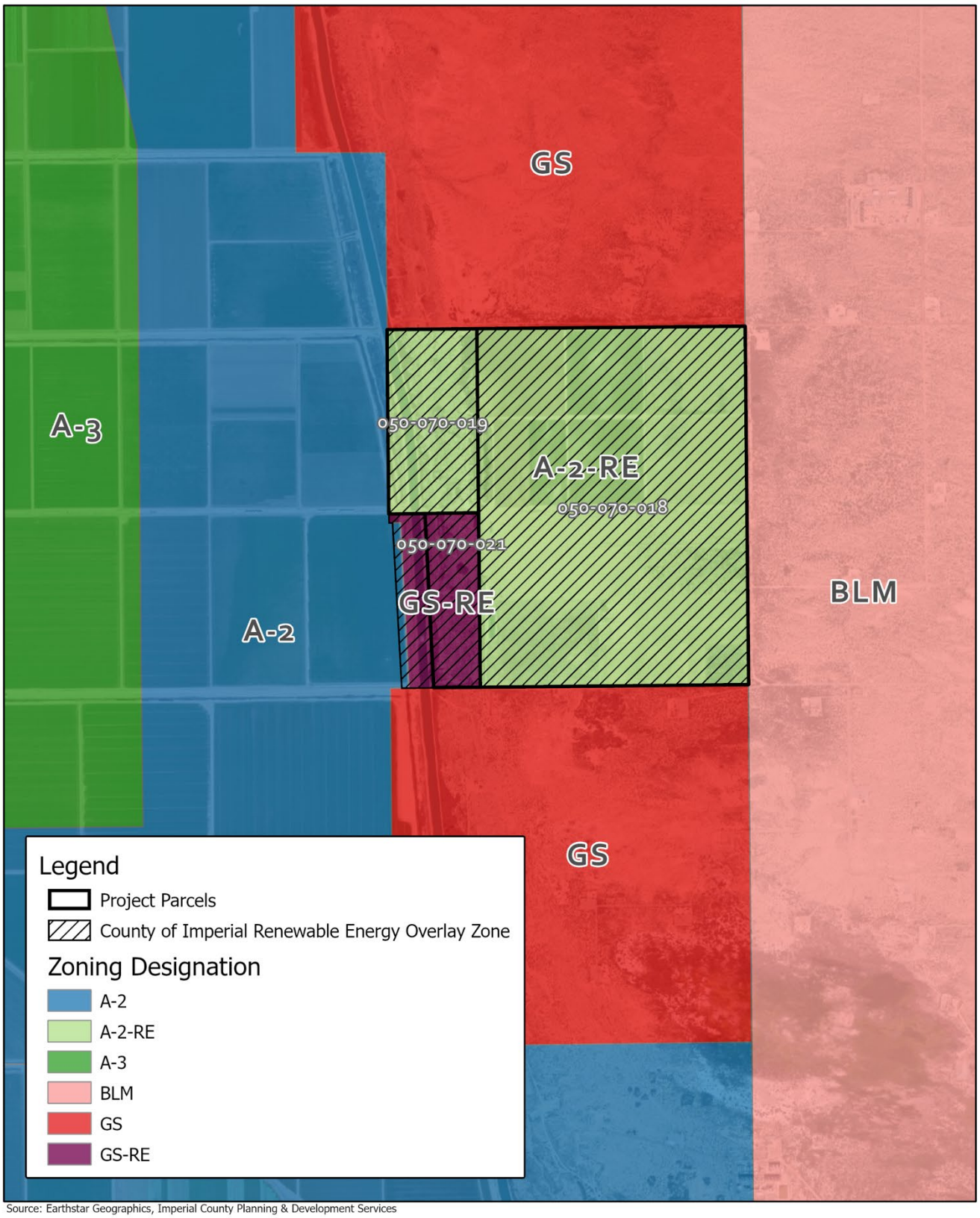


Source: Maxar, Imperial County Planning & Development Services

Project Location

Vikings Solar Energy Generation and Storage Project

Figure 2



Source: Earthstar Geographics, Imperial County Planning & Development Services

N

0 0.4 0.8 Miles

Existing Zoning Designation

Vikings Solar Energy Generation and Storage Project

Figure 3

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

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

ENVIRONMENTAL EVALUATION COMMITTEE (EEC) DETERMINATION

After Review of the Initial Study, the Environmental Evaluation Committee has:

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

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

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

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

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

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE DE MINIMIS IMPACT FINDING: ☐ Yes ☐ No

EEC VOTES	YES	NO	ABSENT
PUBLIC WORKS	☐	☐	☐
ENVIRONMENTAL HEALTH SVCS	☐	☐	☐
OFFICE EMERGENCY SERVICES	☐	☐	☐
APCD	☐	☐	☐
AG	☐	☐	☐
SHERIFF DEPARTMENT	☐	☐	☐
ICPDS	☐	☐	☐

Jim Minnick, Director of Planning/EEC Chairman

Date:

PROJECT SUMMARY

Project Location

The proposed Project would be located on approximately 604 acres of private and Imperial County-owned land located at the intersection of Nelson Pit Road and Graeser Road in the western part of unincorporated Imperial County (Figure 3-1 and 3-2). It is approximately 5.5 miles east of the City of Holtville in Section 36 within Township 15 South, and Range 16 East of the San Bernardino Base and Meridian {SBB&M) of the "Holtville East" topographic quadrangles 7.5-minute (Assessor's Parcel Numbers [APNs]) 050-070- 018, 050-070-019 and 050-070- 021.

Project Summary

The Project proposes to utilize either thin film or crystalline solar photovoltaic (PV) technology modules mounted either on fixed frames or horizontal single-axis tracker (HSAT) systems. The fixed frame PV module arrays would be mounted on racks that would be supported by driven piles. The fixed-frame racks would be secured at a fixed tilt of 20 to 30 degrees from horizontal facing a southerly direction. Individual PV modules would be mounted two high on a fixed frame, providing a two-foot ground clearance and resulting in the tops of the panels at approximately 7.5 feet above the ground. The fixed PV modules would be arranged in arrays spaced approximately 15 to 25 feet apart (pile-to-pile) to maximize performance and to allow access for panel cleaning .

If HSAT technology is used, the PV modules would rotate around the north-south HSAT axis so that the PV modules would continue to face the sun as it moves across the sky throughout the day. The PV modules would reach their maximum height (up to nine [9] feet above the ground) at both sunrise and sunset. At noon, the HSAT system is rotated so that the PV modules would be horizontal with a nominal height of about six (6) feet above the ground. The individual PV systems would be arranged in large arrays by placing them in columns spaced approximately 10 feet apart.

The battery storage system would be constructed as a multiple structure facility, consisting of up to 20 battery modules at full build out, the footprint of which would be up to 450 square feet per module. Each module will house the batteries, mounting racks and associated electrical equipment. Each module will be of a metal frame construction, retrofitted to add insulation, air-conditioning, and fire suppression for battery reliability, with separate rooms for the electronic controls, inverters, and rectifiers. Due to the slightly positive pressure required within each module to ensure functionality of the fire suppression system, the modules will not be vented. Each module will utilize a supply and return air conditioning system; this system has a fresh air (economizer mode) intake system and is also referred to as a closed loop system.

The electrical energy produced by the project would be conducted through a new project substation would be constructed on the southern boundary of APN 050-070-019. This substation would take the delivery of the up to 34.5 kV power from the project and increase the voltage of the electricity to 230 kV, where it would feed into the interconnection switching station for metering and delivery to the IID 230 kV KN/KS Line.

Environmental Setting

The Project area is located on a combination of private land (two parcels) and County-owned land (one parcel) in the western part of unincorporated Imperial County. The Project area is idle land and agriculture. The Project area is located at the intersection of Nelson Pit Road and Graeser Road and is accessible from I-8 via Evan Hewes Highway and Graeser Road. The northwest portion of the solar energy facility site is bisected by Graeser Road and the East Highline Canal (APN 050-070-019). The Holtville Airport is located 1.6 miles to the north, and the nearest developed or proposed solar PV projects are located approximately 7.25 miles to the south, across State Route 98.

General Plan Consistency

The Project is located within the unincorporated area of Imperial County. Two of the parcels (APN 050-070-018 and 050-070-019) are designated as Agriculture in the Imperial County General Plan. APN 050-070-021 is designated as "Recreation/Open Space". All are located within a Renewable Energy Overlay Zone (Figure 3). The Project would be consistent with the goals and objectives of the Renewable Energy and Transmission Element of the County's General Plan (2015).

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

    a) Earlier Analysis Used. Identify and state where they are available for review.

    b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

    c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

    a) The significance criteria or threshold, if any, used to evaluate each question; and

    b) The mitigation measure identified, if any, to reduce the impact to less than significance.

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	No Impact **(NI)**
I. AESTHETICS.				
Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Discussion:

a) No Impact. There are no designated scenic vistas in the Project vicinity. A visual resources impact assessment was prepared for the Project and it was determined that the Project would not have a substantial adverse effect on the expansive views from the three key observation points (KOPs) selected for analysis (SWCA 2021a). Rather, the thin horizontal edge of solar arrays and rectangular geometric shapes of the project facilities would be absorbed into the existing vegetation and built features with similar lines, forms, and colors that comprise the landscape. No adverse impacts on a scenic vista have been identified and this environmental parameter is not proposed for further analysis in the EIR.

b) No Impact. There are no designated or eligible scenic highways in the project vicinity. The nearest highway is Highway 115 located 1.4 miles southwest of the Project site. This highway is not a designated scenic highway. The nearest eligible state scenic highway according to Caltrans California State Scenic Highway System Map is Route-78, located 39.82 miles northwest of the Project site.

The Project vicinity does not contain any rock outcroppings and has very few trees. According to the Class III Cultural Resources Inventory Report prepared for the Project, there are no historic buildings within the project vicinity (SWCA 2021e). As such, construction of the Project is not anticipated to substantially damage scenic resources. No impacts have been identified for this issue area and this environmental parameter is not proposed for further analysis in the EIR.

c) Less than Significant Impact. The existing visual character from public viewpoints would not be substantially altered in the project vicinity. From KOP 1, which represents an elevated view overlooking the Project site, the proposed gen-tie line would be visible but would be mostly unnoticed due to the current existing structures that

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

obscure the view. From KOP 2, the Project would visually blend in with the existing built features and irrigated agricultural fields between the viewer and the Project site. The view from KOP 3 is mostly blocked by existing vegetation, residential and agricultural structures, and transmission lines running east to west across the landscape. As previously described, the Project would not substantially degrade the existing visual character or quality of public views from this distance; rather, the horizontal and rectangular project facilities would appear to be absorbed into the existing vegetation and built features that comprise the broader landscape. The project would not substantially degrade existing visual character and quality and the impact would be less than significant (SWCA 2021a).

d) Less than Significant Impact. The Project would not include any substantial source of nighttime light in the Project vicinity. Any lighting required for safety and security within the Project area would be hooded and oriented downward. The glare analysis for the Project concluded that viewers at KOP 3 may experience glare from the northeastern-most project array area if no vegetation or structures are in the field of view, and that the other array areas will not produce glare. KOP 3 will have potential for glare for approximately 10 minutes a day for 2 months a year (SWCA 2021a). However, given the presence of existing vegetation and structures, it likely that these effects would be less than significant.

A Visual Resource Assessment for the Vikings Solar Energy Storage Project has been prepared for the Project and the EIR will evaluate potential impacts associated with security lighting and potential glint and glare from the solar panels.

II. AGRICULTURAL AND FOREST RESOURCES.

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☒	☐	☐	☐
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or	☐	☐	☐	☒

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**
timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒

Discussion:

a) Potentially Significant Impact. According to the most recent California Department of Conservation Farmland Mapping (2018) the Project site contains: Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance and Other Land. All 18.36 acres of Prime Farmland and 236.8 acres of Farmland of Local Importance are located within parcel 050-070-018. Parcel 050-070-019 contains 0.47 acres of Farmland of Statewide Importance with the remainder being Other Land. Parcel 050-070-021 contains only Other Land. There are no Williamson Act lands within or adjacent to the project area.

The Land Evaluation Site Assessment (LESA) performed for the Project resulted in a Land Evaluation score of 21.42 and a Site Assessment score of 26.25, for a cumulative total of 47.67 points out of 100 (SWCA 2020a). Based on the California Agricultural LESA Model methodology and final score, the Project site is considered to represent a significant agricultural resource and its temporary conversion to a non-agricultural use would result in a significant impact on agricultural resources. The County Department of Agriculture provided comments on the CUP application regarding providing mitigation for the loss of this farmland. The EIR will evaluate the project's conversion of important farmland to a non-agricultural use and propose feasible mitigation, as appropriate, to reduce the impacts to less-than-significant levels.

b) No Impact. Project parcels 050-070-019 and -018 are both zoned A-2-RE (General Agriculture with Renewable Energy Overlay) and parcel 050-070-021 is zoned GS-RE (Government/Special Public Zone with Renewable Energy Overlay). Solar energy facilities are allowed with the A-2-RE and GS-RE zones, subject to a CUP. For these reasons, the proposed project would not conflict with existing zoning for agricultural use, or a Williamson Act contract. No impacts are identified for this issue area. This environmental parameter is not proposed for detailed analysis in the EIR.

c) No Impact. Neither the Project area nor surrounding areas are used for timber production or are defined as forest lands. The proposed Project would not conflict with any zoning designations designed to preserve timber or agricultural resources. No impacts are identified for this issue area. This environmental parameter is not proposed for further analysis in the EIR.

d) No Impact. There are no existing forest lands either on-site or in the Project vicinity. The proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use. Therefore, no impact would occur under this threshold. This environmental parameter is not proposed for further analysis in the EIR.

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

e) No Impact. The proposed Project does not include changes in the existing environment which, due to their location or nature, would result in the conversion of neighboring farmland to non-agricultural use. Proximate publicly owned lands include the U.S. Bureau of Land Management (BLM) Imperial Sand Dunes Recreational Area (i.e., Algodones Dunes), located approximately 12 miles to the east; BLM Hot Springs, located approximately 2 miles south of the project site (BLM 2021); and several wildlife areas and wildlife refuges located approximately 22 miles to the northwest of the Project site (California Department of Fish and Wildlife 2015). There are no publicly owned lands or other existing easements in the neighboring areas; therefore, for the purposes of this assessment, there is no protected resource land within the neighboring areas. No impacts are identified for this issue area. This environmental parameter is not proposed for further analysis in the EIR.

III. AIR QUALITY.

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:

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

Discussion:

a) Less Than Significant Impact. The Project area is located within the jurisdiction of the Imperial County Air Pollution Control District (ICAPCD), in the Salton Sea Air Basin (SSAB). The SSAB is classified by the State as a nonattainment area for ozone (O3) as well as a nonattainment area for the State standards pertaining to particulate matter less than 10 microns (PM10). In addition, the SSAB is classified as a serious nonattainment area for the PM10 standard. An air quality and greenhouse gas emission analysis has been prepared for the Project (SWCA 2021b) and the EIR will evaluate potential air quality impacts.

The ICAPCD provided comments on the CUP application regarding the need to prepare a Tier 1 Preliminary Analysis as well as other requirements. With or without the implementation of any proposed mitigation measures, the Project's emissions from both short-term construction and long-term operation are not anticipated to exceed the applicable ICAPCD thresholds of significance nor the South Coast Air Quality Management District (SCAQMD) Greenhouse Gas (GHG) annual threshold of significance, thus the Project is not anticipated to conflict with or obstruct implementation of the applicable air quality plan and impacts would be less than significant (SWCA 2021b).

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

b) Less Than Significant Impact. The SSAB is classified by the State as a nonattainment area for O3 as well as a nonattainment area for the State standards pertaining to PM10. In addition, the SSAB is classified as a serious nonattainment area for the PM10 standard. With or without the implementation of mitigation measures, the Project's emissions from both short-term construction and long-term operation are not anticipated to exceed the applicable ICAPCD thresholds of significance nor the SCAQMD GHG annual threshold of significance, thus the impacts to air quality are considered less than significant (SWCA 2021b). The EIR will evaluate Project-related increases of criteria pollutant emissions.

c and d) Less Than Significant Impact. The Project area does not contain any permanent residents or sensitive receptors. Although impacts would be less than significant, the ICAPCD CEQA Air Quality Handbook contains standard mitigation measures for construction equipment and fugitive PM10 that shall be implemented at all construction sites, as appropriate and feasible, regardless of site size. The ICAPCD CEQA Air Quality Handbook also contains discretionary measures for fugitive PM10 control that shall be implemented at non-residential construction sites greater than five acres and residential construction sites greater than ten acres. The Project is non-residential and is greater than 5 acres; therefore, all standard and discretionary measures for construction-related emissions shall apply. The Project is considered a Tier 1 project and is required to implement all standard operational mitigation measures.

Potential sources of odors during construction activities include diesel exhaust from construction equipment and diesel vehicles. These odors would not affect a substantial number of people and dissipate as a function of distance from the source. While the proposed Project's odor impact is expected to be less than significant, and the Project is not expected to expose sensitive receptors to substantial pollutant concentrations, these impacts will be further evaluated in the EIR.

IV. BIOLOGICAL RESOURCES.

Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct	☒	☐	☐	☐

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**
removal, filling, hydrological interruption, or other means?				
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion:

a) Potentially Significant Unless Mitigation Incorporated. Nine special-status plant species were identified as potentially occurring in the Project area. The occurrence potential is considered to be low to unlikely for all of these, based on habitat conditions within the project site (SWCA 2021c).

Fifteen special-status species of fauna were reported as having the potential to occur within the Project area. One special-status wildlife species was found on-site during the December 2020 survey, a western burrowing owl (Athene cunicularia) (non-nesting) (SWCA 2021c).

One mammal, the Yuma hispid cotton rat (*Sigmodon hispidus eremicus*), is considered to be unlikely to occur on the Project site, and to have a moderate potential for occurrence near the project site. Project implementation would result in the direct removal of habitat on-site. While the majority of the site is characterized as disturbed/ruderal and active agriculture with scattered areas of creosote and white bursage scrub, it could provide foraging habitat for birds and mammals, neither of which are anticipated to be directly impacted by Project construction. Because of their mobility, these animals generally move out of harm's way and thus unlikely to be injured or killed during grading and construction (SWCA 2021c).

Nesting birds could occur anywhere within or adjacent to the Project site, and as such could be directly or indirectly impacted during project construction. Pre-construction nest surveys are recommended if work is scheduled during the breeding bird season, generally considered to be from 1 February to 31 August. If found, nests must be protected either by buffer areas or timing to avoid disturbance to active nests. Impacts during operations are not anticipated. There are specific survey requirements for burrowing owls, known to nest in the vicinity (SWCA 2021c). The EIR will present the results of the Biological Resources Technical Report (SWCA 2021c) and the Aquatic Resources Technical Report (SWCA 2021d) and identify feasible mitigation measures to reduce impacts to below a level of significance.

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b) Potentially Significant Impact. Riparian vegetation consists of broadleaf cattail (*Typha latifolia*), arrow weed (*Pluchea sericea*), giant wild rye (*Arundo donax*), and saltcedar (*Tamarix* sp.). The Aquatic Resources Technical Report (SWCA 2021d) identified 2.8 acres of Wetland Waters of the U.S., 8.4 acres of Non-Wetland Waters of the U.S., 0.6 acres of non-wetland Waters of the State and 6.58 acres of CDFW Jurisdictional Streambed in the project area. While the layout has been designed to avoid all drainages, wetlands, and riparian habitats in the immediate vicinity, the current location of the battery storage component could result in potential impacts to unnamed Reservoir Number 3 which has 0.836 acres of CDFW Jurisdictional Streambed. Thus, there would be Potentially Significant impacts.

c) Potentially Significant Impact. The Project site contains 6.508 acres (3,020 linear feet) of CDFW jurisdictional streambed and 2.872 acres (2,420 linear feet) of Waters of the U.S. However, these areas would be avoided and there would be no impact. The Project layout has been designed to avoid all drainages, wetlands, and riparian habitats in the immediate vicinity. However, the current location of the battery storage component could result in potential impacts to unnamed Reservoir Number 3 which has 0.836 acres of CDFW Jurisdictional Streambed. Indirect impacts to drainages may result from erosion and stormwater flows from the Project site into drainages below the project elevation. However, the Project proponent will be required to prepare a storm water pollution prevention plan (SWPPP) which will include best management practices (BMPs) to avoid and/or control site runoff, sedimentation and erosion. These measures should be sufficient to prevent impacts to aquatic resources (SWCA 2021d).

d) Less Than Significant Impact. The Project site currently provides unrestricted wildlife movement for animals of all sizes within the property. There are no federal, state, or local parks or designated wildlife corridors or conservation areas on or adjacent to the subject property. Similarly, there are no U.S. Fish and Wildlife (USFWS)-designated critical habitat or Habitat Conservation Plan and no California Department of Fish and Wildlife (CDFW) Natural Community Conservation Plan at or adjacent to the Project site. The Project will not interfere substantially with the currently restricted movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites (SWCA 2021c). Thus, the impact would be less than significant.

e) Potentially Significant Unless Mitigation Incorporated. The Imperial County General Plan Open Space and Conservation Element (County of Imperial 2016) contains an Open Space Conservation Policy that requires detailed investigations to be conducted to determine the significance, location, extent, and condition of natural resources in the County, and to notify any agency responsible for protecting plant and wildlife before approving a project which would impact a rare, sensitive, or unique plant or wildlife habitat. As noted above, implementation of the Project has the potential to result in significant impacts to candidate, sensitive, or special status species, and washes and ephemeral streams. Such impacts could conflict with Open Space and Conservation Element and are considered potentially significant.

f) No Impact. The Project Area is not located within an area that is subject to a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. No impact would occur.

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**
V. CULTURAL RESOURCES.				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to State CEQA Guidelines § 15064.5?	☒	☐	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☒	☐	☐	☐

Discussion:

a, b, and c) Potentially Significant Impact. A confidential records search of the California Historical Resources Information System (CHRIS), a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC), archival research, and a pedestrian field survey were used to evaluate the presence or likelihood of the presence of cultural resources within the Project area. A record search conducted by the SCIC identified 50 previously recorded resources within a 0.8- km (0.5-mile) radius of the Project area. Of these 50 resources, three are mapped within the Project area itself. The search of the SLF maintained by the NAHC was negative within the Project area (SWCA 2021e). The NAHC noted that negative results may not indicate the absence of Native American cultural resources in the area and provided a contact list of 16 Native American tribal organizations that may have knowledge of cultural resources in or near the study area. The County, as lead agency, is conducting its own Native American consultation for the Project, as part of its AB 52 responsibilities.

The locations of the three previously recorded resources were investigated but two of them (P-13-000304/CA-IMP-304 and P-13-003213/CA-INY-3213) were unable to be relocated. Both are presumed either misplotted or destroyed. As a consequence, the two resources will not be impacted by the Project (SWCA 2021e).

The third previously recorded resource (P-13-008333/CA-INY-7835) is the East Highline Canal, which has been previously recommended eligible for the California Register of Historical Resources (CRHR). It therefore qualifies as a historical resource under CEQA, and any adverse impacts to the resources could constitute a significant impact on the environment. This resource will be left in place and avoided and as a consequence will not be impacted by the Project (SWCA 2021e).

Project-related ground disturbing activities could cause a substantial adverse change in a historical or archaeological resource. Although unlikely, there is a potential for unknown human remains to be unearthed during earthwork activities. Therefore, a potentially significant impact is identified for these resources. The findings of the cultural resources report will be included in the EIR analysis and feasible mitigation measures identified that would avoid or reduce significant impacts to below a level of significance.

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**
VI. ENERGY.				
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

Discussion:

a) Less Than Significant. No wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation would occur. This is considered a less than significant impact and will be further evaluated in the EIR.

b) No Impact. Construction of the Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and no impacts would occur under this criteria.

VII. GEOLOGY AND SOILS.				
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:				
1) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☒	☐
2) Strong seismic ground shaking?	☐	☒	☐	☐
3) Seismic-related ground failure, including liquefaction?	☐	☒	☐	☐
4) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☒	☐	☐

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

Discussion:

a.1) Less Than Significant Impact. The Project area is located in southern California, an area known to be geologically active, and which is subject to seismic events. The Project site does not lie within a currently delineated State of California, Alquist-Priolo Earthquake Fault Zone (Landmark Consulting 2021). Well-delineated fault lines cross through this region as shown on California Geological Survey [CGS] maps; however, no active faults are mapped in the immediate vicinity of the site. Therefore, active fault rupture is unlikely to occur at the Project site. However, because of the high tectonic activity and deep alluvium of the region, the potential for surface rupture cannot be precluded on undiscovered or new faults that may underlie the site. A soils and geology report was prepared for the Project (Terraphase Engineering, 2019) and will be discussed in the EIR. The EIR will evaluate the potentially significant adverse impacts related to seismicity, fault-rupture and ground failure.

a.2) Potentially Significant Impact Unless Mitigation Incorporated. The Project site is located in the seismically active Imperial Valley of southern California with numerous mapped faults traversing the region including the San Andreas, San Jacinto, and Elsinore Fault Zones in southern California. The Imperial fault represents a transition from the more continuous San Andreas fault to a more nearly echelon pattern characteristic of the faults under the Gulf of California). A search of known faults or seismic zones that lie within a 62- mile (100-kilometer) radius of the Project site was conducted. The criterion for fault classification adopted by the CGS defines Earthquake Fault Zones along Holocene-active or pre-Holocene faults. Earthquake Fault Zones are regulatory zones that address the hazard of surface fault rupture. A Holocene-active fault is one that has ruptured during Holocene time (within the last 11,700 years). A pre-Holocene fault is a fault that has not ruptured in the last 11,700 years. Pre-Holocene faults may still be capable of surface rupture in the future, but are not regulated by the Alquist-Priolo act (Landmark Consulting, 2021).

A review of the current Earthquake Fault Zone maps indicates that the nearest zoned fault to the Project site is the Rico fault located approximately 7.1 miles west and the Imperial fault located approximately 7.9 miles west to southwest. The primary seismic hazard at the Project site is the potential for strong groundshaking during earthquakes along the Rico, Imperial and Brawley Faults (Landmark Consulting 2021).

a.3) Potentially Significant Unless Mitigation Incorporated. Liquefaction is the loss of soil strength from sudden shock (usually earthquake shaking), causing the soil to become a fluid mass. Liquefaction describes a

phenomenon in which saturated soil loses shear strength and deforms as a result of increased pore water pressure induced by strong ground shaking during an earthquake. Dissipation of the excess pore pressures will produce volume changes within the liquefied soil layer, which can cause settlement. Shear strength reduction combined with inertial forces from the ground motion may also result in lateral migration (lateral spreading). Factors known to influence liquefaction include soil type, structure, grain size, relative density, confining pressure, depth to groundwater (typically occurs in the upper 50 feet), and the intensity and duration of ground shaking. Soils most susceptible to liquefaction are saturated, loose sandy soils and low plasticity clay and silt (Landmark Consulting 2021).

Groundwater at the project site is likely to be present at the interface between surface sands and underlying clays. There is uncertainty in the accuracy of short-term water level measurements, particularly in fine grained soil. The referenced groundwater levels should not be interpreted to represent permanent condition. Groundwater levels may fluctuate with precipitation, East Highline Canal water stage, site watering, drainage, and site grading (Landmark Consulting 2021).

The soils encountered at the points of exploration included saturated sands and silty sands that could liquefy during a Maximum Considered Earthquake. Liquefaction can occur within a three-foot thick sand layer at a depth of 26 feet below ground surface and two isolated silt and sand layers at depths of 15 and 42 feet. The likely triggering mechanism for liquefaction appears to be strong ground shaking associated with the rupture of the Rico and Imperial faults (Landmark Consulting 2021).

Liquefaction Induced Settlements. Based on empirical relationships, total induced settlements are estimated to be about ½ inch should liquefaction occur. Differential settlement is estimated at be two-thirds of the total potential settlement in accordance with *California Special Publication 117*. Accordingly, there is a potential for ⅓ inch of liquefaction induced differential settlement at the Project site. The differential settlement based on seismic settlements is estimated at 1 inch over a distance of 100 feet. Foundations should be designed for a maximum deflection of L/720. Because of the depth of the liquefiable layer, the 15 foot thick non-liquefiable layer may act as a bridge over the liquefiable layer resulting in a fairly uniform ground surface settlement; therefore, wide area subsidence of the soil overburden would be the expected effect of liquefaction rather than bearing capacity failure of the proposed structures (Landmark Consulting 2021).

Liquefaction Induced Ground Failure. Small ground fissure or sand boil formation is unlikely because of the thickness of the overlying unliquefiable soil. Sand boils are conical piles of sand derived from the upward flow of groundwater caused by excess porewater pressures created during strong ground shaking. Sand boils are not inherently damaging by themselves, but are an indication that liquefaction occurred at depth. Liquefaction induced lateral spreading is not expected to occur at this site due to the planar topography. If the liquefiable layer lies at a depth greater that about twice the height of a free face, lateral spread is not likely to develop. No slopes or free faces occur at this site except for the shallow retention basin, which depths are substantially above the first liquefiable layer (Landmark Consulting 2021).

a.4) Less Than Significant. The hazard of landsliding is unlikely due to the regional planar topography. No ancient landslides are shown on geologic maps of the region and no indications of landslides were observed during site investigations (Landmark Consulting 2021).

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

b) Potentially Significant Impact Unless Mitigation Incorporated. The Project would result in changes to the current topography because of grading and site preparation activities. Although these changes will be designed to meet stringent regulatory requirements, there is a potential for soil erosion, loss of topsoil, and geologic instability. The EIR will evaluate these potentially significant adverse impacts.

c) Potentially Significant Impact Unless Mitigation Incorporated. As discussed in a. 3 and 4, the proposed Project risk for on- or off-site landslide, lateral spreading, subsidence, or collapse are expected to be less than significant. However, the proposed Project risk for on- or off-site liquefaction are expected to be potentially significant unless mitigation is incorporated. These issues will be addressed in the EIR.

d) Less Than Significant Impact. Expansive soils are characterized by their ability to undergo significant volume change (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from rainfall, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors, and may cause unacceptable settlement or heave of structures, concrete slabs supported-on-grade, or pavements supported over these materials. Depending on the extent and location below finished subgrade, expansive soils can have a detrimental effect on structures. The near surface soils in the Project site are sands which are considered non-expansive. The EIR will evaluate the potential impacts related to expansive soils.

e) No Impact. A septic system and leach field are not proposed as part of the Project. No impacts are expected.

f) Less Than Significant Impact. Geologic mapping shows the surficial geology of the Project area consists of alluvial, lacustrine, and eolian deposits that date from recent times to the late Pleistocene. The Los Angeles County Museum (LACM) records search indicates the museum has a number of localities in similar sediments in the vicinity of the project area. A review of the scientific literature provided context for these and other fossil discoveries. Project activities would entail grading and trenching, which could impact sediments with high paleontological potential in the subsurface. Regulatory compliance and adherence to these measures will reduce impacts of the project on paleontological resources to a less-than-significant level as required by CEQA. Thus, potential impacts to paleontological resources would be less than significant.

VIII. GREENHOUSE GAS EMISSIONS.

Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan or policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Discussion:

a) Less Than Significant. Greenhouse gases (GHGs) emitted by human activity are implicated in global climate change or global warming. The principal GHGs are Carbon Dioxide (CO2), Methane (CH4), Nitrous Oxide (N2O), and Fluorinated Gases. The transportation sector (e.g., on-road motor vehicles, off-highway vehicles, aircraft) is

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the single largest source of GHG emissions and accounts for one-half of GHG emissions globally. With or without the implementation of the proposed mitigation measures, the Project's emissions from both short-term construction and long-term operation do not exceed the applicable ICAPCD thresholds of significance nor the SCAQMD GHG annual threshold of significance, thus the impacts to air quality are considered less than significant (SWCA 2021b). Construction emissions would not exceed the 3,000 MT CO2E annual threshold of significance. Therefore, the Project's direct and indirect GHG emissions would have a less than significant impact on the environment.

b) Less Than Significant. The Project would not conflict with any local or state plan, policy, or regulation aimed at reducing GHG emissions from land use and development. Thus, impacts would be less than significant.

IX. HAZARDS AND HAZARDOUS MATERIALS.

Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the Project Area?	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

Discussion:

a) Less Than Significant Impact. The Project area is characterized as an agricultural and open desert area that is currently vacant. The proposed Project would require the limited transport, storage, and use of fuels, and other fluids for the fueling/servicing of construction equipment.

Transportation, storage, and disposal/recycling of such products are extensively regulated at the local, state and federal levels. Construction and operations will be required to be in compliance with these regulations. The hazardous materials handled onsite would be limited to small amounts of everyday use cleaners and common chemicals used for maintenance. The applicant will be required to comply with State laws and County Ordinance restrictions, which regulate and control hazardous materials handled on-site. Such hazardous waste would be transported off-site for disposal according to applicable State and County restrictions and laws governing the disposal of hazardous waste during construction and operation of the project. Disposal of hazardous wastes on the Project site is not proposed. However, these issues will be addressed in the EIR. The Imperial County Department of Environmental Health did not have any comments on the proposed Project in their letter on the CUP application.

b) Less Than Significant Impact. Based on a search of the Government Code Section 65962.5 "Cortese" list, there are no hazardous materials sites listed on the Cortese Knox list. According to the State Water Resources Control Board, there are no Underground Storage Tanks in the vicinity of the landfill. This Phase I ESA revealed the following recognized environmental conditions (REC's) in connection with the property:

- There is a potential of buried asbestos concrete (transite) pipe existing onsite for irrigation water distribution piping. The pipe material is only considered "friable" when disturbed. The piping material is not required to be removed, but if disturbed, requires proper handling with respiratory protection and if removed should be properly disposed by a qualified ACM abatement contractor.

- Old tires, household debris and concrete debris piles are found in the western portion of the subject site. This debris should be cleaned up and properly disposed.

This assessment has revealed the following "de minimis" environmental conditions (REC's) in connection with the property:

- Pesticide residues (low concentrations) typical to agricultural crop applications are present in the near surface soils.

- Pole-mounted sealed electrical transformers owned and maintained by the Imperial Irrigation District (IID) exist on this subject property. All IID transformers containing PCB's have been replaced. If the transformers begin to leak, the IID should be notified, and the transformers replaced. (GS Lyon 2021).

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

c) No Impact. Construction of the proposed Project would not emit hazardous emissions, handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. The nearest school, Holtville Middle School, is located 6 miles west of the Project site. No impacts would occur, and this environmental parameter is not proposed for further analysis in the EIR.

d) No Impact. Based on a search of the Government Code Section 65962.5 "Cortese" list, there are no hazardous materials sites listed on the Cortese Knox list. While no impacts are anticipated to occur, this environmental parameter will be further discussed in the EIR (GS Lyon 2021).

e) Less Than Significant Impact. The nearest airport to the Project site is the Holtville Airport located less than 2 miles north of the project site. The Holtville Airport consists of a long and wide runway, but it has essentially no other facilities. There are no hangars or other significant structures on the property. According to the *Imperial County Airport Land Use Commission (ALUC) Compatibility Plan* (Imperial County 1996), the Project parcels are outside the compatibility zones of the Holtville Airport. The Project site is approximately 1.4 miles south of the boundary line of Compatibility Zone C. Nonetheless, the EIR will determine whether the height of the any of the proposed components will require notification in accordance with Federal Aviation Administration (FAA) requirements.

f) Potentially Significant Impact Unless Mitigation Incorporated. Construction of the Project would generate construction trips and the potential for temporary roadway lane closures during construction of proposed traffic improvements, which could temporarily affect an emergency response or evacuation plan. This impact is considered potentially significant and will be addressed in the EIR.

g) Less than Significant. The Project site is located in the unincorporated area of Imperial County. According to the Seismic and Public Safety Element of the General Plan, the potential for a major fire in the unincorporated areas of the County is generally low (County of Imperial, n.d.). This is considered a less than significant impact and will be addressed in the EIR

X. HYDROLOGY AND WATER QUALITY.

Would the project:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces in a manner which would:				

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**
1) Result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
2) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☒	☐
3) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional resources of polluted runoff; or	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

Discussion:

a) Potentially Significant Impact Unless Mitigation Incorporated. Construction of the Project facilities would involve excavation, soil stockpiling, grading, and the installation of solar arrays and access roads. There are multiple construction related activities that could have potential direct or indirect impacts on the water quality of local surface water features and shallow groundwater resources including; sedimentation, erosion, handling hazardous materials, and dewatering. Disturbing the geomorphic characteristics and stability of the channel bed and banks may initiate chronic erosion in natural and engineered channels thereby resulting in increased turbidity. A similar circumstance could occur upon decommissioning of the Project prior to site restoration. In both cases, such impacts could be exacerbated if surface vegetation is not reestablished and stabilized prior to the next high-flow or precipitation event and could result in significant direct impacts within the immediate vicinity of construction and indirect impacts on water quality further downstream. This is considered a significant impact. The Imperial Irrigation District provided a comment letter on the CUP application addressing potential impacts to IID drains from project runoff.

Hazardous materials associated with construction would be limited to substances associated with mechanized equipment, such as gasoline and diesel fuels, engine oil, and hydraulic fluids. If precautions are not taken to contain contaminants, accidental spills of these substances during construction could produce contaminated stormwater runoff (nonpoint source pollution), a major contributor to the degradation of water quality in surface waters. Without proper containment and incident response measures in place, the operation of construction equipment could result in significant direct and indirect impacts on water quality. This is considered a significant impact.

Construction of the Project could, at times, also require dewatering of shallow, perched groundwater in the immediate vicinity of excavations and installation of underground features at a limited number of areas where groundwater depths are shallow. Groundwater withdrawn from the construction areas could be subsequently discharged to local drainage ditches or via land application. These discharges may contain sediments, dissolved solids, salts, and other water quality constituents found in the shallow groundwater, which could degrade the

quality of receiving waters. Degradation of local receiving waters from the introduction of shallow groundwater during construction dewatering could result in a significant impact on receiving waters. This is considered a significant impact.

Post-construction runoff from the constructed facilities would carry two main water quality impacts that could impact surface water drainages and drains. The first is caused by an increase in the type and quantity of pollutants in storm water runoff. As runoff flows over developed surfaces, water can entrain a variety of potential pollutants including, but not limited to, oil and grease, pesticides, trace metals, and nutrients. These pollutants can become suspended in runoff and carried to receiving waters. These effects are commonly referred to as non-point source water quality impacts.

Long-term operation of the solar facility poses a limited threat to surface water quality after the completion of construction. The Project would be subject to the County's Grading Regulations as specified in Section 91010.02 of the Ordinance Code. However, since the Project site is located in unincorporated Imperial County and not subject to a Municipal Separate Storm Sewer System (MS4) or National Pollutant Discharge Elimination System (NPDES) General Industrial Permit, there is no regulatory mechanism in place to address post construction water quality concerns. Based on this consideration, the Project has the potential to result in both direct and indirect water quality impacts that could be significant. Long-term point discharges from the Project would be minimal; however, reductions in water quality could occur where the water released is of lower quality than ambient conditions. These discharges would be infrequent, but could include landscape irrigation, uncontaminated pumped ground water, and discharges of potable water during water tank cleaning [as defined in 40 CFR 35.2005(21)]. In this context, long-term water quality impacts from point sources would be less than significant.

The second potential impact from post-construction runoff is a potential increase in the quantity of water delivered to adjacent or nearby water bodies during storms, referred to as hydromodification. Increased impervious surfaces from surfaces such as asphalt, concrete, and other compacted surfaces can interrupt the natural cycle of gradual percolation of water through vegetation and soil. Instead, large volumes of water runoff collects and is routed to drainage systems where it is discharged to the nearest receiving water. This process can contribute to stream bank scouring and downstream flooding, resulting in impacts on aquatic life and damage property. For these reasons, the Project could result in on- and off-site discharges that could indirectly impact downstream surface waters by increasing drain scour and/or sedimentation. Therefore, this indirect impact is considered significant.

b) Less than Significant. Groundwater recharge in the area will not be significantly affected because of the fact that the majority of the Project site will feature a pervious landscape in both the existing and proposed conditions. Retention basins will also provide infiltration and groundwater recharge. During the construction phase, a significant amount of construction dewatering is not expected to be required. Potential construction that may require dewatering includes footings and foundations for the Project substation and overhead collection system poles. Dewatering associated with these portions of construction will be localized to transmission pole locations or the substation and will not result in a significant decrease in production rates of existing or planned wells. In the post construction condition, no pumping of groundwater is anticipated. Groundwater at/near the Project site is not used for beneficial uses, such as municipal, domestic, or industrial supply. Water needs would be provided by adjacent Imperial Irrigation District (IID) Canals and are expected to be much less than the needs of the existing

agricultural land. As a result, no significant impacts on groundwater levels are expected. Potential impacts to groundwater resources are expected to be less than significant and will be addressed in the EIR.

c.1), c.2) and c.3) Less Than Significant Impact. The proposed drainage patterns and general drainage system would be similar to the existing site conditions. Drainage from the construction zone would be routed to the detention basins for detention and infiltration. The remainder of the site would follow existing drainage patterns with storm flows conveyed toward existing IID Drains. Because of the postponement of agricultural irrigation during the life of the Project, it is anticipated that the annual runoff from the project site would decrease when compared to the existing condition, which is similar to when agricultural fields are fallowed and/or abandoned. Therefore, the proposed Project would result in no significant impacts associated with the alteration of drainage patterns resulting in substantial erosion or siltation on or off site.

Existing drainage patterns would not be substantially altered because of the proposed Project. The majority of the site would sheet flow through the pervious native soils, toward the shallow ponding areas. Peak flow runoff from the Project would be collected in shallow ponding areas. The Project facilities would be designed in anticipation of this ponding, and there is no potential for increased flooding onsite or in offsite IID drains. Because of the use of infiltration, it is anticipated that the annual runoff from the Project site would decrease when compared to the existing condition. The Project will be designed to meet County of Imperial storage requirements for storm water runoff, which will result in an impoundment of runoff in excess of the anticipated volume of runoff to be generated by the 100-year storm event. Therefore, the proposed Project would result in no significant impacts associated with the alteration of drainage patterns resulting in on- or off-site flooding.

Under proposed conditions, the existing drainage characteristics of the Project site would remain substantially the same. To retain the total volume of a 3-inch precipitation covering the solar energy facility site with no reduction from infiltration, storm water retention basins would be constructed on the solar energy facility site. Because of the implementation of infiltration, it is anticipated that the annual runoff from the Project site would decrease when compared to the existing condition. Therefore, the proposed project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. This is considered a less than significant impact.

d) Less Than Significant Impact. In recognition of the Project site's inland location, the threat of tsunamis or seiche originating from the Salton Sea is considered negligible. The topography within the vicinity of Project site is generally level and, therefore, the hazard of mudflows adversely affecting the Project facilities is very low. For this reason, no significant impact would occur.

e) Less than Significant. The Project area is located within the Colorado River Hydrologic Region, which includes the lower Colorado River system; the Salton Sea drainage system; and several internal basins. The Project site lies within the Salton Sea watershed southeastern portion of the irrigated portion of the Imperial Valley. Imperial County is a desert region with less than six inches of rainfall per year, but rainfall can be concentrated and lead to flooding. Most of the surface-water supplies in the area are a result of irrigation from the Colorado River. The water is diverted from the Colorado River at the Palo Verde Weir north of Blythe by the Palo Verde Irrigation District for use in the Palo Verde Valley of northeast Imperial County and southeast Riverside County; and at the Imperial Dam into the All-American Canal by the IID and the Bard Irrigation District for use in the Imperial, Yuma, Bard, and Coachella Valleys. The IID manages over 3,000 miles of canals and drains in the

area and is the largest irrigation district in the United States. Since 1942, the area has received its water through the All-American Canal, which runs 82 miles from the Imperial Dam on the Colorado River west to agricultural areas and cities in the Imperial Valley. The 82-mile All-American Canal has several main canals that branch off, including the Westside Main canal. These three canals supply water service to Imperial Valley and are operated and maintained by IID. The IID serves irrigation water and electric power to farmers and residents in the lower southeastern portion of California's desert.

The EIR will identify regional and local hydrology and summarize federal, state, and local laws, policies, and regulations that are applicable to the Project.

XI. LAND USE AND PLANNING.

Would the project:

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

Discussion:

a) No Impact. The Project site is located in a sparsely populated, agriculturally zoned portion of eastern Imperial County. The Project site is surrounded by agricultural lands to the west and open desert to the north, south, and east. There are no established residential communities located within or in the vicinity of the Project site. The County Department of Public Works (DPW) provided comments on the CUP letter that were mostly related to preserving the County's survey monuments as well as a desire to see lot tie agreements since the APNs are owned by multiple land owners. Construction of the Project would not divide an established community; no impact would occur, and this environmental parameter is not proposed for further analysis in the EIR.

b) No Impact. Project parcels 050-070-019 and 050-070-018 are both zoned A-2-RE (General Agriculture with Renewable Energy Overlay) and parcel 050-070-021 is zoned GS-RE (Government/Special Public Zone with Renewable Energy Overlay). All parcels are located within the Renewable Energy Overlay Zone. Project parcels 050-070-019 and 050-070-018 are both designated by the General Plan as Agriculture and parcel 050-070-021 is Recreation/Open Space. The current land use is idle land and agriculture. The Project would not conflict with any applicable land use plan, policy, or regulation. There are no adopted habitat conservation plans or natural community conservation plans encompassing the Project site therefore there is no potential for the Project to conflict with any land use plan, policy or regulation. The EIR will evaluate the existing and proposed land uses, land use designations and zone classifications within the Project site and the surrounding area to identify the proposed Project's consistency with the goals, objectives, policies and programs of each General Plan Element. The proposed Project's compatibility with relevant goals, policies, and programs of the General Plan will be presented in a General Plan Consistency Analysis (included as an Appendix to the EIR) and in each resource section of the EIR.

XII. MINERAL RESOURCES.

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☒	☐
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☒	☐

Discussion:

a, b) Less Than Significant Impact. According to Figure 8: Imperial County Existing Mineral Resources of the Conservation and Open Space Element of the General Plan (County of Imperial 2016), the Project site appears to be near sand and gravel, construction mines. Given this information, the EIR will evaluate whether the Project would result in the loss of availability of a known mineral resource.

XIII. NOISE.

Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion:

a and b) Less Than Significant Impact. There are no sensitive receptors within one mile of the Project site. Construction would be performed in discrete steps, each of which has its own mix of equipment, and consequently its own noise characteristics. These various sequential phases would change the character of the noise generated on site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase.

Construction of the proposed Project would require the use of earthmovers, bulldozers, loaders, scrapers, cranes, forklifts, pile drivers, water trucks, and pickup trucks. This equipment would be used on the Project site. The maximum noise level generated by each earthmover on the Project site is assumed to be 88 dBA Lmax at 50 feet from the earthmover. Each bulldozer would also generate 88 dBA Lmax at 50 feet. The maximum noise level

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

generated by water and pickup trucks is approximately 86 dBA Lmax at 50 feet from these vehicles. While full sized pile drivers can generate noise levels in excess of 96 dBA Lmax, the post driver required for the solar panel mounts would generate noise levels of 85 to 88 dBA Lmax. Each doubling of a sound source with equal strength increases the noise level by 3 dBA. As each piece of construction equipment operates as an independent noise source, the combined noise level during construction would be 91 dBA Lmax at a distance of 50 feet.

The variation in power and usage of the various equipment types creates complexity in characterizing construction noise levels. The estimated composite site noise level is based on the assumption that all equipment would operate at a given usage load factor, for a given hour (i.e., front end loaders are assumed to be used for up to 40 percent of 1 hour, or 24 minutes), to calculate the composite average daytime hourly Leq. Using a conservative load factor of 40 percent for all on-site equipment, the average noise level at the existing residence would be 73 dBA Leq. This noise level would not exceed the County's 75 dBA Leq construction noise threshold. Furthermore, the project must comply with County standards regarding construction hours (i.e., construction limited to normal weekday working hours, 7 a.m. to 7 p.m., Monday through Friday). Therefore, impacts from construction noise are considered less than significant.

Traffic noise associated with construction of the proposed Project is not anticipated to be a significant source of noise. Traffic noise is not greatly influenced by lower levels of traffic, such as those associated with the proposed Project's construction effort. For example, traffic levels would have to double in order for traffic noise on area roadways to increase by 3 dBA. The proposed Project's construction traffic on area roadways would increase hourly traffic volumes by much less than double; therefore, impacts from traffic noise are considered less than significant.

c) No Impact. The proposed Project is located within the vicinity of the Holtville Airport, which is located two (2) miles north of the Project site. According to the *Imperial County Airport Land Use Commission (ALUC) Compatibility Plan* (Imperial County, 1996), the project parcels are outside the compatibility zones of the Holtville Airport. The Project site is approximately 1.4 miles south of the boundary line of Compatibility Zone C. As discussed above the noise level would not exceed the County's 75 dBA Leq construction noise threshold. Furthermore, the Project must comply with County standards regarding construction hours (i.e., construction limited to normal weekday working hours, 7 a.m. to 7 p.m., Monday through Friday). Therefore, impacts from construction noise are considered less than significant. For these reasons, the Project would not expose people residing or working in the area to excessive noise levels; therefore, no impact would occur, and this environmental parameter is not proposed for further analysis in the EIR.

XIV. POPULATION AND HOUSING.

Would the project:

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

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion:

a) No Impact. The County Executive Office provided comments on the CUP application related to the development of a fiscal and economic impact analysis and The Project would not result in any full-time employees on the site at the conclusion of construction. Thus, there would be no unplanned population growth in the Project vicinity. There would be no impact and this environmental parameter is not proposed for further analysis in the EIR.

b) No Impact. There are no year-round residents within the Project area. The proposed Project would not result in the displacement of any residents. There would be no impact and this environmental parameter is not proposed for further analysis in the EIR.

XV. PUBLIC SERVICES.

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

Fire protection?	☐	☒	☐	☐
Police protection?	☐	☒	☐	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion:

Fire and Police) Potentially Significant Impact Unless Mitigation Incorporated. Fire protection services are provided to the Project area by the County of Imperial Fire Department through the Holtville Fire Department Station, located in the City of Holtville approximately 6.5 miles to the west.

The County of Imperial Sheriff's Department provides law enforcement to the Project area. Sheriff's officers that patrol the project area are based at the Holtville Police Department in the City of Holtville located approximately 6.5 miles west of the Project area.

The County Fire Department provided a comment letter on the CUP application related to the need for additional full time equivalents and new fire apparatus as a result of the Project. The County Executive Officer also provided a comment letter outlining the for a Development Agreement or a Public Benefit Agreement. The County of Imperial has a Development Impact Fee (DIF) which is authorized by County of Imperial Ordinance No. 4.32. This fee is applied to all development projects in incorporated and unincorporated County of Imperial land. Payment of the DIF is required of developers to fund public facilities such as fire protection facilities and sheriff facilities. When the Project is constructed, DIF fees will be required to ensure that resources will be available for capital

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

improvements to implement the County's capital and operational funding of future facilities. Potential impacts on fire and police services could be potentially significant and will be evaluated in the EIR.

Schools, Parks, and Other Public Facilities) No Impact. Construction of the Project would not include the provision of, or the need for, new schools, parks or other public facilities. The Project would not result in new long-term housing. There would not be a permanent increase in the population. Because the Project would not result in a substantial increase in population, it does not require additional schools, parks, or other public facilities beyond that which already exists. No physical impacts related to the provision of schools, parks, or other facilities would occur and this environmental parameter is not proposed for further analysis in the EIR.

XVI. RECREATION.

Would the project:

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion:

a, and b) No Impact. There are no existing neighborhood or regional parks within the Project area. The proposed Project would not result in an increase in the population of the area. There would be no impact to recreation and this environmental parameter is not proposed for further analysis in the EIR.

XVII. TRANSPORTATION / TRAFFIC.

Would the project:

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Would the Project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☒	☐	☐	☐

Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

Discussion:

a) Less than Significant. Construction of the Project is anticipated to be consistent with the County of Imperial General Plan and is not anticipated to conflict with a program, plan, ordinance or policy addressing roadway, transit, bicycle or pedestrian facilities. Construction of the Project would temporarily increase the number of vehicle trips in the area and the number of on-site personnel. However, these increases are not expected to be substantial. Project conflicts with applicable programs, plans, ordinance or policies addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities will also be addressed in the EIR.

b) Less Than Significant. A transportation impact analysis (TIA) was prepared to determine and evaluate traffic impacts on the local circulation system due to construction of the Project. construction traffic would not result in congestion and excessive delays at study intersections and roadways. In compliance with Senate Bill 743 (SB 743) and CEQA Section 15064.3b, the TIA included an assessment of Project-related changes in vehicle miles traveled (VMT) compared to existing conditions. The Office of Planning and Research (OPR) provides screening criteria that allow small projects (from a traffic standpoint) to screen out of a detailed VMT analysis based on the number of daily trips it generates. Projects that generate fewer than 110 trips per day can be presumed to result in less than significant VMT impacts.

The proposed Project would be remotely controlled. No employees would be based at the Project site. Security related monitoring would be done remotely. Personnel may conduct unscheduled security rounds, and maintenance workers may access the site periodically to clean the panels and maintain the equipment and project area. The public would not have access to the facility. Thus, the Project will not generate more than 110 trips per day. Therefore, the Project meets the small project screening criteria, and it will not have significant VMT impact (Kittleson and Associates, 2021).

c) Less Than Significant Impact. The Project site would include one primary access driveway, currently contemplated on Nelson Pit Road, bisecting the Project area and a secondary access driveway (if required) with a location that is yet to be determined. This driveway would be provided with a minimum of 30-foot double swing gates with a “Knox Box” for keyed entry. Internal to the Project site, up to 30-foot-wide roads would be provided between the crystalline solar photovoltaic arrays, as well as around the perimeter of each Project site inside the perimeter security fence to provide access to all areas of each site for maintenance and emergency vehicles. Design features that would result in transportation-related hazards or safety concerns are not anticipated (Kittleson and Associates, 2021).

d) Potentially Significant. Construction of the Project would generate construction trips and the potential for temporary roadway lane closures exists. It is anticipated that emergency access would be maintained at all times, and appropriate detours would be provided, as necessary. Nonetheless, impacts related to emergency access are considered potentially significant and will be addressed in the EIR.

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

XVIII. TRIBAL CULTURAL RESOURCES.

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

a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☒	☐	☐	☐
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☒	☐	☐	☐

Discussion:

a) and b) Potentially Significant. In compliance with Assembly Bill 52 (Chapter 532, Statutes 2014), the ICPDSD sent letters to one (1) California Native American Tribe on March 26, 2021, providing notification of the Project and an invitation to participate in consultation. Under AB-52, California Native American Tribes have 30 days from the date of receipt of the notice to request consultation. On April 8, the Quechan Tribe Historic Preservation Officer requested consultation with the County. Results of any Native American consultation will be included in the EIR. As discussed under Response to Item V. Cultural Resources, implementation of the Project could have potentially significant impacts to archaeological resources, which could be considered a significant resource to a California Native American tribe.

XIX. UTILITIES AND SERVICE SYSTEMS.

Would the project:

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☒	☐	☐

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**
c) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion:

a) Less Than Significant Impact. Water for construction (primarily dust control) would be obtained from local 11D irrigation canals or laterals in conformance with IID construction water acquisition requirements. Water would be picked up from a nearby lateral canal and delivered to the construction location by a water truck which would be capable of carrying approximately 4,000 gallons per load. It is estimated that up to 275 acre-feet of water would be needed for site grading and dust control over the expected Project construction period. The IID provided a comment letter on the CUP application regarding the acquisition of a water supply agreement for the Project. Potable drinking water will be obtained for the duration of the Project from a state-approved provider. Therefore, the proposed Project would not require or result in the construction of new water treatment facilities or expansion of existing facilities. This is considered a less than significant impact.

b) Potentially Significant Impact Unless Mitigation Incorporated.

Construction

As described in the Project Description, construction of the Project would take up to 11 months. Water for construction (primarily dust control) would be obtained from local 11D irrigation canals or laterals in conformance with IID construction water acquisition requirements. Water would be picked up from a nearby lateral canal and delivered to the construction location by a water truck which would be capable of carrying approximately 4,000 gallons per load. It is estimated that up to 275 acre-feet of water would be needed for site grading and dust control over the expected Project construction period. The IID provided a comment letter on the CUP application regarding the acquisition of a water supply agreement for the Project. Potable drinking water will be obtained for the duration of the Project from a state-approved provider.

Operations and Maintenance

Panel washing and operational water required for O&M of the project will be provided by IID. Up to three 10,000 gallon fire water tanks would be constructed across the solar energy facility site and kept filled during operations for on-site fire protection. Water will also be used for periodic cleaning of the solar PV panels. It is anticipated that the solar PV panels will be washed up to two times per year to ensure optimum solar absorption by removing dust

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

particles and other buildup. Water for washing the PV modules, if required, would be purchased from the IID and delivered to the project site by water trucks. The volume of water to be used for PV module washing and dust control, if needed, is estimated at up to 10 acre-feet per year.

Decommissioning

Water may also be required during decommissioning of the Project and site restoration at the end of the Project's life. Total water demand during decommissioning is estimated to be 50 AF.

Total and Annual Water Demand

A Water Supply Assessment would be prepared in accordance with SB-610. The Water Supply Assessment would determine the anticipated water demand for construction, operation, and decommissioning of the Project.

c, d, and e) No Impact. Relatively small amounts of trash would be generated during construction from packaging materials delivered to the site. Construction related waste would be transported to a local landfill authorized to receive this waste for disposal. Portable toilets would be located on-site during construction and sanitary waste would be removed from the site by a local contractor. Impacts associated with water quality will be addressed in the EIR under the Hydrology/Water Quality section.

XX. WILDFIRE.

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

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

	Potentially Significant Impact **(PSI)**	Potentially Significant Unless Mitigation Incorporated **(PSUMI)**	Less Than Significant Impact **(LTSI)**	***No Impact*** **(NI)**

Discussion:

a) No Impact. According to the Draft Fire Hazard Severity Zone Map for Imperial County prepared by the California Department of Forestry and Fire Protection, the Project area is not located in or near state responsibility areas or lands classified as very high hazard severity zones (California Department of Forestry and Fire Protection 2007). As noted under Hazards and Hazardous Materials (Response IX. f) the proposed project would not substantially impair an adopted emergency response plan or emergency evacuation plan. No impact is identified for this issue area and this environmental parameter is not proposed for further analysis in the EIR.

b) No Impact. The Project area is not located in or near state responsibility areas or lands classified as very high hazard severity zones (California Department of Forestry and Fire Protection 2007). Therefore, the proposed Project would not exacerbate wildfire risks. No impact is identified for this issue area and this environmental parameter is not proposed for further analysis in the EIR.

c) No Impact. The Project site is not located in or near state responsibility areas or lands classified as very high hazard severity zones (California Department of Forestry and Fire Protection 2007). The proposed Project would not require the installation or maintenance of associated infrastructure that may exacerbate fire risk or that would result in temporary or ongoing impacts to the environment. No impact is identified for this issue area and this environmental parameter is not proposed for further analysis in the EIR.

d) Less than Significant. The Project site is not located in or near state responsibility areas or lands classified as very high hazard severity zones (California Department of Forestry and Fire Protection 2007). The proposed Project would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. No impact is identified for this issue area and this environmental parameter is not proposed for further analysis in the EIR.

Note: Authority cited: Sections 21083 and 21083.05, Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21093, 21094, 21095, and 21151, Public Resources Code; Sundstrom v. County of Mendocino, (1988) 202 Cal.App.3d 296; Leonoff v. Monterey Board of Supervisors, (1990) 222 Cal.App.3d 1337; Eureka Citizens for Responsible Govt. v. City of Eureka (2007) 147 Cal.App.4th 357; Protect the Historic Amador Waterways v. Amador Water Agency (2004) 116 Cal.App.4th at 1109; San Franciscans Upholding the Downtown Plan v. City and County of San Francisco (2002) 102 Cal.App.4th 656.

Revised 2009- CEQA
Revised 2011- ICPDS
Revised 2016 – ICPDS
Revised 2017 – ICPDS
Revised 2019 – CEQA

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	*No Impact* (NI)

SECTION III. MANDATORY FINDINGS OF SIGNIFICANCE

The following are Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current project, and the effects of probable future projects.)	☒	☐	☐	☐
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Discussion:

a) Potentially Significant Impact. The EIR's biological resources section will discuss direct and indirect impacts on plants and wildlife species. The EIR will also evaluate direct and indirect impacts on cultural and tribal cultural resources. Finally, the EIR will evaluate the Project's contribution to cumulative impacts, identify whether the contribution is cumulatively considerable, and propose feasible mitigation, as appropriate, to reduce such impacts to less-than-significant levels.

b) Potentially Significant Impact. The Project has the potential to contribute to cumulative impacts related to air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, transportation and traffic, tribal cultural resources, and utilities and service systems. The EIR will evaluate the project's contribution to cumulative impacts in these areas as well as other areas as further impacts are identified.

c) Less Significant Impact. The Project could potentially result in less than significant environmental effects on human beings, either directly or indirectly. These impacts will be fully addressed in the EIR.

SECTION IV. PERSONS & ORGANIZATIONS CONSULTED/ REFERENCES

A. COUNTY OF IMPERIAL

- Jim Minnick, Director of Planning & Development Services
- Michael Abraham, AICP, Asst. Director of Planning & Development Services
- Diana Robinson, Planner III
- Mariela Moran, Planner II
- Imperial County Air Pollution Control District
- Department of Public Works
- Fire Department
- Agricultural Commissioner
- Environmental Health Services
- Sheriff's Office

B. OTHER AGENCIES/ORGANIZATIONS

- CDFW
- IID
- USFWS
- RWQCB
- SWRCB
- NAHC

C. REFERENCES

California Department of Fish and Wildlife. 2015. Inland Deserts Region Imperial Wildlife Area, Imperial County. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=87823&inline. Accessed December 2020. California Department of Forestry and Fire Protection, 2007. Fire Hazards and Severity Zones Map, Imperial County.

California Department of Forestry and Fire Protection. 2007. Fire Hazard Severity Zones.

California Dept. of Conservation, 2018. Imperial County Farmland and Monitoring Program (FMMP) Imperial County Important Farmland 2018. Available at: (https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed April 15, 2021.

County of Imperial, 1996. Imperial County Airport Land Use Commission Compatibility Plan.

County of Imperial, 2016. Final Conservation and Open Space Element of the Imperial County General Plan. Adopted by the Imperial County Board of Supervisors, March 8. Available at: http://www.icpds.com/CMS/Media/Conservation-&-Open-Space-Element-2016.pdf.

County of Imperial, 2015. Renewable Energy and Transmission Element of the Imperial County General Plan. Adopted by the Imperial County Board of Supervisors, October 6. Available at: https://www.icpds.com/assets/planning/renewable-energy-and-transmission-element-2015.pdf.

County of Imperial, n.d. Final Seismic and Public Safety Element of the Imperial County General Plan. Available at: https://www.icpds.com/assets/planning/seismic-and-public-safety.pdf.

GS Lyon Consultants, 2021. Phase I ESA Report. January.

Kittleson and Associates, 2021. Vikings Solar Energy Storage Project Transportation Study. January 29.

Landmark Consulting, 2021. Geotechnical Report. January.

SWCA 2020a. California Land Evaluation and Site Assessment for the Viking Solar Energy Project, Imperial County, California. December.

SWCA 2021a. Visual Resource Assessment for the Vikings Solar Energy Storage Project. January.

SWCA 2021b. Air Quality Technical Report Vikings Solar Energy Storage Project Imperial County, California. February.

SWCA 2021c. Biological Resources Technical Report Vikings Solar Energy Storage Project Imperial County, California. January.

SWCA 2021d.Aquatic Resources Technical Report Vikings Solar Energy Storage Project Imperial County, California. January.

SWCA 2021e.Cultural Resources Technical Report Vikings Solar Energy Storage Project Imperial County, California. January.

U.S. Bureau of Land Management (BLM). 2020. BLM Recreation Web Map. Available at: https://www.blm.gov/visit/imperial-sand-dunes. Accessed April 2021.

B Public Scoping Meeting Materials/ Comments

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PUBLIC SCOPING MEETING FOR THE VIKINGS SOLAR ENERGY GENERATION AND STORAGE PROJECT

Conditional Use Permit (#20-0025)

County of Imperial

May 12, 2021, 6:00 PM

SCOPING MEETING OVERVIEW

- Introductions
- Purpose of Public Scoping Meeting
- Roles and Responsibilities
- Project Overview
- CEQA Purpose, Process, Schedule
- Topics to be Addressed in Draft EIR
- Contact Information
- Public Comments
- Adjourn

Introductions

- County of Imperial – CEQA Lead Agency
- CEQA Consultants
- Project Applicant
  - Vikings Energy LLC.
  - Consultant Team

Purpose of Scoping Meeting

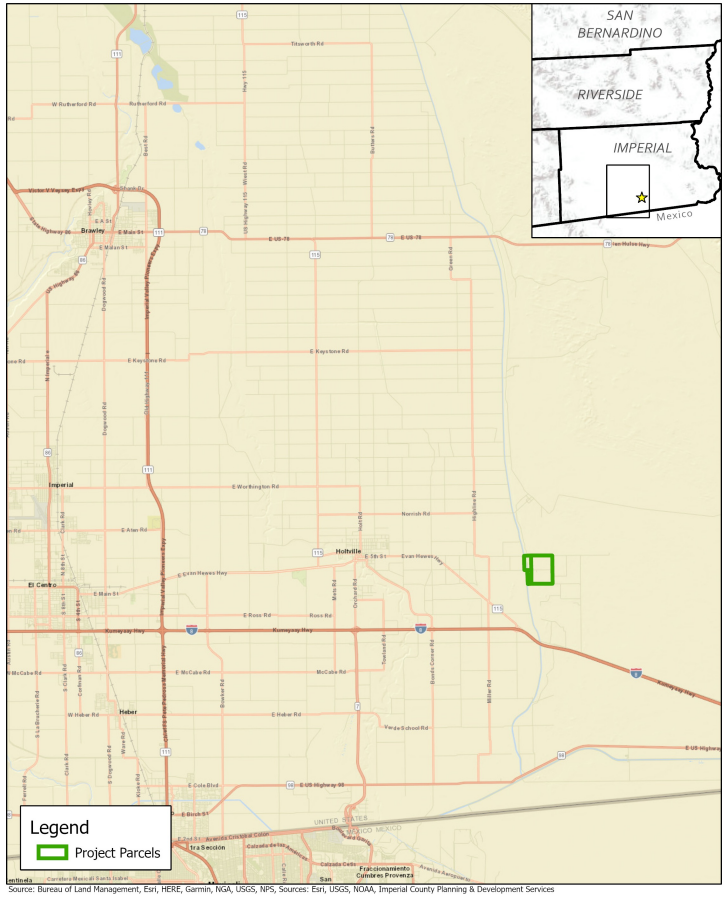
- Inform public of proposed Project and the County's intent to prepare an Environmental Impact Report (EIR)
- Present an overview of the CEQA process
- Review topics to be addressed in the Draft EIR
- Solicit comments and receive input on:
  - Scope and content of the environmental analysis (direct, indirect, cumulative, unavoidable)
  - Potential measures to reduce adverse environmental impacts
  - Potential Alternatives to avoid or reduce environmental impacts

Roles and Responsibilities

- Imperial County is the “Lead Agency” responsible for Project’s CEQA documentation
- County is responsible for:
  - Adequacy/accuracy/objectivity of Project’s CEQA document
  - Considering Project’s CEQA document prior to acting upon/approving Project
- County has retained McIntyre Environmental, Inc. to prepare the Environmental Impact Report (EIR)

Project Overview

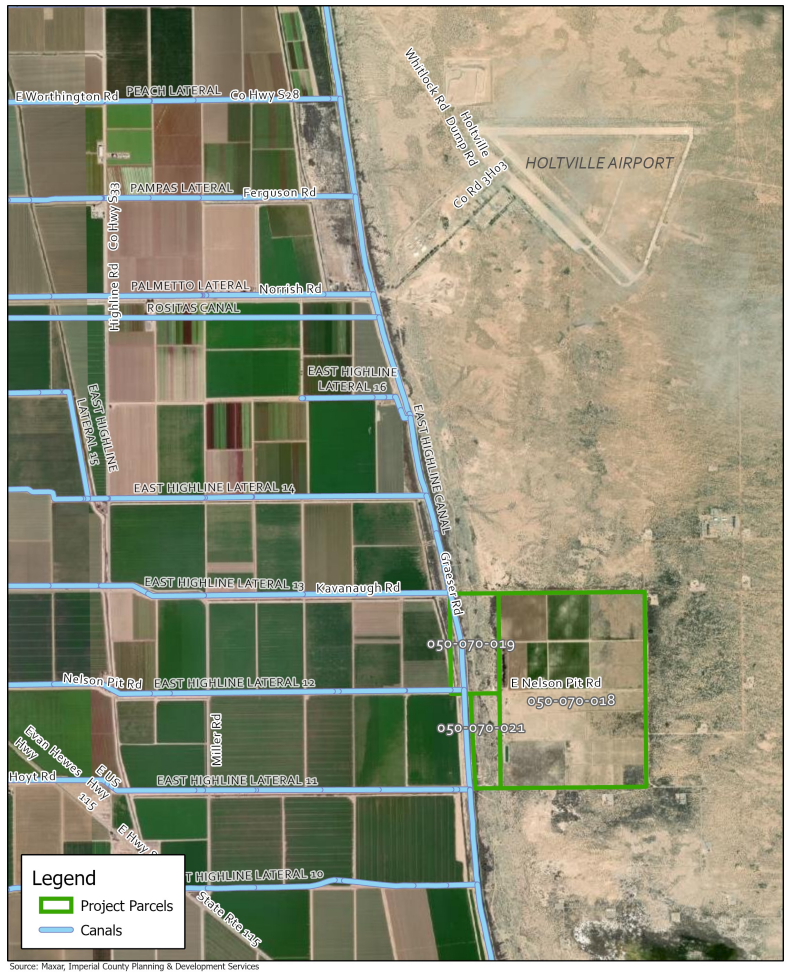
- Vikings Solar Energy Farm, LLC (Project Applicant) proposes to develop a nominal 150-megawatt (MW) solar photovoltaic (PV) energy generation project with an integrated, not to exceed 300 MW battery storage project. The electrical energy produced would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District's (IID) 230 kV KN/KS transmission line via a gen-tie line approximately 120 feet in height.
- The proposed Project would be located on approximately 604 acres of private and Imperial County-owned land located at the intersection of Nelson Pit Road and Graeser Road in the western part of unincorporated Imperial County.



Regional Location
Vikings Solar Energy Generation and Storage Project
Figure 3-1

PROJECT LOCATION

- The Project site is generally located south of Kavanaugh Road, west of Graeser Road, the East Highline Canal and IID's KN/KS 230 kV transmission line, approximately 1.8 miles north of Interstate 8 (I-8). The northwest portion of the solar energy facility site is bisected by Graeser Road and the East Highline Canal (APN 050-070-019).
- The Project site is located approximately 5.5 miles east of the City of Holtville in Section 36 within Township 15 South, and Range 16 East of the San Bernardino Base and Meridian (SBB&M) of the "Holtville East" topographic quadrangles 7.5-minute.
- (Assessor's Parcel Numbers [APNs] 050-070-018, 050-070-019 and 050-070-021).



Project Location
Vikings Solar Energy Generation and Storage Project
Figure 3-2

Existing Characteristics

- The project area consists of previously graded, vacant, former agricultural cropland and undeveloped Sonoran Desert scrub.
- Within and adjacent to the west of the project area lies the existing East Highline Canal, a 122-mile aqueduct that connects the All-American Canal in the south and terminates just south of the Niland Marina in the north.
- The vicinity of the project area is characterized by open and vast views with flat to undulating topography.
- The overall character of the immediate landscape is agricultural to the west and natural open space to the north, east, and south.

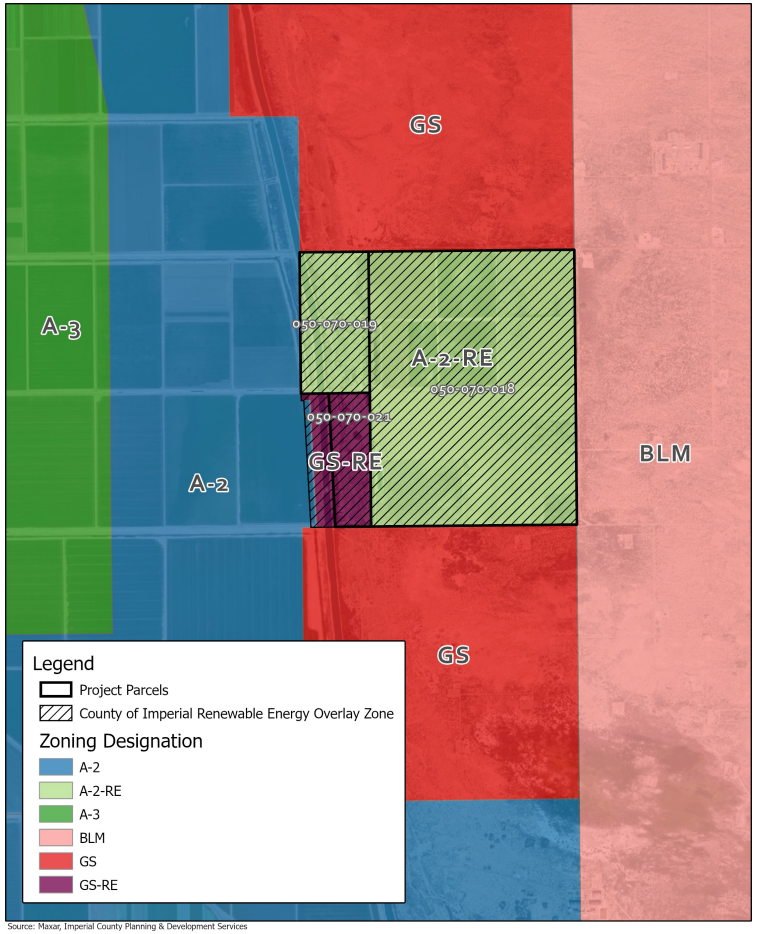
Surrounding Land Use

- The Project site is surrounded by agricultural uses on the west and by open desert on the north, south and east.
- The Holtville Airport is located 1.6 miles to the north
- The nearest developed or proposed solar PV projects are located approximately 7.25 miles to the south, across State Route 98.
- The Algodones Dunes, including the Imperial Sand Dunes Recreation Area and North Algodones Dunes Wilderness Area, are approximately 12 miles east of the project area.
- A network of smooth, light grey to dark grey, paved roads; textured, light tan to dark tan, dirt access roads; and associated road signage is present throughout the entire area. This includes the heavily traveled Evan Hewes Highway (also known as County Route S80 and State Route 115 in this area) and I-8, and lightly traveled local roads.

General Plan and Zoning Designation

- **General Plan Designation:** Two of the parcels (APN 050-070-18 and 050-070-019) are designated as Agriculture in the Imperial County General Plan. APN 050-070-021 is designated as "Recreation/Open Space". All are located within a Renewable Energy Overlay Zone.

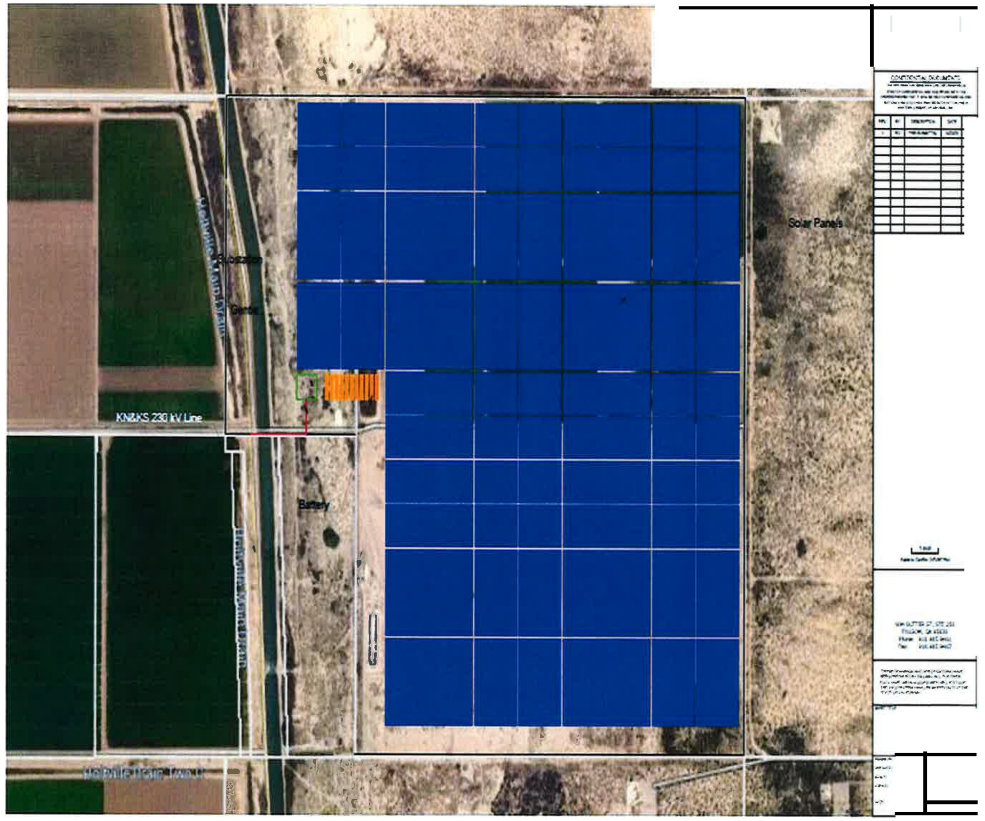
- **Zoning:** Project parcels 050-070-019 and 050-070-018 are both zoned A-2-RE (General Agriculture with Renewable Energy Overlay) and parcel 050-070-021 is zoned GS-RE (Government / Special Public Zone with Renewable Energy Overlay).



Existing Zoning Designation
Vikings Solar Energy Generation and Storage Project
Figure 3-3

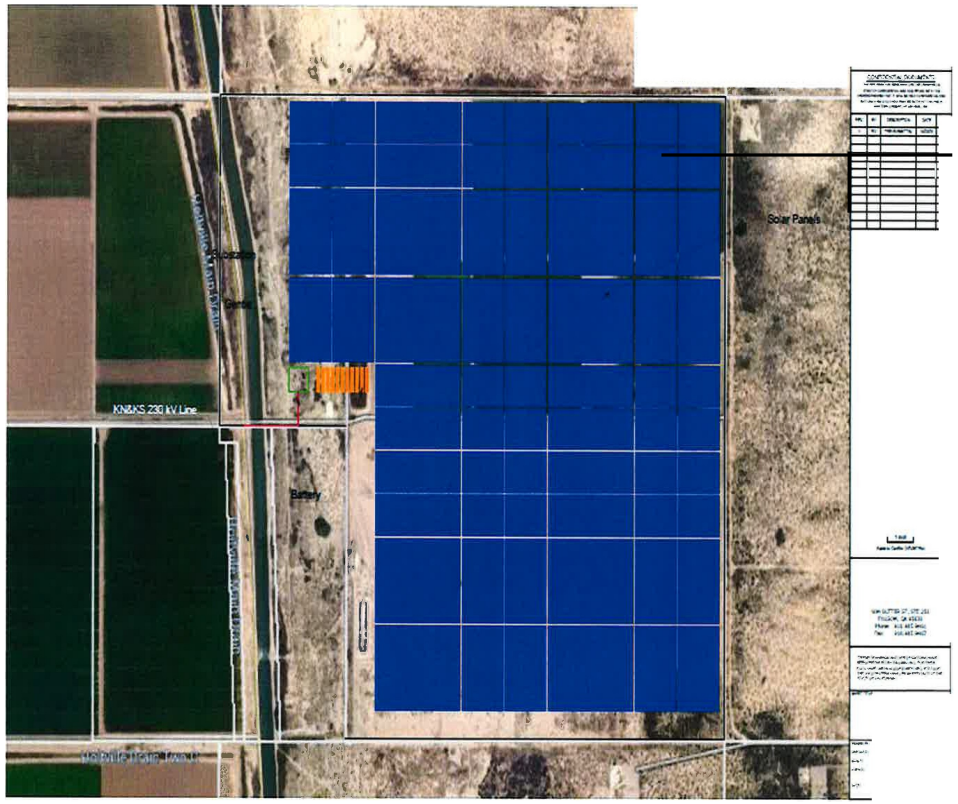
Proposed Project

- The Project proposes to utilize either thin film or crystalline solar photovoltaic (PV) technology modules mounted either on fixed frames or horizontal single-axis tracker (HSAT) systems.
- The fixed frame PV module arrays would be mounted on racks that would be supported by driven piles. The fixed-frame racks would be secured at a fixed tilt of 20 to 30 degrees from horizontal facing a southerly direction.
- Individual PV modules would be mounted two high on a fixed frame, providing a two-foot ground clearance and resulting in the tops of the panels at approximately 7.5 feet above the ground. The fixed PV modules would be arranged in arrays spaced approximately 15 to 25 feet apart (pile-to-pile) to maximize performance and to allow access for panel cleaning.



Proposed Project (cont.)

- If HSAT technology is used, the PV modules would rotate around the north-south HSAT axis so that the PV modules would continue to face the sun as it moves across the sky throughout the day.
- The PV modules would reach their maximum height (up to nine [9] feet above the ground) at both sunrise and sunset. At noon, the HSAT system is rotated so that the PV modules would be horizontal with a nominal height of about six (6) feet above the ground.
- The individual PV systems would be arranged in large arrays by placing them in columns spaced approximately 10 feet apart.

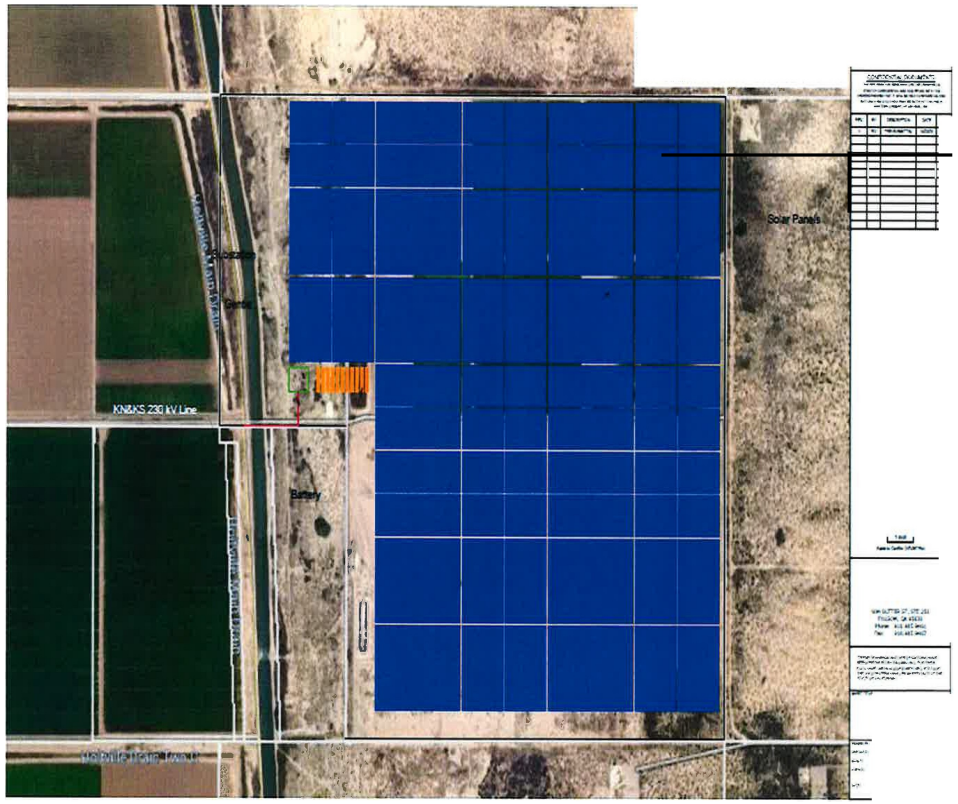


Proposed Project (cont.)

- The battery storage system would be constructed as a multiple structure facility, consisting of up to 20 battery modules at full build out, the footprint of which would be up to 450 square feet per module.
- Each module will house the batteries, mounting racks and associated electrical equipment. Each module will be of a metal frame construction, retrofitted to add insulation, air-conditioning, and fire suppression for battery reliability, with separate rooms for the electronic controls, inverters, and rectifiers.
- Due to the slightly positive pressure required within each module to ensure functionality of the fire suppression system, the modules will not be vented. Each module will utilize a supply and return air conditioning system; this system has a fresh air (economizer mode) intake system and is also referred to as a closed loop system.

Proposed Project (cont.)

- The electrical energy produced by the project would be conducted through a new project substation would be constructed on the southern boundary of APN 050-070-019.
- This substation would take the delivery of the up to 34.5 kV power from the project and increase the voltage of the electricity to 230 kV, where it would feed into the interconnection switching station for metering and delivery to the IID 230 kV KN/KS Line.



REQUIRED PROJECT APPROVALS/ACTIONS

County of Imperial

- Conditional Use Permit (#20-0025)
- Air Pollution Control District – Authority to Construct and Permit to Operate
- Grading Permits (Imperial County Planning & Development Services Department)
- Building Permits (Imperial County Planning & Development Services Department)
- Dust Control Plan (Imperial County Air Pollution Control District)
- Rule 310 Exemption (Imperial County Air Pollution Control District)
- Encroachment Permits (Imperial County Public Works Department)

Other Approvals

- Encroachment Permits (Imperial Irrigation District)
- Right-of-Way Permit (Imperial Irrigation District)
- Water Supply Agreement (Imperial Irrigation District)
- General Construction Storm Water Permit Notice of Intent/Storm Water Pollution Prevention Plan (California State Water Resource Control Board)

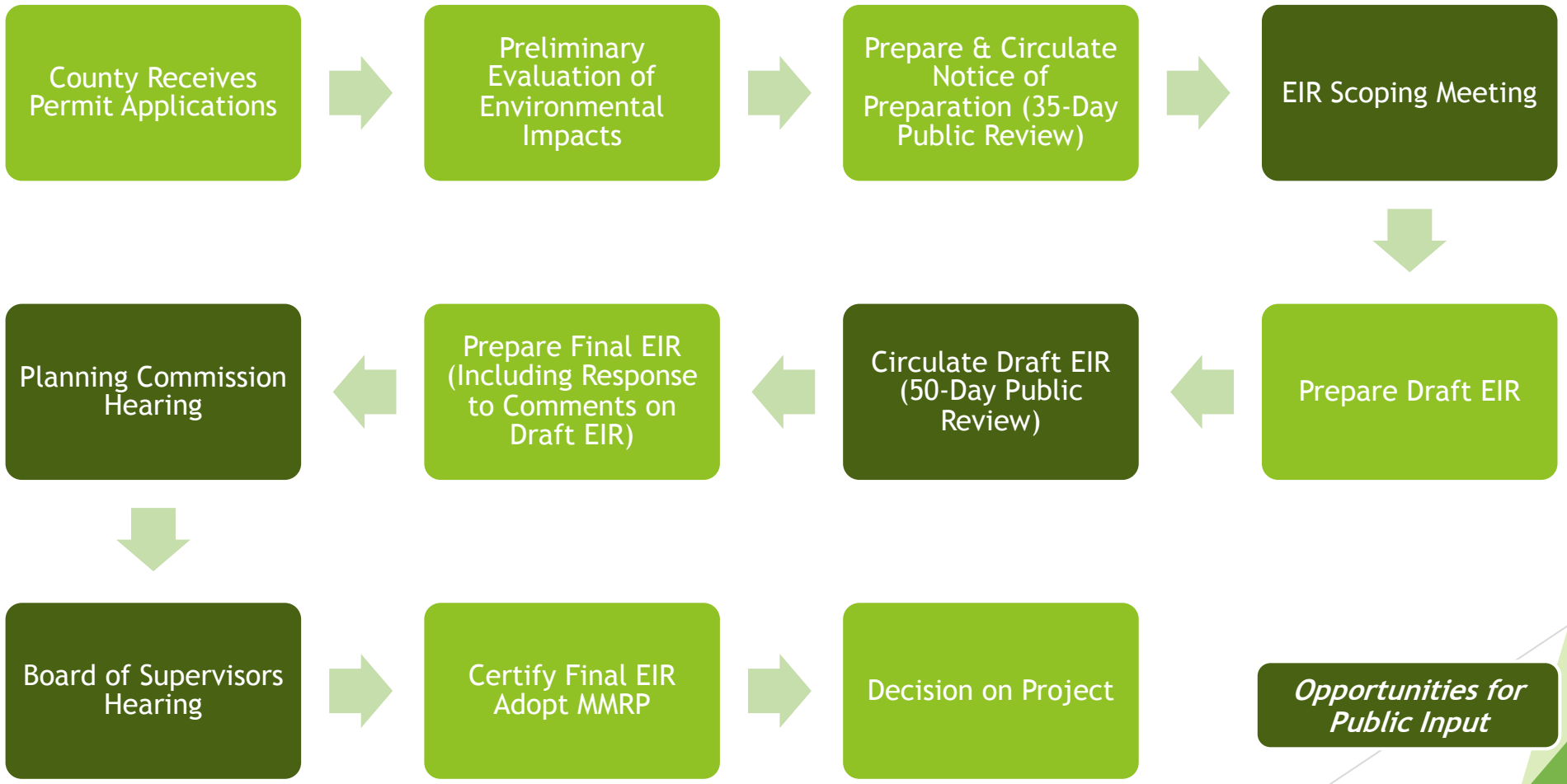
Environmental Determination

- An environmental initial study has been prepared to determine if the project may have a significant effect on the environment
- Evaluated all environmental issues
- Determined that the proposed project may have a significant effect on the environment
- An Environmental Impact Report will be required

DRAFT EIR WILL:

- **Analyze Project's Environmental Impacts**
  - Short-Term Construction
  - Long-Term Operational
  - Direct and Indirect
  - Cumulative
  - Growth Inducing
  - Unavoidable
- **Identify feasible mitigation measures to avoid/reduce Project's significant impacts**
- **Evaluate feasible Alternatives to the Proposed Project**
- **Undergo 50-day public review period**

CEQA EIR PROCESS



TOPICS TO BE ANALYZED IN DRAFT EIR

- Aesthetics
- Agricultural Resources
- Air Quality
- Biological Resources
- Aesthetics
- Energy
- Geology & Soils
- Greenhouse Gas Emissions
- Hazards & Hazardous Materials
- Hydrology & Water Quality
- Land Use and Planning
- Noise
- Transportation/Traffic
- Tribal / Cultural Resources
- Utilities & Service Systems
- Cumulative Impacts
- Project Alternatives

TENTATIVE EIR SCHEDULE

Tentative Schedule	
35-Day NOP Scoping Period	May 6, 2021 – June 9, 2021
Public Scoping Meeting	May 12, 2021
Draft EIR Preparation	June to August 2021
50-Day Draft EIR Public Review	October to November 2021
Final EIR Preparation	January 2022
Public Hearings	February 2022

Public Comments

- Please fill out a speaker slip and hand it in.
- When your name is called, please walk up to the microphone, state your name and what agency/organization you represent (if any).
- Each speaker will be given 3 minutes to speak.
- In addition, you can fill out a Comment Form and hand it in before you leave or send it to the address provided on the form.

Public Comments

- Your comments may be submitted in writing to:

Jim Minnick, Director,
Imperial County
Planning & Development Services Department,
801 Main Street,
El Centro, CA 92243

- You can email comments to DianaRobinson@co.imperial.ca.us.
- Available project information may be reviewed at this location, www.icpds.com.
- Due to the limits mandated by State law, your response must be sent at the earliest possible date but no later than June 9, 2021.

Adjournment

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There were no attendees to the Public Scoping Meeting, and no comments were given.

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C Conditional Use Permit Application

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CONDITIONAL USE PERMIT

I.C. PLANNING & DEVELOPMENT SERVICES DEPT.
801 Main Street, El Centro, CA 92243 (760) 482-4236

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

1. PROPERTY OWNER'S NAME ARB Inc., RL&R Strahm and the County of Imperial	EMAIL ADDRESS	
2. MAILING ADDRESS (Street / P O Box, City, State) See Attached Property Owner Exhibit	ZIP CODE See Attached Property	PHONE NUMBER Owner Exhibit
3. APPLICANT'S NAME Vikings Energy Farm, LLC	EMAIL ADDRESS ziad@zglobal.biz	
4. MAILING ADDRESS (Street / P O Box, City, State) 604 Sutter Street, Suite 250, Folsom, CA	ZIP CODE 95630	PHONE NUMBER 916-985-9461
4. ENGINEER'S NAME CA. LICENSE NO. To be determined	EMAIL ADDRESS To be determined	
5. MAILING ADDRESS (Street / P O Box, City, State) To be determined	ZIP CODE To be determined	PHONE NUMBER To be determined

6. ASSESSOR'S PARCEL NO. 050-070-018, 050-070-019 and 050-070-021	SIZE OF PROPERTY (in acres or square foot) Approximately 603.61 acres	ZONING (existing) A-2-RE and GS-RE
7. PROPERTY (site) ADDRESS 3000 Nelsons Pit Rd, Holtville, CA 92250 and 2910 Nelsons Pit Rd, Holtville, CA 92250		
8. GENERAL LOCATION (i.e. city, town, cross street) On the intersection of Nelsons Pit Rd and Graeser Rd. Approximately 5.5 miles east of the City of Holtville		
9. LEGAL DESCRIPTION See attached Property Owner Exhibit for detailed legal descriptions. (also see Attachment 1 [Project Description]) for Additional detail.		

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

10. DESCRIBE PROPOSED USE OF PROPERTY (list and describe in detail) Develop the Vikings Solar Energy Generation & Storage, a nominal 100-megawatt (MW) alternating current (AC) solar photovoltaic energy generation ~~and 450 megawatt hour (MWh)~~ battery energy storage project (See Attachment 1 [Project Description]) 400 MW PTPT NOT TO EXCEED

11. DESCRIBE CURRENT USE OF PROPERTY Idle land and Agriculture (see Attachment 1) 200 MW PTPT.

12. DESCRIBE PROPOSED SEWER SYSTEM See Attachment 1

13. DESCRIBE PROPOSED WATER SYSTEM See Attachment 1

14. DESCRIBE PROPOSED FIRE PROTECTION SYSTEM See Attachment 1

5/12/21
6/2/21

15. IS PROPOSED USE A BUSINESS? ☑ Yes ☐ No	IF YES, HOW MANY EMPLOYEES WILL BE AT THIS SITE? 0 (See Attachment 1)

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

See attached owners affidavit
Print Name

Date

Applicant: Vikings Energy Farm, LLC
Signature

MOHAMMED S. ALRAI
Print Name

12/7/2020
Date

Signature

REQUIRED SUPPORT DOCUMENTS

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

APPLICATION RECEIVED BY:	DR	DATE	02/17/21
APPLICATION DEEMED COMPLETE BY:		DATE	
APPLICATION REJECTED BY:		DATE	
TENTATIVE HEARING BY:		DATE	
FINAL ACTION: ☐ APPROVED ☐ DENIED		DATE	

REVIEW / APPROVAL BY OTHER DEPT'S required.
☐ P. W.
☐ E. H. S.
☐ A. P. C. D.
☐ O. E. S.
☐ _____
☐ _____

CUP #
20-0025

OWNER'S AFFIDAVIT

In the event the applicant is not owner, the following shall be signed and acknowledge by the owner.

Permission is hereby granted to Vikings Energy Farm, LLC. to apply for this
(Lessee, Tenant, Contractor-Specify)

Conditional Use Permit (Land Use) on the described property located at address
(State permit type clearly i.e. building, land used)

3000 E. Nelsons Pit Rd, Holtville, CA 92250 Further identified by Assessor's Parcel Number

(APN) 050-070-018-00 is hereby granted.

Roy Strahm
OWNER (SIGNATURE)

R.L & R Strahm
OWNER (TYPED OR PRINT)

2605 N. Holt Rd Holtville, ca 92250
OWNER'S ADDRESS

12-2-2020
DATE

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA
COUNTY OF Imperial } S.S.

On December 2, 2020 before me, Debra A. Baro, Notary Public, personally appeared Roy Strahm, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Debra A. Baro (Seal)

DEBRA A. BARO
Notary Public - California
Imperial County
Commission # 2205612
My Comm. Expires Jul 25, 2021

ATTENTION NOTARY: Although the information requested below is OPTIONAL, it could prevent fraudulent attachment of this certificate to unauthorized document.

Title or Type of Document _____
Number of Pages _____ Date of Document _____
Signer(s) Other Than Named Above _____

OWNER'S AFFIDAVIT

In the event the applicant is not owner, the following shall be signed and acknowledge by the owner.

Permission is hereby granted to Vikings Energy Farm, LLC. to apply for this
(Lessee, Tenant, Contractor-Specify)

Conditional Use Permit (Land Use) on the described property located at address
(State permit type clearly i.e. building, land used)

2910 Nelsons Pit Road, Holtville, CA 92250 Further identified by Assessor's Parcel Number

(APN) 050-070-019-000 is hereby granted.

OWNER (SIGNATURE)

John M. Perisich
OWNER (TYPED OR PRINT)

26000 Commercentre Dr., Lake Forest CA 92630
OWNER'S ADDRESS

12/2/2020
DATE

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

Please see attached California Acknowledgement

STATE OF CALIFORNIA
COUNTY OF Imperial } S.S.

On _____ before me, _____, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ (Seal)

ATTENTION NOTARY: **Although the information requested below is OPTIONAL, it could prevent fraudulent attachment of this certificate to unauthorized document.**

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ACKNOWLEDGEMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Orange)

On December 2, 2020 before me, Tracy J. Kalantari
(insert name and title of the officer)

personally appeared John M. Perisich,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

TRACY J. KALANTARI
Notary Public - California
Orange County
Commission # 2184020
My Comm. Expires Feb 20, 2021

Signature T. Kalantari (Seal)

1.	PROPERTY OWNER'S NAME ARB Inc.	EMAIL ADDRESS		
2.	MAILING ADDRESS (Street / P O Box, City, State) 9201 Campo Road, San Diego, CA	ZIP CODE 91977	PHONE NUMBER	
2B.	MAILING ADDRESS (Street / P O Box, City, State)	ZIP CODE	PHONE NUMBER	
6.	ASSESSOR'S PARCEL NO. **050-070-019**	SIZE OF PROPERTY (in acres of square foot) 80.00 acres		ZONING (Existing) A-2-RE
7.	PROPERTY (site) ADDRESS 2910 Nelsons Pit Road, Holtville, CA 92250			
8.	GENERAL LOCATION (i.e. city, town, cross street) At the intersection of Nelsons Pit Rd. and Graeser Rd. Approximately five (5) miles east of Holtville, CA.			
9.	LEGAL DESCRIPTION THE WEST HALF OF THE NORTHWEST QUARTER OF SECTION THRITY-SIX (36), TOWNSHIP FIFTEEN (15) SOUTH, RANGE SIXTEEN (16) EAST, S.B.M., IN THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA, ACCORDING TO THE UNITED STATES GOVERNMENT PLAT OF RESURVEY APPROVED NOVEMBER 4, 1908 AND ON FILE IN THE UNITED STATES LAND OFFICE AT LOS ANGELES, CALIFORNIA. APN: 050-070-19-00 APN: 050-070-019			

1.	PROPERTY OWNER'S NAME RL&R Strahm, a California general partnership	EMAIL ADDRESS		
2.	MAILING ADDRESS (Street / P O Box, City, State) 2605 N Holt, Holtville, CA	ZIP CODE 92250	PHONE NUMBER 760-356-5253	
2B.	MAILING ADDRESS (Street / P O Box, City, State)	ZIP CODE	PHONE NUMBER	
6.	ASSESSOR'S PARCEL NO. **050-070-018**	SIZE OF PROPERTY (in acres of square foot) 480 acres		ZONING (Existing) A-2-RE
7.	PROPERTY (site) ADDRESS 3000 E Nelsons Pit Rd, Holtville, CA 92250			
8.	GENERAL LOCATION (i.e. city, town, cross street) A quarter mile east of the intersection of Nelsons Pit Rd. and Graeser Rd. Approximately five (5) miles east of Holtville, CA.			
9.	LEGAL DESCRIPTION <u>PARCEL1:</u> THE EAST HALF, AND THE EAST HALF OF THE SOUTHWEST QUARTER, AND THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 36, TOWNSHIP 15 SOUTH, RANGE 16 EAST, SAN BERNARDINO BASE AND MERIDIAN, COUNTY OF			

IMPERIAL, STATE OF CALIFORNIA, ACCORDING TO THE UNITED STATES GOVERNMENT OFFICIAL PLAT OF SURVEY APPROVED AND ON FILE IN THE DISTRICT LAND OFFICE.

EXCEPTING THEREFROM, AN UNDIVIDED 50% INTEREST OF ALL MINERAL AND GEOTHERMAL RIGHTS NOW HELD BY THE GRANTOR APPURTENANT TO THE PROPERTY, BUT WITHOUT ANY RIGHT WHATSOEVER TO ENTER UPON THE SURFACE OF SAID LAND OR ANY PORTION THEREOF, AS RESERVED BY THE NUSSBAUM FAMILY LIMITED PARTNERSHIP, A CALIFORNIA LIMITED PARTNERSHIP, IN DEED RECORDED APRIL 1, 2008 AS INSTRUMENT NO. 08-9138 OF OFFICIAL RECORDS.

PARCEL 2:
THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 36, TOWNSHIP 15 SOUTH, RANGE 16 EAST, SAN BERNARDINO BASE AND MERIDIAN, COUNTY OF IMPERIAL, STATE OF CALIFORNIA, ACCORDING TO THE UNITED STATES GOVERNMENT PLAT OF SURVEY APPROVED AND ON FILE IN THE DISTRICT LAND OFFICE;

EXCEPTING THEREFROM ALL OIL AND MINERAL RIGHTS AS RESERVED BY J. LILLIAN CALLANDER IN DEED RECORDED DECEMBER 4, 1951 AS INSTRUMENT NO. 22 IN BOOK 827, PAGE(S) 354 OF OFFICIAL RECORDS.

EXCEPTING THEREFREOM, AN UNDIVIDED 50% INTEREST OF ALL MINERAL AND GEOTHERMAL RIGHTS NOW HELD BY THE GRANTOR APPURTENANT TO THE PROPERTY, BUT WITHOUT ANY RIGHT WHATSOEVER TO ENTER UPON THE SURFACE OF SAID LAND OR ANY PORTION THEREOF WITHIN 500 FEET VERTICAL DISTANCE BELOW THE SURFACE THEREOF, AS RESERVED BY THE NUSSBAUM FAMILY LIMITED PARTNERSHIP, A CALIORNIA LIMITED PARTNERSHIP, IN DEED RECORDED APRIL 1, 2008 AS INSTRUMENT NO. 08-9138 OF OFFICIAL RECORDS.

APN: 050-070-018

PARCEL 3:
A RIGHT OF WAY FOR AN UNDERGROUND TILE LINE ACROSS THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 36, TOWNSHIP 15 SOUTH, RANGE 16 EAST, SAN BERNARDINO BASE AND MERIDIAN, COUNTY OF IMPERIAL, STATE OF CALIFORNIA, ACCORDING TO THE UNITED STATES GOVERNMENT OFFICIAL PLAT OF SURVEY APPROVED AND ON FILE IN NTHE DISTRICT LAND OFFICE, THER CENTERLINE OF WHICH IS DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT WHICH IS 1,262.25 FEET SOUTH OF THE NORTHEAST CORNER OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SAID SECTION 36; THENCE NORTH 76°22'00' WEST, 1,185 FEET TO A POINT IN THE EAST BANK OF THE EAST HIGHLINE CANAL, AS NOW CONSTRUCTED ACROSS SAID PROPERTY.

APN: 050-070-018

1.	PROPERTY OWNER'S NAME County of Imperial		EMAIL ADDRESS	
2.	MAILING ADDRESS (Street / P O Box, City, State)		ZIP CODE	PHONE NUMBER
2B.	MAILING ADDRESS (Street / P O Box, City, State)		ZIP CODE	PHONE NUMBER
6.	ASSESSOR'S PARCEL NO. **050-070-021**	SIZE OF PROPERTY (in acres of square foot) 43.61 acres		ZONING (Existing) GS-RE
7.	PROPERTY (site) ADDRESS None available			
8.	GENERAL LOCATION (i.e. city, town, cross street) On the intersection of Nelsons Pit Rd. and Graeser Rd. Approximately five (5) miles east of Holtville, CA.			
9.	LEGAL DESCRIPTION			

D Visual Resource Assessment

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Visual Resource Assessment for the Vikings Solar Energy Storage Project

JANUARY 2022

PREPARED FOR

Vikings Energy Farm, LLC

PREPARED BY

SWCA Environmental Consultants

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VISUAL RESOURCE ASSESSMENT FOR THE VIKINGS SOLAR ENERGY STORAGE PROJECT

Prepared for

Vikings Energy Farm, LLC
750 West Main Street
El Centro, California 92243
Attn: Jamie Nagel, Senior Project Manager

SWCA Environmental Consultants
1455 Frazee Road, Suite 500
San Diego, California 92108
www.swca.com

SWCA Project No. 64085

January 2022

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) has been contracted by Vikings Energy Farm, LLC (the applicant), to evaluate the existing conditions of the landscape within and surrounding the proposed Vikings Solar Energy Storage Project (project) and to describe potential changes to the landscape resulting from the project. The Applicant is proposing to develop the project, a nominal 150-megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project with an integrated up to 300 megawatts (MW) battery storage system on approximately 604 acres of land in the County of Imperial, California. This visual resource assessment presents the anticipated visual impact of the project's construction and operation on the scenery and views in the surrounding area based on views from key observation points (KOPs).

The project area is located on approximately 604 acres, 5.8 miles east of Holtsville, Imperial County, California. The project area is north of Interstate 8 (I-8; also known as Kumeyaay Highway) in portions of Sections 12, 22, and 33, Township 15 South, Range 16 East (Figure 1).

2 CHARACTERISTIC LANDSCAPE

The project area consists of previously graded, vacant, former agricultural cropland and undeveloped Sonoran Desert scrub. Within and adjacent to the west of the project area lies the existing New Coachella Canal, a 122-mile aqueduct that conveys Colorado River water from the All-American Canal, through the Imperial Valley, to the Coachella Valley for irrigation purposes. The vicinity of the project area is characterized by open and vast views with flat to undulating topography. A mixed semi-desert landscape is present to the north, east, and south; smooth dirt and soft sand dunes that lead to distant mountain forms are present to the north and east; and agricultural cropland dominates the landscape to the west. Vegetation in the geometric agricultural fields is defined by distinct edges of exposed soils, with consistent groupings of bright yellow to dark green colors and a smooth, carpet-like texture. The vegetation to the north, east, and south is consistent and includes localized, isolated areas of globular shaped trees with pale green foliage and grey with woody trunks and branches ranging from 20 to 50 feet in height, with smooth, light khaki to dark brown, low-profile desert shrubs near residential developments throughout the landscape. Human uses such as agricultural production, electrical transmission, and geothermal energy production occur near the project.

The project area elevation ranges from 10 feet below mean sea level to 60 feet above mean sea level (amsl). The Algodones Dunes, including the Imperial Sand Dunes Recreation Area and North Algodones Dunes Wilderness Area, are approximately 12 miles east of the project area. The dunes consist of gradually sloping sand dune formations that reach up to 400 feet above mean sea level (amsl) and are predominantly obscured from the KOPs due to the height of existing vegetation and structures and the low (inferior) position of local viewing locations.

The overall character of the immediate landscape is agricultural to the west and natural open space to the north, east, and south. The most notable natural features in the landscape are the textured dirt and soft, light tan, scenic sand dunes leading to mountain ranges in the background. The dark grey, subdued formations of the Chocolate Mountains approximately 25 miles to the north of the project area are approximately 2,000 feet amsl and are visible along the horizon; other portions of the mountain range are not prominent in the landscape given their distance from the project area. Agricultural development to the west of the project largely contributes to the human-made changes in the natural landscape, as have surrounding roads and transmission lines with scattered rural residences and agricultural buildings located on subdivided land. The existing human-made features in the landscape are primarily geometric and consist of vertical, continuous, galvanized, grey to silver (metallic) and light brown to dark brown (wood-

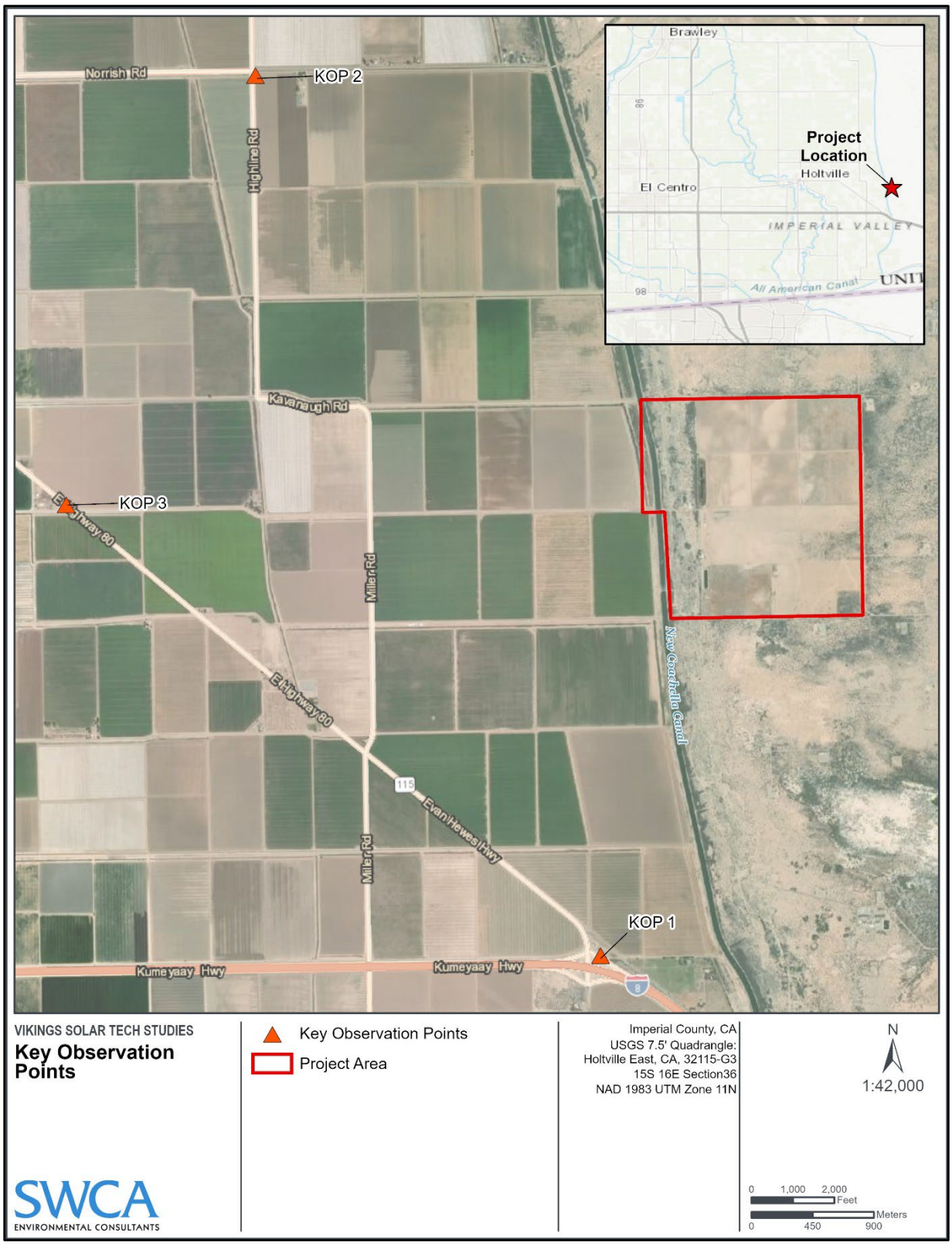

Figure 1. Project and KOP locations.

tone) transmission line infrastructure; rectangular, constructed agricultural buildings; stacked crop bales covered with bright white sheeting; and blocky, bright yellow to dark green agricultural plots.

Additionally, geometric forms from the geothermal energy facilities are visible to the east and south of the project area.

A network of smooth, light grey to dark grey, paved roads; textured, light tan to dark tan, dirt access roads; and associated road signage is present throughout the entire viewshed. This includes the heavily traveled Evan Hewes Highway (also known as County Route S80 and State Route 115 in this area) and I-8, and lightly traveled local roads. The roads contribute contrast with the existing agricultural fields.

3 METHODS

To provide a systematic basis for evaluating impacts to visual resources resulting from the construction and operation of the proposed project, the assessment was based on the Bureau of Land Management's (BLM) Visual Resource Management System. BLM Form 8400-1 (BLM 1986) was adapted for project purposes and used to document the potential visual contrast of the proposed project components to the surrounding landscape (Appendix A). The BLM's process is an industry standard and is often applied to non-BLM visual assessments to provide project proponents and authorizing agencies a consistent and translatable methodology for understanding visual impacts from proposed projects.

3.1 KOP Identification

KOPs selected for further analysis represent visually sensitive areas that would have potential views of the project and consist of either high-use travel routes, or local roads with nearby residential development.

Assessments of existing visual conditions were made based on professional judgment by SWCA visual resource specialists that took into consideration sensitive receptors and sensitive viewing areas in the project vicinity. In coordination with the applicant and Imperial County representatives, the following three KOPs were identified: KOP 1) the intersection of I-8 and Evan Hewes Highway (representing I-8 travelers south of the project area), KOP 2) the intersection of Norrish Road and Highline Road (representing local road travelers and isolated residences northwest of the project area), and KOP 3) the intersection of Evan Hewes Highway and Nelson Pit Road (representing Evan Hewes Highway travelers east of the project area) (see Figure 1 and appendix B).

3.2 Field Reconnaissance

A field visit to the project area was conducted on December 2, 2020, to document and gain an understanding of the existing landscape character to compare with the character of the proposed project components (e.g., solar arrays, battery storage facility, substation, and generation tie [gen-tie] line), as well as to collect the necessary photo documentation from each KOP for analysis and computer simulations.

An image series of two to three horizontal photographs were taken with a digital single-lens reflex (DSLR) camera at each KOP for use in producing the visual simulations. These images were combined ("stitched") using Adobe Photoshop to create a cylindrical panoramic image that represents a person's average peripheral vision of approximately 125 degrees (horizontally) by 55 degrees (vertically). The stitched photographs represent the view a person would see looking towards the project from each KOP.

The photo points were recorded using a global positioning system (GPS) unit and photographs were collected under typical, sunny, and generally clear viewing conditions.

3.3 Visual Simulations

Photo-realistic simulations of the project components were made using ArcGIS, Google Earth Pro, Autodesk products (AutoCAD and 3DS Max), and Adobe Photoshop software for each KOP (Appendix B). The proposed layout of the solar array, battery storage, substation, and gen-tie were modeled based on most recent design files available, dated December 2020, then the images (or "models") of the layout were superimposed onto the panoramic photographs taken during the field reconnaissance.

The simulations were developed by superimposing a three-dimensional computer model of the proposed project components on a digital elevation model and then placing that onto the base photographs at the correct scale and distance. Date and time-of-day inputs determine shadows and reflected light, and the software accounts for distance and haze to increase accuracy of viewing conditions. The specifications of the project layout included: 1) portrait photovoltaic panels, 2) solar array panels oriented at 30 degrees, and 3) solar array strings placed in rows 15 to 25 feet apart. Project modeling also included a 10-foot-high battery storage system, 230 kilovolt gen-tie line, substation, and 6-foot-high security fence.

3.4 Contrast Analysis

The visual contrast analysis is a qualitative discussion of anticipated contrast between the existing landscape character and the proposed activities and/or facilities. Factors taken into consideration for such an analysis include distance of the proposed project elements from the viewer and the level of perceived contrast between the proposed project elements and the existing landscape. These factors are further defined below.

The following distance zones were used for evaluating impacts on scenery from each KOP:

- Foreground: up to 0.5 mile
- Midground: 0.5 to 3 miles
- Background: 3 to 5 miles

The level of perceived contrast between the proposed project elements and the existing landscape from each KOP were classified using the following terms:

- None: The element contrast is not visible or perceived.
- Weak: The element contrast can be seen but does not attract attention.
- Moderate: The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- Strong: The element contrast demands attention, would not be overlooked, and is dominant in the landscape.

3.5 Glare Analysis

To determine the potential for significant glint or glare from solar panels and other built-project components that may affect residents and motorists traveling on I-8, Evan Hewes Highway, and local roads, SWCA used the Sandia National Laboratory's online Solar Glare Hazard Analysis Tools by Forge

Solar. The glare tool and associated report illustrate via Google Earth imagery where the project is located relative to sensitive viewing locations such as airports, KOPs, and roads/highways. Using simple parameters provided by the applicant, the glare analysis provides a quantitative assessment of when and where glare from the project components will occur throughout the year and shows potential effects on the human eye at locations where glare occurs. The glare analysis also assesses the project's energy production so that the applicant can compare alternative designs to maximize energy production while mitigating the impacts of glare. Additional information regarding the orientation and tilt of the photovoltaic (PV) panels, reflectance of project components, local environmental conditions, and ocular factors (e.g., flash blindness) are considered in the analysis (Forge Solar 2020). The PV panels used in this analysis are fixed-frame racks with a tilt of 30 degrees and a max height of 10 feet above the ground, facing south. As shown in the visual simulations (see Appendix B), the area's agricultural, roaded setting contains screening vegetation and contrasting patches of land. Existing vegetation and structures are considered when analyzing the results of the glare analysis.

4 RESULTS

4.1 Visual Simulations and Contrast Analysis by KOP

Impacts to scenic resources were determined by examining the simulations and evaluating the visual change and contrast with the existing landscape that would result from the construction and operation of the project. The visual impact analysis for each of the three KOPs is provided below. Contrast Rating Worksheets for each of the KOPs are provided in Appendix A.

4.1.1 *KOP 1: Interstate 8 and Evan Hewes Highway, Looking East*

This KOP represents the view of a passenger in a vehicle traveling northwest on Evan Hewes Highway, departing the I-8 overpass, southwest of the project site (see Figure 1). The view from this KOP is characterized by broad, panoramic views of flat, consistent, and horizontal terrain with isolated areas of light khaki to light brown desert shrubs and clustered, low, rounded, globular, moderately tall, green to dark green trees. In the foreground area, distinct agricultural plots are defined by distinct edges of exposed soils and yellow to light green vegetation. Transmission lines made of light brown to dark brown, vertically standing wood poles are consistent horizontally across the landscape. In the background, distant views of the vertical, galvanized metal transmission line and slow, gradual rise in elevation lead to dark-colored landforms. The transmission lines and large, white, stacked crop bales in the midground draw the eye and are a focus of attention from this KOP location due to the dominance and prominence of the features within the broad, panoramic landscape and against the pale blue sky.

The proposed project would be approximately 1.5 miles south of this KOP location. Based on the inferior viewer perspective, the overall distance from the KOP, and the proposed project location in relation to the viewer, the proposed project would not be perceivable from this KOP due to the presence of existing vegetation and agricultural improvements and the prominence of the existing transmission line structures and stacked crop bales in the foreground and midground are the focus of viewer attention. The gen-tie would be perceivable, but would be similar in form, line, color, and texture to the existing transmission line infrastructure in the immediate area. Therefore, it is anticipated that there would be no perceived visual contrast created by the project within the existing landscape from this KOP.

4.1.2 *KOP 2: Norrish Road and Highline Road, Looking Southeast*

This KOP represents the view from local residences and vehicular traffic traveling south on Highline Road, northwest of the project site (see Figure 1). Views of the immediate foreground from this KOP are represented by perpendicular roads with light brown, uniform, rectangular, and white residential and agricultural buildings; light to dark grey, concave, concrete irrigation canals; smooth brown to dark brown, vertical, wood and galvanized metal transmission lines; and fine, light tan soils intermixed with dark tan shrubs. The midground of the KOP includes geometric agricultural plots with light bright green to dark green vegetation divided by light tan access roads consisting of farming equipment. In the background, distant views of concentrated, upright trees are intermixed with the consistent, horizontal lines of low vegetation in agricultural plots; tall, vertical, galvanized metal transmission lines are visible and consistent across the horizon. The human-made, uniform, rectangular building structures in the foreground draw the eye and are a focus of attention from this KOP because of their prominence against the broad, panoramic landscape and the pale blue sky.

The proposed project area is approximately 2.3 miles southeast of this KOP location. Based on the inferior viewer perspective and the presence of existing features within the immediate foreground area that dominate the viewshed and obstruct views towards the proposed project, the project would not be perceivable from this KOP. In the midground area of the KOP, the irrigated agricultural fields influence visibility of project components due to the similar color characteristics; the light to dark grey tones blend in with the proposed project features. Therefore, it is anticipated that there would be no perceived visual contrast created by the project within the existing landscape from this KOP.

4.1.3 *KOP 3: Evan Hewes Highway and Nelson Pit Road*

This KOP represents the view of a passenger in a vehicle traveling southeast on Evan Hewes Highway west of the project site (see Figure 1). Views from this KOP are characterized by broad, panoramic views of flat, consistent, and horizontal terrain with isolated areas of light khaki to light brown desert shrubs and clustered, low, rounded, globular, moderately tall, green to dark green trees. In the immediate foreground, existing upright, geometric roadway signage is prominent within the vast, horizontal landscape. Distinct edges of exposed soft light tan soils and vegetation along access roads and a concave canal are prominent in the foreground. In the background, distant views of clustered trees with consistent agriculture fields visible across the horizon the lead to dark colored mountain landforms in the distance. The light tan horizontal access road and parallel canal in the foreground draw the eye to the isolated residence in the midground and are a focus of attention from this location because of their prominence in the broad, panoramic landscape.

The proposed project would be approximately 2.6 miles east of this KOP location. Based on the inferior viewer perspective, the proposed project location in relation to the viewer, the overall distance from the KOP, the presence of existing vegetation, and the isolated landforms in the background, the proposed project would not be perceivable from this KOP. From KOP 3, much of the project area is obscured by existing vegetation, residential and agricultural structures, and existing transmission lines. Therefore, it is anticipated that there would be no perceived visual contrast created by the project within the existing landscape from this KOP.

4.2 Glare Analysis

The analysis concluded that the project has the possibility to create low-potential afterimage (green ocular impact) and potential temporary afterimage (yellow ocular impact) glare for the receptors looking directly east at project site from KOP 3. Viewers at KOP 3 may experience glare from the northeastern-most

project array area if no vegetation or structures are in the field of view. KOP 3 will have potential for glare for up to 133 minutes per year; the glare would occur from mid-March to mid-April and mid-August to mid-September, within the hour between 2:30PM and 3:30PM, for approximately 5 minutes per day. The analysis determined that the other array areas will not produce glare. The results from the solar glare analysis are provided in Appendix C.

Regarding the nearest airport (Holtville Airport, approximately 1.5 miles north of the project area), four potential flight paths were considered. During takeoff and landing procedures, airborne viewers (e.g., pilots) would be elevated in relation to the project area. The results of the glare analysis conducted for this project indicate that airborne viewers would not experience glare within the four, 2-mile-long takeoff and landing flight path segments analyzed by ForgeSolar established parameters to meet FAA requirements. This airport does not have an air traffic control tower, so no tower viewers were analyzed.

5 PRELIMINARY CEQA ANALYSIS

This technical report will inform the overall evaluation of potential environmental effects from the project in order to satisfy the requirements of the California Environmental Quality Act (CEQA). There are four CEQA criteria for aesthetics that the project must meet. Each criteria is presented here as a question, with preliminary assessments of project impacts to visual resources provided as answers.

1. Would the project have a substantial adverse effect on a scenic vista?

   No Impact. There are no designated scenic vistas in the project vicinity. As described above in Section 4.1, the project would not have a substantial adverse effect on the expansive views from the three KOPs. Rather, the thin horizontal edge of solar arrays and rectangular geometric shapes of the project facilities would be absorbed into the existing vegetation and built features with similar lines, forms, and colors that comprise the landscape. Therefore, no impacts to scenic vistas would occur.

2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

   No Impact. There are no designated or eligible scenic highways in the project vicinity.

3. Would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

   Less Than Significant. The existing visual character from public viewpoints would not be substantially altered in the vicinity of the project site. From KOP 1, which represents an elevated view overlooking the project area, the proposed gen-tie line would be visible but would be mostly unnoticed due to the current existing structures that obscure the view. From KOP 2, the project visually blends in with the existing built features and irrigated agricultural fields between the viewer and the project area. The view from KOP 3 is mostly blocked by existing vegetation, residential and agricultural structures, and transmission lines running east to west across the landscape. As previously described, the project would not substantially degrade the existing visual character or quality of public views from this distance; rather, the horizontal and rectangular project facilities would appear to be absorbed into the existing vegetation and built features that comprise the broader landscape. The project would not substantially degrade existing visual character and quality and the impact would be less than significant.

4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

   Less Than Significant. The project would not include any substantial source of nighttime light in the vicinity of the project site. Any lighting required for safety and security within the project site would be hooded and oriented downward.

   The glare analysis for the project concluded that viewers at KOP 3 may experience glare from the northeastern-most project array area if no vegetation or structures are in the field of view, and that the other array areas will not produce glare (see Appendix C). KOP 3 will have potential for glare for approximately 10 minutes a day for 2 months a year. However, given the presence of existing vegetation and structures, it likely that these effects would be less than significant.

5.1 Suggested Mitigation Measures

Project impacts were evaluated against the CEQA significance criteria above to identify opportunities to mitigate for impacts to aesthetics and visual resources resulting from sources of visual contrast and glare that would potentially affect views in the area. Mitigation measures such as the use of non-reflective materials, finishes and surface treatments on project components in addition to vegetation screening, would further reduce visual contrast and glare associated with the project.

Visual barriers, to include vegetation, are the most effective at mitigating glare from solar arrays when the vegetation is located as close to the glare source as possible. If vegetation is used, native and naturalized plants should be specified to match or complement height and characteristics of existing vegetation if applicable within the area. Existing vegetation within and surrounding the project area should be maintained and preserved to the greatest extent possible. If non-native species are used for vegetation screening, it should mimic characteristics that exist within the area. Preserving existing vegetation will reduce the project's overall impact on the existing health of soils, wildlife, cost, and visual aesthetics.

6 LITERATURE CITED

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APPENDIX A

Contrast Rating Worksheets

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VISUAL CONTRAST RATING WORKSHEET

Date: 12/2/2020

Project Name: **Vikings Solar Energy**	Key Observation Point Number: **KOP 1**
Project Type: Solar Facility	Key Observation Point Name: Interstate 8 and Evans Hewes Highway
Evaluator's Names: Spenser Branch/ Chris Bockey	Photo Numbers: 2198-2200

CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Smooth, broad, flat agricultural land leading up to undulating mountains in the distant background	Distinctive geometric, agricultural fields Clustered, vertical, amorphic deciduous trees Isolated areas of low rounded globular shrubs	Vertical, thin, transmission line structures with distinctive horizontal connector arms Irregular to geometric elements of agricultural equipment Rectangular, linear stacked crop bails Rectangular, concave, continuous irrigation ditches
LINE	Distinctive, horizontal, continuous lines	Irregular, broken shrubs in foreground Distinct edges of exposed soils and agricultural vegetation at transitions	Bold, vertical transmission line structures with softly curved horizontal transmission line wires
COLOR	Variations of light khaki to light brown exposed soils	Light tan-muted rust-light grey shrubs Yellow-green agriculture fields	Bright-white crop bails Galvanized, grey to silver transmission structures Light brown to dark brown tones in wood transmission line structures Light grey to dark grey concrete road and irrigation ditches
TEX-TURE	Smooth, consistent, directional Fine, soft soils	Smooth, carpet-like texture of agriculture fields Clustered, coarse areas of shrubs and deciduous tress	Continuous and repetitive transmission line infrastructure Isolated and geometric, smooth surfaced crop bail covers

PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change	No perceived change	Thin, horizontal or regular edge of solar arrays Rectangular, geometric battery storage infrastructure Geometric, angular transmission line interconnect facility
LINE	No perceived change	No perceived change	Horizontal line of solar array edge Horizontal and vertical lines of battery storage facility
COLOR	No perceived change	No perceived change	Dark subdued grey to blue black of solar arrays Light grey earth tones of battery storage facility Muted reflective grey substation and transmission line infrastructure

TEXTURE	No perceived change	No perceived change	Smooth, continuous, organized, solar facility infrastructure Vertical, repetitive transmission line structures

CONTRAST ANALYSIS

DEGREE OF CONSTRAST		FEATURES												
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
ELEMENTS	Form				X				X			X		
	Line				X				X			X		
	Color				X				X			X		
	Texture				X				X				X	

Recommended Mitigation Measures

Materials and surface treatments for structures and roads should repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. For example, if the project will be viewed against an earthen or other non-sky background, appropriately colored materials should be selected to help blend structures with the project's backdrop.

Unless safety or functional requirements preclude it, all structures should be color treated to reduce contrasts with existing landscape.

Materials, coatings, or paints that have little or no reflectivity should be used on structures. Semi-gloss finishes should be used rather than flat or gloss finishes. Substation equipment should be specified with a low-reflectivity, neutral finish. Insulators at substations should be non-reflective. The surfaces of substation structures should be given low reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Security fence surrounding the substations should have a dulled, darkened finish to reduce contrast.

Electric transmission towers should be color treated to reduce contrasts with the existing landscape. Monopole towers should have a low-reflectivity treatment. Where transmission facilities using monopole towers are located within the same ROW or corridor, the color treatment should match the existing facilities within the ROW, unless they contrast with the visual backdrop.

Notes

VISUAL CONTRAST RATING WORKSHEET

Date: 12/2/2020

Project Name: **Vikings Solar Energy**	Key Observation Point Number: **KOP 2**
Project Type: Solar Facility	Key Observation Point Name: Norrish Road and Highline Road
Evaluator's Names: Spenser Branch/Chris Bockey	Photo Numbers: 2452-2453

CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Endless, broad, flat, vast open terrain	Distinct agricultural plot Cluster of deciduous trees in foreground and sporadic areas of trees in the background	Isolated rectangular farming buildings Concave concrete canal Consistent transmission lines in foreground and background Prominent concrete irrigation canal
LINE	Perpendicular, consistent lines through terrain	Irregular, broken shrubs in foreground Distinct edges of exposed agriculture soils	Perpendicular road and vertical transmission lines with curved sagging conductor wires Rectangular concave irrigation ditch Horizontal continuous elements
COLOR	Light brown-dark brown soils	Light tan-brown desert shrubs Yellow green-dark green tees Bright green-green vegetation in midground	Light brown to dark brown tones in wood transmission line Light grey to dark grey concrete irrigation ditch Light grey-grey water irrigating agriculture
TEX-TURE	Smooth, consistent terrain Fine, smooth soils	Inconsistent patches of trees Smooth low laying clusters of shrubs	Uniform farming buildings Ordered consistent transmission lines Smooth matt concrete road and canal

PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change	No perceived change	Thin or horizontal or regular edge for solar arrays Geometric isolation Rectangular battery storage Transmission interconnect
LINE	No perceived change	No perceived change	Horizontal line from solar array edge Horizontal and vertical lines from battery storage
COLOR	No perceived change	No perceived change	Dark subdued grey to blue black solar arrays Light grey earth tones from battery storage Muted reflective grey substation and transmission
TEX-TURE	No perceived change	No perceived change	Smooth solar facility Vertical transmission lines

CONTRAST ANALYSIS

DEGREE OF CONSTRAST		FEATURES												
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
ELEMENTS	Form				X				X			X		
	Line				X				X			X		
	Color				X				X			X		
	Texture				X				X				X	

Recommended Mitigation Measures

Materials and surface treatments for structures and roads should repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. For example, if the project will be viewed against an earthen or other non-sky background, appropriately colored materials should be selected to help blend structures with the project's backdrop.

Unless safety or functional requirements preclude it, all structures should be color treated to reduce contrasts with existing landscape.

Materials, coatings, or paints that have little or no reflectivity should be used on structures. Semi-gloss finishes should be used rather than flat or gloss finishes. Substation equipment should be specified with a low-reflectivity, neutral finish. Insulators at substations should be non-reflective. The surfaces of substation structures should be given low reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Security fence surrounding the substations should have a dulled, darkened finish to reduce contrast.

Electric transmission towers should be color treated to reduce contrasts with the existing landscape. Monopole towers should have a low-reflectivity treatment. Where transmission facilities using monopole towers are located within the same ROW or corridor, the color treatment should match the existing facilities within the ROW, unless they contrast with the visual backdrop.

Notes

VISUAL CONTRAST RATING WORKSHEET

Date: 12/2/2020

Project Name: **Vikings Solar Energy**	Key Observation Point Number: **KOP 3**
Project Type: Solar Facility	Key Observation Point Name: Evans Hewes Highway and Nelson Pit Road
Evaluator's Names: Spenser Branch/Chris Bockey	Photo Numbers: 2276-2277

CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Broad, flat fast land that appears endless along horizon	Distinct agricultural plots Cluster of deciduous trees in midground	Isolated rectangular buildings Consistent transmission lines in and background Prominent concave concrete irrigation canal
LINE	Horizontal perpendicular and consistent lines appear through terrain	Consistent shrubs parallel canal Distinct edges of exposed agriculture soils Horizontal continuous agriculture plots	Vertical transmission lines in background Vertical poles and street signs in foreground Circular concrete canal
COLOR	Light tan-dark brown soils Green-brown-light tan desert shrubs	Light tan-brown desert shrubs Light green-dark green tees Bright green- dark green agriculture	Light brown to dark brown tones in wood street sign Light grey to dark grey concrete irrigation ditch Bright white buildings Galvanized transmission lines
TEX-TURE	Smooth, consistent terrain Fine, smooth soils	Inconsistent clustered areas of trees Smooth low laying clusters of shrubs Soft smooth agriculture	Consistent transmission line in background Rough, cracked uneven road

PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No perceived change	No perceived change	Thin or horizontal or regular edge for solar arrays Geometric isolation Rectangular battery storage Transmission interconnect
LINE	No perceived change	No perceived change	Horizontal line from solar array edge Horizontal and vertical lines from battery storage
COLOR	No perceived change	No perceived change	Dark subdued grey to blue black solar arrays Light grey earth tones from battery storage Muted reflective grey substation and transmission
TEX-TURE	No perceived change	No perceived change	Smooth solar facility Vertical transmission lines

CONTRAST ANALYSIS

DEGREE OF CONSTRAST		FEATURES												
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
ELEMENTS	Form				X				X			X		
	Line				X				X			X		
	Color				X				X			X		
	Texture				X				X				X	

Recommended Mitigation Measures

Materials and surface treatments for structures and roads should repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. For example, if the project will be viewed against an earthen or other non-sky background, appropriately colored materials should be selected to help blend structures with the project's backdrop.

Unless safety or functional requirements preclude it, all structures should be color treated to reduce contrasts with existing landscape.

Materials, coatings, or paints that have little or no reflectivity should be used on structures. Semi-gloss finishes should be used rather than flat or gloss finishes. Substation equipment should be specified with a low-reflectivity, neutral finish. Insulators at substations should be non-reflective. The surfaces of substation structures should be given low reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Security fence surrounding the substations should have a dulled, darkened finish to reduce contrast.

Electric transmission towers should be color treated to reduce contrasts with the existing landscape. Monopole towers should have a low-reflectivity treatment. Where transmission facilities using monopole towers are located within the same ROW or corridor, the color treatment should match the existing facilities within the ROW, unless they contrast with the visual backdrop.

Notes

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APPENDIX B

Visual Simulations

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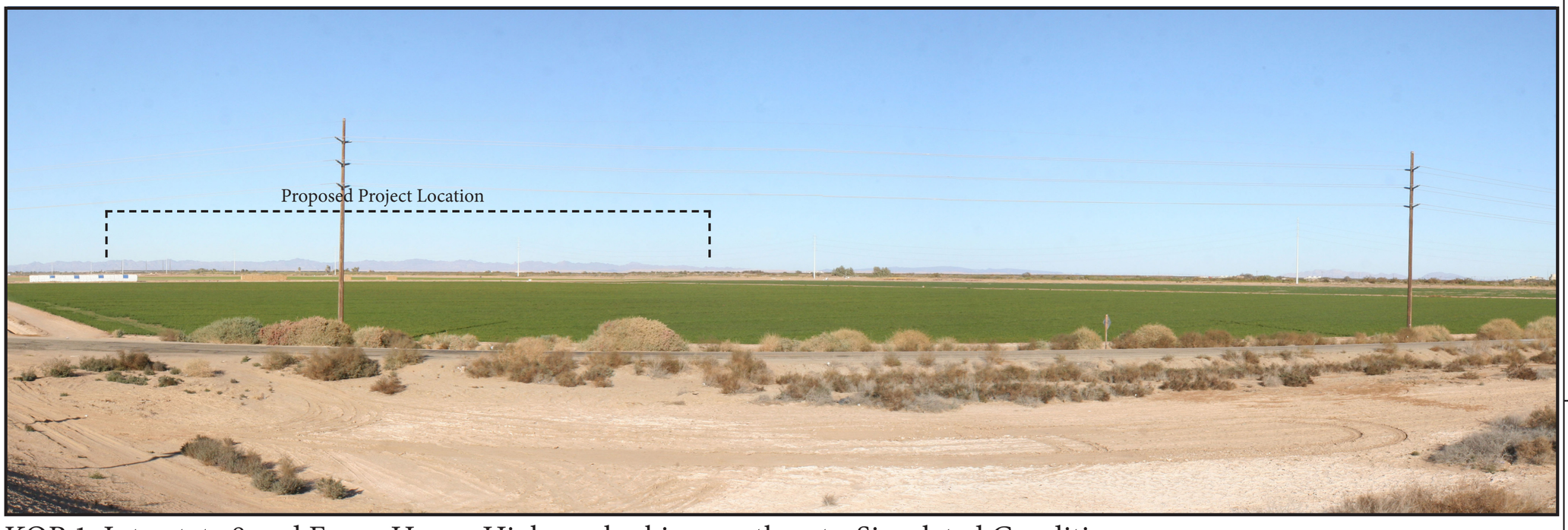
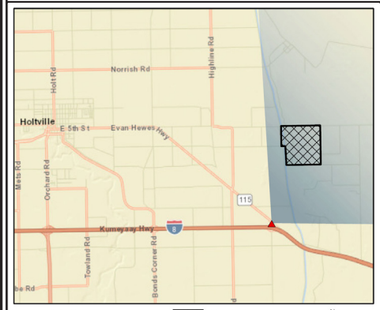
KOP 1: Interstate 8 and Evens Hewes Highway looking northeast - Existing Condition



KOP 1: Interstate 8 and Evens Hewes Highway looking northeast - Simulated Condition

Vikings Solar Energy Storage Project

KOP 1: Interstate 8 and Evens Hewes Highway



Base Photographic Documentation

Date	12/02/2020
Time (24H)	14:20
Longitude (°)	-115.285089
Latitude (°)	32.774261
Viewpoint Elevation (ft)	29
Camera Height (m)	1.5
Camera Heading(deg.)	15

Camera Information

Camera Make & Model	Canon 20D
Camera Sensor Size	23.6mm x 15.6mm
Lens Make & Model	Canon EFS 18-55 mm
Lens Focal Legth	24mm
Crop Factor	1.53

Sun and Weather Information

Sun Azimuth (°)	281.09
Sun Elevation (°)	-58.22
Lighting Angle on Project	Back Lit
Weather Conditions	Sunny
Avg. Predicted Visibility	10 miles
Tempature (°F)	72
Humidity (%)	40

Proposed Infrastructure Information

Closest Distance to Project	1.55 miles
Solar Array Max. Height	10 ft
Battery Storage Max Height	10 ft
Gen-tie Max Height	120 ft

Simulation was prepared using information provided by Apex Energy Solutions, LLC. Solar facility locations, colors, and heights may differ based on final engineering and design.

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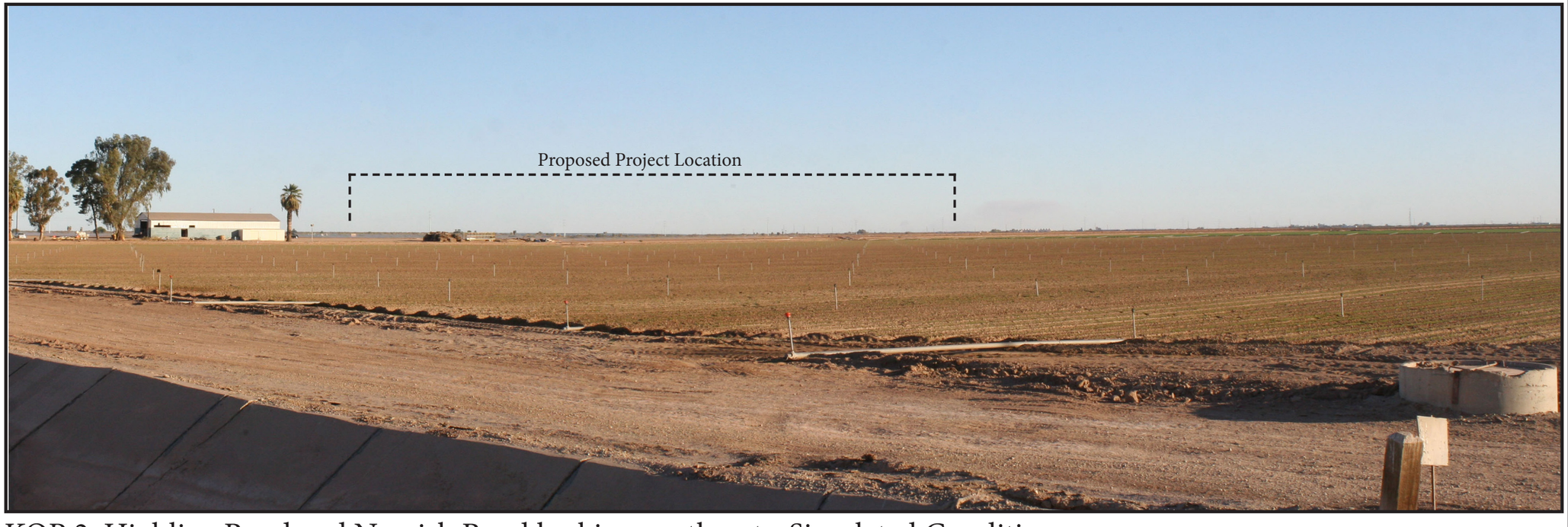
KOP 2: Highline Road and Norrish Road looking southeast - Existing Condition



KOP 2: Highline Road and Norrish Road looking southeast - Simulated Condition

Vikings Solar Energy Storage Project

KOP 2: Highline Road and Norrish Road

Base Photographic Documentation

Date	12/02/2020
Time (24H)	15:20
Longitude (°)	-115.310505
Latitude (°)	32.832418
Viewpoint Elevation (ft)	-1
Camera Height (m)	1.5
Camera Heading(deg.)	131

Camera Information

Camera Make & Model	Canon 20D
Camera Sensor Size	23.6mm x 15.6mm
Lens Make & Model	Canon EFS 18-55 mm
Lens Focal Legth	24mm
Crop Factor	1.53

Sun and Weather Information

Sun Azimuth (°)	298.08
Sun Elevation (°)	-70.08
Lighting Angle on Project	Back Lit
Weather Conditions	Sunny
Avg. Predicted Visibility	10 miles
Tempature (°F)	72
Humidity (%)	40

Proposed Infrastructure Information

Closest Distance to Project	1.55 miles
Solar Array Max. Height	10 ft
Battery Storage Max Height	10 ft
Gen-tie Max Height	120 ft

Simulation was prepared using information provided by Apex Energy Solutions, LLC. Solar facility locations, colors, and heights may differ based on final engineering and design.

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KOP 3: Evans Hewes Highway and Nelson Pit Road looking east - Existing Condition

KOP 3: Evans Hewes Highway and Nelson Pit Road looking east - Simulated Condition

Vikings Solar Energy Storage Project

KOP 3:Evans Hewes Highway and Nelson Pit Road

Base Photographic Documentation

Date	12/02/2020
Time (24H)	15:00
Longitude (°)	-115.325384
Latitude (°)	32.803724
Viewpoint Elevation (ft)	-5
Camera Height (m)	1.5
Camera Heading(deg.)	90

Camera Information

Camera Make & Model	Canon 20D
Camera Sensor Size	23.6mm x 15.6mm
Lens Make & Model	Canon EFS 18-55 mm
Lens Focal Legth	24mm
Crop Factor	1.53

Sun and Weather Information

Sun Azimuth (°)	288.78
Sun Elevation (°)	-67
Lighting Angle on Project	Back Lit
Weather Conditions	Sunny
Avg. Predicted Visibility	10 miles
Tempature (°F)	72
Humidity (%)	40

Proposed Infrastructure Information

Closest Distance to Project	1.55 miles
Solar Array Max. Height	10 ft
Battery Storage Max Height	10 ft
Gen-tie Max Height	120 ft

Simulation was prepared using information provided by Apex Energy Solutions, LLC. Solar facility locations, colors, and heights may differ based on final engineering and design.

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APPENDIX C

Solar Glare Analysis

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Site Configuration: Vikings Solar

Project site configuration details and results.

Created **Jan. 11, 2021 1:26 p.m.**
Updated **Jan. 11, 2021 1:31 p.m.**
DNI **varies** and peaks at **1,000.0 W/m^2**
Analyze every **1** minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone **UTC0**
Site Configuration ID: 47824.8552

Summary of Results

Glare with potential for temporary after-image predicted

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
PV array 1	30.0	180.0	1	133	-

Component Data

PV Array(s)

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Note: PV array encompasses a large surface area (greater than 25 acres). Accuracy of path receptor glare analysis may be affected by footprint size. Additional analyses of array sub-sections may provide more information on expected glare.

Name: PV array 1
Axis tracking: Fixed (no rotation)
Tilt: 30.0 deg
Orientation: 180.0 deg
Rated power: -
Panel material: Smooth glass without AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 6.55 mrad
Approx. area: 24,710,932 sq-ft

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	32.810676	-115.263538	33.92	10.00	43.92
2	32.810660	-115.281104	25.04	10.00	35.04
3	32.803254	-115.280664	22.21	10.00	32.21
4	32.803254	-115.276329	39.44	10.00	49.44
5	32.796076	-115.276372	37.03	10.00	47.03
6	32.796076	-115.263476	33.39	10.00	43.39

2-Mile Flight Path Receptor(s)

Name: FP 1
Description:
Threshold height : 50 ft
Direction: 270.0 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 50.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
Threshold	32.844902	-115.259474	55.33	50.00	105.34
2-mile point	32.844907	-115.225020	77.35	581.44	658.79

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Name: FP 2
Description:
Threshold height : 50 ft
Direction: 90.2 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 50.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
Threshold	32.845046	-115.278113	57.80	50.00	107.80
2-mile point	32.845157	-115.312567	-2.68	663.94	661.26

Name: FP 3
Description:
Threshold height : 50 ft
Direction: 135.9 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 50.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
Threshold	32.844311	-115.276263	55.57	50.00	105.58
2-mile point	32.865074	-115.300240	0.16	658.87	659.03

Name: FP 4
Description:
Threshold height : 50 ft
Direction: 313.1 deg
Glide slope: 3.0 deg
Pilot view restricted? Yes
Vertical view restriction: 30.0 deg
Azimuthal view restriction: 50.0 deg

Point	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
Threshold	32.834324	-115.264681	40.55	50.00	90.55
2-mile point	32.814561	-115.239535	59.98	584.02	644.00

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Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 1	32.774646	-115.285503	24.69	5.00	29.69
OP 2	32.832699	-115.310713	-0.87	5.00	4.13
OP 3	32.803762	-115.325448	-3.77	5.00	1.23

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PV Array Results

Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
PV array 1	30.0	180.0	1	133	-	-

Click the name of the PV array to scroll to its results

PV & Receptor Analysis Results detailed results for each PV array and receptor

PV array 1 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
FP: FP 1	0	0
FP: FP 2	0	0
FP: FP 3	0	0
FP: FP 4	0	0
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	1	133

PV array 1 - Receptor (FP 1)

No glare found

PV array 1 - Receptor (FP 2)

No glare found

PV array 1 - Receptor (FP 3)

No glare found

PV array 1 - Receptor (FP 4)

No glare found

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PV array 1 - OP Receptor (OP 1)

No glare found

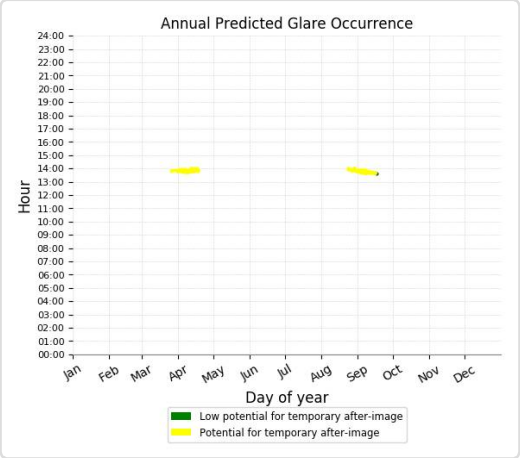
PV array 1 - OP Receptor (OP 2)

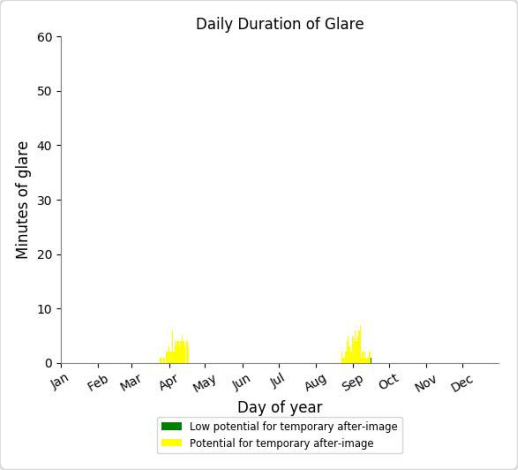
No glare found

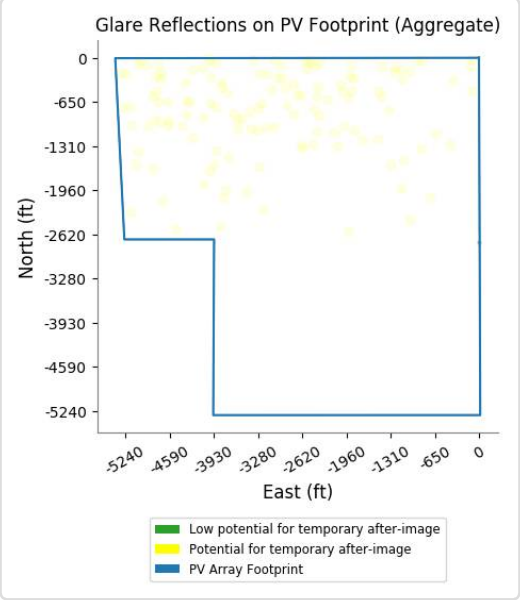
PV array 1 - OP Receptor (OP 3)

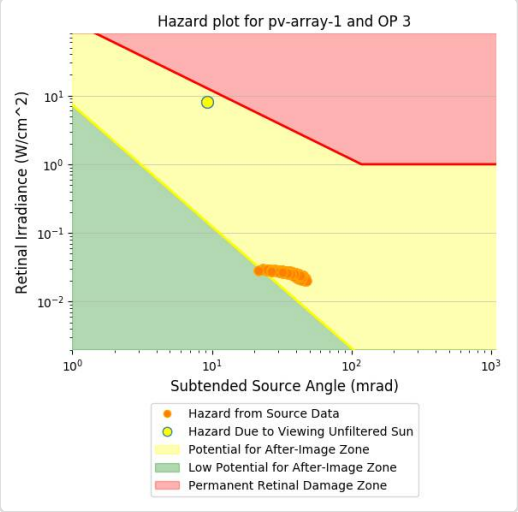
PV array is expected to produce the following glare for receptors at this location:

- 1 minutes of "green" glare with low potential to cause temporary after-image.
- 133 minutes of "yellow" glare with potential to cause temporary after-image.









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Assumptions

- Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
- Detailed system geometry is not rigorously simulated.
- The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values and results may vary.
- The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. I should not be used in place of more rigorous modeling methods.
- Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
- The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
- Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
- Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
- Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
- Glare analysis methods used: OP V1, FP V1, Route V1
- Refer to the **Help page** for assumptions and limitations not listed here.

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E Land Evaluation and Site Assessment

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California Land Evaluation and Site Assessment for the Vikings Solar Energy Storage Project, Imperial County, California

JANUARY 2022

PREPARED FOR

Vikings Energy Farm, LLC

PREPARED BY

SWCA Environmental Consultants

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CALIFORNIA LAND EVALUATION AND SITE ASSESSMENT FOR THE VIKINGS SOLAR PROJECT, IMPERIAL COUNTY, CALIFORNIA

Prepared for

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SWCA Project No. 64085

January 2022

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) prepared this California Land Evaluation and Site Assessment (LESA) to provide agencies and decision makers with a concise and accurate assessment to assist with the evaluation of the potentially significant effects on the environment associated with the conversion of agricultural land considered in the environmental review process, including the California Environmental Quality Act (CEQA). The LESA is based on the Land Evaluation & Site Assessment Model produced by the California Department of Conservation (DOC) in 1997 (California Agricultural LESA Model) to provide lead agencies with an optional methodology to ensure that potentially significant effects related to agricultural land conversions are quantitatively and consistently considered in the environmental review process. The California Agricultural LESA Model evaluates measures of soil resource quality, a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, the factors are rated, weighted, and combined, resulting in a single numeric score. The project score becomes the basis for making a determination of a project's potential significance.

The LESA performed for the Vikings Solar Energy Storage Project (Project) resulted in a Land Evaluation score of 21.42 and a Site Assessment score of 26.25, for a cumulative total of 47.67 points out of 100. Based on the California Agricultural LESA Model methodology and final score, the Project site is considered to represent a significant agricultural resource and the Project would have the potential to result in significant impacts on agricultural resources.

2 PROJECT SETTING

Vikings Energy Farm, LLC is proposing to develop a nominal 150-megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation Project with an integrated up to 300 megawatts (MW) battery storage system on approximately 604 acres of land in the County of Imperial, California. The Project would be located at the intersection of Nelson Pit Road and Graeser Road, approximately 5.5 miles east of the city of Holtville. The Project would be located on Imperial County Assessor's Parcel Numbers (APNs) 050-070-018-000 (approximately 480.00 acres), 050-070-019 (approximately 80.00 acres), and 050-070-021 (approximately 43.61 acres) (Figures 1 and 2).

Favorable climate, productive soils, and the availability of irrigation water have permitted Imperial County to become a leading producer of agricultural products. Irrigation is critical for crop production in Imperial County. Water for irrigation in the county is diverted from the Colorado River at the Palo Verde Diversion Dam north of Blythe by the Palo Verde Irrigation District, and at Imperial Dam through the All-American Canal headworks and desilting basins by the Imperial Irrigation District (IID) and the Bard Irrigation District for use in the Yuma, Bard, Imperial, and Coachella Valleys. In the Imperial Valley, approximately 2.9 million acre-feet of water is delivered annually to over 500,000 acres of agricultural lands via an elaborate gravity-flow system (County of Imperial 2015).

3 PURPOSE OF THIS CALIFORNIA LAND EVALUATION AND SITE ASSESSMENT

The purpose of this LESA is to provide agencies and decision makers with a concise and accurate assessment to assist with the evaluation of the potentially significant effects on the environment associated with agricultural land conversion considered in the environmental review process, including CEQA.

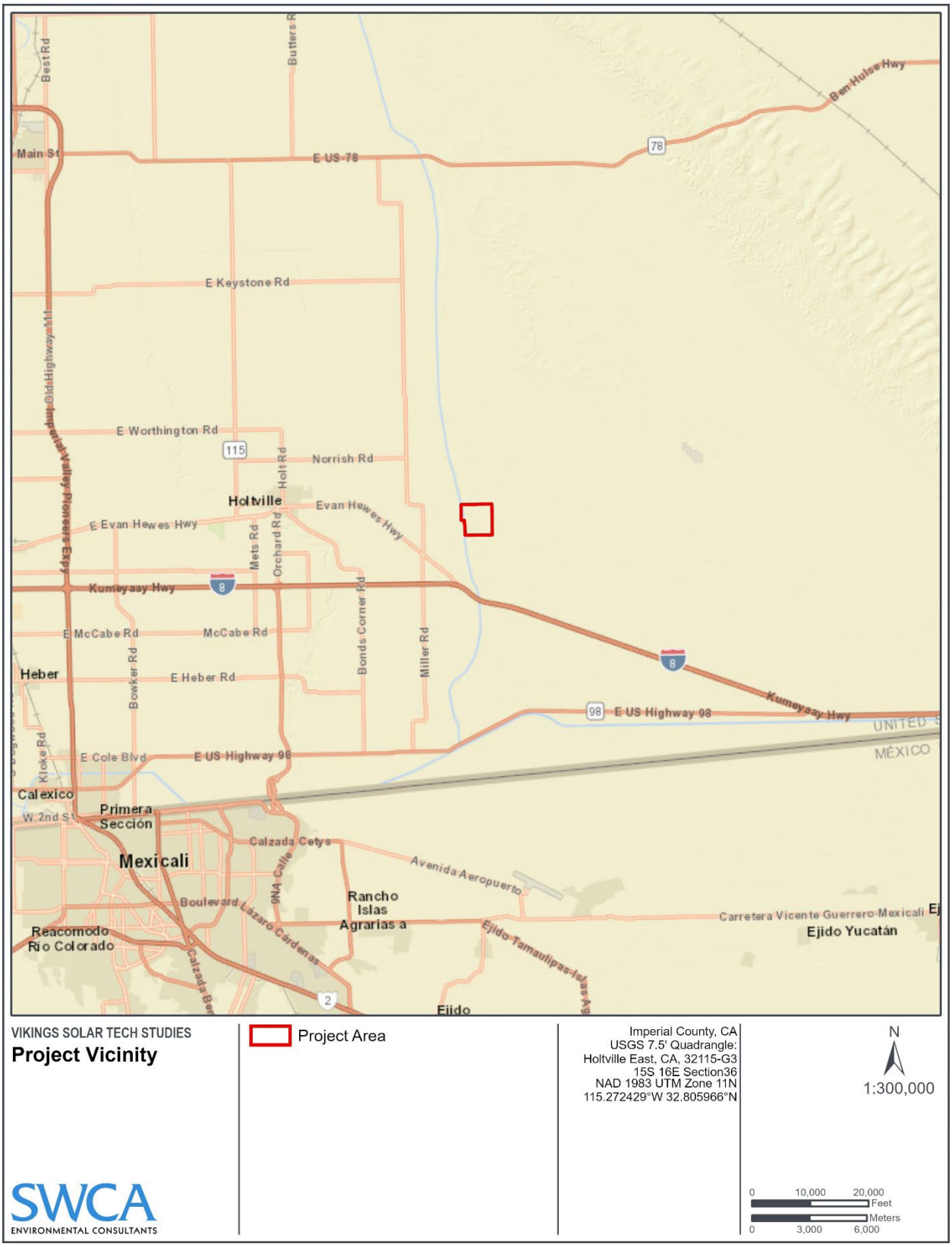

Figure 1. Project vicinity map.

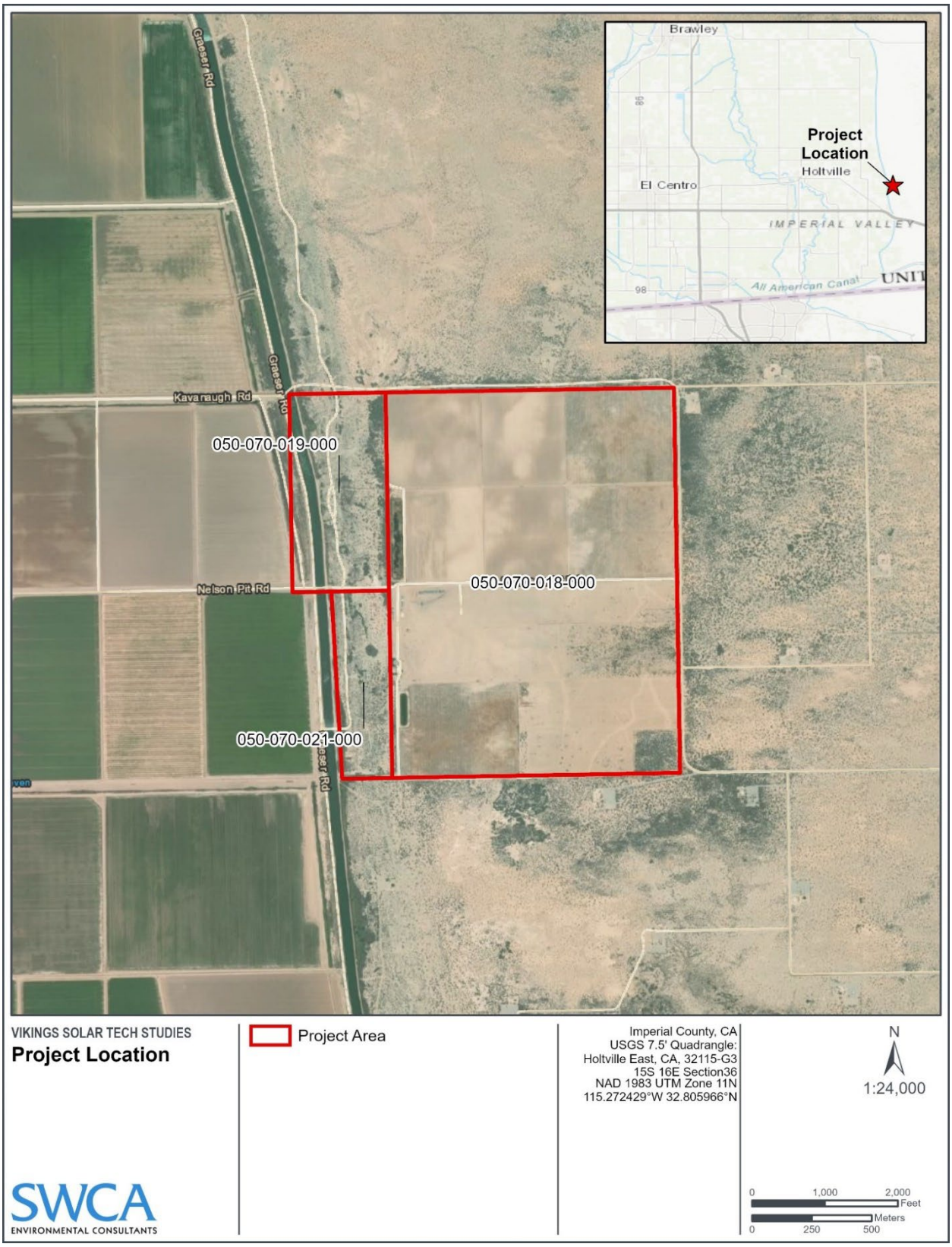

Figure 2. Project location map.

The California Agricultural LESA Model is a point-based approach that is generally used for rating the relative value of agricultural land resources. In basic terms, a LESA model is created by defining and measuring two separate sets of factors. The first set, Land Evaluation, includes factors that measure the inherent soil-based qualities of land as they relate to agricultural suitability. The second set, Site Assessment, includes factors that are intended to measure social, economic, and geographic attributes that also contribute to the overall value of agricultural land (DOC 1997). The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. It is this project score that becomes the basis for making a determination of a project's potential significance, based upon a range of established scoring thresholds (DOC 1997).

This document and associated analysis were prepared using the instructions and guidance within the *Land Evaluation and Site Assessment (LESA) Instruction Manual* (DOC 1997).

4 PROJECT DESCRIPTION

As stated in the Section 2, Project Setting, Vikings Energy Farm LLC is proposing to develop the Vikings Solar Energy Storage Project, a nominal 150-megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation Project with an integrated up to 300 megawatts (MW) battery storage system on approximately 604 acres of land in the County of Imperial, California. The Project proposes to utilize either thin film or crystalline solar PV technology modules mounted either on fixed frames or horizontal single-axis tracker (HSAT) systems.

The proposed battery energy storage system (BESS or ESS) would be constructed adjacent to the Project's solar facilities and would consist of either lithium ion (Li-ion) or flow batteries. The batteries will either be housed in storage containers or buildings fitted with heating, ventilation, and air conditioning (HVAC) and fire suppression systems as necessary, depending on the final selection of battery technology. Inside the housing, the batteries will be placed on racks, the orientation of which depends on the type of housing. Underground trenches with conduits will be used to connect the batteries to the control and monitoring systems, and inverters to convert the PV-produced direct current (DC) power to AC power.

The Project site would include one primary access driveway located off of East Nelson Road, bisecting the Project area and a secondary access driveway (if required) with a to-be-determined location. This driveway would be provided with minimum 30-foot double swing gates with a "Knox Box" for keyed entry. Internal to the Project site, up to 30-foot-wide roads would be provided between the PV arrays, as well as around the perimeter of each section of arrays inside the perimeter security fence to provide access to all areas of each section for maintenance and emergency vehicles.

Six-foot-high security fencing would be installed around the perimeter of each of the Project sites at the commencement of construction, and site access would be limited to authorized site workers. In addition, a motion detection system and closed-circuit camera system may also be installed. The site would be remotely monitored 24 hours per day, 7 days per week. In addition, routine unscheduled security rounds may be made by the security team monitoring the site.

Once construction is completed, the Project would be remotely controlled. No employees would be based at the Project sites. Primary security-related monitoring would be done remotely. Security personnel may conduct unscheduled security rounds and would be dispatched to the site in response to a fence breach or other alarm. Site maintenance workers may access the Project site periodically to clean the panels and maintain the equipment and Project area. The public would not have access to the facility. Access to the Project site would be infrequent and limited to authorized personnel.

Periodic washing of the PV modules is not expected to be necessary but could be needed to remove dust in order to maintain power generation efficiency. The amount of water needed for this purpose is conservatively estimated at 5 acre-feet per washing, with up to two washings per year, or a total of up to 10 acre-feet per year. This water would be water purchased from the IID. Each washing is expected to take 1 to 2 weeks to complete. Vegetation growing on the site would periodically (approximately every 3 months) be removed manually and/or treated with herbicides.

5 REGULATORY SETTING

5.1 Federal

5.1.1 *Farmland Protection Policy Act (7 USC Section 4201)*

The Farmland Protection Policy Act (FPPA) (7 United States Code [USC] Section 4201) was passed by U.S. Congress in 1994 with the intention to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that, to the extent possible, federal programs are administered to be compatible with state and local units of government and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every 2 years.

The FPPA does not authorize the Federal Government to regulate the use of private or nonfederal land or, in any way, affect the property rights of owners. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land (NRCS 2019).

5.2 State

5.2.1 *California Department of Conservation Farmland Mapping and Monitoring Program*

The DOC Division of Land Resource Protection developed the Farmland Mapping and Monitoring Program (FMMP) in 1984 to analyze impacts to California's agricultural resources. Land is rated based on the land capability classification system, California's Revised Storie Index, and recent land use. Land designations include:

- **Prime Farmland (P):** Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.
- **Farmland of Statewide Importance (S):** Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.
- **Unique Farmland (U):** Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the last 4 years prior to the mapping date.

- **Farmland of Local Importance (L):** Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. In Imperial County, Farmland of Local Importance is defined Unirrigated and uncultivated lands with Prime and Statewide soils.
- **Grazing Land (G):** Land on which the existing vegetation is suited to the grazing of livestock.
- **Urban and Built-Up Land (D):** Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
- **Other Land (X):** Land not included in any other mapping category. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines and borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

The FMMP maps are updated every 2 years with the use of a computer mapping system, aerial imagery, public review, and field reconnaissance (DOC 2019).

5.2.2 *California Land Conservation Act of 1965*

The California Land Conservation Act of 1965, also known as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments, which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.

For the purposes of this LESA evaluation, all land under an active Williamson Act contract is considered Protected Resource Land.

5.3 Imperial County

5.3.1 *Imperial County General Plan Agricultural Element*

The *Imperial County General Plan Agricultural Element* is intended to be a comprehensive, internally consistent, and long-term expression of community goals with regard to agriculture and serves as the foundation for development decisions by local authorities (County of Imperial 2015). The Agricultural Element describes the status and trends of agricultural resources within the planning area and identifies goals, objectives, policies, measures, and timeframes related to conserving agricultural lands while minimizing or avoiding conflicts with urban and other land uses.

The Agricultural Element identifies multiple important trends and/or issues related to future agricultural production in Imperial County, including, but not limited to, loss of important farmland to urban and other uses, water conservation and the future availability of adequate quantities of irrigation water, salinity/selenium levels in the Salton Sea, and a need for balancing renewable energy development and continued agricultural operations.

The Agricultural Element identifies 11 goals relative to agricultural production within the unincorporated areas of the county. These goals, together with objectives and policies that stem from them, provide

direction for private development as well as government actions and programs. Each goal is identified below:

- **Goal 1:** All Important Farmland, including the categories of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance, as defined by Federal and State agencies, should be reserved for agricultural uses.
- **Goal 2:** Adopt policies that prohibit "leapfrogging" or "checkerboard" patterns of nonagricultural development in agricultural areas and confine future urbanization to adopted Sphere of Influence areas.
- **Goal 3:** Limit the introduction of conflicting uses into farming areas, including residential development of existing parcels which may create the potential for conflict with continued agricultural use of adjacent property.
- **Goal 4:** Maximize the inherent productivity of Imperial County's agricultural resources by ensuring future availability of adequate and affordable irrigation water and by managing water such that it is used effectively and not wasted.
- **Goal 5:** Improve the quality of irrigation water runoff and reduce the extensive use of pesticides and other chemicals to minimize impacts to downstream water bodies, wetland habitats, and the overall environment.
- **Goal 6:** Strive to prevent the adoption of inappropriate, unnecessary, and restricting Federal, State, and local regulations that threaten the ability of farmers and livestock producers to profitably produce food and fiber for the nation.
- **Goal 7:** Establish positive relations with the general public and inform the general public that the County's entire economy is intricately dependent upon agricultural production.
- **Goal 8:** Improve the financial viability of the agricultural sector of Imperial County's economy through actions that have the potential to improve yields and reduce costs.
- **Goal 9:** Increase the value of locally produced agricultural commodities and improve and stabilize the County's economy by promoting local agricultural packaging and processing operations.
- **Goal 10:** Encourage the continuation and expansion of cattle/dairy production on agricultural land.
- **Goal 11:** Encourage the continuation and expansion of aquacultural production.

5.3.2 *Right-To-Farm Ordinance*

On August 7, 1990, the County of Imperial Board of Supervisors approved the "Right-to-Farm" Ordinance, which required a notice be mailed to owners of real property within Imperial County, mailed to potential purchasers of property in Imperial County, and attached to all building permits issued for projects within 0.25 mile of agricultural land. The Imperial County Right-to-Farm notice states that individuals who purchase or own land near agricultural lands or operations may be subject to inconvenience or discomfort arising from such operations. These may include, but are not limited to, noise, odors, light, fumes, dust, smoke, insects, chemicals, storage and disposal of manure, and the application by spraying or otherwise of chemical fertilizers, soil amendments, herbicides, and pesticides. One or more of these inconveniences may occur within existing laws and regulations and adjacent landowners shall be prepared to accept such inconveniences as a normal and necessary aspect of living in a county with a strong rural character and an active agricultural sector (County of Imperial 2015).

6 LAND EVALUATION AND SITE ASSESSMENT

The LESA Model consists of two parts: the Land Evaluation Section and Factors and the Site Assessment Factors. Scoring is included in the tables below, and each section's process and findings are described in detail below.

6.1 Part One: Scoring of Land Evaluation Factors

The California LESA Model includes two Land Evaluation factors that are rated separately:

1. **The Land Capability Classification Rating.** The U.S. Department of Agriculture (USDA) Land Capability Classification (LCC) indicates the suitability of soils for common crop types. Groupings are made according to the limitations of the soils when used to grow crops, and the risk of damage to soils when they are used in agriculture. Soils are rated from Class I to VIII, with soils having the fewest limitations receiving the highest rating (Class I). Specific subclasses are also used to further characterize soils (DOC 1997).
2. **The Storie Index Rating.** The Storie Index provides a numeric rating based on a 100-point scale of the relative degree of suitability or value of a given soil for intensive agriculture. The rating is based on soil characteristics only. Four factors that represent the inherent characteristics and qualities of the soil are considered in the index rating, including profile characteristics, texture of the surface layer, slope, and other factors such as drainage and salinity (DOC 1997).

A total of 12 soil units and one water unit are present within the Project site (Figure 3). Pursuant to the LESA Instruction Manual (DOC 1997), the table below summarizes the LCC and Storie Index rating of each soil unit in proportion to the Project area; these ratings were used to calculate the Project's LCC Total Score and Storie Index Total Score (see Table 1; equivalent to Table 1A of the Instruction Manual). The application of the Land Evaluation model results in an LCC score of 52.24 and a Storie Index Score of 33.45.

Table 1. Land Capability Classification and Storie Index Scores

Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
103	7.1	0.012	IVs-4	40	0.48	26	0.312
107	1.2	0.002	IIIs-6	60	0.12	52	0.104
122	24.7	0.041	IIIw-3	60	2.46	43	1.763
123	3.5	0.006	IIIw-3	60	0.36	43	0.258
125	11.7	0.019	IVw-3	40	0.76	13	0.247
129	67.4	0.111	VIIIe	0	0	10	1.11
130	4	0.007	IVs-4	40	0.28	57	0.399
133	2.5	0.004	IIIs-4	60	0.24	56	0.224
135	446.9	0.738	IIIw-4	60	44.28	36	26.568
139	0.7	0.001	IIIs-4	60	0.06	85	0.085
141	2.9	0.005	VIIIe	0	0	20	0.1
142	24.2	0.04	IIw-4	80	3.2	57	2.28
145	9.1	0.014	N/A	-	-	N/A	-
Totals	605.9	1		**LCC Total Score**	52.24	**Storie Index Total Score**	33.45

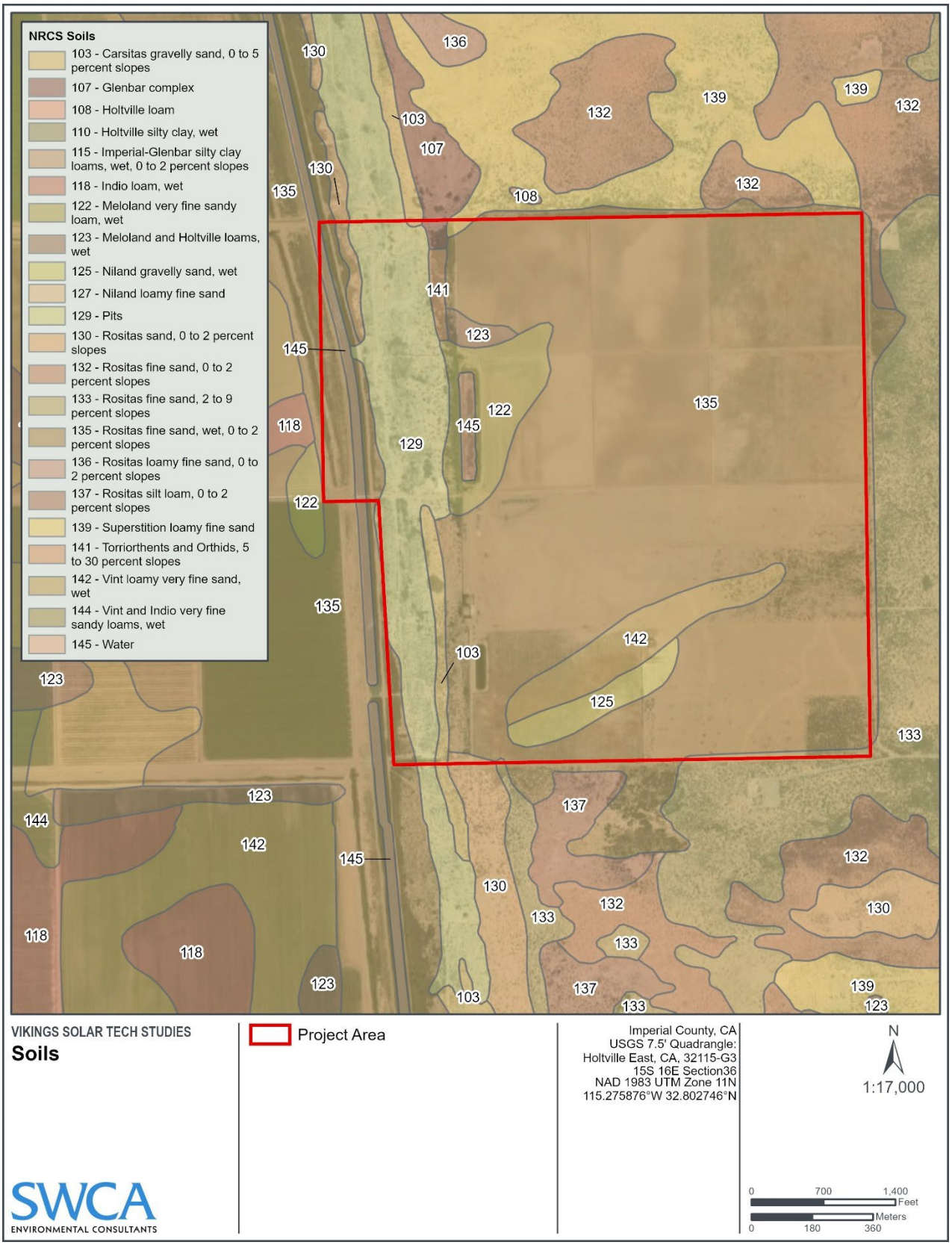

Figure 3. Soils map.

6.2 Part Two: Scoring of Site Assessment Factors

The California LESA Model includes four Site Assessment factors that are separately rated:

1. The Project Size Rating;
2. The Water Resources Availability Rating;
3. The Surrounding Agricultural Land Use Rating; and
4. The Surrounding Protected Resource Land Rating.

6.2.1 *Project Size Rating*

The Project Size Rating consists of the total acreage of the Project site and the acreage of different quality lands that comprise the Project site. Under the Project Size Rating, relatively fewer acres of high-quality soils are required to achieve a maximum Project Size score. Alternatively, a maximum score on lesser quality soils could also be derived, provided there is a sufficiently large acreage present. Based on the LESA Instruction Manual (DOC 1997) project sizing scoring rubric (Table 2), the Project will result in a score of 100 because the acreage of land within the Project site includes more than 160 acres of LCC Class III soils (see Table 3; equivalent to Table 1B in the Instruction Manual).

Table 2. Project Size Scoring Rubric

LCC Class I or II Soils		LCC Class III Soils		LCC Class IV or lower	
Acres	**Score**	**Acres**	**Score**	**Acres**	**Score**
80+	100	160+	100	320+	100
60-79	90	120-159	90	240-319	80
40-59	80	80-119	80	160-239	60
20-39	50	60-79	60	100-159	40
10-19	30	40-59	30	40-99	20
<10	0	20-39	10	<40	0
		<10	0		

Source: DOC 1997

Table 3. Project Size Rating Acreages

Map Soil Unit	LCC	LCC Class I–II	LCC Class III	LCC Class IV–VIII
103	IVs-4			7.1
107	IIIs-6		1.2	
122	IIIw-3		24.7	
123	IIIw-3		3.5	
125	IVw-3			11.7
129	VIIIe			67.4
130	IVs-4			4
133	IIIs-4		2.5	
135	IIIw-4		446.9	
139	IIIs-4		0.7	

Map Soil Unit	LCC	LCC Class I–II	LCC Class III	LCC Class IV–VIII
141	VIIIe			2.9
142	IIw-4	24.2		
145	N/A	-	-	-
	Total	**24.2**	**479.5**	**93.1**

6.2.2 *Water Resources Availability Rating*

The Water Resources Availability Rating is based on identifying the various water resources that may supply a given property and determining whether different restrictions to those resources are likely to take place in periods of drought and non-drought. For each water resource available to the Project site, an analysis is conducted to determine whether irrigated and dryland agriculture is feasible and if any physical or economic restrictions exist, both during drought and non-drought years. Based on the LESA Instruction Manual, definitions of the terms physical restriction, economic restriction, and feasible are provided below:

- A *physical restriction* is an occasional or regular interruption or reduction in a water supply, or shortened irrigation season, that forces a change in agricultural practices, such as planting a crop that uses less water or leaving land fallow. This could be in the form of cutbacks in supply by irrigation and water districts, or by ground or surface water becoming depleted or unusable. Poor water quality can also result in a physical restriction, i.e., by requiring the planting of salt-tolerant plants, or by effectively reducing the amount of available water.
- An *economic restriction* is a rise in the cost of water to a level that forces a reduction in consumption. This could be from surcharge increases from water suppliers as they pass along the cost of finding new water supplies, the extra cost of pumping more ground water to make up for losses in surface water supplies, or the extra energy costs of pumping the same amount of ground water from deeper within an aquifer.
- Irrigated agricultural production is *feasible* when:
    1. There is an existing irrigation system on the Project site that can serve the portion of the Project identified in Step 2;
    2. Physical and/or economic restrictions are not severe enough to halt production; and
    3. It is possible to achieve a viable economic return on crops through irrigated production.

  Dryland production is *feasible* when rainfall is adequate to allow an economically viable return on a non-irrigated crop.

Based on a review of information provided in the Agricultural Element, it was assumed that the only viable water source in the Project area is water supplied by the IID. The IID depends solely on the Colorado River for surface water supply, as rainfall in the service area is less than 3 inches per year and groundwater in the Imperial Valley is of poor quality and is generally unsuitable for domestic or irrigation purposes (IID 2020a). The IID water right for imported water from the Colorado River is currently capped at 3.1 million acre-feet (MAF) per year plus 50 percent of any declared surplus. Further, by 2026 the IID is required to take actions to reduce net annual consumptive use of Colorado River water by 408,000 acre-feet, with the conserved water transferred out of the Imperial Region, resulting in an overall net consumptive use of just over 2.6 MAF per year (IID 2012).

Based on the IID Service Area Plan prepared in 2020, the IID has developed long-term strategies to mitigate the challenges to the IID's water supply, primarily through protection of the Colorado River

water rights held in trust for IID uses within the district. Total water demand in 2018 was documented at approximately 2.6 MAF per year, with total water conservation for transfer purposes documented at 495,897 acre-feet (AF). Future water demand in 2030 is estimated to be approximately 2.3 MAF per year with 487,000 AF available for transfer purposes and future water demand in 2040 is estimated to be approximately the same. Based on the documented current water demand and projected future water demand and available water supply through Colorado River water rights, the IID has sufficient water resources to supply existing and future water demand in its service area (IID 2020b).

Based on the LESA Instruction Manual and information regarding irrigation water supply availability provided by the County and the IID, the Project resulted in a Water Resources Availability Score of 100 (Table 4).

Table 4. Water Resources Availability Score

Project Proportion	Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score
1	Irrigation District Water	1.0	100	100
			Total Water Resources Score	**100**

6.2.3 *Surrounding Agricultural Land Use Rating*

The Surrounding Agricultural Land Use Rating is based on the identification of a project's Zone of Influence (ZOI), which is defined as land within any parcels that are within 0.25 mile of the boundaries of the smallest rectangle that encloses the whole of the project property. The boundary of the Project ZOI is illustrated on Figure 4. Based on the California FMMP, the ZOI consists of approximately 42.98 acres of land designated as Urban and Built-Up Land, 1.42 acres of land designated as Farmland of Local Importance, 424.91 acres of land designated as Prime Farmland, 195.59 acres of land designated as Farmland of Statewide Importance, and 3,127.27 acres of Other land (DOC 2016). Aerial imagery was also evaluated to ensure accuracy of which surrounding land appeared to have been used for agricultural uses. Therefore, the percentage of land within the ZOI that consisted of agricultural uses was calculated by combining the acreages of Farmland of Local Importance, Prime Farmland, and Farmland of Statewide Importance and dividing by the total acreage of the ZOI. Approximately 16.4% of the ZOI consists of land in agricultural uses, and this resulted in a score of 0 on the DOC's LESA Model Instruction Manual rating scale as it was less than 40% (Table 5).

Table 5. Surrounding Agricultural Land and Surrounding Protected Resource Land Scores

Zone of Influence						
Total Acres	Acres in Agriculture	Acres of Protected Resource Land	Precent in Agriculture	Percent Protected Resource Land	Surrounding Agricultural Land Score	Surrounding Protected Resource Land Score
3,792.17	621.92	0	16.4	0	0	0

6.2.4 *Surrounding Protected Resource Land Rating*

The Surrounding Protected Resource Land Rating functions as an extension of the Surrounding Agricultural Land Use Rating and is similarly scored. Protected resource lands are defined as lands that are subject to long-term restrictions that are compatible with or supportive of agricultural uses of land, including, but not limited to, Williamson Act contracted lands; publicly owned lands maintained as park,

forest, or watershed resources; and lands with agricultural, wildlife habitat, open space, or natural resource easements that restrict the conversion of such land to urban or industrial uses (DOC 1997). On February 23, 2010, the County Board of Supervisors approved Minute Order #10a forcing all existing Williamson Act contracts within the county into non-renewal, and the County is not currently entering into new contracts (AgAlert 2010).

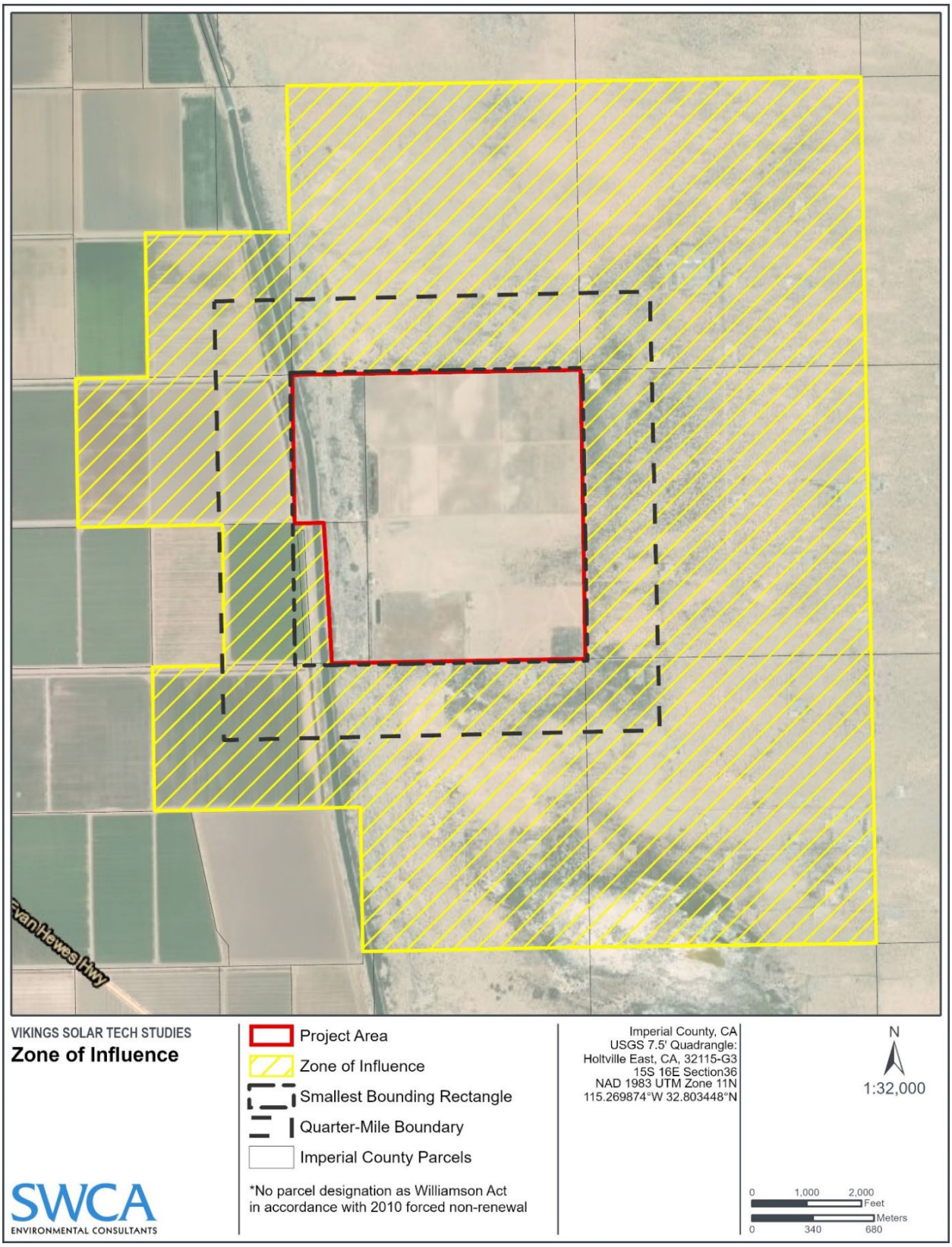

Figure 4. Zone of Influence map.

The last of the active contracts within the county are due to expire on January 1, 2021; therefore, for the purposes of this assessment, it is assumed that no active Williamson Act contracts would be located within the project ZOI (County of Imperial 2012; refer to Appendix A: Figure A-1). Proximate publicly owned lands include the U.S. Bureau of Land Management (BLM) Imperial Sand Dunes Recreational Area (i.e., Algodones Dunes), located approximately 12 miles to the east; BLM Hot Springs, located approximately 2 miles south of the Project site (BLM 2020); and several wildlife areas and wildlife refuges located approximately 22 miles to the northwest of the Project site (California Department of Fish and Wildlife 2015). There are no publicly owned lands or other existing easements within the Project ZOI; therefore, for the purposes of this assessment, there is no protected resource land within the ZOI. The Project resulted in a corresponding Surrounding Protected Resource Land score of 0, based on the LESA Instruction Manual rating scale, as protected resource land represents less than 40% of the ZOI (see Table 5).

7 CONCLUSION

Upon completion of each of the Land Evaluation factors and Site Assessment factors scores, each factor is weighted based on the standard weights assigned in the LESA Instruction Manual and added together for a final score based on a 100-point scale. Table 6 corresponds to Table 8, Final LESA Score Sheet, in the LESA Instruction Manual, and Table 7 presents the California Agricultural LESA Model scoring thresholds. Based on these thresholds, the Project site represents a significant agricultural resource because each of the Land Evaluation factors and Site Assessment factors scores are greater than or equal to 20 points (DOC 1997).

Table 6. Final LESA Score Sheet

	Factor Scores	Factor Weight	Weighted Factor Scores
Land Evaluation Factors			
Land Capability Classification	52.24	0.25	13.0600
Storie Index	33.45	0.25	8.3625
Land Evaluation Subtotal		*0.50*	*21.4225*
Site Assessment Factors			
Project Size	100	0.15	15.0000
Water Resource Availability	100	0.15	15.0000
Surrounding Agricultural Land	0	0.15	0.0000
Protected Resource Land	0	0.05	0.0000
Site Assessment Subtotal		*0.50*	*30.0000*
		Final LESA Score	**51.4225**

Table 7. California LESA Model Scoring Thresholds

Total LESA Score	Scoring Decision
0–39 points	Not Considered Significant
40–59 points	Considered Significant only if Land Evaluation and Site Assessment sub-scores are each greater than or equal to 20 points
60–79 points	Considered Significant unless either Land Evaluation or Site Assessment sub-score is less than 20 points
80–100 points	Considered Significant

8 REFERENCES CITED

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APPENDIX A

County of Imperial Williamson Act Year of Termination Map

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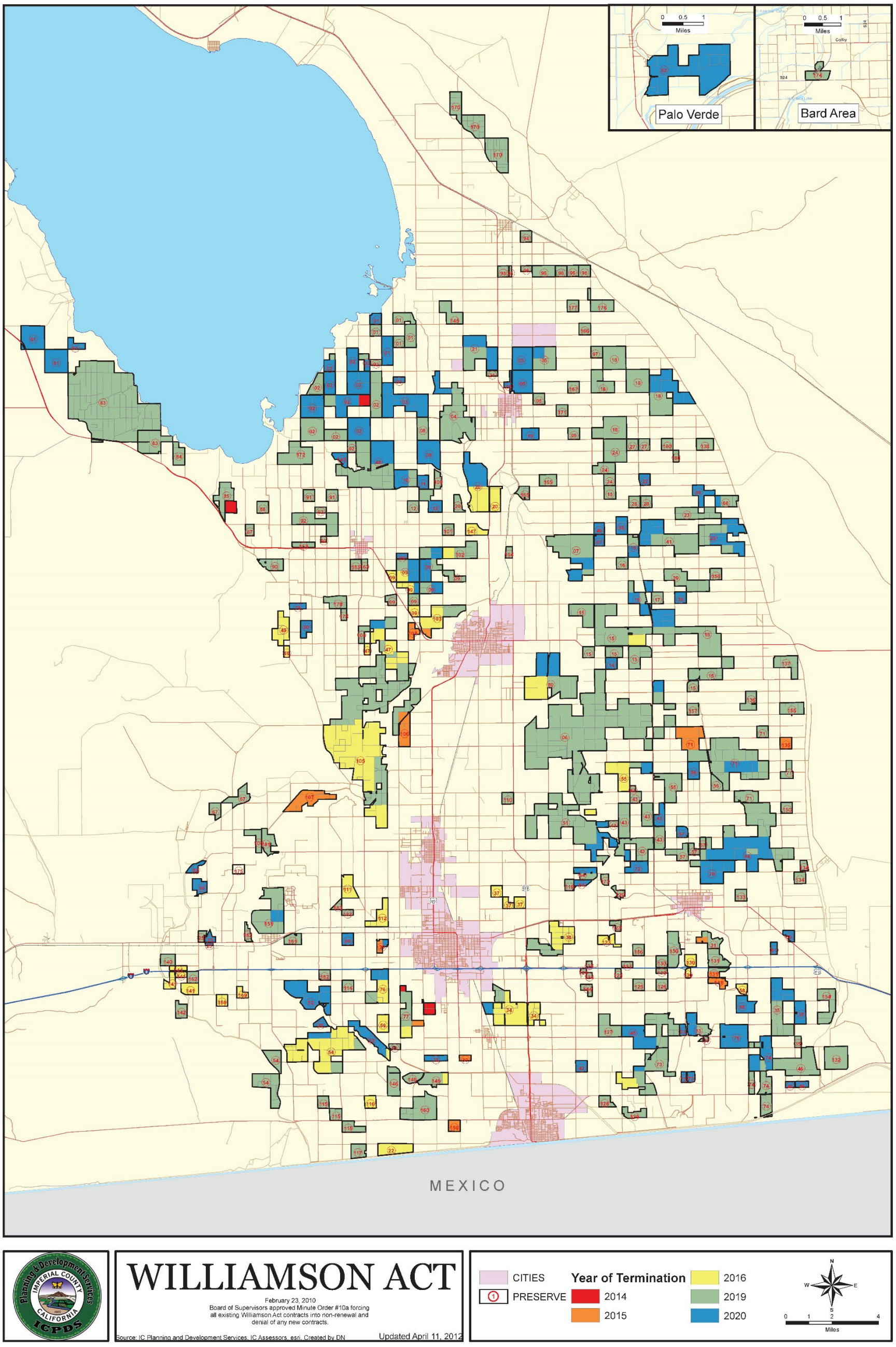

Figure A-1. County of Imperial Williamson Act Year of Termination Map

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Air Quality & Greenhouse Gas Technical Report

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Air Quality & Greenhouse Gas Technical Report

Vikings Solar Energy Storage Project

Imperial County, California

JANUARY 2022

PREPARED FOR

Vikings Energy Farm, LLC

PREPARED BY

SWCA Environmental Consultants

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AIR QUALITY & GREENHOUSE GAS TECHNICAL REPORT VIKINGS SOLAR ENERGY STORAGE PROJECT, IMPERIAL COUNTY, CALIFORNIA

Prepared for

Vikings Energy Farm, LLC

Prepared by

SWCA Environmental Consultants

January 2022

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1 INTRODUCTION

Vikings Energy Farm, LLC (Applicant), retained SWCA Environmental Consultants (SWCA) to conduct an air quality and greenhouse gas emissions (GHGs) technical report in support of the proposed Vikings Solar Energy Storage Project (project) in Imperial County, California (county). The purpose of this report is to explain the methodologies used to evaluate the effects of the proposed installation of a solar photovoltaic (PV) energy generation project on ambient air quality & GHGs. This air quality technical report provides a summary of the air pollutant and GHG emissions calculation methodologies, a summary of the mitigation measures assumed and the results of the air pollutant and GHG emissions calculations. The evaluation of project impacts was conducted as recommended in the Imperial County Air Pollution Control District (ICAPCD) California Environmental Quality Act (CEQA) Guidelines dated December 2017 (ICAPCD 2017), which is incorporated into this technical document by reference.

2 PROJECT DESCRIPTION AND LOCATION

The project site is located at the intersection of E. Nelson Pit Road and Graeser Road, approximately 5.5 miles east of the city of Holtville and 15 miles east of the city of El Centro in Section 36 of Township 15 South and Range 16 East of the San Bernardino Base and Meridian of the Holtville East U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. The project is located on Imperial County Assessor's Parcel Numbers (APNs) 050-070-018-000 (approximately 480 acres), 050-070-019 (approximately 80 acres), and 050-070-021 (approximately 44 acres), owned by RL&R Strahm, ARB Inc., and the County of Imperial, respectively.

The project proposes to utilize solar photovoltaic (PV technology modules mounted on fixed frames or horizontal single-axis tracker (HSAT) systems. The fixed-frame PV module arrays would be mounted on racks that would be supported by driven piles, arranged in arrays spaced up to 30 feet apart (pile to pile) to maximize performance and to allow access for panel cleaning. These arrays would be separated from each other and the perimeter security fence by up to 30-foot-wide interior roads to provide access to all areas for maintenance and emergency vehicles

Electricity generated by the PV modules would be collected by a direct current (DC) collection system routed underground in trenches. This DC power would be delivered to one of the pad-mounted inverters in weatherproof enclosures located within the arrays. Underground or overhead 12.5-kilovolt (kV) or 34.5-kV collection lines would transmit the electricity to the new on-site substation, proposed to be located on the southern boundary of APN 050-070-019. A new interconnection switching station would be constructed at the southern boundary of APN 050-070-019, immediately adjacent to the project substation. The project substation and interconnection switching station would be connected via a single overhead 230-kV tie line. The interconnection switching station would be enclosed within its own fence.

To connect to the project's interconnection facilities, the medium voltage power produced by the project would be conveyed underground, or above ground where necessary, to cross over any sensitive site features. Distribution from the site would be via an overhead connection. The electrical energy produced by the project would be conducted through the project interconnection facilities to the proposed 230-kV generator intertie (gentie) line and delivered to the existing Imperial Irrigation District (IID) approved point of interconnection (POI) on the 230-kV KN & KS Line. The proposed battery energy storage system (BESS or ESS) would be constructed adjacent to the project's solar facilities and would consist of either lithium ion (Li-ion) or flow batteries. Underground trenches with conduits would be used to connect the batteries to the control and monitoring systems, and inverters would be used to convert the PV-produced DC power to alternating current power.

VIKINGS SOLAR TECH STUDIES
Project Vicinity

SWCA ENVIRONMENTAL CONSULTANTS

Figure 1. Vicinity map.

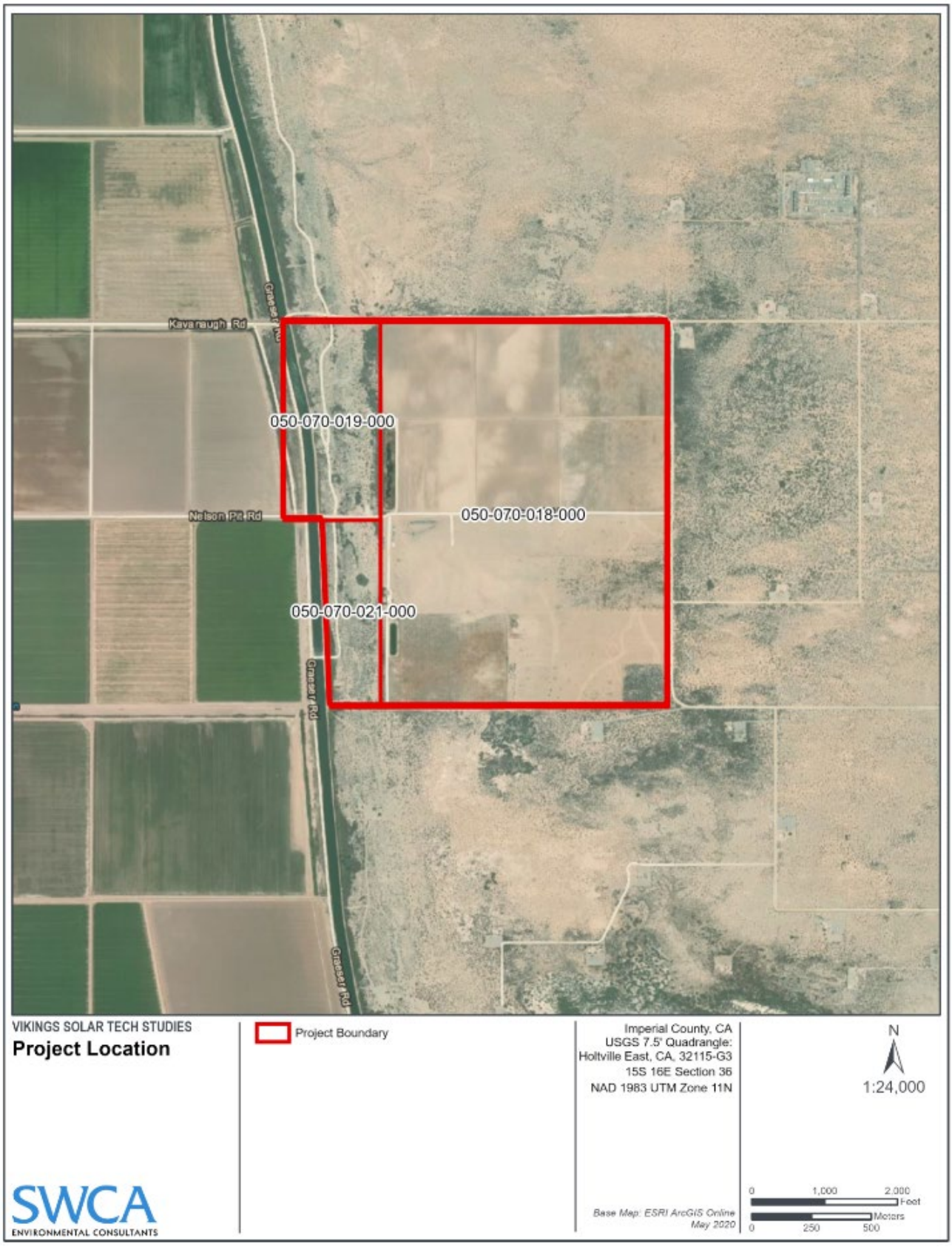

Figure 2. Project location.

The proposed battery energy storage system (BESS or ESS) would be constructed adjacent to the projects solar facilities and would consist of either lithium ion (Li-ion) or flow batteries. The batteries will either be housed in storage containers or buildings fitted with heating, ventilation and air conditioning (HVAC) and fire suppression systems as necessary, depending on the final selection of battery technology. Inside the housing the batteries will be placed on racks, the orientation of which depends on the type of housing. Underground trenches with conduits will be used to connect the batteries to the control and monitoring systems, and inverters to convert the PV produced DC power to AC power.

Six-foot-high security fencing would be installed around the perimeter of each of the project sites at the commencement of construction, and site access would be limited to authorized site workers.

2.1 Construction Scheduling and Phasing

It is anticipated that construction activities start in the first quarter of 2022 and would last approximately 12 months with the Project operation starting in 2023. Further details about the construction phasing are provided in the Methodology section of this report.

2.2 Operations

Once construction is completed the Project would be remotely controlled. No employees would be based at the Project site. Primary security–related monitoring would be done remotely. Security personnel may conduct unscheduled security rounds and would be dispatched to the site in response to a fence breach or other alarm. Site maintenance workers would access the Project site two times per year to clean the panels, inspect the equipment and maintain the Project area. The public would not have access to the facility. Access to the Project site would be infrequent and limited to authorized personnel.

Periodic washing of the PV modules is not expected to be necessary but could be needed to remove dust in order to maintain power generation efficiency. The amount of water needed for this purpose is conservatively estimated at 5 acre-feet per washing, with up to two washings per year, or a total of up to 10 acre-feet per year. This water would be water purchased from the IID. Utilizing a water truck, each washing is expected to take one to two weeks to complete. Vegetation growing on the site would periodically (approximately every three months) be removed manually and/or treated with herbicides.

2.3 Existing Environment

The Project is located in Imperial County within the Salton Sea Air Basin (SSAB). The SSAB consists of all of Imperial County and a portion of Riverside County. Both the Imperial County Air Pollution Control District (ICAPCD) and South Coast Air Quality Management District (SCAQMD) have jurisdiction within the SSAB. The ICAPCD has full jurisdiction within all Imperial County and SCAQMD only has jurisdiction within Riverside County. Ambient air quality is affected by the climate, topography, and the type and amount of pollutants emitted.

2.4 Climate and Topography

The SSAB is generally an arid desert region, with a significant portion located below sea level. The climatic condition in the SSAB is strongly influenced by the large-scale sinking and warming of air within the semi- permanent subtropical high-pressure center over the Pacific Ocean. When the fringes of mid-latitude storms pass through the Imperial Valley in winter, the coastal mountains create a strong “rain shadow” effect that makes Imperial Valley the second driest location in the U.S. The flat terrain near the

Salton Sea, intense heat from the sun during the day, and strong radiational cooling at night create deep convective thermals during the daytime and equally strong surface-based temperature inversions at night. The temperature inversions and light nighttime winds trap any local air pollution emissions near the ground. The area is subject to frequent hazy conditions at sunrise, followed by rapid daytime dissipation as winds pick up and the temperature rises.

The lack of clouds and atmospheric moisture creates strong diurnal and seasonal temperature variations ranging from an average summer maximum of 108 degrees (°) Fahrenheit down to a winter morning minimum of 38° Fahrenheit. The most pleasant weather occurs from about mid-October to early May when daily highs are in the 70s and 80s with very infrequent cloudiness or rainfall. Imperial County experiences significant rainfall an average of only four times per year. The rainy period of the year lasts for 3.4 months, from December 4 to March 16, with a sliding 31-day rainfall of at least 0.5 inches. The rainless period of the year lasts for over 8 months, from March to early December.

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

The SSAB also experiences surface inversions almost every day of the year. These inversions are caused by the presence of the region's typical subtropical high-pressure cell, which causes the air mass aloft to sink. Air masses are large bodies of air with similar temperature and moisture content. An air mass aloft refers to the higher-altitude air mass which inductively suggests that there is a separate (and thus different in temperature and moisture content) air mass at ground level. As this air mass sinks, the temperature thereof rises through compressional heating, thus exceeding the temperature of the air below. This stable atmospheric condition, known as a subsidence inversion, becomes a nearly impenetrable barrier to the vertical mixing of pollutants. These inversions often last for long periods of time, which allows for air stagnation and the buildup of pollutants. During the winter, the area experiences radiation inversions in which the air near the ground surface cools by radiation, whereas the air higher in the atmosphere remains warmer. A shallow inversion layer is created between the two layers and precludes the vertical dispersion of air, thus trapping pollutants. The highest ozone levels are often associated with subsidence inversions.

3 REGULATORY SETTING

Federal, state, and local agencies have set ambient air quality standards for certain air pollutants through statutory requirements and have established regulations and various plans and policies to maintain and improve air quality, as described below.

3.1 Criteria Pollutants

3.1.1 Federal

The federal Clean Air Act (CAA), which was passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The CAA delegates primary responsibility for clean air to the U.S. Environmental Protection Agency (EPA). The EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. Under the act, the EPA has established the National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants that are pervasive in urban environments and for which state and national health-based ambient air quality standards have been established. Ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter (PM_{10} – respirable particles less than 10 microns in diameter, and $PM_{2.5}$ – fine particles less than 2.5 microns in diameter) are the six criteria air pollutants. Ozone is a secondary pollutant, Nitrogen oxides (NO_X) and volatile organic compounds (VOCs) are of particular interest as they are precursors to ozone formation. The NAAQS are divided into primary and secondary standards; the primary standards are set to protect human health within an adequate margin of safety, and the secondary standards are set to protect environmental values, such as plant and animal life. The standards for all criteria pollutants are presented in Table 1.

The CAA requires EPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS have been achieved. The act also mandates that the state submit and implement a State Implementation Plan (SIP) for areas not meeting the NAAQS. These plans must include pollution control measures that demonstrate how the standards will be met.

3.1.2 State

The State of California began to set its ambient air quality standards (i.e., CAAQS) in 1969 under the mandate of the Mulford-Carrell Act. The California Clean Air Act (CCAA) was adopted by the California Air Resources Board (ARB) in 1988. The CCAA requires all air district of the state to achieve and maintain the CAAQS by the earliest practical date. Table 1 shows the CAAQS currently in effect for each of the criteria pollutants, as well as the other pollutants recognized by the state. As shown in Table 1, the CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles

Table 1: State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards	
			Primary	Secondary
Ozone (O3)	1 Hour	0.09 ppm (180 µg/m³)	--	Same as Primary
	8 Hour	0.070 ppm (137 µg/m³)	0.070 ppm (137 µg/m³)	
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m³	150 µg/m³	Same as Primary
	Annual Mean	20 µg/m³	--	
Fine Particulate Matter (PM2.5)	24 Hour	--	35 µg/m³	Same as Primary
	Annual Mean	12 µg/m³	12.0 µg/m³	15 µg/m³
Carbon Monoxide (CO)	1 Hour	20 ppm (23 µg/m³)	35 ppm (40 mg/m³)	--
	8 Hour	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	--
Nitrogen Dioxide (NO2)	1 Hour	0.18 ppm (339 µg/m³)	100 ppb (188 µg/m³)	--
	Annual Mean	0.030 ppm (57 µg/m³)	0.053 ppm (100 µg/m³)	Same as Primary
Sulfur Dioxide (SO2)	1 Hour	0.25 ppm (655 µg/m³)	75 ppb (196 µg/m³)	--
	3 Hour	--	--	0.5 ppm (1300 µg/m³)
	24 Hour	0.04 ppm (105 µg/m³)	0.14 ppm	--
	Annual Mean	--	0.030 ppm	--
Lead (Pb)	30 Day Average	1.5 µg/m³	--	--
	Calendar Quarter	--	1.5 µg/m³	Same as Primary
	Rolling 3-Month Average	--	0.15 µg/m³	Same as Primary
Visibility reducing particles	8 Hour	10-mile visibility standard, extinction of 0.23 per kilometer	No National Standards	
Sulfates	24 Hour	25 µg/m³		
Hydrogen sulfide (H2S)	1 Hour	0.03 ppm (42 µg/m³)		
Vinyl chloride	24 Hour	0.01 ppm (265 µg/m³)		

Notes:
ppm = parts per million; ppb = parts per billion; µg/m³ = micrograms per cubic meter; "--" = no standard.
Source: CARB 2016.

The ARB and local air districts are responsible for achieving CAAQS, which are to be achieved through district-level air quality management plans (AQMPs) that would be incorporated into the SIP. In California, the EPA has delegated authority to prepare SIPs to ARB, which in turn, has delegated that authority to individual air districts. Each district plan is required to either (1) achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each non-attainment pollutant or its precursors, or (2) to provide for implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both state and federal planning requirements.

Other ARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air districts) and setting emissions standards for new motor vehicles and for other emission sources, such as consumer products and certain off-road equipment.

The CCAA substantially adds to the authority and responsibilities of air districts. CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures (TCMs). The CCAA also emphasizes the control of indirect and area-wide sources of air pollutant emissions and gives local air pollution control districts explicit authority to regulate indirect sources of air pollution.

3.1.3 Attainment Status

Depending on whether or not the applicable ambient air quality standards (AAQS) are met or exceeded, the air basin is classified as being in "attainment" or "nonattainment." The USEPA and California Air Resources Board (CARB) determine the air quality attainment status of designated areas by comparing ambient air quality measurements from state or local ambient air monitoring stations with the NAAQS and CAAQS. These designations are determined on a pollutant-by-pollutant basis. Consistent with federal requirements, an unclassifiable/ unclassified designation is treated as an attainment designation.

Table 2 presents the federal and state attainment status for the project area. As shown in the Table 2, the Imperial County is currently designated as nonattainment for O_3 and PM_{10} under state standards. Under federal standards, the County is in marginal nonattainment for O_3, serious nonattainment for PM_{10}, and moderate nonattainment for $PM_{2.5}$. The area is currently in attainment or unclassified status for all other ambient air quality standards.

Table 2: Federal and State Attainment Status

Pollutant	Federal Designation	State Designation
Ozone (O3)[1]	Marginal Nonattainment	Nonattainment
Particulate Matter (PM10)	Serious Nonattainment	Nonattainment
Particulate Matter (PM2.5)	Moderate Nonattainment – partial[2]	Attainment
Carbon Monoxide (CO)	Unclassified/ Attainment	Attainment
Nitrogen Dioxide (NO2)	Unclassified/ Attainment	Attainment
Sulfur Dioxide (SO2)	Attainment	Attainment
Lead (Pb)	Unclassified/ Attainment	Attainment
Hydrogen Sulfide (H2S)	-	Unclassified
Sulfates	-	Attainment
Visibility Reducing Particles	-	Unclassified

Notes:

(-) = Not Identified/ No Status.

[1] The SSAB is marginal nonattainment for the 2015 ozone standard and moderate attainment for the 2008 standard.

[2] Only the Imperial Valley portion of the County is nonattainment for $PM_{2.5}$ NAAQS. USEPA Greenbook 2018, and Source: CARB2017

Toxic Air Contaminants Regulation

California regulates toxic air containments (TACs) primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588 – Connelly). In the early 1980s, the ARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act of 1983 (AB 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

In August 1998, ARB identified DPM emissions from diesel-fueled engines as a TAC. In September 2000, ARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel fueled engines and vehicles (ARB 2000). The goal of the plan is to reduce diesel PM_{10} (inhalable particulate matter) emissions and the associated health risk by 75% in 2010 and by 85% by 2020. The plan identified 14 measures that target new and existing on-road vehicles (e.g., heavy- duty trucks and buses, etc.), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps, etc.), and stationary engines (e.g., stand-by power generators, etc.). During the control measure phase, specific statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles will be evaluated and developed. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions. The proposed Project would be required to comply with applicable diesel control measures.

3.1.4 Local

The ICAPCD is the agency responsible for monitoring air quality, as well as planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district. The air district was formed by the Air Pollution Control Act of 1947.

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 2017). 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. The ICAPCD is the agency principally responsible for comprehensive air pollution control in the region.

The ICAPCD has developed rules and regulations that regulate stationary sources, area sources, and certain mobile source emissions, and is responsible for establishing stationary source permitting requirements and for ensuring that new, modified, or relocated stationary sources do not create net emission increases.

Air Quality Plans. The ICAPCD has developed plans and strategies to achieve attainment for air quality ambient standards. The latest plans include the following:

- 2009 Imperial County Plan for PM_{10}
- 2012 Annual $PM_{2.5}$ SIP

- 2013 Plan for 2006 24-hour $PM_{2.5}$ for moderate nonattainment area
- 2017 Plan for 2008 8-hour Ozone standard
- 2018 Redesignation Request and Maintenance Plan for PM_{10}

The following ICAPCD rules are applicable to the Project:

Rule 106 – Abatement. If the ICAPCD determines that any person is in violation of the Rules and Regulations for limiting the discharge of air contaminants into the atmosphere, the ICAPCD may issue and order for abatement.

Rule 107 – Land Use. The Air Pollution Control Officer has the responsibility to protect public health and property from the damaging effects of air pollution and will review and advise the appropriate land use authorities on all new construction or changes in land use which could become a source of air pollution problems.

Rule 310 – Operational Development Fee: Provides the ICAPCD with a sound method for mitigating emissions produced from operations of new commercial and residential development projects by requiring project proponents to pay fees based on the project's emissions, type and size. The operational fees would assist in attaining the State and federal ambient air quality standards for PM10 and Ozone.

Rule 401 – Opacity of Emissions: Sets limits for release or discharge of emissions into the atmosphere, other than uncombined water vapor, that are dark or darker in shade as designated as No.1 on the Ringelmann Chart or obscure an observer's view to a degree equal to or greater than smoke does as compared to No.1 on the Ringelmann Chart, for a period or aggregated period of more than three minutes in any hour.

Rule 403 – General Limitations on the Discharge of Air Contaminants. Rule 403 sets forth limitations on emissions of pollutants, including particulate matter, from individual sources.

Rule 407 – Nuisance. Rule 407 prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

Stationary Sources

Rule 201 – Permits Required. The construction, installation, modification, replacement, and operation of any equipment which may emit or control Air Contaminants require ICAPCD permits.

Rule 207 – New and Modified Stationary Source Review. Establishes preconstruction review requirements for new and modified stationary sources to ensure the operations of equipment does not interfere with attainment or maintenance of ambient air quality standards.

Rule 208 – Permit to Operate. The ICAPCD would inspect and evaluate the facility to ensure the facility has been constructed or installed and will operate to comply with the provisions of the Authority to Construct permit and comply with all applicable laws, rules, standards, and guidelines.

Regulation VIII – Fugitive Dust Rules. Regulation VIII sets forth rules regarding the control of fugitive dust, including fugitive dust from construction activities. The regulation requires implementation of

fugitive dust control measures to reduce emissions from earthmoving, unpaved roads, handling of bulk materials, and control of track-out/carry-out dust from active construction sites.

3.2 Climate Change and Greenhouse Gases

Construction Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to GHGs, particularly those generated from the production and use of fossil fuels. While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), tetrafluoromethane, hexafluoroethane, HFC-23 (fluoroform), HFC-134a (1,1,1,2-tetrafluoroethane), and HFC-152a (difluoroethane).

GHGs refer to atmospheric gases that absorb solar radiation and subsequently emit radiation in the thermal infrared region of the energy spectrum, trapping heat in the Earth's atmosphere. These gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and water vapor, among others. A growing body of research attributes long-term changes in temperature, precipitation, and other elements of Earth's climate to large increases in GHG emissions since the mid-nineteenth century, particularly from human activity related to fossil fuel combustion. Anthropogenic GHG emissions of particular interest include CO_2, CH_4, N_2O, and fluorinated gases.

GHGs differ in how much heat each can trap in the atmosphere (global warming potential, or GWP). The GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG. The definition of GWP for a particular GHG is expressed relative to CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of carbon dioxide equivalent (CO_2e). For example, the 2007 International Panel on Climate Change Fourth Assessment Report calculates the GWP of CH_4 as 25 and the GWP of N_2O as 298, over a 100-year time horizon (IPCC 2007). Generally, estimates of all GHGs are summed to obtain total emissions for a project or given time period, usually expressed in metric tons ($MTCO_2e$), or million metric tons ($MMTCO_2e$) (SMAQMD 2020).

3.2.1 Federal

At the federal level there is currently no overarching law related to climate change or the reduction of GHGs. The EPA is developing regulations under the CAA to be adopted in the near future, pursuant to the EPA's authority under the CAA. Foremost amongst recent developments have been the settlement agreements between the EPA, several states, and nongovernmental organizations (NGOs) to address GHG emissions from electric generating units and refineries; the U.S. Supreme Court's decision in Massachusetts v. EPA; and EPA's "Endangerment Finding," "Cause or Contribute Finding," and "Mandatory Reporting Rule." On Sept. 20, 2013, the EPA issued a proposal to limit carbon pollution from new power plants. The EPA is proposing to set separate standards for natural gas-fired turbines and coal-fired units. Although periodically debated in Congress, no federal legislation concerning GHG limitations is has yet been adopted. In Coalition for Responsible Regulation, Inc., et al. v. EPA, the United States Court of Appeals upheld the EPA's authority to regulate GHG emissions under CAA. Furthermore, Under the authority of the CAA, the EPA is beginning to regulate GHG emissions starting with large stationary sources. In 2010, the EPA set GHG thresholds to define when permits under the

New Source Review Prevention of Significant Deterioration (PSD) standard and Title V Operating Permit programs are required for new and existing industrial facilities.

3.2.2 State

California has been innovative and proactive in addressing GHG emissions through passage of legislation including Senate and Assembly bills and executive orders, some of which are listed below.

Executive Order (EO) S-3-05. In 2005, the governor issued EO S-3-05, establishing statewide GHG emissions reduction targets. The goal of this EO is to reduce California's GHG emissions to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. The EO further directed the secretary of the California EPA 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. The first such Climate Action Team Assessment Report was produced in March 2006 and has been updated every 2 years thereafter. This goal was further reinforced with the passage of Assembly Bill 32 (AB 32) in 2006 and Senate Bill 32 (SB 32) in 2016.

Assembly Bill 32 (AB 32 California Global Warming Solution Act). In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.), which codified the 2020 GHG emissions reduction goals as outlined in EO S-3- 05, while further mandating that ARB create a scoping plan and implement rules to achieve "real, quantifiable, cost- effective reductions of greenhouse gases." The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code Section 38551(b)). The law requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. The Scoping Plan was prepared and approved on December 11, 2008 and was later updated in May 2014. The update highlights California's progress toward meeting the "near- term" 2020 GHG emission reduction goals (to the level of 427 million MT of CO_2e) defined in the original Scoping Plan. It also evaluates how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use. 2005, the governor issued EO S-3-05, establishing statewide GHG emissions reduction.

Senate Bill 97 (SB 97). Chapter 185, 2007, Greenhouse Gas Emissions: This bill requires the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Executive Order (EO) S-01-07 (January 18, 2007). This order, signed by Governor Schwarzenegger, sets forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020. ARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.

Senate Bill 375 (SB 375). Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires ARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.

Executive Order B-30-15. On April 20, 2015, Governor Brown signed EO B-30-15 to establish a GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's executive order aligns California's GHG reduction targets with those of leading international governments such as the 28-nation European Union which adopted the same target in October 2014. California is on track to meet or exceed its legislated target of reducing GHG emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (AB 32, summarized above). California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2°C, the warming threshold at which there will likely be major climate disruptions such as severe droughts and rising of sea levels. The targets stated in EO B-30-15 have not been adopted by the state legislature.

Senate Bill 32 (SB 32) September 2016. Chapter 249 of the bill codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030. SB 32 provides another intermediate target between the 2020 and 2050 targets set in EO S-3-05.

Renewable Energy Portfolio. The Renewable Portfolio Standard (RPS) promotes diversification of the state's electricity supply and decreased reliance on fossil fuel energy sources. Originally adopted in 2002 with the initial requirement that 20% of electricity retail sales must be served by renewable resources by 2017 (referred to as the "initial RPS"). The goals have been accelerated and increased by EOs S-14-08 and S-21-09 to a goal of 33 percent by 2020.

The program was accelerated in 2015 with SB 350 which mandated a 50% RPS by 2030. SB 350 includes interim annual RPS targets with three-year compliance periods and requires 65% of RPS procurement to be derived from long-term contracts of 10 or more years. In 2018, SB 100 was signed into law, which again increases the RPS to 60% by 2030 and requires all the state's electricity to come from carbon-free resources by 2045.

In April 2011, the Governor signed SB 2 (1X) codifying California's 33 percent RPS goal; Section 399.19 requires the California Public Utilities Commission, in consultation with the California Energy Commission, to report to the Legislature on the progress and status of RPS procurement and other benchmarks. The purpose of the RPS upon full implementation was to provide 33 percent of the state's electricity needs through renewable energy sources. Renewable energy includes (but is not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas.

The program was further accelerated in 2015 with SB 350 which mandated a 50% RPS by 2030. SB 350 includes interim annual RPS targets with three-year compliance periods and requires 65% of RPS procurement to be derived from long-term contracts of 10 or more years. Most recently, on September 10, 2018, Governor Brown signed the SB 100 which aims at eliminating fossil fuel from electricity generation in California. The Bill sets a target of 100 percent carbon-free electricity by 2045.

The RPS is included in ARB's Scoping Plan list of GHG reduction measures to reduce energy sector emissions. It is designed to accelerate the transformation of the electricity sector through such means as investment in the energy transmission infrastructure and systems to allow integration of large quantities of intermittent wind and solar generation. Increased use of renewables would decrease California's reliance on fossil fuels, thus reducing emissions of GHGs from the electricity sector. In 2008, as part of the Scoping Plan original estimates, ARB estimated that full achievement of the RPS would decrease statewide GHG emissions by 21.3 million MT CO_2e. In 2010, ARB revised this number upwards to 24.0 million MT CO_2e.

3.2.3 Air Pollutants

3.2.3.1 CRITERIA AIR POLLUTANTS

The federal and state governments have established ambient air quality standards for six criteria pollutants: carbon monoxide (CO), ozone (O_3), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). Ozone and particulate matter are generally considered as regional pollutants because they or their precursors affect air quality across a region. Pollutants such as CO, NO_2, SO_2, and Pb are local pollutants in that they tend to accumulate in the air locally. In addition to being a regional pollutant, particulate matter is also considered a local pollutant. In the area of the proposed project site, ozone and particulate matters are of particular concern because of their attainment status at the regional level.

3.2.3.2 TOXIC AIR CONTAMINANTS

The federal TACs are air pollutants that may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. Although there are no ambient standards established for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or other acute (short-term) or chronic (long-term) health problems. For TACs that are known or suspected carcinogens, the ARB has consistently found that there are no levels or thresholds below which exposure is risk free. Individual TACs vary greatly in the risks they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health effects, a similar factor, called a Hazard Index, is used to evaluate risk. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). Examples of TAC sources include industrial processes, dry cleaners, gasoline stations, paint and solvent operations, and fossil fuel combustion sources. The TACs that are relevant to the implementation include DPM and airborne asbestos.

DPM was identified as a TAC by the ARB in August 1998 (CARB,1998). DPM is emitted from both mobile and stationary sources. In California, on-road diesel-fueled vehicles contribute approximately 40% of the statewide total, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources, contributing about 3 percent of emissions, include shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations. Emissions from these sources are from diesel-fueled internal combustion engines. Stationary sources that report DPM emissions also include heavy construction, manufacturers of asphalt paving materials and blocks, and diesel-fueled electrical generation facilities a metal found naturally in the environment as well as in manufactured products.

Exposure to DPM can have immediate health effects. DPM can have a range of health effects including irritation of eyes, throat, and lungs, causing headaches, lightheadedness, and nausea. Exposure to DPM also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. Children, the elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. In California, DPM has been identified as a carcinogen.

Airborne Asbestos. Asbestos occurs naturally in ultramafic rock (which includes serpentine). When this material is disturbed in connection with construction, grading, quarrying, or surface mining operations, asbestos-containing dust can be generated. Asbestos is a known carcinogen. Exposure to asbestos can result in adverse health effects such as lung cancer, mesothelioma (cancer of the linings of the lungs and abdomen), and asbestosis (scarring of lung tissues that results in constricted breathing).

3.2.3.3 GREENHOUSE GASES

Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. There is a general scientific consensus that global climate change is occurring, caused in whole or in part by increased emissions of GHGs that keep the Earth's surface warm by trapping heat in the Earth's atmosphere, in much the same way as glass traps heat in a greenhouse. The Earth's climate is changing because human activities, primarily the combustion of fossil fuels, are altering the chemical composition of the atmosphere through the buildup of GHGs. GHGs are released by the combustion of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect.

Carbon Dioxide (CO_2)

In the atmosphere, carbon generally exists in its oxidized form, as CO_2. Natural sources of CO_2 include the respiration (breathing) of humans, animals and plants, volcanic outgassing, decomposition of organic matter and evaporation from the oceans. Anthropogenic sources of CO_2 include the combustion of fossil fuels and wood, waste incineration, mineral production and deforestation. Anthropogenic sources of CO_2 amount to over 30 billion tons per year, globally. Natural sources release substantially larger amounts of CO_2. Nevertheless, natural removal processes, such as photosynthesis by land and ocean-dwelling plant species, cannot keep pace with this extra input of man-made CO_2, and, consequently, the gas is building up in the atmosphere.

Methane (CH_4)

Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands, termites, and oceans. Decomposition occurring in landfills accounts for the majority of human-generated CH_4 emissions in California and in the United States as a whole. Agricultural processes such as intestinal fermentation, manure management, and rice cultivation are also significant sources of CH_4 in California.

Nitrous Oxide (N_2O)

Nitrous oxide is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. Nitrous oxide is a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion produce N_2O, and the quantity emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N_2O emissions in California.

Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF_6)

HFCs are primarily used as substitutes for ozone depleting substances regulated under the Montreal Protocol (1987), an international treaty that was approved on January 1, 1989 and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for ozone depletion. PFCs and SF_6 are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no primary aluminum or magnesium production in California; however, the rapid growth in the semiconductor industry leads to greater use of PFCs.

The magnitude of the impact on global warming differs among the GHGs. The effect each GHG has on climate change is measured as a combination of the volume of its emissions, and its global warming

potential (GWP), expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG emissions are typically measured in terms of pounds or tons of CO_2 equivalents (CO_2e). HFCs, PFCs, and SF_6 have a greater "global warming potential" than CO_2. In other words, these other GHGs have a greater contribution to global warming than CO_2 on a per-mass basis. However, CO_2 has the greatest impact on global warming because of the relatively large quantities of CO_2 emitted into the atmosphere.

3.2.3.4 SENSITIVE RECEPTORS

Some population groups, such as children, the elderly, and acutely and chronically ill persons are considered more sensitive to air pollution than others. Sensitive receptor locations typically include residential areas, hospitals, elder-care facilities, rehabilitation centers, daycare centers, and parks. The Project site is in a rural area surrounded by agricultural fields. Sensitive receptors located within one mile of the Project site consist of a few scattered rural homes, there are no sensitive receptors within 1,500 feet of the Project site boundary. There is currently a house located on the Project site. This and any other structures will be removed by the developer prior to construction.

3.2.3.5 EXISTING AMBIENT LOCAL AIR QUALITY

Existing levels of ambient air concentrations and historical trends and projections in the project area are best documented by measurements made by the ICAPCD and CARB. The closest most representative air monitoring station to the project site is the project site is the El Centro Monitoring Station on 9th Street. The El Centro Monitoring Station monitors ozone, $PM_{2.5}$, and PM_{10}. This was determined to be appropriate since the project area is only nonattainment for ozone, PM_{10} and $PM_{2.5}$. The most recent published data for the monitoring stations is presented in Table 3, which encompasses the years of 2015 through 2019.

Table 3: Existing Local Ambient Air Quality from 2015 – 2019

Pollutant	Averaging Time	Standard	2015	2016	2017	2018	2019
Ozone (O3)	1-Hour	Maximum Concentration (ppm)	0.099	0.108	0.110	0.102	0.080
		Days > CAAQS (0.09 ppm)	2	4	4	2	0
	8-Hour	Maximum Concentration (ppm)[a]	0.079	0.082	0.092	0.090	0.071
		Days > NAAQS (0.07 ppm)	11	11	17	14	1
Particulate Matter (PM10)	24-Hour	Maximum Concentration (μ g/m^3) - National	166	285	269	256	124
		Maximum Concentration (μ g/m^3) - State	172	*	186	253	130
		Days > NAAQS (150 μ g/m^3)	6	10	5	5	0
		Days > CAAQS (50 μ g/m^3)	44	*	60	113	54
	Annual	State Annual Average (20 μ g/m^3)	35.6	45.0	41.6	47.3	34.9
Particulate Matter [c] (PM2.5)	24-Hour	Maximum Concentration (μ g/m^3)	31.2	31.3	23.2	22.4	24.1
		Days > NAAQS (35 μ g/m^3)	0	0	0	0	0
		National Std. 98th Percentile [b]	14	26	21	18	18
	Annual	National Annual (12.0 μ g/m^3)	6.2	9.4	8.4	8.6	7.8

AAM – Annual Arithmetic Mean; CAAQS – California ambient air quality standards; µg/m^3 – micrograms per cubic meter; NAAQS – National ambient air quality standards; ppm – parts per million; n/a – sufficient data not available to determine the value

*The estimated number of measured concentrations above national standards are shown in **bold**.*

Note: Ambient data for CO, NO2, SO2 and airborne lead are not included in this table since the entire Imperial County is currently in compliance with state and federal standards for these pollutants.

[a] The 8-hour ozone standard is attained when the fourth highest concentration in a year, averaged over 3 years, is lessthan or equal to the new national standard of 0.07 ppm. (Values listed in table represent midnight-to-midnight 24-hour averaged and exclude exceptional events.)

[b] Attainment condition for PM2.5 is that the 3-year average of the 98th percentile of 24-hour concentrations at each monitor within an area must not exceed the standard.

[c] O3, PM2.5 and PM10 data are from El Centro Monitoring Station located at 150 9th St., approximately 17 miles from the project site.

Source: CARB,2019, EPA 2019

4 IMPACTS AND MITIGATION MEASURES

4.1 Thresholds of Significance

The Project is Based upon criteria presented in CEQA Appendix G, a project would have a significant air quality impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under applicable federal or state ambient air quality standards;
- Expose sensitive receptors to substantial pollutant concentrations; or

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

The ICAPCD has also established significance thresholds based on the state CEQA significance criteria. adopted guidelines for implementation of CEQA in its CEQA Air Quality Handbook (ICAPCD, 2007, as updated December 12, 2017). The ICAPCD recommended thresholds of significance are discussed below.

4.1.1 Construction

For construction-related emissions, ICAPCD indicates the thresholds presented in Table 4. The ICAPCD guidelines in its CEQA Handbook states that the approach to evaluating construction emissions should be qualitative rather than quantitative. In any case, regardless of the size of the project, the standard mitigation measures for construction equipment and fugitive PM_{10} must be implemented at all construction sites. The implementation of discretionary mitigation measures, including those listed in Section 7.1 of the ICAPCD's Handbook, apply to those construction sites which are 5 acres or more for non-residential developments or 10 acres or more in size for residential developments that generate emissions above the levels in Table 4. The list of mitigation measures that would be implemented for the proposed Project (derived from Section 7.1 of the ICAPCD CEQA Guidelines) is provided in Section 5.1.

Table 4: ICAPCD Construction Thresholds of Significance

Pollutant	Threshold (lbs/day)
ROG	75
NOx	100
CO	550
PM10	150

4.1.2 Operations

For construction-ICAPCD has determined in its CEQA Air Quality Handbook (ICAPCD 2017) that, because the operational phase of a proposed project has the potential of creating lasting or long-term impacts on air quality, it is important that a proposed development evaluate the potential impacts carefully. Therefore, air quality analyses should compare all operational emissions of a project, including motor vehicle, area source, and stationary or point sources to the thresholds in Table 5 provides general guidelines for determining the significance of impacts and the recommended type of environmental analysis required based on the total emissions that are expected from the operational phase of a project.

Table 5: ICAPCD Operations Thresholds of Significance

Pollutant	Tier I	Tier II
NOx and ROG	Less than 137 lbs/day	137 lbs/day and greater
PM10 and Sox	Less than 150 lbs/day	150 lbs/day and greater
CO and PM2.5	Less than 550 lbs/day	550 lbs/day and greater
Level of Significance	Less than Significance	Significant Impact
Level of Analysis	Initial Study	Comprehensive Air Quality Analysis
Environmental Document	Negative Declaration	Mitigated ND or EIR

Source: CEQA Air Quality Handbook, ICAPCD, 2017

As shown, projects with emissions of criteria pollutants below Tier I may potentially have an adverse impact on local air quality but will be required to develop an initial study to determine the level of significance of potential impact. Tier II projects with a potential to emit criteria pollutants above the thresholds of Tier I are considered to have a significant impact on regional and local air quality. Tier II projects are required to implement all standard mitigation measures, as well as identify and implement all feasible discretionary mitigation measures.

Based upon criteria presented in CEQA Appendix G, a project would have a significant air quality impact if it would:

- Generate GHG emissions, either directly or indirectly, that may have an adverse effect on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

The ICAPCD has not adopted threshold of significance for projects' GHG emissions. However, projects in the Imperial County use the SCAQMD's Interim Thresholds as follows:

- Industrial projects: 10,000 metric ton (MT) per year emissions of carbon monoxide equivalent (CO_2e)
- Residential, commercial and mixed-use projects: 3,000 MT CO_2e per year

The proposed Project is considered a commercial development; as such, this analysis, compares the direct and indirect emissions from the project with the 3,000 MT threshold level.

4.1.3 Displaced Grid Electricity Emissions

Indirect sources of emissions can be of different forms. The proposed Project generates electricity from solar energy, a renewable source and as such, is an indirect source of reduction in fossil fuel-powered electricity generation. The proposed Project would provide a renewable energy resource that would displace generation from higher GHG emitting sources. There would be a small amount of indirect GHG emissions from the proposed Project water use. As discussed in Section 2.2, periodic washing of the PV modules may be necessary, and the amount of water needed for this purpose is conservatively estimated at a total of up to 10 acre-feet per year. The GHG emissions from this proposed water use has been determined in the Project's CalEEMod operational calculations.

5 METHODOLOGY

5.1 CalEEMod

The proposed Project would result in both short-term and long-term emissions of air pollutants associated with construction and operations of the proposed Project. Construction emissions would include exhaust from the operation of conventional construction equipment, on-road emissions from employee vehicle trips and haul truck trips, fugitive dust as a result of grading and vehicle travel on paved and unpaved surfaces. Although not anticipated, the CalEEMod conservatively includes operational emissions of 24 one-way vehicle trips per day of full-time employees to commute to and from the project site, to account for any potential periodic washing of the PV modules which is not expected to be necessary but could be needed to remove dust in order to maintain power generation efficiency.

Construction and operational emissions were estimated using the current version of California Emissions Estimator Model (CalEEMod), version 2020.4.0. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operation of a variety of land use projects. The model utilizes widely accepted federal and state models for emission estimates and default data from sources such as USEPA AP-42 emission factors, CARB vehicle emission models, and studies from California agencies such as the California Energy Commission (CEC). The model quantifies direct emissions from construction and operations, as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use.

The model was developed in collaboration with the air districts in California. Default data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions.

5.2 Construction Emissions

Construction emissions associated with the proposed project, including emissions associated with the operation of off-road equipment, haul-truck trips, on-road worker vehicle trips, and vehicle travel on paved and unpaved surfaces and fugitive dust from material handling activities were calculated using CalEEMod version 2020.4.1. Emissions modeling included emissions generated during the following phases: demolition/site preparation (grubbing), grading (to establish access roads and pads for electrical equipment (inverters and step–up transformers)), trenching (for underground electrical collection lines), interconnection connection (substation, transmission lines and installation of electrical infrastructure), and solar array installation (including security fencing).

Modeling input data was based on anticipated construction schedule and phasing. Construction equipment and usage required for each phase were obtained using information provided by the Applicant, or derived from similar projects, and default parameters contained in the model for the Project area (Imperial County). The construction duration is assumed to be approximately 12 months. Project construction would consist of different activities which would be undertaken in phases, through to the operation of the Project. It has been conservatively assumed that several of these phases would occur simultaneously. Table 6 shows the Project's anticipated construction schedule and the phases that overlap to make the "worst-case" construction time period. This occurs in the last week of Month 3 when Trenching, Interconnection Construction and Solar Array Installation occur simultaneously. Table 7 includes the anticipated equipment used in each phase for the Project.

Table 6: Construction Phasing

	Month 1				Month 2				Month 3				Month 4				Month 5-12				Month 13
Construction Phase	Week #																				
Demolition/Site Preparation	X	X	X	X																	
Grading					X	X	X	X	X	X	X										
Trenching									X	X	X	X									
Interconnection Construction												X	X	X							
Solar Array Installation												X	X	X	X	X	X	X	X	X	
Operations Phase																					
Operations																					X

Table 7: Construction Anticipated Equipment

Phase (Duration)	Equipment Used			Daily Vehicle Trips
	Type	Number	Hrs/day	Workers(LD Mix)
1. Demotion/Site Preparation	Rubber Tired Dozers	2	8	180 one-way inbound trips
(26 working days)	Scrapers	1	8	
	Skid Steer Loaders	1	8	180 one-way outbound trips
	Tractors/Loaders/Backhoes	2	8	
2. Grading	Excavators	1	8	
(44 working days)	Graders	2	8	180 one-way inbound trips
	Off-Highway Trucks	1	8	
	Rubber Tired Dozers	1	8	180 one-way outbound trips
	Scrapers	1	8	
	Tractors/Loaders/Backhoes	1	4	
3. Trenching	Cranes	1	7	
(27 working days)	Forklifts	3	8	
	Trenchers	2	8	
	Skid Steer Loaders	1	8	n/a – Due to overlapping construction phases
	Generator Sets	2	8	
	Other General Industrial Equipment	1	8	
	Tractors/Loaders/Backhoes	1	4	
	Welders	1	8	
3. Interconnection Connection	Cranes	1	6	
(16 working days)	Forklifts	1	4	
	Generator Sets	1	8	n/a – Due to overlapping construction phases
	Other General Industrial Equipment	1	8	
	Aerial Lifts	1	6	
	Tractors/Loaders/Backhoes	2	4	
	Welders	1	8	
3. Solar Array Installation	Cranes	1	7	
(243 working days)	Forklifts	5	4	
	Bore/Drill Rigs	2	4	180 one-way inbound trips
	Skid Steer Loaders	2	8	
	Generator Sets	1	8	180 one-way outbound trips
	Off-Highway Trucks	1	6	
	Tractors/Loaders/Backhoes	3	7	
	Welders	1	8	

Notes: For the parameters that are not provided in the table (e.g., equipment horsepower and load factor) CalEEMod defaults were used.

A maximum of 360 one-way daily worker trips (LD_Mix) and 4 one-way daily vendor/delivery trips (HDT_Mix) was utilized for the entirety of the 12 month construction period. The CalEEMod defaults for the on-road vehicles trip lengths were modified for the worker and vendor/delivery to 14 miles given the Projects location.

Approximately 1.25 miles of unpaved roads to the Project which is 91% paved roads for workers, 91% paved for vendors, and 91% paved for haul truck trips.

5.3 Operational Emissions

The Project requires minimal operations and maintenance activities and would not require presence of full- time employees. However, for estimation of operational emissions, it is conservatively assumed that for day-to-day inspection and minor maintenance, some employees would commute to the site. These are very conservative assumptions since no travel to the site is anticipated during operations. The annual operations are assumed to be as follows:

- For site inspection and minor repairs, up to 2 one-way worker trips per day would be generated.
- Routine maintenance activities would include panel washing, which is expected to occur two times annually each taking 2 days. Panel washing activities are estimated to require additional daily trips of 10 workers (which includes the truck transporting the water) during each event for a total of 24 one-way worker trips per day (weekdays) during a peak operational maintenance event. However, this does not occur on a daily basis and will only occur during such maintenance events. Panel washing was assumed to require the use one water truck operating 8 hours/day and 4 days/year.
- The default model generated trip lengths for commercial-work (C-W) were used for the workers commute, a medium heavy duty truck was chosen to represent the worker vehicles and the truck transporting the water, and trip purpose was designated as 100% primary trips.

Operational emissions associated with the proposed project were quantified using CalEEMod version 2020.4.0.

5.4 Displaced Grid Energy Emissions

In addition to the direct and indirect emissions created from project construction and operation, the project's renewable electricity generation would create an indirect emissions reduction of GHGs. Operation of the proposed project would likely reduce or "offset" electricity-related emissions on the state-wide utility grid, which includes energy generated by traditional sources, such as natural gas and coal-fired plants. These emissions are often referred to as "displaced" or "avoided" emissions.

Displaced emissions from electricity production were based on an estimated electricity generation rate of 379,991 MWh/year (for 150 MW facility), which was based on the amount of electricity generated by a similar nearby solar facility. Using the U.S. EPA's Emissions Generation Resource Integration Database (eGRID) (eGRID, 2016) as well as CalEEMod for Imperial County the estimated displaced emissions for the Project were calculated. Emissions calculations and assumptions and model output files are included in Appendix A of this report.

6 IMPACT ANALYSIS

Impact AQ-1 Would the project conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact. A project is conforming with applicable adopted plans if it complies with the applicable ICAPCD rules and regulations and emission control strategies in the applicable air quality attainment plans. The project would comply with the applicable rules and regulations, including the use of standard mitigation measures for construction equipment and fugitive PM_{10}.

Consistency with air quality plans is typically conducted based on a comparison of project-generated growth in employment, population, and vehicle miles traveled (VMT) within the region, which is used for development of the emissions inventories contained in the air quality plans. While the Project would contribute to energy supply, which is one factor of population growth, the proposed Project would not significantly increase employment or growth within the region. Moreover, development of the proposed Project would increase the amount of renewable energy and help California meet its Renewable Portfolio Standard (RPS).

Furthermore, the thresholds of significance, adopted by the air district (ICAPCD), determine compliance with the goals of attainment plans in the region. As such, emissions below the ICAPCD regional mass daily emissions thresholds presented in Table 4 and Table 5 would not conflict with or obstruct implementation of the applicable air quality plans. As Table 9 and Table 10 show, the emissions from proposed Project construction (mitigated) and operation (unmitigated) are below the thresholds of significance; therefore, the proposed Project does not conflict with implementation of the ICAPCD applicable air quality plans. Fugitive dust control measures during construction is required.

Impact AQ-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?

Less Than Significant Impact. The Project implementation would generate emissions of criteria air pollutants during construction and operation. The estimated emissions from construction and operations of the Project are summarized in Table 8, Table 9, and Table 10. The detailed assumptions and calculations, as well as CalEEMod outputs are provided in Appendix A of this report.

Table 8: Unmitigated Construction Emissions Summary

Construction Phase	Pollutant Emission (pounds per day)					
	ROG	**NOx**	**CO**	**PM10**	**PM2.5**	**SO2**
Trenching	2.66	24.36	23.80	1.38	1.30	0.04
Interconnection Connection	1.31	11.84	12.36	0.58	0.55	0.02
Solar Array Installation	2.44	22.65	23.74	1.04	0.97	0.05
Off-site (travel to/from Project)	2.30	1.49	18.42	678.58	68.33	0.04
Peak Daily Emission	*8.72*	*61.59*	*78.33*	*731.08*	*78.97*	*0.15*
ICAPCD Significance Thresholds	*75*	*100*	*550*	*150*	*N/A*	*N/A*
Threshold Exceeded?	*No*	*No*	*No*	*Yes*	*N/A*	*N/A*

NA = Not applicable, no threshold

ICAPCD significance thresholds are based on maximum daily emissions.

Emission were quantified using CalEEMod, version 2020.4.0 using "user defined industrial" land use category and modifying default values, where applicable.

Summer model results are presented above.

The phases that overlap to make the "worst-case" construction time period occur in the last week of Month 3 when Trenching, Interconnection Construction and Solar Array Installation occur simultaneously.

Model results (Summer, Winter & Annual) and assumptions are provided in Appendix A.

As Table 8 shows, estimated unmitigated construction emissions for all pollutants, except PM_{10}, are below ICAPCD significance thresholds. Table 9 shows the estimated mitigated emissions are below the ICAPCD significance thresholds with the application of mitigation measures which comply with the standard

mitigation measures for fugitive dust control regarding on-site and off-site unpaved roads and all unpaved traffic areas 1 acre or more with 75 or more average vehicle trips per day being effectively stabilized, and visible emissions limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, dust suppressants and/or watering. In CalEEMod the following mitigation measures were included to reflect these standard mitigation measures for fugitive dust control: reduce speed on unpaved roads 10 miles per hour; water exposed areas 3 times per day and water the unpaved roads traveled to the project a minimum of three times per day.

Table 9: Mitigated Construction Emissions Summary

Construction Phase	Pollutant Emission (pounds per day)					
	ROG	**NOx**	**CO**	**PM10**	**PM2.5**	**SO2**
Trenching	2.66	24.36	23.80	1.38	1.30	0.04
Interconnection Connection	1.31	11.84	12.36	0.58	0.55	0.02
Solar Array Installation	2.44	22.65	23.74	1.04	0.97	0.05
Off-site (travel to/from Project)	2.28	1.22	18.32	121.28	12.69	0.04
Peak Daily Emission	*8.72*	*61.59*	*78.33*	*143.47*	*18.43*	*0.15*
ICAPCD Significance Thresholds	*75*	*100*	*550*	*150*	*N/A*	*N/A*
Threshold Exceeded?	*No*	*No*	*No*	*No*	*N/A*	*N/A*

NA = Not applicable, no threshold

ICAPCD significance thresholds are based on maximum daily emissions.

Emission were quantified using CalEEMod, version 2020.4.0 using "user defined industrial" land use category and modifying default values, where applicable.

Summer model results are presented above.

The phases that overlap to make the "worst-case" construction time period occur in the last week of Month 3 when Trenching, Interconnection Construction and Solar Array Installation occur simultaneously.

Model results (Summer, Winter & Annual) and assumptions are provided in Appendix A.

Prior to construction, the construction contractor will perform recordkeeping of a construction equipment list. The equipment list will include the make, model, horsepower, and actual hours of usage for off-road equipment. The equipment list(s) will be submitted periodically to the ICAPCD to perform a NOx analysis. The ICAPCD's NOx analysis will then be used to assure the Project has remained in compliance with the Less Than Significant Finding of this report. If the ICAPCD's NOx analysis indicates exceedances of thresholds, the Project would be mitigated per Policy 5.

The Project's operation is limited to panel washing/maintenance which it not anticipated but conservatively assumed up to 24 one-way employee vehicle trips per day (weekdays). Operational emissions are summarized in Table 10. As shown, the Project emissions during operations of the facility would be well below the significance thresholds.

Table 10: Unmitigated Operational Emissions Summary

Activity	Pollutant Emission (pounds per day)				
	ROG	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Panel Washing/Normal Maintenance	0.54	4.29	3.78	23.10	2.48
Peak Daily Emission (Total Operational)	0.54	4.29	3.78	23.10	2.48
ICAPCD Significance Thresholds	*137*	*137*	*550*	*150*	*550*
Threshold Exceeded?	*No*	*No*	*No*	*No*	*No*

ICAPCD significance thresholds are based on maximum daily emissions.

Emission were quantified using CalEEMod, version 2020.4.0 using "user defined industrial" category and modifying default valuesusing project-specific data/assumptions, where available.

The data for PM_{10} and $PM_{2.5}$ emissions, include the standard mitigation for fugitive dust that is required for all projects in ImperialCounty.

Model results and assumptions are provided in Appendix A.

Decommissioning. Solar equipment has a lifespan of approximately 20 – 25 years. At the end of the Project site operational term, the applicant may determine that the Project site should be decommissioned and deconstructed, or it may seek an extension of its CUP. The emissions associated with decommissioning of the Project are not quantitatively estimated, as the extent of activities and emissions factors for equipment and vehicles at the time of decommissioning are unknown. The overall activity would be anticipated to be somewhat less than project construction, and the emissions from off- road and on-road equipment are expected to be much lower than those for the Project construction. However, without changes in fugitive dust control methods it is likely that fugitive dust emissions would be closer to those estimated for construction. Overall, similar to construction, emissions associated with decommissioning would be less than significant.

As presented above, the proposed Project would not violate any air quality standards or contribute substantially to an existing or projected air quality violation. The impact is less than significant, and no mitigation required; however, per requirements of ICAPCD, the standard mitigation measures would be implemented during construction and operation of the Project, including an Operational Dust Control Plan (ODCP) outlining strategies for controlling dust emissions during Project operations. The required ICAPCD mitigation measures (for all projects) are listed in Section 5.1 of this report.

Impact AQ-3 Would the project expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. Some population groups, such as children, the elderly, and acutely and chronically ill persons are considered more sensitive to air pollution than others. Sensitive receptors locations typically include residential areas, hospitals, elder-care facilities, rehabilitation centers, daycare centers, and parks. The Project site is in a rural area surrounded by agricultural fields and no sensitive receptors located within one mile of the Project site. There is currently a house located on the Project site. This and any other structures will be removed by the developer prior to construction.

Implementation of the proposed Project would not result in the long-term operation of any emission sources that would adversely affect nearby sensitive receptors. Short-term construction activities (12 months) could result in temporary increases in pollutant concentrations. Emissions of all criteria pollutants are below the ICAPCD thresholds and would not have any significant impact. The Project's emissions of toxic air pollutants would be minimal and would consist of DPM (diesel particulate matter) emissions during construction activities. The employee commuting to the site during project construction or operation would use gasoline-fueled vehicles.

In conclusion, because of the minimal emissions of DPM during the short-term Project construction (12 months), the distance from nearest sensitive receptor (more than 1 mile), implementation of the Project would not expose sensitive receptors to substantial pollutant concentrations.

Fugitive Dust. During construction and operations activities, the Project would implement dust control measures as shown in Section 5.1, including an ODCP, to ensure receptors in the project vicinity would not be impacted by the Project's long-term dust emissions during operations.

Naturally Occurring Asbestos. Airborne asbestos is classified as a known human carcinogen and was identified by as a TAC by CARB in 1986. The California Geological Survey prepared maps and lists of the naturally occurring asbestos areas within California counties. According to the 2011 report, the proposed project location is not an area of naturally occurring asbestos (USGS 2011).

Impact AQ-4 Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

No Impact. Short term Project construction occurs more than 1,200 feet from the nearest sensitive receptor in an agricultural rural set, therefore the odors from construction equipment would not affect sensitive receptors. Operation of the Project does not include any component with the potential to generate odorous emissions that could affect a substantial number of people. No impact would occur.

Impact AQ-5 Would the project generate GHG emissions, either directly or indirectly, that may have an adverse effect on the environment?

Beneficial Impact. The Project-related direct and indirect emissions of GHGs were estimated using the similar methods for quantification of criteria air pollutants. The estimated emissions are summarized in Table 11. Detailed assumptions and calculations, as well as CalEEMod outputs are provided in Appendix A of this report. Total GHG emissions from all phases of construction activities were amortized over the estimated 20-year life of the project and added to the annual operational emissions of GHGs. The Project would offset GHG emissions through renewable energy generation and thereby result in environmental benefits by lessening the impacts of global climate change, as such, the annual displaced GHG emissions were estimated to include all direct and indirect emissions associated with implementation of the Project. Project decommissioning emissions were not calculated as the equipment and fuel types that would exist 20 or more years in the future are unknown. Also as described above, it is anticipated that the decommissioning emissions would be lower than the construction emissions.

Table 11: Greenhouse Gas Emissions Summary

Emissions Source	GHG Emissions (Metric Tons CO2e/year)
Construction Equipment & Vehicle Emissions	1,263.4
Operations Emissions	98.6
Construction Emissions – Amortized [1]	63.1
Operational Emissions – Facility site [2]	98.6
Total	161.7
Displaced Emissions (from Project Operation) [3,4]	-220,394
Total Annual Emissions	-220,232
Significance Threshold [5]	3,000
Threshold Exceeded?	No

1. Total construction emissions amortized over project life of 20 years.
2. Includes direct and indirect emissions of project site operation andmaintenance, not including the indirect displaced GHGemissions.
3. Estimation of emissions avoided due to displacement of fossil fuel powered electricity generation.
4. The CalEEMod value of carbon intensity factor for Imperial Irrigation District (IID) isused to estimate displaced GHG emissions.
5. In the absence of ICAPCD-adopted threshold for GHG emissions, the SCAQMDthreshold of 3,000 MT/year for commercial projects is used. Calculations, assumptions and model outputs are provided in Appendix A

As Table 11 shows, the proposed Project's annual indirect GHG emissions from the displacement of fossil fuel fired electricity generation is significantly higher than the Project's annualized direct and indirect emissions sources, as such, the overall effect of the proposed Project is to reduce GHG emissions. Therefore, the proposed project would have a beneficial GHG emissions impact.

Impact AQ-6 Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Less Than Significant Impact. Currently, there are no federal, State, or local climate change or GHG emissions regulations that address the GHG emissions Project construction. The project operation will, there are a number of federal, State, and local plans and policies, and GHG emissions reduction strategies that are potentially applicable to the proposed project, either directly or indirectly. The project operation is consistent with the following:

- The Project is consistent with the AB 32 scoping plan strategies to increase the total amount of renewable energy sources consistent with the goal of the State's Renewable Portfolio Standard (RPS).
- The Project is consistent with the CARB's emission reduction strategy presented in the Scoping Plans. The 2008 Scoping Plan specifically addresses critical measures directed at emission sources that are included in the cap-and-trade program that are designed to achieve cost- effective emissions reductions while accelerating the necessary transition to the low-carbon economy.
- The proposed Project implementation will help California meet its Renewable Portfolio Standard (RPS) requirements.

The Project would help promote California's GHG policies by creating renewable energy resources and would not exceed applicable GHG screening levels. Therefore, the proposed Project would not conflict with an applicable plan, policy, or regulation adopted to reduce GHG emissions. Moreover, Projects that

are consistent with applicable plan, policy, or regulation adopted to reduce GHG emissions are considered less than significant during construction, operation and reclamation.

6.1 Mitigation Measures

As discussed in the ICAPCD CEQA Handbook, all construction projects within Imperial County must comply with the requirements of ICAPCD Regulation VIII for control of fugitive dust. In addition, the Handbook lists additional (discretionary) mitigation measures that may be warranted as feasible, to control fugitive dust and equipment exhaust emissions.

6.2 Construction

In compliance with the ICAPCD requirements, the following measures would be implemented during construction of the Project:

AQ-MM.1 Regulation VIII (Fugitive Dust Control Measures). All construction sites, regardless of size, must comply with the requirements contained within Regulation VIII.

6.2.1 Standard Mitigation Measures for Fugitive Dust (PM_{10}) Control

Construction

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 would 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 1 acre or more with 75 or more average vehicle trips per day would 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.
d) The transport of Bulk Materials shall be completely covered unless 6 inches of freeboard space from the top of the container is maintained with no spillage and loss of Bulk Material. In addition, the cargo compartment of all Haul Trucks is to be cleaned and/or washed at delivery site after removal of Bulk Material.
e) All Track-Out or Carry-Out would 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 amounts of water, chemical stabilizers or by sheltering or enclosing the operation and transfer line.

The construction of any new unpaved Road is prohibited within any area with a population of 500 or more unless the road meets the definition of a Temporary Unpaved Road. Any temporary unpaved road shall be effectively stabilized, and visible emissions shall be limited to no greater than 20 opacity for dust emission by paving, chemical stabilizers, dust suppressants and/or watering.

6.2.2 Discretionary Mitigation Measures for Fugitive Dust (PM_{10}) Control

For projects with construction site of 5 acres or more for non-residential developments, in order to provide a greater degree of PM_{10} reductions, above that required by Regulation VIII, the ICAPCD recommends the following:

a) Water exposed soil with adequate frequency for continued moist soil.

b) Replace ground cover in disturbed areas as quickly as possible.

c) Use automatic sprinkler system installed on all soil piles.

d) Limit vehicle speed for all construction vehicles to 15 miles per hour on any unpaved surface at the construction site.

e) Develop a trip reduction plan to achieve a 1.5 AVR for construction employees.

f) Implement a shuttle service to and from retail services and food establishments during lunch hours.

AQ-MM.2 Construction Equipment Control Measures

6.2.3 Standard Mitigation Measures for Exhaust Equipment Emissions Control

These include:

a) Use of equipment with alternative fueled or catalyst-equipped diesel engine, including for all off-road and portable diesel-powered equipment.

b) Minimize idling time either by shutting equipment off when not in use or limit the idling time to a maximum of 5 minutes.

c) Limit, to the extent feasible, the hours of operation of heavy-duty equipment and/or the number of equipment in use.

d) Replace fossil fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set)

6.2.4 Enhanced Mitigation Measures for Construction Equipment

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

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).

6.3 Operation

6.3.1 Operational Dust Control Plan

To help reduce fugitive dust emissions from onsite unpaved roads and accumulation of small dunes during operations, an Operational Dust Control Plan (ODCP) would be prepared. The ODCP would include strategies for how dust emissions would be controlled and maintained during Project operations. The ODCP would be submitted to the ICAPCD for approval prior to the issuance of a Certificate of Occupancy.

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APPENDIX A

CalEEMod Results

Air Pollutant & GHG Emission Calculations

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Viking Solar Project

Imperial County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	604.00	User Defined Unit	604.00	26,310,240.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2023
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project area is approximately 604 acres

Construction Phase - Construction duration approximately 12 months

Off-road Equipment - Equipment Details

Off-road Equipment - Equipment details

Off-road Equipment - Equipment details

Off-road Equipment - Equipment details

Off-road Equipment - Equipment details

Grading - Approx. 1 pass over the 604 acres during site prep
Approx. 3 passes over the 604 acres during grading
Demolition of an on-site building/structure

Viking Solar Project - Imperial County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Trips and VMT - Max worker trips 360 one-way trips (180 round trips)
Max delivery/vendor trips 4 one-way trips (2 round trips)
Max haul trips 0
Trip length modified to 14 miles due to location of Project from nearest city.

On-road Fugitive Dust - Approx 1.25 miles of unpaved road to project

Vehicle Trips - No employees would be based at the Project sites
Operational traffic is not anticipated. Conservatively included, up to 2 washings per year - Max 24 one way trips per day during these maintenance events (0.04)
Trip length modified to 14 miles due to location of Project from nearest city.

Fleet Mix - Conservatively assume a medium heavy duty truck

Road Dust - Approx 1.25 miles of unpaved road to project

Consumer Products - None

Area Coating - None

Landscape Equipment - None

Energy Use - 500 kw-hr/day (0.000019)

Water And Wastewater - 10 acre-feet=3258516.48 gallons

Solid Waste - None

Operational Off-Road Equipment - Not anticpated but conservatively assumed water vehicle - Assume 2 solar panel washing per year each taking two days

Construction Off-road Equipment Mitigation - Reduced speed & watering of unpaved roads to the project

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	8
tblConstructionPhase	NumDays	10,850.00	243.00
tblConstructionPhase	NumDays	10,850.00	27.00
tblConstructionPhase	NumDays	1,085.00	44.00
tblConstructionPhase	NumDays	10,850.00	16.00
tblConstructionPhase	NumDays	420.00	26.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

Viking Solar Project - Imperial County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	12/10/2077	12/31/2022
tblConstructionPhase	PhaseEndDate	1/15/2072	3/31/2022
tblConstructionPhase	PhaseEndDate	6/14/2030	3/23/2022
tblConstructionPhase	PhaseEndDate	12/28/2074	4/11/2022
tblConstructionPhase	PhaseEndDate	4/17/2026	1/31/2022
tblConstructionPhase	PhaseStartDate	12/29/2074	3/24/2022
tblConstructionPhase	PhaseStartDate	6/15/2030	3/1/2022
tblConstructionPhase	PhaseStartDate	4/18/2026	2/1/2022
tblConstructionPhase	PhaseStartDate	1/16/2072	3/24/2022
tblConstructionPhase	PhaseStartDate	9/7/2024	1/1/2022
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	T24E	0.00	1.9000e-005
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.52	0.00
tblFleetMix	LDT1	0.06	0.00
tblFleetMix	LDT2	0.18	0.00
tblFleetMix	LHD1	0.03	0.00
tblFleetMix	LHD2	6.9080e-003	0.00
tblFleetMix	MCY	0.02	0.00
tblFleetMix	MDV	0.15	0.00
tblFleetMix	MH	3.6330e-003	0.00
tblFleetMix	MHD	8.2760e-003	1.00
tblFleetMix	OBUS	9.1800e-004	0.00
tblFleetMix	SBUS	7.7900e-004	0.00
tblFleetMix	UBUS	1.2100e-004	0.00
tblGrading	AcresOfGrading	110.00	1,812.00

Viking Solar Project - Imperial County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblGrading	AcresOfGrading	52.00	604.00
tblGrading	MaterialExported	0.00	250.00
tblLandUse	LandUseSquareFeet	0.00	26,310,240.00
tblLandUse	LotAcreage	0.00	604.00
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.37	0.45
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.48	0.48
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType	Welders	Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Other General Industrial Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Other General Industrial Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00

Viking Solar Project - Imperial County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	4.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblRoadDust	RoadPercentPave	50	91
tblSolidWaste	LandfillCaptureGasFlare	94.00	0.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblSolidWaste	LandfillNoGasCapture	6.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripNumber	31.00	0.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	4,312.00	0.00
tblTripsAndVMT	VendorTripNumber	4,312.00	0.00
tblTripsAndVMT	VendorTripNumber	4,312.00	4.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripNumber	15.00	360.00
tblTripsAndVMT	WorkerTripNumber	18.00	360.00
tblTripsAndVMT	WorkerTripNumber	11,050.00	0.00
tblTripsAndVMT	WorkerTripNumber	11,050.00	0.00
tblTripsAndVMT	WorkerTripNumber	11,050.00	360.00
tblVehicleTrips	CC_TL	9.50	14.00
tblVehicleTrips	CC_TTP	0.00	100.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	WD_TR	0.00	0.04
tblWater	OutdoorWaterUseRate	0.00	3,258,516.48

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.7525	4.6056	6.3410	0.0141	104.2867	0.2031	104.4898	10.6403	0.1894	10.8297	0.0000	1,252.2518	1,252.2518	0.2286	0.0183	1,263.4224
Maximum	**0.7525**	**4.6056**	**6.3410**	**0.0141**	**104.2867**	**0.2031**	**104.4898**	**10.6403**	**0.1894**	**10.8297**	**0.0000**	**1,252.2518**	**1,252.2518**	**0.2286**	**0.0183**	**1,263.4224**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.7525	4.6056	6.3410	0.0141	18.9799	0.2031	19.1830	2.0373	0.1894	2.2268	0.0000	1,252.2509	1,252.2509	0.2286	0.0183	1,263.4215
Maximum	**0.7525**	**4.6056**	**6.3410**	**0.0141**	**18.9799**	**0.2031**	**19.1830**	**2.0373**	**0.1894**	**2.2268**	**0.0000**	**1,252.2509**	**1,252.2509**	**0.2286**	**0.0183**	**1,263.4215**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**81.80**	**0.00**	**81.64**	**80.85**	**0.00**	**79.44**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2022**	**3-31-2022**	1.9241	1.9241
2	**4-1-2022**	**6-30-2022**	1.1883	1.1883
3	**7-1-2022**	**9-30-2022**	1.1387	1.1387
		Highest	1.9241	1.9241

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.1000e-004	5.0000e-005	5.5500e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0108	0.0108	3.0000e-005	0.0000	0.0115
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0431	0.0431	1.0000e-005	0.0000	0.0435
Mobile	3.6900e-003	0.1025	0.0557	9.5000e-004	2.9854	9.2000e-004	2.9863	0.3054	8.8000e-004	0.3063	0.0000	90.0350	90.0350	4.0000e-004	0.0101	93.0589
Offroad	1.0100e-003	7.1400e-003	6.5800e-003	3.0000e-005		2.6000e-004	2.6000e-004		2.4000e-004	2.4000e-004	0.0000	2.3222	2.3222	7.5000e-004	0.0000	2.3410
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	3.1197	3.1197	5.4000e-004	7.0000e-005	3.1528
Total	**5.2100e-003**	**0.1097**	**0.0678**	**9.8000e-004**	**2.9854**	**1.2000e-003**	**2.9866**	**0.3054**	**1.1400e-003**	**0.3066**	**0.0000**	**95.5307**	**95.5307**	**1.7300e-003**	**0.0102**	**98.6077**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	5.1000e-004	5.0000e-005	5.5500e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0108	0.0108	3.0000e-005	0.0000	0.0115
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0431	0.0431	1.0000e-005	0.0000	0.0435
Mobile	3.6900e-003	0.1025	0.0557	9.5000e-004	2.9854	9.2000e-004	2.9863	0.3054	8.8000e-004	0.3063	0.0000	90.0350	90.0350	4.0000e-004	0.0101	93.0589
Offroad	1.0100e-003	7.1400e-003	6.5800e-003	3.0000e-005		2.6000e-004	2.6000e-004		2.4000e-004	2.4000e-004	0.0000	2.3222	2.3222	7.5000e-004	0.0000	2.3410
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	3.1197	3.1197	5.4000e-004	7.0000e-005	3.1528
Total	**5.2100e-003**	**0.1097**	**0.0678**	**9.8000e-004**	**2.9854**	**1.2000e-003**	**2.9866**	**0.3054**	**1.1400e-003**	**0.3066**	**0.0000**	**95.5307**	**95.5307**	**1.7300e-003**	**0.0102**	**98.6077**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition/Site Preparation	Site Preparation	1/1/2022	1/31/2022	6	26	
2	Grading	Grading	2/1/2022	3/23/2022	6	44	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3	Trenching	Building Construction	3/1/2022	3/31/2022	6	27	
4	Interconnection Connection	Building Construction	3/24/2022	4/11/2022	6	16	
5	Solar Array Installation	Building Construction	3/24/2022	12/31/2022	6	243	

Acres of Grading (Site Preparation Phase): 604

Acres of Grading (Grading Phase): 1812

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Interconnection Connection	Cranes	1	6.00	231	0.29
Trenching	Cranes	1	7.00	231	0.29
Solar Array Installation	Cranes	1	7.00	231	0.29
Grading	Excavators	1	8.00	158	0.38
Trenching	Forklifts	3	8.00	89	0.20
Trenching	Generator Sets	2	8.00	84	0.74
Grading	Graders	2	8.00	187	0.41
Solar Array Installation	Bore/Drill Rigs	2	4.00	221	0.50
Solar Array Installation	Off-Highway Trucks	1	6.00	402	0.38
Solar Array Installation	Welders	1	8.00	46	0.45
Interconnection Connection	Forklifts	1	4.00	89	0.20
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Demolition/Site Preparation	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Trenching	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Demolition/Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Trenching	Welders	1	8.00	46	0.45
Solar Array Installation	Forklifts	5	4.00	89	0.20
Interconnection Connection	Generator Sets	1	8.00	84	0.74
Solar Array Installation	Generator Sets	1	8.00	84	0.74
Interconnection Connection	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Solar Array Installation	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Interconnection Connection	Welders	1	8.00	46	0.45
Solar Array Installation	Skid Steer Loaders	2	8.00	65	0.45
Demolition/Site Preparation	Skid Steer Loaders	1	8.00	65	0.37
Demolition/Site Preparation	Scrapers	1	8.00	367	0.48
Grading	Off-Highway Trucks	1	8.00	402	0.38
Trenching	Trenchers	2	8.00	78	0.50
Trenching	Other General Industrial Equipment	1	8.00	88	0.34
Trenching	Skid Steer Loaders	1	8.00	65	0.37
Interconnection Connection	Aerial Lifts	1	6.00	63	0.31
Interconnection Connection	Other General Industrial Equipment	1	8.00	88	0.34

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition/Site Preparation	6	360.00	4.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Grading	7	360.00	4.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Trenching	12	0.00	0.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Interconnection Connection	8	0.00	0.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Solar Array Installation	16	360.00	4.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition/Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4769	0.0000	0.4769	0.1207	0.0000	0.1207	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0377	0.4011	0.2526	5.3000e-004		0.0182	0.0182		0.0168	0.0168	0.0000	46.3926	46.3926	0.0150	0.0000	46.7677
Total	**0.0377**	**0.4011**	**0.2526**	**5.3000e-004**	**0.4769**	**0.0182**	**0.4951**	**0.1207**	**0.0168**	**0.1374**	**0.0000**	**46.3926**	**46.3926**	**0.0150**	**0.0000**	**46.7677**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition/Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8000e-004	3.8200e-003	1.3300e-003	2.0000e-005	0.0939	6.0000e-005	0.0939	9.4900e-003	5.0000e-005	9.5400e-003	0.0000	1.7859	1.7859	1.0000e-005	2.5000e-004	1.8601
Worker	0.0245	0.0163	0.1892	4.3000e-004	8.4385	2.6000e-004	8.4387	0.8497	2.4000e-004	0.8499	0.0000	39.6764	39.6764	1.2300e-003	1.2700e-003	40.0864
Total	**0.0247**	**0.0202**	**0.1905**	**4.5000e-004**	**8.5324**	**3.2000e-004**	**8.5327**	**0.8592**	**2.9000e-004**	**0.8595**	**0.0000**	**41.4623**	**41.4623**	**1.2400e-003**	**1.5200e-003**	**41.9465**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1860	0.0000	0.1860	0.0471	0.0000	0.0471	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0377	0.4011	0.2526	5.3000e-004		0.0182	0.0182		0.0168	0.0168	0.0000	46.3925	46.3925	0.0150	0.0000	46.7676
Total	**0.0377**	**0.4011**	**0.2526**	**5.3000e-004**	**0.1860**	**0.0182**	**0.2042**	**0.0471**	**0.0168**	**0.0638**	**0.0000**	**46.3925**	**46.3925**	**0.0150**	**0.0000**	**46.7676**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition/Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.8000e-004	3.8200e-003	1.3300e-003	2.0000e-005	0.0169	6.0000e-005	0.0169	1.8000e-003	5.0000e-005	1.8500e-003	0.0000	1.7859	1.7859	1.0000e-005	2.5000e-004	1.8601
Worker	0.0245	0.0163	0.1892	4.3000e-004	1.5089	2.6000e-004	1.5091	0.1578	2.4000e-004	0.1580	0.0000	39.6764	39.6764	1.2300e-003	1.2700e-003	40.0864
Total	**0.0247**	**0.0202**	**0.1905**	**4.5000e-004**	**1.5257**	**3.2000e-004**	**1.5261**	**0.1596**	**2.9000e-004**	**0.1599**	**0.0000**	**41.4623**	**41.4623**	**1.2400e-003**	**1.5200e-003**	**41.9465**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0933	0.0000	1.0933	0.1766	0.0000	0.1766	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0745	0.7863	0.4899	1.2900e-003		0.0313	0.0313		0.0288	0.0288	0.0000	113.0928	113.0928	0.0366	0.0000	114.0072
Total	**0.0745**	**0.7863**	**0.4899**	**1.2900e-003**	**1.0933**	**0.0313**	**1.1246**	**0.1766**	**0.0288**	**0.2054**	**0.0000**	**113.0928**	**113.0928**	**0.0366**	**0.0000**	**114.0072**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.1000e-004	6.4700e-003	2.2500e-003	3.0000e-005	0.1589	9.0000e-005	0.1590	0.0161	9.0000e-005	0.0162	0.0000	3.0223	3.0223	1.0000e-005	4.2000e-004	3.1478
Worker	0.0415	0.0277	0.3201	7.3000e-004	14.2805	4.3000e-004	14.2809	1.4379	4.0000e-004	1.4383	0.0000	67.1447	67.1447	2.0800e-003	2.1500e-003	67.8386
Total	**0.0418**	**0.0341**	**0.3224**	**7.6000e-004**	**14.4394**	**5.2000e-004**	**14.4399**	**1.4540**	**4.9000e-004**	**1.4545**	**0.0000**	**70.1670**	**70.1670**	**2.0900e-003**	**2.5700e-003**	**70.9864**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4264	0.0000	0.4264	0.0689	0.0000	0.0689	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0745	0.7863	0.4899	1.2900e-003		0.0313	0.0313		0.0288	0.0288	0.0000	113.0927	113.0927	0.0366	0.0000	114.0071
Total	**0.0745**	**0.7863**	**0.4899**	**1.2900e-003**	**0.4264**	**0.0313**	**0.4577**	**0.0689**	**0.0288**	**0.0977**	**0.0000**	**113.0927**	**113.0927**	**0.0366**	**0.0000**	**114.0071**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.1000e-004	6.4700e-003	2.2500e-003	3.0000e-005	0.0286	9.0000e-005	0.0287	3.0500e-003	9.0000e-005	3.1400e-003	0.0000	3.0223	3.0223	1.0000e-005	4.2000e-004	3.1478
Worker	0.0415	0.0277	0.3201	7.3000e-004	2.5534	4.3000e-004	2.5539	0.2671	4.0000e-004	0.2675	0.0000	67.1447	67.1447	2.0800e-003	2.1500e-003	67.8386
Total	**0.0418**	**0.0341**	**0.3224**	**7.6000e-004**	**2.5820**	**5.2000e-004**	**2.5826**	**0.2701**	**4.9000e-004**	**0.2706**	**0.0000**	**70.1670**	**70.1670**	**2.0900e-003**	**2.5700e-003**	**70.9864**

3.4 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0359	0.3289	0.3214	5.2000e-004		0.0187	0.0187		0.0176	0.0176	0.0000	44.5735	44.5735	9.6900e-003	0.0000	44.8157
Total	**0.0359**	**0.3289**	**0.3214**	**5.2000e-004**		**0.0187**	**0.0187**		**0.0176**	**0.0176**	**0.0000**	**44.5735**	**44.5735**	**9.6900e-003**	**0.0000**	**44.8157**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Trenching - 2022

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0359	0.3289	0.3214	5.2000e-004		0.0187	0.0187		0.0176	0.0176	0.0000	44.5734	44.5734	9.6900e-003	0.0000	44.8156
Total	**0.0359**	**0.3289**	**0.3214**	**5.2000e-004**		**0.0187**	**0.0187**		**0.0176**	**0.0176**	**0.0000**	**44.5734**	**44.5734**	**9.6900e-003**	**0.0000**	**44.8156**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Trenching - 2022

Mitigated Construction Off-Site

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

3.5 Interconnection Connection - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0105	0.0947	0.0989	1.7000e-004		4.6300e-003	4.6300e-003		4.4000e-003	4.4000e-003	0.0000	14.4777	14.4777	3.1300e-003	0.0000	14.5559
Total	**0.0105**	**0.0947**	**0.0989**	**1.7000e-004**		**4.6300e-003**	**4.6300e-003**		**4.4000e-003**	**4.4000e-003**	**0.0000**	**14.4777**	**14.4777**	**3.1300e-003**	**0.0000**	**14.5559**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Interconnection Connection - 2022

Unmitigated Construction Off-Site

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

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0105	0.0947	0.0989	1.7000e-004		4.6300e-003	4.6300e-003		4.4000e-003	4.4000e-003	0.0000	14.4777	14.4777	3.1300e-003	0.0000	14.5559
Total	**0.0105**	**0.0947**	**0.0989**	**1.7000e-004**		**4.6300e-003**	**4.6300e-003**		**4.4000e-003**	**4.4000e-003**	**0.0000**	**14.4777**	**14.4777**	**3.1300e-003**	**0.0000**	**14.5559**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Interconnection Connection - 2022

Mitigated Construction Off-Site

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

3.6 Solar Array Installation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2967	2.7520	2.8849	6.1500e-003		0.1265	0.1265		0.1184	0.1184	0.0000	534.5725	534.5725	0.1493	0.0000	538.3046
Total	**0.2967**	**2.7520**	**2.8849**	**6.1500e-003**		**0.1265**	**0.1265**		**0.1184**	**0.1184**	**0.0000**	**534.5725**	**534.5725**	**0.1493**	**0.0000**	**538.3046**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Solar Array Installation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6900e-003	0.0357	0.0124	1.7000e-004	0.8774	5.2000e-004	0.8780	0.0887	4.9000e-004	0.0892	0.0000	16.6916	16.6916	8.0000e-005	2.3200e-003	17.3844
Worker	0.2290	0.1527	1.7680	4.0400e-003	78.8674	2.3900e-003	78.8698	7.9412	2.2000e-003	7.9435	0.0000	370.8218	370.8218	0.0115	0.0119	374.6540
Total	**0.2307**	**0.1885**	**1.7805**	**4.2100e-003**	**79.7448**	**2.9100e-003**	**79.7477**	**8.0299**	**2.6900e-003**	**8.0326**	**0.0000**	**387.5134**	**387.5134**	**0.0116**	**0.0142**	**392.0384**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2967	2.7520	2.8849	6.1500e-003		0.1265	0.1265		0.1184	0.1184	0.0000	534.5719	534.5719	0.1493	0.0000	538.3040
Total	**0.2967**	**2.7520**	**2.8849**	**6.1500e-003**		**0.1265**	**0.1265**		**0.1184**	**0.1184**	**0.0000**	**534.5719**	**534.5719**	**0.1493**	**0.0000**	**538.3040**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Solar Array Installation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6900e-003	0.0357	0.0124	1.7000e-004	0.1578	5.2000e-004	0.1583	0.0168	4.9000e-004	0.0173	0.0000	16.6916	16.6916	8.0000e-005	2.3200e-003	17.3844
Worker	0.2290	0.1527	1.7680	4.0400e-003	14.1020	2.3900e-003	14.1044	1.4749	2.2000e-003	1.4771	0.0000	370.8218	370.8218	0.0115	0.0119	374.6540
Total	**0.2307**	**0.1885**	**1.7805**	**4.2100e-003**	**14.2598**	**2.9100e-003**	**14.2627**	**1.4917**	**2.6900e-003**	**1.4944**	**0.0000**	**387.5134**	**387.5134**	**0.0116**	**0.0142**	**392.0384**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.6900e-003	0.1025	0.0557	9.5000e-004	2.9854	9.2000e-004	2.9863	0.3054	8.8000e-004	0.3063	0.0000	90.0350	90.0350	4.0000e-004	0.0101	93.0589
Unmitigated	3.6900e-003	0.1025	0.0557	9.5000e-004	2.9854	9.2000e-004	2.9863	0.3054	8.8000e-004	0.3063	0.0000	90.0350	90.0350	4.0000e-004	0.0101	93.0589

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	24.16	0.00	0.00	87,942	87,942
Total	24.16	0.00	0.00	87,942	87,942

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.40	14.00	11.90	0.00	100.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0431	0.0431	1.0000e-005	0.0000	0.0435
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0431	0.0431	1.0000e-005	0.0000	0.0435
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	499.895	0.0431	1.0000e-005	0.0000	0.0435
Total		**0.0431**	**1.0000e-005**	**0.0000**	**0.0435**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	499.895	0.0431	1.0000e-005	0.0000	0.0435
Total		**0.0431**	**1.0000e-005**	**0.0000**	**0.0435**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	5.1000e-004	5.0000e-005	5.5500e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0108	0.0108	3.0000e-005	0.0000	0.0115
Unmitigated	5.1000e-004	5.0000e-005	5.5500e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0108	0.0108	3.0000e-005	0.0000	0.0115

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.1000e-004	5.0000e-005	5.5500e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0108	0.0108	3.0000e-005	0.0000	0.0115
Total	**5.1000e-004**	**5.0000e-005**	**5.5500e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0108**	**0.0108**	**3.0000e-005**	**0.0000**	**0.0115**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.1000e-004	5.0000e-005	5.5500e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0108	0.0108	3.0000e-005	0.0000	0.0115
Total	**5.1000e-004**	**5.0000e-005**	**5.5500e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0108**	**0.0108**	**3.0000e-005**	**0.0000**	**0.0115**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	3.1197	5.4000e-004	7.0000e-005	3.1528
Unmitigated	3.1197	5.4000e-004	7.0000e-005	3.1528

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 3.25852	3.1197	5.4000e-004	7.0000e-005	3.1528
Total		**3.1197**	**5.4000e-004**	**7.0000e-005**	**3.1528**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 3.25852	3.1197	5.4000e-004	7.0000e-005	3.1528
Total		**3.1197**	**5.4000e-004**	**7.0000e-005**	**3.1528**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Off-Highway Trucks	1	8.00	4	402	0.38	Diesel

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Off-Highway Trucks	1.0100e-003	7.1400e-003	6.5800e-003	3.0000e-005		2.6000e-004	2.6000e-004		2.4000e-004	2.4000e-004	0.0000	2.3222	2.3222	7.5000e-004	0.0000	2.3410
Total	**1.0100e-003**	**7.1400e-003**	**6.5800e-003**	**3.0000e-005**		**2.6000e-004**	**2.6000e-004**		**2.4000e-004**	**2.4000e-004**	**0.0000**	**2.3222**	**2.3222**	**7.5000e-004**	**0.0000**	**2.3410**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Viking Solar Project

Imperial County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	604.00	User Defined Unit	604.00	26,310,240.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2023
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project area is approximately 604 acres

Construction Phase - Construction duration approximately 12 months

Off-road Equipment - Equipment Details

Off-road Equipment - Equipment details

Off-road Equipment - Equipment details

Off-road Equipment - Equipment details

Off-road Equipment - Equipment details

Grading - Approx. 1 pass over the 604 acres during site prep
Approx. 3 passes over the 604 acres during grading
Demolition of an on-site building/structure

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Trips and VMT - Max worker trips 360 one-way trips (180 round trips)
Max delivery/vendor trips 4 one-way trips (2 round trips)
Max haul trips 0
Trip length modified to 14 miles due to location of Project from nearest city.

On-road Fugitive Dust - Approx 1.25 miles of unpaved road to project

Vehicle Trips - No employees would be based at the Project sites
Operational traffic is not anticipated. Conservatively included, up to 2 washings per year - Max 24 one way trips per day during these maintenance events (0.04)
Trip length modified to 14 miles due to location of Project from nearest city.

Fleet Mix - Conservatively assume a medium heavy duty truck

Road Dust - Approx 1.25 miles of unpaved road to project

Consumer Products - None

Area Coating - None

Landscape Equipment - None

Energy Use - 500 kw-hr/day (0.000019)

Water And Wastewater - 10 acre-feet=3258516.48 gallons

Solid Waste - None

Operational Off-Road Equipment - Not anticpated but conservatively assumed water vehicle - Assume 2 solar panel washing per year each taking two days

Construction Off-road Equipment Mitigation - Reduced speed & watering of unpaved roads to the project

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	8
tblConstructionPhase	NumDays	10,850.00	243.00
tblConstructionPhase	NumDays	10,850.00	27.00
tblConstructionPhase	NumDays	1,085.00	44.00
tblConstructionPhase	NumDays	10,850.00	16.00
tblConstructionPhase	NumDays	420.00	26.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	12/10/2077	12/31/2022
tblConstructionPhase	PhaseEndDate	1/15/2072	3/31/2022
tblConstructionPhase	PhaseEndDate	6/14/2030	3/23/2022
tblConstructionPhase	PhaseEndDate	12/28/2074	4/11/2022
tblConstructionPhase	PhaseEndDate	4/17/2026	1/31/2022
tblConstructionPhase	PhaseStartDate	12/29/2074	3/24/2022
tblConstructionPhase	PhaseStartDate	6/15/2030	3/1/2022
tblConstructionPhase	PhaseStartDate	4/18/2026	2/1/2022
tblConstructionPhase	PhaseStartDate	1/16/2072	3/24/2022
tblConstructionPhase	PhaseStartDate	9/7/2024	1/1/2022
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	T24E	0.00	1.9000e-005
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.52	0.00
tblFleetMix	LDT1	0.06	0.00
tblFleetMix	LDT2	0.18	0.00
tblFleetMix	LHD1	0.03	0.00
tblFleetMix	LHD2	6.9080e-003	0.00
tblFleetMix	MCY	0.02	0.00
tblFleetMix	MDV	0.15	0.00
tblFleetMix	MH	3.6330e-003	0.00
tblFleetMix	MHD	8.2760e-003	1.00
tblFleetMix	OBUS	9.1800e-004	0.00
tblFleetMix	SBUS	7.7900e-004	0.00
tblFleetMix	UBUS	1.2100e-004	0.00
tblGrading	AcresOfGrading	110.00	1,812.00

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblGrading	AcresOfGrading	52.00	604.00
tblGrading	MaterialExported	0.00	250.00
tblLandUse	LandUseSquareFeet	0.00	26,310,240.00
tblLandUse	LotAcreage	0.00	604.00
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.37	0.45
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.48	0.48
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType	Welders	Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Other General Industrial Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Other General Industrial Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	4.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblRoadDust	RoadPercentPave	50	91
tblSolidWaste	LandfillCaptureGasFlare	94.00	0.00

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblSolidWaste	LandfillNoGasCapture	6.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripNumber	31.00	0.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	4,312.00	0.00
tblTripsAndVMT	VendorTripNumber	4,312.00	0.00
tblTripsAndVMT	VendorTripNumber	4,312.00	4.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripNumber	15.00	360.00
tblTripsAndVMT	WorkerTripNumber	18.00	360.00
tblTripsAndVMT	WorkerTripNumber	11,050.00	0.00
tblTripsAndVMT	WorkerTripNumber	11,050.00	0.00
tblTripsAndVMT	WorkerTripNumber	11,050.00	360.00
tblVehicleTrips	CC_TL	9.50	14.00
tblVehicleTrips	CC_TTP	0.00	100.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	WD_TR	0.00	0.04
tblWater	OutdoorWaterUseRate	0.00	3,258,516.48

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	8.7164	61.5868	78.3319	0.1481	728.2473	3.0270	731.0778	77.5913	2.8474	78.9692	0.0000	14,329.6371	14,329.6371	2.7344	0.1271	14,434.6862
Maximum	**8.7164**	**61.5868**	**78.3319**	**0.1481**	**728.2473**	**3.0270**	**731.0778**	**77.5913**	**2.8474**	**78.9692**	**0.0000**	**14,329.6371**	**14,329.6371**	**2.7344**	**0.1271**	**14,434.6862**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	8.7164	61.5868	78.3319	0.1481	140.6398	3.0270	143.4703	16.2882	2.8474	18.4317	0.0000	14,329.6371	14,329.6371	2.7344	0.1271	14,434.6862
Maximum	**8.7164**	**61.5868**	**78.3319**	**0.1481**	**140.6398**	**3.0270**	**143.4703**	**16.2882**	**2.8474**	**18.4317**	**0.0000**	**14,329.6371**	**14,329.6371**	**2.7344**	**0.1271**	**14,434.6862**

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**80.69**	**0.00**	**80.38**	**79.01**	**0.00**	**76.66**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0298	0.7197	0.4252	7.3300e-003	22.9662	7.1100e-003	22.9733	2.3500	6.8000e-003	2.3568		764.3705	764.3705	3.3900e-003	0.0854	789.8948
Offroad	0.5039	3.5679	3.2885	0.0132		0.1290	0.1290		0.1187	0.1187	0.0000	1,279.8885	1,279.8885	0.4139		1,290.2371
Total	**0.5394**	**4.2881**	**3.7754**	**0.0206**	**22.9662**	**0.1363**	**23.1025**	**2.3500**	**0.1257**	**2.4757**	**0.0000**	**2,044.3912**	**2,044.3912**	**0.4177**	**0.0854**	**2,080.2727**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0298	0.7197	0.4252	7.3300e-003	22.9662	7.1100e-003	22.9733	2.3500	6.8000e-003	2.3568		764.3705	764.3705	3.3900e-003	0.0854	789.8948
Offroad	0.5039	3.5679	3.2885	0.0132		0.1290	0.1290		0.1187	0.1187	0.0000	1,279.8885	1,279.8885	0.4139		1,290.2371
Total	**0.5394**	**4.2881**	**3.7754**	**0.0206**	**22.9662**	**0.1363**	**23.1025**	**2.3500**	**0.1257**	**2.4757**	**0.0000**	**2,044.3912**	**2,044.3912**	**0.4177**	**0.0854**	**2,080.2727**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition/Site Preparation	Site Preparation	1/1/2022	1/31/2022	6	26	
2	Grading	Grading	2/1/2022	3/23/2022	6	44	
3	Trenching	Building Construction	3/1/2022	3/31/2022	6	27	
4	Interconnection Connection	Building Construction	3/24/2022	4/11/2022	6	16	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5	Solar Array Installation	Building Construction	3/24/2022	12/31/2022	6	243	

Acres of Grading (Site Preparation Phase): 604

Acres of Grading (Grading Phase): 1812

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Interconnection Connection	Cranes	1	6.00	231	0.29
Trenching	Cranes	1	7.00	231	0.29
Solar Array Installation	Cranes	1	7.00	231	0.29
Grading	Excavators	1	8.00	158	0.38
Trenching	Forklifts	3	8.00	89	0.20
Trenching	Generator Sets	2	8.00	84	0.74
Grading	Graders	2	8.00	187	0.41
Solar Array Installation	Bore/Drill Rigs	2	4.00	221	0.50
Solar Array Installation	Off-Highway Trucks	1	6.00	402	0.38
Solar Array Installation	Welders	1	8.00	46	0.45
Interconnection Connection	Forklifts	1	4.00	89	0.20
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Demolition/Site Preparation	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Trenching	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Demolition/Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Welders	1	8.00	46	0.45
Solar Array Installation	Forklifts	5	4.00	89	0.20

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Interconnection Connection	Generator Sets	1	8.00	84	0.74
Solar Array Installation	Generator Sets	1	8.00	84	0.74
Interconnection Connection	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Solar Array Installation	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Interconnection Connection	Welders	1	8.00	46	0.45
Solar Array Installation	Skid Steer Loaders	2	8.00	65	0.45
Demolition/Site Preparation	Skid Steer Loaders	1	8.00	65	0.37
Demolition/Site Preparation	Scrapers	1	8.00	367	0.48
Grading	Off-Highway Trucks	1	8.00	402	0.38
Trenching	Trenchers	2	8.00	78	0.50
Trenching	Other General Industrial Equipment	1	8.00	88	0.34
Trenching	Skid Steer Loaders	1	8.00	65	0.37
Interconnection Connection	Aerial Lifts	1	6.00	63	0.31
Interconnection Connection	Other General Industrial Equipment	1	8.00	88	0.34

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition/Site Preparation	6	360.00	4.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Grading	7	360.00	4.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Trenching	12	0.00	0.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Interconnection Connection	8	0.00	0.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Solar Array Installation	16	360.00	4.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition/Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					36.6823	0.0000	36.6823	9.2809	0.0000	9.2809			0.0000			0.0000
Off-Road	2.8963	30.8516	19.4291	0.0406		1.4002	1.4002		1.2882	1.2882		3,933.7728	3,933.7728	1.2723		3,965.5794
Total	**2.8963**	**30.8516**	**19.4291**	**0.0406**	**36.6823**	**1.4002**	**38.0825**	**9.2809**	**1.2882**	**10.5691**		**3,933.7728**	**3,933.7728**	**1.2723**		**3,965.5794**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0144	0.2706	0.1014	1.4400e-003	7.4659	4.2500e-003	7.4701	0.7543	4.0700e-003	0.7583		151.3868	151.3868	7.0000e-004	0.0210	157.6564
Worker	2.2837	1.2179	18.3202	0.0366	671.0860	0.0197	671.1057	67.5562	0.0182	67.5743		3,693.9140	3,693.9140	0.1100	0.1061	3,728.2833
Total	**2.2981**	**1.4885**	**18.4216**	**0.0380**	**678.5518**	**0.0240**	**678.5758**	**68.3105**	**0.0222**	**68.3327**		**3,845.3008**	**3,845.3008**	**0.1107**	**0.1271**	**3,885.9397**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition/Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					14.3061	0.0000	14.3061	3.6195	0.0000	3.6195			0.0000			0.0000
Off-Road	2.8963	30.8516	19.4291	0.0406		1.4002	1.4002		1.2882	1.2882	0.0000	3,933.7728	3,933.7728	1.2723		3,965.5794
Total	**2.8963**	**30.8516**	**19.4291**	**0.0406**	**14.3061**	**1.4002**	**15.7063**	**3.6195**	**1.2882**	**4.9077**	**0.0000**	**3,933.7728**	**3,933.7728**	**1.2723**		**3,965.5794**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0144	0.2706	0.1014	1.4400e-003	1.3418	4.2500e-003	1.3460	0.1428	4.0700e-003	0.1469		151.3868	151.3868	7.0000e-004	0.0210	157.6564
Worker	2.2837	1.2179	18.3202	0.0366	119.9169	0.0197	119.9366	12.5259	0.0182	12.5440		3,693.9140	3,693.9140	0.1100	0.1061	3,728.2833
Total	**2.2981**	**1.4885**	**18.4216**	**0.0380**	**121.2586**	**0.0240**	**121.2826**	**12.6687**	**0.0222**	**12.6909**		**3,845.3008**	**3,845.3008**	**0.1107**	**0.1271**	**3,885.9397**

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					49.6954	0.0000	49.6954	8.0259	0.0000	8.0259			0.0000			0.0000
Off-Road	3.3845	35.7387	22.2699	0.0585		1.4236	1.4236		1.3097	1.3097		5,666.5216	5,666.5216	1.8327		5,712.3383
Total	**3.3845**	**35.7387**	**22.2699**	**0.0585**	**49.6954**	**1.4236**	**51.1190**	**8.0259**	**1.3097**	**9.3357**		**5,666.5216**	**5,666.5216**	**1.8327**		**5,712.3383**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0144	0.2706	0.1014	1.4400e-003	7.4659	4.2500e-003	7.4701	0.7543	4.0700e-003	0.7583		151.3868	151.3868	7.0000e-004	0.0210	157.6564
Worker	2.2837	1.2179	18.3202	0.0366	671.0860	0.0197	671.1057	67.5562	0.0182	67.5743		3,693.9140	3,693.9140	0.1100	0.1061	3,728.2833
Total	**2.2981**	**1.4885**	**18.4216**	**0.0380**	**678.5518**	**0.0240**	**678.5758**	**68.3105**	**0.0222**	**68.3327**		**3,845.3008**	**3,845.3008**	**0.1107**	**0.1271**	**3,885.9397**

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.3812	0.0000	19.3812	3.1301	0.0000	3.1301			0.0000			0.0000
Off-Road	3.3845	35.7387	22.2699	0.0585		1.4236	1.4236		1.3097	1.3097	0.0000	5,666.5216	5,666.5216	1.8327		5,712.3383
Total	**3.3845**	**35.7387**	**22.2699**	**0.0585**	**19.3812**	**1.4236**	**20.8048**	**3.1301**	**1.3097**	**4.4398**	**0.0000**	**5,666.5216**	**5,666.5216**	**1.8327**		**5,712.3383**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0144	0.2706	0.1014	1.4400e-003	1.3418	4.2500e-003	1.3460	0.1428	4.0700e-003	0.1469		151.3868	151.3868	7.0000e-004	0.0210	157.6564
Worker	2.2837	1.2179	18.3202	0.0366	119.9169	0.0197	119.9366	12.5259	0.0182	12.5440		3,693.9140	3,693.9140	0.1100	0.1061	3,728.2833
Total	**2.2981**	**1.4885**	**18.4216**	**0.0380**	**121.2586**	**0.0240**	**121.2826**	**12.6687**	**0.0222**	**12.6909**		**3,845.3008**	**3,845.3008**	**0.1107**	**0.1271**	**3,885.9397**

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6623	24.3596	23.8046	0.0383		1.3829	1.3829		1.3009	1.3009		3,639.5437	3,639.5437	0.7910		3,659.3192
Total	**2.6623**	**24.3596**	**23.8046**	**0.0383**		**1.3829**	**1.3829**		**1.3009**	**1.3009**		**3,639.5437**	**3,639.5437**	**0.7910**		**3,659.3192**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Trenching - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6623	24.3596	23.8046	0.0383		1.3829	1.3829		1.3009	1.3009	0.0000	3,639.5437	3,639.5437	0.7910		3,659.3192
Total	**2.6623**	**24.3596**	**23.8046**	**0.0383**		**1.3829**	**1.3829**		**1.3009**	**1.3009**	**0.0000**	**3,639.5437**	**3,639.5437**	**0.7910**		**3,659.3192**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Interconnection Connection - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3138	11.8411	12.3620	0.0212		0.5790	0.5790		0.5496	0.5496		1,994.8725	1,994.8725	0.4310		2,005.6476
Total	**1.3138**	**11.8411**	**12.3620**	**0.0212**		**0.5790**	**0.5790**		**0.5496**	**0.5496**		**1,994.8725**	**1,994.8725**	**0.4310**		**2,005.6476**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Interconnection Connection - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3138	11.8411	12.3620	0.0212		0.5790	0.5790		0.5496	0.5496	0.0000	1,994.8725	1,994.8725	0.4310		2,005.6476
Total	**1.3138**	**11.8411**	**12.3620**	**0.0212**		**0.5790**	**0.5790**		**0.5496**	**0.5496**	**0.0000**	**1,994.8725**	**1,994.8725**	**0.4310**		**2,005.6476**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Solar Array Installation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.4423	22.6500	23.7438	0.0507		1.0411	1.0411		0.9747	0.9747		4,849.9202	4,849.9202	1.3544		4,883.7798
Total	**2.4423**	**22.6500**	**23.7438**	**0.0507**		**1.0411**	**1.0411**		**0.9747**	**0.9747**		**4,849.9202**	**4,849.9202**	**1.3544**		**4,883.7798**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0144	0.2706	0.1014	1.4400e-003	7.4659	4.2500e-003	7.4701	0.7543	4.0700e-003	0.7583		151.3868	151.3868	7.0000e-004	0.0210	157.6564
Worker	2.2837	1.2179	18.3202	0.0366	671.0860	0.0197	671.1057	67.5562	0.0182	67.5743		3,693.9140	3,693.9140	0.1100	0.1061	3,728.2833
Total	**2.2981**	**1.4885**	**18.4216**	**0.0380**	**678.5518**	**0.0240**	**678.5758**	**68.3105**	**0.0222**	**68.3327**		**3,845.3008**	**3,845.3008**	**0.1107**	**0.1271**	**3,885.9397**

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Solar Array Installation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.4423	22.6500	23.7438	0.0507		1.0411	1.0411		0.9747	0.9747	0.0000	4,849.9201	4,849.9201	1.3544		4,883.7798
Total	**2.4423**	**22.6500**	**23.7438**	**0.0507**		**1.0411**	**1.0411**		**0.9747**	**0.9747**	**0.0000**	**4,849.9201**	**4,849.9201**	**1.3544**		**4,883.7798**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0144	0.2706	0.1014	1.4400e-003	1.3418	4.2500e-003	1.3460	0.1428	4.0700e-003	0.1469		151.3868	151.3868	7.0000e-004	0.0210	157.6564
Worker	2.2837	1.2179	18.3202	0.0366	119.9169	0.0197	119.9366	12.5259	0.0182	12.5440		3,693.9140	3,693.9140	0.1100	0.1061	3,728.2833
Total	**2.2981**	**1.4885**	**18.4216**	**0.0380**	**121.2586**	**0.0240**	**121.2826**	**12.6687**	**0.0222**	**12.6909**		**3,845.3008**	**3,845.3008**	**0.1107**	**0.1271**	**3,885.9397**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0298	0.7197	0.4252	7.3300e-003	22.9662	7.1100e-003	22.9733	2.3500	6.8000e-003	2.3568		764.3705	764.3705	3.3900e-003	0.0854	789.8948
Unmitigated	0.0298	0.7197	0.4252	7.3300e-003	22.9662	7.1100e-003	22.9733	2.3500	6.8000e-003	2.3568		764.3705	764.3705	3.3900e-003	0.0854	789.8948

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	24.16	0.00	0.00	87,942	87,942
Total	24.16	0.00	0.00	87,942	87,942

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.40	14.00	11.90	0.00	100.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409
Unmitigated	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409
Total	**5.7100e-003**	**5.6000e-004**	**0.0617**	**0.0000**		**2.2000e-004**	**2.2000e-004**		**2.2000e-004**	**2.2000e-004**		**0.1322**	**0.1322**	**3.5000e-004**		**0.1409**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409
Total	**5.7100e-003**	**5.6000e-004**	**0.0617**	**0.0000**		**2.2000e-004**	**2.2000e-004**		**2.2000e-004**	**2.2000e-004**		**0.1322**	**0.1322**	**3.5000e-004**		**0.1409**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Off-Highway Trucks	1	8.00	4	402	0.38	Diesel

Viking Solar Project - Imperial County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Off-Highway Trucks	0.5039	3.5679	3.2885	0.0132		0.1290	0.1290		0.1187	0.1187	0.0000	1,279.8885	1,279.8885	0.4139		1,290.2371
Total	**0.5039**	**3.5679**	**3.2885**	**0.0132**		**0.1290**	**0.1290**		**0.1187**	**0.1187**	**0.0000**	**1,279.8885**	**1,279.8885**	**0.4139**		**1,290.2371**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Viking Solar Project

Imperial County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	604.00	User Defined Unit	604.00	26,310,240.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2023
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project area is approximately 604 acres

Construction Phase - Construction duration approximately 12 months

Off-road Equipment - Equipment Details

Off-road Equipment - Equipment details

Off-road Equipment - Equipment details

Off-road Equipment - Equipment details

Off-road Equipment - Equipment details

Grading - Approx. 1 pass over the 604 acres during site prep
Approx. 3 passes over the 604 acres during grading
Demolition of an on-site building/structure

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Trips and VMT - Max worker trips 360 one-way trips (180 round trips)
Max delivery/vendor trips 4 one-way trips (2 round trips)
Max haul trips 0
Trip length modified to 14 miles due to location of Project from nearest city.

On-road Fugitive Dust - Approx 1.25 miles of unpaved road to project

Vehicle Trips - No employees would be based at the Project sites
Operational traffic is not anticipated. Conservatively included, up to 2 washings per year - Max 24 one way trips per day during these maintenance events (0.04)
Trip length modified to 14 miles due to location of Project from nearest city.

Fleet Mix - Conservatively assume a medium heavy duty truck

Road Dust - Approx 1.25 miles of unpaved road to project

Consumer Products - None

Area Coating - None

Landscape Equipment - None

Energy Use - 500 kw-hr/day (0.000019)

Water And Wastewater - 10 acre-feet=3258516.48 gallons

Solid Waste - None

Operational Off-Road Equipment - Not anticpated but conservatively assumed water vehicle - Assume 2 solar panel washing per year each taking two days

Construction Off-road Equipment Mitigation - Reduced speed & watering of unpaved roads to the project

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	8
tblConstructionPhase	NumDays	10,850.00	243.00
tblConstructionPhase	NumDays	10,850.00	27.00
tblConstructionPhase	NumDays	1,085.00	44.00
tblConstructionPhase	NumDays	10,850.00	16.00
tblConstructionPhase	NumDays	420.00	26.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	12/10/2077	12/31/2022
tblConstructionPhase	PhaseEndDate	1/15/2072	3/31/2022
tblConstructionPhase	PhaseEndDate	6/14/2030	3/23/2022
tblConstructionPhase	PhaseEndDate	12/28/2074	4/11/2022
tblConstructionPhase	PhaseEndDate	4/17/2026	1/31/2022
tblConstructionPhase	PhaseStartDate	12/29/2074	3/24/2022
tblConstructionPhase	PhaseStartDate	6/15/2030	3/1/2022
tblConstructionPhase	PhaseStartDate	4/18/2026	2/1/2022
tblConstructionPhase	PhaseStartDate	1/16/2072	3/24/2022
tblConstructionPhase	PhaseStartDate	9/7/2024	1/1/2022
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblConsumerProducts	ROG_EF_PesticidesFertilizers	5.152E-08	0
tblEnergyUse	T24E	0.00	1.9000e-005
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.52	0.00
tblFleetMix	LDT1	0.06	0.00
tblFleetMix	LDT2	0.18	0.00
tblFleetMix	LHD1	0.03	0.00
tblFleetMix	LHD2	6.9080e-003	0.00
tblFleetMix	MCY	0.02	0.00
tblFleetMix	MDV	0.15	0.00
tblFleetMix	MH	3.6330e-003	0.00
tblFleetMix	MHD	8.2760e-003	1.00
tblFleetMix	OBUS	9.1800e-004	0.00
tblFleetMix	SBUS	7.7900e-004	0.00
tblFleetMix	UBUS	1.2100e-004	0.00
tblGrading	AcresOfGrading	110.00	1,812.00

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblGrading	AcresOfGrading	52.00	604.00
tblGrading	MaterialExported	0.00	250.00
tblLandUse	LandUseSquareFeet	0.00	26,310,240.00
tblLandUse	LotAcreage	0.00	604.00
tblOffRoadEquipment	LoadFactor	0.50	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.37	0.45
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.48	0.48
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Welders
tblOffRoadEquipment	OffRoadEquipmentType	Welders	Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Scrapers
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Trenchers
tblOffRoadEquipment	OffRoadEquipmentType		Other General Industrial Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Aerial Lifts
tblOffRoadEquipment	OffRoadEquipmentType		Other General Industrial Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	HaulingPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	VendorPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOnRoadDust	WorkerPercentPave	50.00	91.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	4.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblRoadDust	RoadPercentPave	50	91
tblSolidWaste	LandfillCaptureGasFlare	94.00	0.00

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblSolidWaste	LandfillNoGasCapture	6.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripLength	20.00	14.00
tblTripsAndVMT	HaulingTripNumber	31.00	0.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripLength	11.90	14.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	4,312.00	0.00
tblTripsAndVMT	VendorTripNumber	4,312.00	0.00
tblTripsAndVMT	VendorTripNumber	4,312.00	4.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripLength	10.20	14.00
tblTripsAndVMT	WorkerTripNumber	15.00	360.00
tblTripsAndVMT	WorkerTripNumber	18.00	360.00
tblTripsAndVMT	WorkerTripNumber	11,050.00	0.00
tblTripsAndVMT	WorkerTripNumber	11,050.00	0.00
tblTripsAndVMT	WorkerTripNumber	11,050.00	360.00
tblVehicleTrips	CC_TL	9.50	14.00
tblVehicleTrips	CC_TTP	0.00	100.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	WD_TR	0.00	0.04
tblWater	OutdoorWaterUseRate	0.00	3,258,516.48

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	8.2228	61.6776	72.7759	0.1426	728.2473	3.0270	731.0778	77.5913	2.8474	78.9692	0.0000	13,771.1594	13,771.1594	2.7303	0.1302	13,877.0205
Maximum	**8.2228**	**61.6776**	**72.7759**	**0.1426**	**728.2473**	**3.0270**	**731.0778**	**77.5913**	**2.8474**	**78.9692**	**0.0000**	**13,771.1594**	**13,771.1594**	**2.7303**	**0.1302**	**13,877.0205**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	8.2228	61.6776	72.7759	0.1426	140.6398	3.0270	143.4703	16.2882	2.8474	18.4317	0.0000	13,771.1594	13,771.1594	2.7303	0.1302	13,877.0205
Maximum	**8.2228**	**61.6776**	**72.7759**	**0.1426**	**140.6398**	**3.0270**	**143.4703**	**16.2882**	**2.8474**	**18.4317**	**0.0000**	**13,771.1594**	**13,771.1594**	**2.7303**	**0.1302**	**13,877.0205**

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**80.69**	**0.00**	**80.38**	**79.01**	**0.00**	**76.66**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0281	0.8001	0.4352	7.3300e-003	22.9662	7.1300e-003	22.9733	2.3500	6.8100e-003	2.3568		764.3094	764.3094	3.3900e-003	0.0860	790.0315
Offroad	0.5039	3.5679	3.2885	0.0132		0.1290	0.1290		0.1187	0.1187	0.0000	1,279.8885	1,279.8885	0.4139		1,290.2371
Total	**0.5377**	**4.3686**	**3.7854**	**0.0206**	**22.9662**	**0.1364**	**23.1026**	**2.3500**	**0.1257**	**2.4757**	**0.0000**	**2,044.3301**	**2,044.3301**	**0.4177**	**0.0860**	**2,080.4094**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0281	0.8001	0.4352	7.3300e-003	22.9662	7.1300e-003	22.9733	2.3500	6.8100e-003	2.3568		764.3094	764.3094	3.3900e-003	0.0860	790.0315
Offroad	0.5039	3.5679	3.2885	0.0132		0.1290	0.1290		0.1187	0.1187	0.0000	1,279.8885	1,279.8885	0.4139		1,290.2371
Total	**0.5377**	**4.3686**	**3.7854**	**0.0206**	**22.9662**	**0.1364**	**23.1026**	**2.3500**	**0.1257**	**2.4757**	**0.0000**	**2,044.3301**	**2,044.3301**	**0.4177**	**0.0860**	**2,080.4094**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition/Site Preparation	Site Preparation	1/1/2022	1/31/2022	6	26	
2	Grading	Grading	2/1/2022	3/23/2022	6	44	
3	Trenching	Building Construction	3/1/2022	3/31/2022	6	27	
4	Interconnection Connection	Building Construction	3/24/2022	4/11/2022	6	16	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5	Solar Array Installation	Building Construction	3/24/2022	12/31/2022	6	243	

Acres of Grading (Site Preparation Phase): 604

Acres of Grading (Grading Phase): 1812

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Interconnection Connection	Cranes	1	6.00	231	0.29
Trenching	Cranes	1	7.00	231	0.29
Solar Array Installation	Cranes	1	7.00	231	0.29
Grading	Excavators	1	8.00	158	0.38
Trenching	Forklifts	3	8.00	89	0.20
Trenching	Generator Sets	2	8.00	84	0.74
Grading	Graders	2	8.00	187	0.41
Solar Array Installation	Bore/Drill Rigs	2	4.00	221	0.50
Solar Array Installation	Off-Highway Trucks	1	6.00	402	0.38
Solar Array Installation	Welders	1	8.00	46	0.45
Interconnection Connection	Forklifts	1	4.00	89	0.20
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Demolition/Site Preparation	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Trenching	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Demolition/Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Welders	1	8.00	46	0.45
Solar Array Installation	Forklifts	5	4.00	89	0.20

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Interconnection Connection	Generator Sets	1	8.00	84	0.74
Solar Array Installation	Generator Sets	1	8.00	84	0.74
Interconnection Connection	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Solar Array Installation	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Interconnection Connection	Welders	1	8.00	46	0.45
Solar Array Installation	Skid Steer Loaders	2	8.00	65	0.45
Demolition/Site Preparation	Skid Steer Loaders	1	8.00	65	0.37
Demolition/Site Preparation	Scrapers	1	8.00	367	0.48
Grading	Off-Highway Trucks	1	8.00	402	0.38
Trenching	Trenchers	2	8.00	78	0.50
Trenching	Other General Industrial Equipment	1	8.00	88	0.34
Trenching	Skid Steer Loaders	1	8.00	65	0.37
Interconnection Connection	Aerial Lifts	1	6.00	63	0.31
Interconnection Connection	Other General Industrial Equipment	1	8.00	88	0.34

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition/Site Preparation	6	360.00	4.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Grading	7	360.00	4.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Trenching	12	0.00	0.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Interconnection Connection	8	0.00	0.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT
Solar Array Installation	16	360.00	4.00	0.00	14.00	14.00	14.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition/Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					36.6823	0.0000	36.6823	9.2809	0.0000	9.2809			0.0000			0.0000
Off-Road	2.8963	30.8516	19.4291	0.0406		1.4002	1.4002		1.2882	1.2882		3,933.7728	3,933.7728	1.2723		3,965.5794
Total	**2.8963**	**30.8516**	**19.4291**	**0.0406**	**36.6823**	**1.4002**	**38.0825**	**9.2809**	**1.2882**	**10.5691**		**3,933.7728**	**3,933.7728**	**1.2723**		**3,965.5794**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0139	0.2987	0.1038	1.4400e-003	7.4659	4.2600e-003	7.4701	0.7543	4.0800e-003	0.7584		151.5004	151.5004	6.8000e-004	0.0211	157.7937
Worker	1.7906	1.2806	12.7617	0.0310	671.0860	0.0197	671.1057	67.5562	0.0182	67.5743		3,135.3227	3,135.3227	0.1060	0.1091	3,170.4803
Total	**1.8045**	**1.5793**	**12.8655**	**0.0325**	**678.5518**	**0.0240**	**678.5758**	**68.3105**	**0.0222**	**68.3327**		**3,286.8231**	**3,286.8231**	**0.1067**	**0.1302**	**3,328.2740**

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition/Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					14.3061	0.0000	14.3061	3.6195	0.0000	3.6195			0.0000			0.0000
Off-Road	2.8963	30.8516	19.4291	0.0406		1.4002	1.4002		1.2882	1.2882	0.0000	3,933.7728	3,933.7728	1.2723		3,965.5794
Total	**2.8963**	**30.8516**	**19.4291**	**0.0406**	**14.3061**	**1.4002**	**15.7063**	**3.6195**	**1.2882**	**4.9077**	**0.0000**	**3,933.7728**	**3,933.7728**	**1.2723**		**3,965.5794**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0139	0.2987	0.1038	1.4400e-003	1.3418	4.2600e-003	1.3460	0.1428	4.0800e-003	0.1469		151.5004	151.5004	6.8000e-004	0.0211	157.7937
Worker	1.7906	1.2806	12.7617	0.0310	119.9169	0.0197	119.9366	12.5259	0.0182	12.5440		3,135.3227	3,135.3227	0.1060	0.1091	3,170.4803
Total	**1.8045**	**1.5793**	**12.8655**	**0.0325**	**121.2586**	**0.0240**	**121.2826**	**12.6687**	**0.0222**	**12.6909**		**3,286.8231**	**3,286.8231**	**0.1067**	**0.1302**	**3,328.2740**

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					49.6954	0.0000	49.6954	8.0259	0.0000	8.0259			0.0000			0.0000
Off-Road	3.3845	35.7387	22.2699	0.0585		1.4236	1.4236		1.3097	1.3097		5,666.5216	5,666.5216	1.8327		5,712.3383
Total	**3.3845**	**35.7387**	**22.2699**	**0.0585**	**49.6954**	**1.4236**	**51.1190**	**8.0259**	**1.3097**	**9.3357**		**5,666.5216**	**5,666.5216**	**1.8327**		**5,712.3383**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0139	0.2987	0.1038	1.4400e-003	7.4659	4.2600e-003	7.4701	0.7543	4.0800e-003	0.7584		151.5004	151.5004	6.8000e-004	0.0211	157.7937
Worker	1.7906	1.2806	12.7617	0.0310	671.0860	0.0197	671.1057	67.5562	0.0182	67.5743		3,135.3227	3,135.3227	0.1060	0.1091	3,170.4803
Total	**1.8045**	**1.5793**	**12.8655**	**0.0325**	**678.5518**	**0.0240**	**678.5758**	**68.3105**	**0.0222**	**68.3327**		**3,286.8231**	**3,286.8231**	**0.1067**	**0.1302**	**3,328.2740**

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.3812	0.0000	19.3812	3.1301	0.0000	3.1301			0.0000			0.0000
Off-Road	3.3845	35.7387	22.2699	0.0585		1.4236	1.4236		1.3097	1.3097	0.0000	5,666.5216	5,666.5216	1.8327		5,712.3383
Total	**3.3845**	**35.7387**	**22.2699**	**0.0585**	**19.3812**	**1.4236**	**20.8048**	**3.1301**	**1.3097**	**4.4398**	**0.0000**	**5,666.5216**	**5,666.5216**	**1.8327**		**5,712.3383**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0139	0.2987	0.1038	1.4400e-003	1.3418	4.2600e-003	1.3460	0.1428	4.0800e-003	0.1469		151.5004	151.5004	6.8000e-004	0.0211	157.7937
Worker	1.7906	1.2806	12.7617	0.0310	119.9169	0.0197	119.9366	12.5259	0.0182	12.5440		3,135.3227	3,135.3227	0.1060	0.1091	3,170.4803
Total	**1.8045**	**1.5793**	**12.8655**	**0.0325**	**121.2586**	**0.0240**	**121.2826**	**12.6687**	**0.0222**	**12.6909**		**3,286.8231**	**3,286.8231**	**0.1067**	**0.1302**	**3,328.2740**

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6623	24.3596	23.8046	0.0383		1.3829	1.3829		1.3009	1.3009		3,639.5437	3,639.5437	0.7910		3,659.3192
Total	**2.6623**	**24.3596**	**23.8046**	**0.0383**		**1.3829**	**1.3829**		**1.3009**	**1.3009**		**3,639.5437**	**3,639.5437**	**0.7910**		**3,659.3192**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Trenching - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6623	24.3596	23.8046	0.0383		1.3829	1.3829		1.3009	1.3009	0.0000	3,639.5437	3,639.5437	0.7910		3,659.3192
Total	**2.6623**	**24.3596**	**23.8046**	**0.0383**		**1.3829**	**1.3829**		**1.3009**	**1.3009**	**0.0000**	**3,639.5437**	**3,639.5437**	**0.7910**		**3,659.3192**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Interconnection Connection - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3138	11.8411	12.3620	0.0212		0.5790	0.5790		0.5496	0.5496		1,994.8725	1,994.8725	0.4310		2,005.6476
Total	**1.3138**	**11.8411**	**12.3620**	**0.0212**		**0.5790**	**0.5790**		**0.5496**	**0.5496**		**1,994.8725**	**1,994.8725**	**0.4310**		**2,005.6476**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Interconnection Connection - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3138	11.8411	12.3620	0.0212		0.5790	0.5790		0.5496	0.5496	0.0000	1,994.8725	1,994.8725	0.4310		2,005.6476
Total	**1.3138**	**11.8411**	**12.3620**	**0.0212**		**0.5790**	**0.5790**		**0.5496**	**0.5496**	**0.0000**	**1,994.8725**	**1,994.8725**	**0.4310**		**2,005.6476**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Solar Array Installation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.4423	22.6500	23.7438	0.0507		1.0411	1.0411		0.9747	0.9747		4,849.9202	4,849.9202	1.3544		4,883.7798
Total	**2.4423**	**22.6500**	**23.7438**	**0.0507**		**1.0411**	**1.0411**		**0.9747**	**0.9747**		**4,849.9202**	**4,849.9202**	**1.3544**		**4,883.7798**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0139	0.2987	0.1038	1.4400e-003	7.4659	4.2600e-003	7.4701	0.7543	4.0800e-003	0.7584		151.5004	151.5004	6.8000e-004	0.0211	157.7937
Worker	1.7906	1.2806	12.7617	0.0310	671.0860	0.0197	671.1057	67.5562	0.0182	67.5743		3,135.3227	3,135.3227	0.1060	0.1091	3,170.4803
Total	**1.8045**	**1.5793**	**12.8655**	**0.0325**	**678.5518**	**0.0240**	**678.5758**	**68.3105**	**0.0222**	**68.3327**		**3,286.8231**	**3,286.8231**	**0.1067**	**0.1302**	**3,328.2740**

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Solar Array Installation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.4423	22.6500	23.7438	0.0507		1.0411	1.0411		0.9747	0.9747	0.0000	4,849.9201	4,849.9201	1.3544		4,883.7798
Total	**2.4423**	**22.6500**	**23.7438**	**0.0507**		**1.0411**	**1.0411**		**0.9747**	**0.9747**	**0.0000**	**4,849.9201**	**4,849.9201**	**1.3544**		**4,883.7798**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0139	0.2987	0.1038	1.4400e-003	1.3418	4.2600e-003	1.3460	0.1428	4.0800e-003	0.1469		151.5004	151.5004	6.8000e-004	0.0211	157.7937
Worker	1.7906	1.2806	12.7617	0.0310	119.9169	0.0197	119.9366	12.5259	0.0182	12.5440		3,135.3227	3,135.3227	0.1060	0.1091	3,170.4803
Total	**1.8045**	**1.5793**	**12.8655**	**0.0325**	**121.2586**	**0.0240**	**121.2826**	**12.6687**	**0.0222**	**12.6909**		**3,286.8231**	**3,286.8231**	**0.1067**	**0.1302**	**3,328.2740**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0281	0.8001	0.4352	7.3300e-003	22.9662	7.1300e-003	22.9733	2.3500	6.8100e-003	2.3568		764.3094	764.3094	3.3900e-003	0.0860	790.0315
Unmitigated	0.0281	0.8001	0.4352	7.3300e-003	22.9662	7.1300e-003	22.9733	2.3500	6.8100e-003	2.3568		764.3094	764.3094	3.3900e-003	0.0860	790.0315

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	24.16	0.00	0.00	87,942	87,942
Total	24.16	0.00	0.00	87,942	87,942

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	16.40	14.00	11.90	0.00	100.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409
Unmitigated	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409
Total	**5.7100e-003**	**5.6000e-004**	**0.0617**	**0.0000**		**2.2000e-004**	**2.2000e-004**		**2.2000e-004**	**2.2000e-004**		**0.1322**	**0.1322**	**3.5000e-004**		**0.1409**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.7100e-003	5.6000e-004	0.0617	0.0000		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004		0.1322	0.1322	3.5000e-004		0.1409
Total	**5.7100e-003**	**5.6000e-004**	**0.0617**	**0.0000**		**2.2000e-004**	**2.2000e-004**		**2.2000e-004**	**2.2000e-004**		**0.1322**	**0.1322**	**3.5000e-004**		**0.1409**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Off-Highway Trucks	1	8.00	4	402	0.38	Diesel

Viking Solar Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Off-Highway Trucks	0.5039	3.5679	3.2885	0.0132		0.1290	0.1290		0.1187	0.1187	0.0000	1,279.8885	1,279.8885	0.4139		1,290.2371
Total	**0.5039**	**3.5679**	**3.2885**	**0.0132**		**0.1290**	**0.1290**		**0.1187**	**0.1187**	**0.0000**	**1,279.8885**	**1,279.8885**	**0.4139**		**1,290.2371**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

G Biological Resource Reports

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G-1 Biological Resources Assessment

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Biological Resources Assessment

Vikings Solar Energy Storage Project

Imperial County, California

JANUARY 2022

PREPARED FOR

Vikings Energy Farm, LLC

PREPARED BY

SWCA Environmental Consultants

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BIOLOGICAL RESOURCES ASSESSMENT
VIKINGS SOLAR ENERGY STORAGE PROJECT, IMPERIAL COUNTY, CALIFORNIA

Prepared for

Vikings Energy Farm, LLC
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El Centro, California 92243

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SWCA Project No. 64085

January 2022

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1 INTRODUCTION

Vikings Energy Farm, LLC (Applicant), retained SWCA Environmental Consultants (SWCA) to conduct a biological resources assessment in support of the proposed Vikings Solar Energy Storage Project (project) in Imperial County, California (county). The Applicant is proposing to develop a nominal 150-megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project with an integrated up to 300 megawatts (MW) battery storage system on approximately 604 acres of land in the County of Imperial, California. The following assessment was conducted to analyze the project's potential impacts on biological resources that may be located in the project area, in compliance with the California Environmental Quality Act (CEQA).

2 PROJECT DESCRIPTION AND LOCATION

The project site is located at the intersection of E. Nelson Pit Road and Graeser Road, approximately 5.5 miles east of the city of Holtville and 15 miles east of the city of El Centro in Section 36 of Township 15 South and Range 16 East of the San Bernardino Base and Meridian of the Holtville East U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. The project is located on Imperial County Assessor's Parcel Numbers (APNs) 050-070-018-000 (approximately 480 acres), 050-070-019 (approximately 80 acres), and 050-070-021 (approximately 44 acres), owned by RL&R Strahm, ARB Inc., and the County of Imperial, respectively.

The project proposes to utilize solar photovoltaic (PV technology modules mounted on fixed frames or horizontal single-axis tracker (HSAT) systems. The fixed-frame PV module arrays would be mounted on racks that would be supported by driven piles, arranged in arrays spaced approximately 15 to 25 feet apart (pile to pile) to maximize performance and to allow access for panel cleaning. These arrays would be separated from each other and the perimeter security fence by up to 30-foot-wide interior roads.

Electricity generated by the PV modules would be collected by a direct current (DC) collection system routed underground in trenches. This DC power would be delivered to one of the pad-mounted inverters in weatherproof enclosures located within the arrays. Underground or overhead 12.5-kilovolt (kV) or 34.5-kV collection lines would transmit the electricity to the new on-site substation, proposed to be located on the southern boundary of APN 050-070-019. A new interconnection switching station would be constructed at the southern boundary of APN 050-070-019, immediately adjacent to the project substation. The project substation and interconnection switching station would be connected via a single overhead 230-kV tie line. The interconnection switching station would be enclosed within its own fence.

To connect to the project's interconnection facilities, the medium voltage power produced by the project would be conveyed underground, or above ground where necessary, to cross over any sensitive site features. Distribution from the site would be via an overhead connection. The electrical energy produced by the project would be conducted through the project interconnection facilities to the proposed 230-kV generator intertie (gentie) line and delivered to the existing Imperial Irrigation District (IID) approved point of interconnection (POI) on the 230-kV KN & KS Line. The proposed battery energy storage system (BESS or ESS) would be constructed adjacent to the project's solar facilities and would consist of either lithium ion (Li-ion) or flow batteries. Underground trenches with conduits would be used to connect the batteries to the control and monitoring systems, and inverters would be used to convert the PV-produced DC power to alternating current power.

Figure 1. Vicinity map.

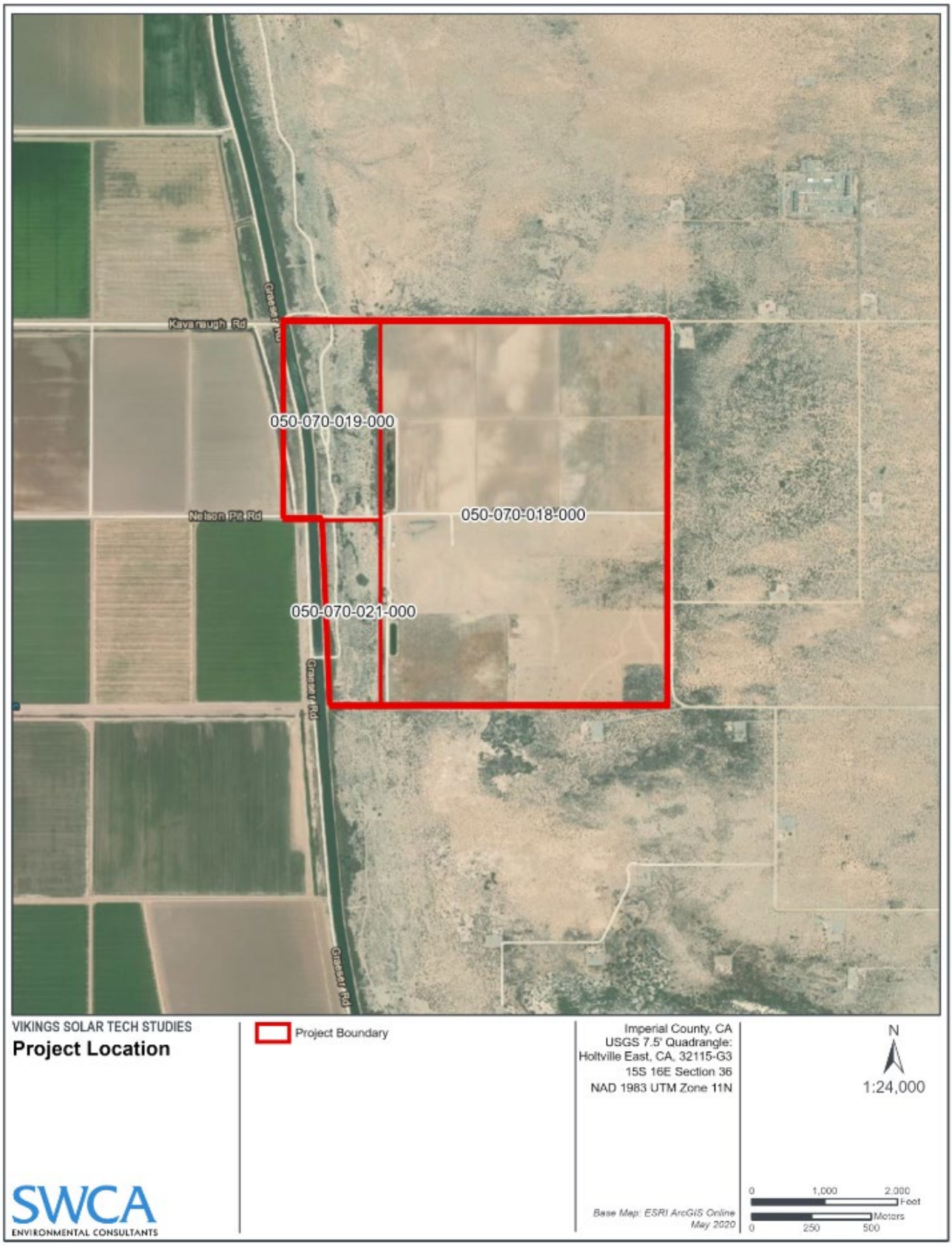

Figure 2. Project location.

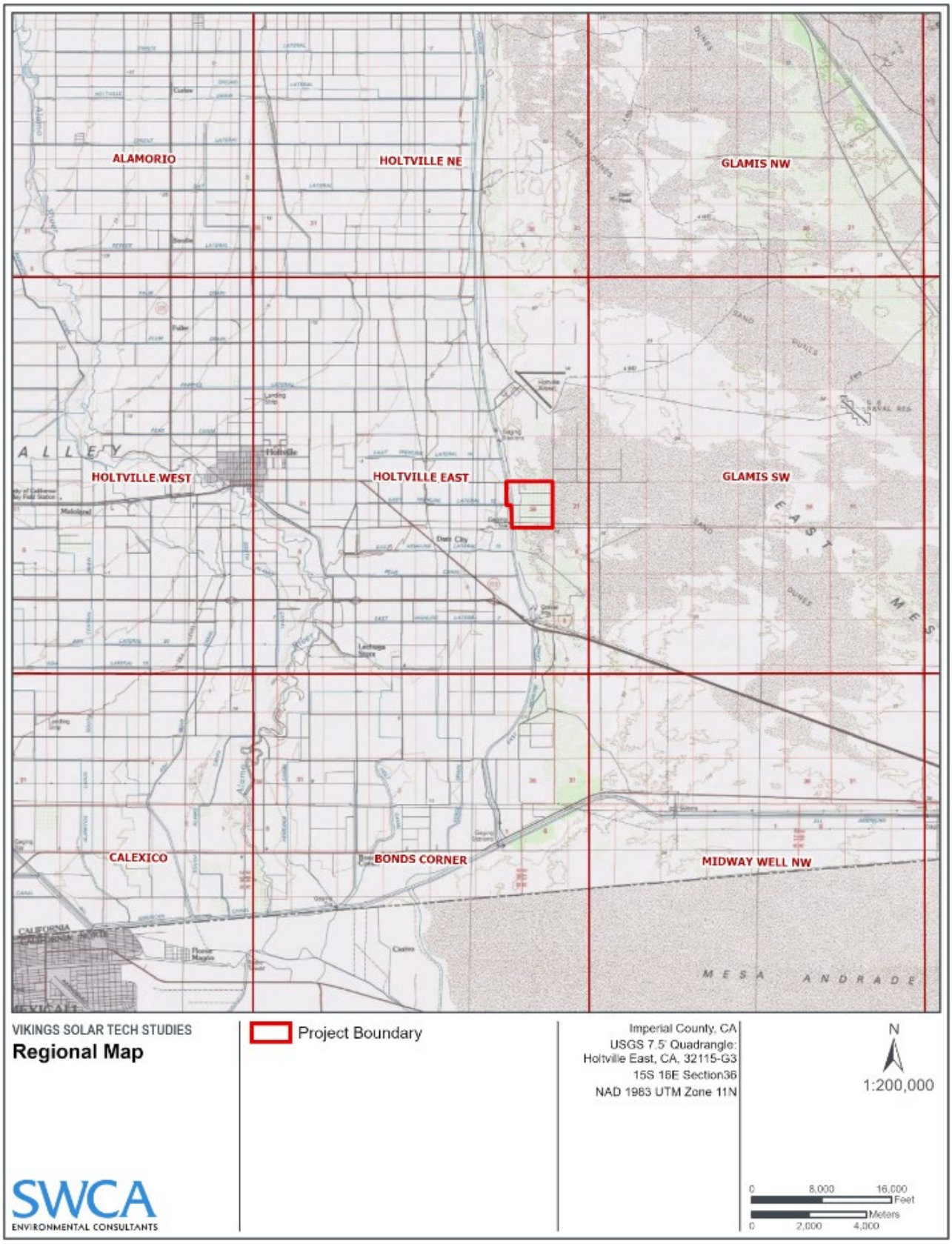

Figure 3. Topographic map.

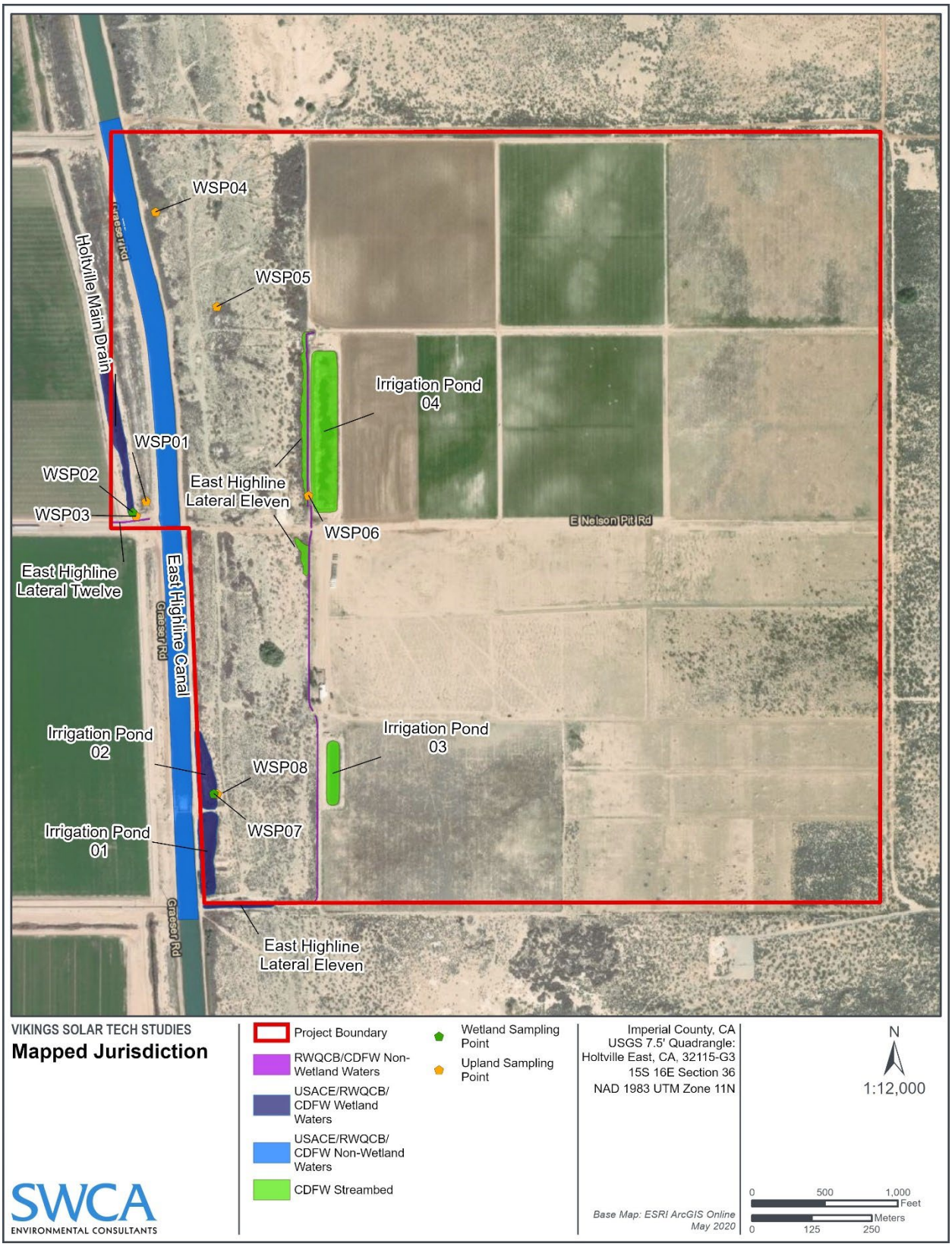

Figure 4. Site plan with aquatic features.

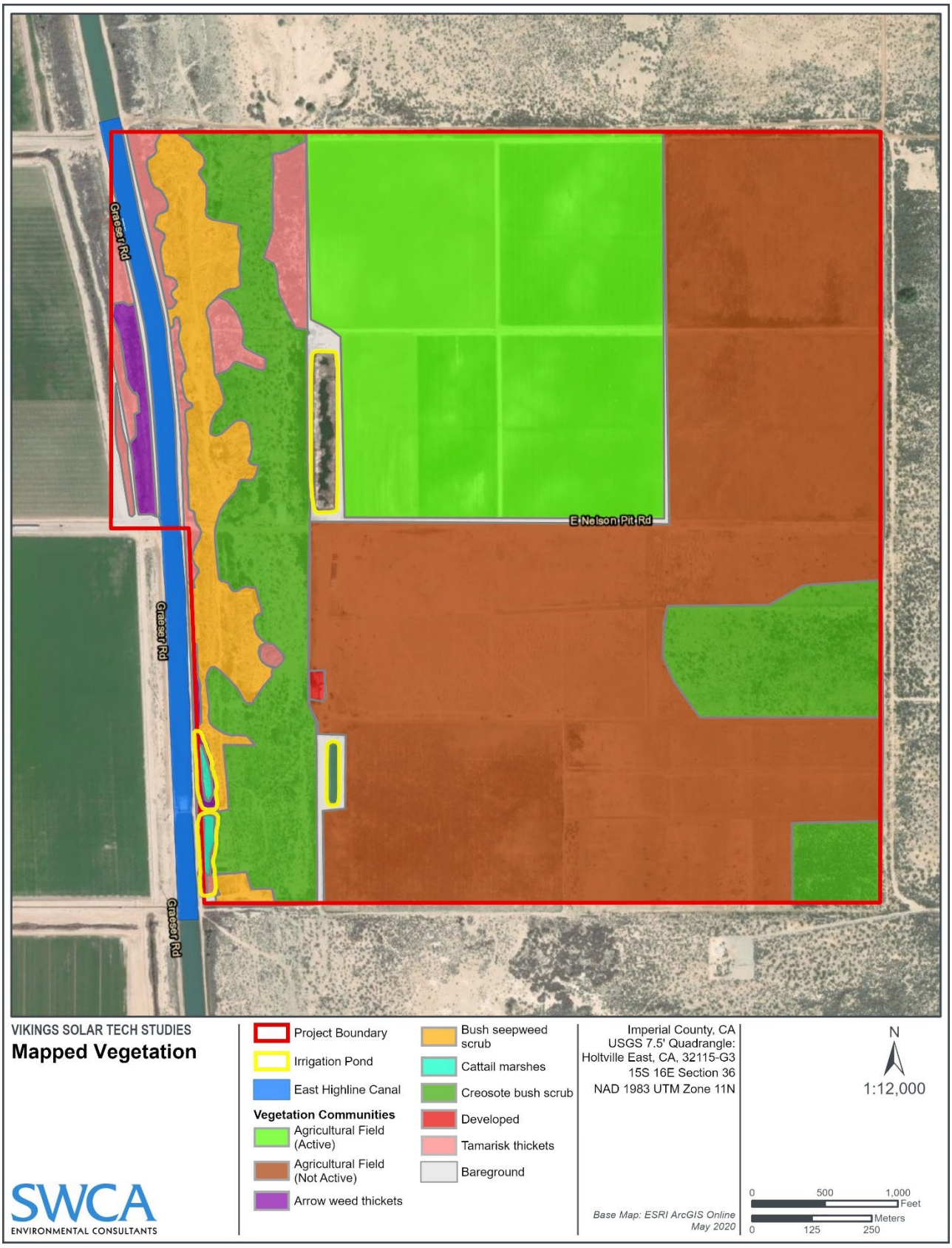

Figure 5. Site plan with vegetation communities.

The proposed battery energy storage system (BESS or ESS) would be constructed adjacent to the projects solar facilities and would consist of either lithium ion (Li-ion) or flow batteries. The batteries will either be housed in storage containers or buildings fitted with heating, ventilation and air conditioning (HVAC) and fire suppression systems as necessary, depending on the final selection of battery technology. Inside the housing the batteries will be placed on racks, the orientation of which depends on the type of housing. Underground trenches with conduits will be used to connect the batteries to the control and monitoring systems, and inverters to convert the PV produced DC power to AC power.

Six-foot-high security fencing would be installed around the perimeter of each of the project sites at the commencement of construction, and site access would be limited to authorized site workers.

2.1 Site Characteristics

The project lies in the Colorado Desert, a subregion within the larger Sonoran Desert. The region is characterized by very low rainfall (2–3 inches per year), which occurs during winter and the summer monsoon. High temperatures may reach 120ºF or higher, and winter lows are rarely below freezing. The region is generally low in elevation and flat, with extremes of 275 feet below sea level and peaks up to about 10,000 feet.

The project site is generally level, ranging from about 23 to 45 feet above mean ground level. Surrounding land uses include active as well as inactive agriculture (farmed cropland) to the west and undeveloped open space to the north, south, and east. Appendix A provides representative photographs.

The project site is composed of three parcels. Parcel 1 (APN 050-070-018-000) is the largest of the three parcels comprising the project site, stretching from Kavanaugh Road in the north to East Highline Lateral Eleven in the south and west, and east to the project boundary. Two agricultural reservoirs/ irrigation ponds are present along the western boundary of this parcel, with one immediately north of E. Nelson Pit Road and the second near the southwest corner of the parcel. Current land use consists of a mix of actively farmed agricultural land in the north and northwest, and fallow fields that do not appear recently farmed along the southern and eastern edges. Native vegetation cover types are not present in most of the fields; however, creosote bush (*Larrea tridentata*) is present as the predominant species in the southeastern corner of the parcel.

Parcel 2 (APN 050-070-019-000) is in the northwest quadrant of the project site, extending west across Graeser Road, East Highline Canal, and Holtville Main Drain, north to Kavanaugh Road, and south to E. Nelson Pit Road. The East Highline Lateral Eleven canal lies along the border between this parcel and Parcel 1. The parcel is composed of primarily disturbed/ruderal upland desert vegetation, with a mix of riparian/upland species near the canals. Upland vegetation consists of creosote bush, alkali goldenbush (*Isocoma acradenia*), common Mediterranean grass (*Schismus barbatus*), and sparsely scattered California fan palms (*Washingtonia filifera*).

Parcel 3 (APN 050-070-021-000) is in the southwest corner of the project site, with E. Nelson Pit Road along the north and the East Highline Lateral Eleven canal on the south. Two abandoned reservoirs/irrigation ponds are situated north of the East Highline Lateral Eleven canal in the southern and southwestern portions of the parcel. Disturbed/ruderal upland desert vegetation is the dominant cover type, with riparian vegetation surrounding reservoirs. The upland vegetation cover type is the same as found on Parcel 2. Riparian vegetation consists of broadleaf cattail (*Typha latifolia*), arrowweed (*Pluchea sericea*), giant wild rye (*Arundo donax*), and saltcedar (*Tamarix* sp.).

Aquatic resources are described in more detail in a separate aquatic resources report (SWCA 2021). Figure 4 illustrates the location and jurisdiction of each identified feature. Vegetation recorded on site is also shown in Figure 5.

3 REGULATORY SETTING

The following discussion summarizes federal, state, and local laws, regulations, and policies relating to plants, wildlife, and special-status habitats. Regulations covering aquatic resources (wetlands, ponds, streams, etc.) are excluded and are discussed in a separate aquatic resources report (SWCA 2021). Only those regulations potentially applicable to the proposed project are included herein.

3.1 Federal Regulations

3.1.1 Federal Endangered Species Act

The U.S. Congress passed the Endangered Species Act (ESA) in 1973 to protect endangered species and species threatened with extinction (federally listed species). The ESA operates in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

Section 9 of the ESA prohibits the "take" of endangered or threatened wildlife species. The legal definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 United States Code [USC] 1532 [19]). Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns (50 Code of Federal Regulations [CFR] 17.3). Harassment is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns (50 CFR 17.3). Actions that result in take can result in civil or criminal penalties.

The U.S. Fish and Wildlife Service (USFWS) is authorized to issue permits under Sections 7 and 10 of the ESA. Section 7 mandates that all federal agencies consult with the USFWS for terrestrial species and/or National Marine Fisheries Service (NMFS) for marine species to ensure that federal agency actions do not jeopardize the continued existence of a listed species or adversely modify critical habitat for listed species. Any anticipated adverse effects require preparation of a biological assessment to determine potential effects of the project on listed species and critical habitat. If the project adversely affects a listed species or its habitat, the USFWS or NMFS prepares a Biological Opinion. The Biological Opinion may recommend "reasonable and prudent alternatives" to the project to avoid jeopardizing or adversely modifying habitat including "take" limits.

The ESA defines critical habitat as habitat deemed essential to the survival of a federally listed species. The ESA requires the federal government to designate "critical habitat" for any species it lists under the ESA. Under Section 7, all federal agencies must ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify its designated critical habitat. These complementary requirements apply only to federal agency actions, and the latter apply only to specifically designated habitat. A critical habitat designation does not set up a preserve or refuge, and applies only when federal funding, permits, or projects are involved (i.e., a federal nexus). Critical habitat requirements do not apply to activities on private land that do not involve a federal nexus.

Section 10 of the ESA includes provisions to authorize take that is incidental to, but not the purpose of, activities that are otherwise lawful. Under Section 10(a)(1)(B), the USFWS may issue permits (incidental take permits) for take of ESA-listed species if the take is incidental and does not jeopardize the survival and recovery of the species. To obtain an incidental take permit, an applicant must submit a habitat conservation plan outlining steps to minimize and mitigate permitted take impacts to listed species.

3.1.2 Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) prohibits any person, unless permitted by regulations, to

> …pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatsoever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention … for the protection of migratory birds ... or any part, nest, or egg of any such bird. (16 USC 703)

The list of migratory birds includes nearly all bird species native to the United States. The statute was extended in 1974 to include parts of birds, as well as eggs and nests. The Migratory Bird Treaty Reform Act of 2004 further defined species protected under the MBTA and excluded all non-native species. Thus, it is illegal under the MBTA to directly kill or destroy a nest of nearly any native bird species.

3.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668–668c) prohibits anyone from "taking" bald eagles (*Haliaeetus leucocephalus*), including their parts, nests, or eggs, without a permit issued by the Secretary of the Interior. In 1962, Congress amended the act to cover golden eagles (*Aquila chrysaetos*). The BGEPA provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The BGEPA defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." The 1962 amendments included a specific exemption for possession of eagles for religious purposes of Native American tribes; however, an Indian Religious Permit is required.

On November 10, 2009, the USFWS implemented new rules under the existing BGEPA, requiring USFWS permits for all activities that may disturb or incidentally take an eagle or its nest as a result of an otherwise legal activity. Under USFWS rules (16 USC § 22.3; 72 Federal Register 31,132, June 5, 2007), "disturb" means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits and causes injury, death, or nest abandonment.

3.2 State Regulations

3.2.1 California Endangered Species Act

The California Department of Fish and Wildlife (CDFW) administers the California Endangered Species Act (CESA), which prohibits the "taking" of listed species except as otherwise provided in state law. Section 86 of the Fish and Game Code defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Under certain circumstances, the CESA applies these take prohibitions to species petitioned for listing (state candidates). Pursuant to the requirements of the CESA, state lead agencies (as defined under CEQA Public Resources Code Section 21067) are required to consult with the CDFW to ensure that any action or project is not likely to jeopardize the continued

existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat. Additionally, the CDFW encourages informal consultation on any proposed project that may impact a candidate species. The CESA requires the CDFW to maintain a list of threatened and endangered species. The CDFW also maintains a list of candidates for listing under the CESA and of species of special concern (or watch list species).

3.2.2 Fully Protected Species

The California Fish and Game Code provides protection from take for a variety of species, referred to as fully protected species. Section 5050 lists protected amphibians and reptiles, and Section 3515 prohibits take of fully protected fish species. Eggs and nests of fully protected birds are protected under Section 3511. Migratory non-game birds are protected under Section 3800, and mammals are protected under Section 4700. Except for take related to scientific research, all take of fully protected species is prohibited.

3.2.3 Nesting Birds and Raptors

Section 3503 of the 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. Section 3503.5 provides protection for all birds of prey, including their eggs and nests.

3.2.4 Migratory Bird Protection

Take or possession of any migratory non-game bird as designated in the MBTA is prohibited by Section 3513 of the Fish and Game Code.

3.2.5 Bats

Fish and Game Code Section 4150 prohibits the take of bats, regardless of their listing status.

3.2.6 California Environmental Quality Act

The CEQA was adopted in 1970 and applies to discretionary actions directly undertaken, financed, or permitted by state or local government lead agencies. CEQA requires that a project's effects on environmental resources must be analyzed and assessed using criteria determined by the lead agency. CEQA defines a rare species in a broader sense than the definitions of threatened, endangered, or California species of concern. Under this definition, the CDFW can request additional consideration of species not otherwise protected.

3.2.7 Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (Fish and Game Code Section 1900-1913) directed the California Department of Fish and Game (now known as CDFW) to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and protected endangered and rare plants from take. The NPPA thus includes measures to preserve, protect, and enhance rare and endangered native plants.

The CESA has largely superseded the NPPA for all plants designated as endangered by the NPPA. The NPPA nevertheless provides limitations on take of rare and endangered species as follows: "...no person

will import into this state, or take, possess, or sell within this State" any rare or endangered native plant, except in compliance with provisions of the CESA. Individual landowners are required to notify the CDFW at least 10 days in advance of changing land uses to allow the CDFW to salvage any rare or endangered native plant material.

3.2.7.1 CALIFORNIA DESERT NATIVE PLANTS ACT

The California Desert Native Plants Act protects non-listed California desert native plants from unlawful harvesting on public and private lands in the counties of Riverside, San Bernardino, Imperial, Inyo, Kern, Los Angeles, Mono, and San Diego (California Food and Agriculture Code, Sections 80001-80006, Division 23). A wide range of desert plants is protected under this act, including all species in the agave and cactus families. Harvest, transport, sale, or possession of specific native desert plants is prohibited without a valid permit or wood receipt and the required tags and seals. Species listed as rare, endangered, or threatened under federal or state law or regulations are excluded from this provision.

3.3 Federal, Regional, and Local Conservation Plans

There are no federal, state, or local parks or designated wildlife corridors or conservation areas on or adjacent to the subject property. Similarly, there are no USFWS-designated critical habitat or Habitat Conservation Plan and no CDFW Natural Community Conservation Plan at or adjacent to the project site.

3.3.1 Imperial County General Plan: Conservation and Open Space Element

The Imperial County General Plan contains the Conservation and Open Space Element (Imperial County 2016), which defines policies intended to conserve and protect the county's environmental resources, including biological resources, while encouraging economic development and growth. This Element lists the following four purposes:

- *Promote the protection, maintenance, and use the County's natural and cultural resources with particular emphasis on scarce resources and resources that require special control and management.*
- *Prevent the wasteful exploitation, destruction, and neglect of the State's natural and cultural resources.*
- *Recognize that natural resources must be maintained for their ecological value, as well as for the direct benefit to the public.*
- *Protect open space for the conservation of natural and cultural resources, the managed production of resources, outdoor recreation, and public health and safety.*

The Element defines goals specific to the conservation of biological resources:

> *Goal 1: Environmental resources shall be conserved for future generations by minimizing environmental impacts in all land use decisions and educating the public on their value.*
>
> > *Objective 1.1: Encourage uses and activities that are compatible with the fragile desert environment and foster conservation.*
> >
> > *Objective 1.2: Coordinate the acquisition, designation, and management of important natural and cultural resource areas in Imperial County with other governmental agencies as appropriate.*

Objective 1.3: Develop standards to protect significant natural and cultural resource areas for the purpose of enhancing both the planning and decision-making process.

Objective 1.4: Ensure the conservation and management of the County's natural and cultural resources.

Objective 1.5: Provide opportunities for enjoyment of a quality natural experience to present and future generations.

Objective 1.6: Promote the conservation of ecological sites and preservation of cultural resource sites through scientific investigation and public education.

Goal 2: The County will integrate programmatic strategies for the conservation of critical habitats to manage their integrity, function, productivity, and long-term viability.

Objective 2.1: Designate critical habitats for federally listed and state-listed species.

Objective 2.2: Develop management programs, including preservation of habitat for flat-tailed horned lizard, desert pupfish, and burrowing owl.

Objective 2.3: Support investigation of long-term climate change effects on biological resources.

Objective 2.4: Use the CEQA and NEPA process to identify, conserve, and restore sensitive vegetation and wildlife resources.

Objective 2.5: Give conservation of sensitive species and habitat a high priority in County park acquisition and development programs.

Objective 2.6: Attempt to identify, reduce, and eliminate all forms of pollution; including air, noise, soil, and water.

The county defines policies and programs to implement these goals and objectives:

***Policy:** Provide a framework for the conservation and enhancement of natural and created open space, which provides wildlife habitat values.*

- *Identify Resource Areas to conserve and enhance native vegetation and wildlife. These areas include agency-designated sensitive habitats with the USFWS, Bureau of Land Management Areas of Critical Environmental Concern, and CDFW. These designated lands are designed for the protection and perpetuation of rare, endangered, and threatened species and areas important for scientific study.*
- *Projects within or in the vicinity of a Resource Area should be designed to minimize adverse impacts on the biological resources it was created to protect.*
- *Accept donations of land which have high wildlife value. Where appropriate, Imperial County shall attempt to exchange donated lands of high wildlife value with other state, federal, or other resource agencies equipped to protect and manage such lands for other lands more appropriate to County needs.*
- *Develop an environmental mitigation program that protects and restores Salton Sea wildlife habitats as offsets to biological disturbances identified through the CEQA review process for development projects. The program would allow the County and/or Salton Sea Joint Powers Agreement (JPA) to restore habitat through financing mechanisms including land banks and/or direct financial contributions from the developers to mitigate their impacts.*

- *Conserve the native habitat of sensitive plants and animals through the dedication of open space easements, or other means that will ensure their long-term protection and survival. Such easements may preclude the erecting of any structures (temporary or permanent), vegetation removal, or any other activities. These dedicated open space easements would also serve to reduce potential indirect impacts to sensitive biological resources that may result from human activities associated with future developments.*
- *Areas designated for biological open space conservation shall include buffers, which provide important breeding and foraging habitats for native and migratory birds and animals. Such buffers shall serve to separate future development from adjacent native habitat areas to ensure the perpetual regeneration of these habitats.*
- *Protect riparian habitat and other types of wetlands from loss or modification by dedicating open space easements with adequate buffer zones, and by other means to avoid impacts from adjacent land uses. Road crossings or other disturbances of riparian habitat should be minimized and only allowed when alternatives have been considered and determined infeasible.*
- *Rock outcrops which serve as significant boulder habitat for sensitive biological resources should be considered within open space easements.*
- *Preserve existing California fan palms in natural settings and other individual specimen trees which contribute to the community character and provide wildlife habitat.*
- *Preserve and encourage the open space designation of wildlife corridors, which are essential to the long-term viability of wildlife populations.*
- *Integrate open space dedications in private developments with surrounding uses to maximize a functional open space/recreation and wildlife management system.*

4 METHODOLOGY

4.1 Literature Review

The literature review consisted of reviewing publicly available spatial data from a variety of public agencies, geospatial data warehouses, and previously written reports related to the project area and surrounding nine-quadrangle buffer area to ensure that current and accurate data were integrated into the review. The nine USGS 7.5' topographic quadrangles queried in this search were Alamorio; Holtville NE; Glamis NW; Holtville West; Holtville East (site location); Glamis SW; Calexico; Bonds Corner; and Midway Well NW.

Pertinent sources reviewed included, but were not limited to, the following:

- CDFW California Natural Diversity Database (CNDDB) RAREFIND 5
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants
- eBird online database of bird distribution and abundance
- USFWS Critical Habitat Mapper and File Data
- Google Earth aerial imagery

4.2 Field Surveys

A reconnaissance-level flora and fauna survey of the project site was completed by SWCA biologist Marshall Webb on December 1 and 2, 2020. Survey goals were to characterize the existing biological conditions, preliminarily assess the site's potential to support special-status plant and wildlife species and document the occurrence of such species. Existing biological conditions were noted, and comprehensive lists of identified plant and wildlife species were compiled (Appendices B and C).

This survey should be considered preliminary since late fall is not the optimal time of year for biological surveys. Multi-season, focused, and/or protocol surveys may be necessary in the correct season(s) to fully identify the project's flora and fauna.

4.2.1 Assessment of Special-Status Species Potential

Special-status species are plants and animals in one or more of the following categories:

- Species listed or proposed for listing as threatened or endangered under the federal ESA (50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [proposed species]).
- Species that are candidates for possible future listing as threatened or endangered under the ESA (67 Federal Register 40657, June 13, 2002).
- Species listed or proposed for listing by the State of California as threatened or endangered under the CESA (14 California Code of Regulations [CCR] 670.5).
- Species that meet the definitions of rare or endangered under the CEQA (State CEQA Guidelines Section 15380).
- Plants listed as rare under the California Native Plant Protection Act (California Department of Fish and Game Code Section 1900 et seq.).
- Plants considered by the CNPS to be "rare, threatened, or endangered in California" (Lists 1B and 2).
- Animals fully protected in California (California Fish and Game Code Sections 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).
- Animals listed on the California Special Animals List such as Species of Special Concern, Fully Protected, and for invertebrates, all species regardless of the reason for inclusion (CDFW November 2020).

5 FINDINGS

5.1 Vegetation

The majority of the project site, including the northern and northwestern portions, is under active cultivation. The southern areas are fallow agricultural lands, characterized by expanses of disturbed sandy soils with mostly non-native plants, such as Mediterranean grass and Saharan mustard (*Brassica tournefortii*). Typical native plant species encountered were creosote bush, white bursage (*Ambrosia dumosa*), burrobush (*Ambrosia* [*Hymenoclea*] *salsola*) and widely scattered California fan palm. Pockets of natural vegetation are scattered about the southern and western areas, with creosote bush and

white bursage scrub occurring in generally sparse relative cover. The generally sparse understory includes mostly non-native annual grasses such as Mediterranean grass and cheatgrass (*Bromus tectorum*).

Aquatic resources areas immediately adjacent to the project site support native and non-native plant communities, including Sandbar Willow (*Salix exigua*) Shrubland Alliance and Saltbush Scrub/Shadscale Scrub, the latter containing plants in the saltbush genus *Atriplex*. Other common native plants include arrowweed (*Pluchea* spp.), broadleaf cattail (*Typha latifolia*), fragrant flatsedge (*Cyperus odoratus*), and common red (*Phragmites australis*). Non-native and invasive saltcedar and Athel tamarisk (*Tamarix aphylla*) are common.

5.2 Wildlife

Few species of wildlife were observed or detected during the December 2020 field survey, due to a combination of the time of year and the lack of well-developed natural habitats on-site. The only reptile seen were a few side-blotched lizards (*Uta stansburiana*). Birds seen included mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferus*), and American coot (*Fulica americana*), along with fly-over sightings of red-tailed hawk (*Buteo jamaicensis*) and common raven (*Corvus corax*). One western burrowing owl (*Athene cunicularia*) was sighted; this species is discussed separately below. Appendix C provides a list of wildlife detected on the subject property.

Wildlife common to the Colorado Desert are expected to utilize areas of the subject property where suitable habitat occurs, such as areas with at least moderate vegetation and near aquatic resources. Reptiles (lizards and snakes) including western zebra-tailed lizard (*Callisaurus draconoides rhodostictus*) and sidewinder (*Crotalus cerastes*) and birds such as killdeer (*Charadrius vociferus*), mourning dove (*Zenaida macroura*), white-winged dove (*Zenaida asiatica*), Gambel's quail (*Callipepla gambelii*), and raptors such as red-tailed hawk are likely to occur on-site. Nesting habitat is limited to ground- and shrub-nesting birds, as tree habitat is not present except for in the widely scattered California fan palms. Mammals such as black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii,*) and coyote (*Canis latrans*) may also be present.

5.3 Wildlife Movement Corridors and Habitat Linkages

Wildlife corridors and habitat linkages are features that promote habitat connectivity. Wildlife corridors are typically discrete linear features within a landscape that are constrained by development or other non-habitat areas. Habitat linkages are networks of corridors through and between larger natural open space that facilitate movement of wildlife, thus providing long-term resilience of ecosystems against the detrimental effects of habitat fragmentation. Regional connection between high-quality open space habitats is critical to ongoing interchange of genetic material between populations, wildlife movement to escape natural disasters (fires, floods), colonization and expansion of populations, and plant propagation.

The project site currently provides unrestricted wildlife movement for animals of all sizes within the property.

6 SPECIAL-STATUS FLORA AND FAUNA

Appendix D lists the special-status plant and animal species previously reported as occurring on the Holtville East USGS quadrangle where the project lies and the eight quadrangles surrounding it: Alamorio; Holtville NE; Glamis NW; Holtville West; Glamis SW; Calexico; Bonds Corner; and Midway Well NW.

The relative occurrence potential shown on these tables is based on habitat suitability, current natural resource conditions of the project site, general knowledge of the project region, distance to known CNDDB and CNPS observation records, and the age of the records. Each occurrence potential rating is defined as follows:

- Present: Species has recently been documented on-site.
- High: Species has been documented on-site or adjacent to the project boundaries, habitat is suitable in the project area, and records are recent (within 20 years).
- Moderate: Project area is within known range of the species, habitat is suitable in the project area, and records are non-historic (within 40 years).
- Low: Project area is within known range of the species, habitat is marginal, records are distant, or known records are older (within 75 years).
- Unlikely: Project area is outside of known range of the species, records are distant, and/or there is no suitable habitat in the project area.
- Absent: Species has been extirpated; records are historic (greater than 75 years), no suitable habitat.

6.1 Special-Status Flora

Special-status flora include taxa listed as endangered or threatened under the federal ESA, the CESA, or both. This term "special-status" also includes plant species listed by the state as rare and those species listed by the CNPS with a Rare Plant Rank (RPR) of 1 or 2 on the most current CDFW "*Special Vascular Plants, Bryophytes, and Lichens List*" (CDFW, September 2020).

The literature search identified nine special-status plant species in the search area. Appendix D-1 lists the preliminary potential for occurrence for each special-status species within the project area. The occurrence potential is considered to be low to unlikely for all of these, based on habitat conditions within the project site.

No special-status plant species were identified during the December 2020 field survey; however, late fall is not the optimal season for floristic surveys.

6.2 Special-Status Fauna

Special-status fauna include species or subspecies listed as endangered, threatened, or candidate for listing as endangered or threatened under the federal ESA, the CESA, or both. All wildlife species designated by the CDFW as Fully Protected, Species of Special Concern, or Watch List species, as well as other wildlife included in the most current CDFW "Special Animals" list, are also included (CDFW 2020).

Fifteen special-status species of fauna were reported in the literature as occurring within the nine-quadrangle search area, with the subject property in the center. One special-status wildlife species was found on-site during the December 2020 survey, a western burrowing owl (non-nesting).

One mammal, the Yuma hispid cotton rat (*Sigmodon hispidus eremicus*), is considered to be unlikely to occur on the project site, and to have a moderate potential for occurrence near the project site (discussed in detail below). This finding is based solely on habitat conditions found during the December 2020 field survey, previous records, habitat conditions on and immediately adjacent to the project site.

6.2.1 Nesting Birds

The field survey occurred outside of the nesting season (February 1 to August 31) and no nesting bird activity was detected. However, there is potential nesting habitat within the shrubs and low vegetation in the southern third of the project site (outside areas of active agricultural land uses). Higher quality nesting habitat is present immediately adjacent to the site in the riparian habitats associated with aquatic features.

6.2.2 Birds

6.2.2.1 BURROWING OWL

Burrowing owl (*Athene cunicularia*), also called western burrowing owl, is a CDFW Special-Status Species that occupies open areas of the desert and high desert and is frequently encountered in Imperial County. This small owl occurs in a wide range of mostly open habitats in California, including grasslands, shrub-steppe, deserts, pastures, and agricultural areas.

One burrowing owl was observed at an active burrow in the southeastern portion of APN 050-070-018-000. The burrow consists of an old concrete agricultural standpipe. Burrowing owls are known to utilize a range of artificial and natural burrows. The individual owl found during this field survey is a wintering individual, possibly a transient. Although protected, the presence of this owl is not a fatal flaw to project development. Suitable habitat for burrowing owl includes short vegetation and, in the breeding season, the presence of small mammal burrows. The California range of this species extends from Redding south to San Diego, east through the Mojave Desert, and west to San Francisco and Monterey. The key characteristics of suitable habitat are moderately low and sparse vegetation, a prey base of small mammals during nesting, and burrows or similar sites for shelter. This species occurs at low densities throughout Imperial County, where it is present during both the breeding and non-breeding seasons, as recorded in the CNDDB.

6.2.3 Mammals

6.2.3.1 YUMA HISPID COTTON RAT

Yuma hispid cotton rat is a CDFW Special Status Species. Little is known about this subspecies of cotton rat (Bureau of Reclamation 2016). This small rodent occurs in wetlands and adjacent uplands where it requires dense herbaceous plants for cover and feeding. It feeds on plant material, seeds, and occasionally insects, and nests either above ground or underground in burrows.

The proposed development areas of the project site do not contain suitable habitat for this cotton rat. Suitable habitat appears to be present in some of the vegetated aquatic features immediately adjacent to the site.

7 POTENTIAL IMPACTS AND RECOMMENDATIONS

This section describes the anticipated direct and indirect impacts to biological resources that may result from implementation of the proposed project. This analysis was based on the results of the biological resources surveys conducted at the site, information from literature, and database resources.

Field surveys conducted in the appropriate season(s) will be necessary to verify the flora and fauna on the parcel and within the proposed development envelope and may yield different results.

7.1 Potential Impacts

Project implementation would result in the direct removal of habitat on-site. While the majority of the site is characterized as Disturbed/Ruderal and active agriculture with scattered areas of creosote and white bursage scrub, it could provide foraging habitat for birds and mammals, neither of which are anticipated to be directly impacted by project construction. Because of their mobility, these animals generally move out of harm's way and thus unlikely to be injured or killed during grading and construction.

Nesting birds could occur anywhere within or adjacent to the project site, and as such could be directly or indirectly impacted during project construction. Pre-construction nest surveys are recommended if work is scheduled during the breeding bird season, generally considered to be from 1 February to 31 August (discussed below in Section 7.2, Recommendations). If found, nests must be protected either by buffer areas or timing to avoid disturbance to active nests. Impacts during operations are not anticipated. There are specific survey requirements for burrowing owls, know to nest in the vicinity. These are described below in Section 7.2, Recommendations.

Indirect impacts to off-site biotic resources are possible during construction (noise, dust), which could temporarily alter the wildlife behavior. However, given that the northern two-thirds of the project site and areas to the west are already highly disturbed, it is likely that the impact to plants and wildlife would be minimal.

7.2 Recommendations

Implementation of the measures described below would reduce potential impacts to less than significant levels.

7.2.1 Nesting Bird Surveys

If activities associated with vegetation removal, construction, or grading are planned during the bird nesting/breeding season (generally February 1 through August 31; January 1 for raptors), a qualified biologist shall conduct surveys for active nests. Preconstruction nesting bird surveys should be conducted weekly beginning 14 days prior to initiation of ground-disturbing activities, with the last survey conducted no more than 3 days prior to the start of clearance/construction work. If ground-disturbing activities are delayed, additional preconstruction surveys should be conducted so that no more than 3 days have elapsed between the survey and ground-disturbing activities.

Active nests found within 100 feet of the construction zone shall be delineated with highly visible construction fencing or other exclusionary material that would inhibit entry by personnel or equipment into the buffer zone. Installation of the exclusionary material will be completed by construction personnel under the supervision of a qualified biologist prior to initiation of construction activities. The buffer zone shall remain intact and maintained while the nest is active (i.e., occupied or being constructed by at least one adult bird) and until young birds have fledged and no continued use of the nest is observed, as determined by a qualified biologist. The barrier shall be removed by construction personnel at the direction of the biologist.

7.2.2 Burrowing Owl Surveys

No more than 14 days prior to the commencement of initial ground-disturbing activities, the applicant shall implement focused pre-construction surveys for burrowing owls. Surveys shall be conducted prior to the initiation of ground disturbance and be conducted by a qualified biologist(s), approved by Imperial

County. Surveys for burrowing owls shall be conducted in conformance with the 2012 CDFW Staff Report on Burrowing Owl Mitigation. Surveys shall be completed within all areas proposed for ground disturbance and vegetation clearing/trimming and a 50-foot buffer surrounding such areas.

Non-breeding Season (September 1 – January 31):

Occupied Burrows: For burrowing owls present during the non-breeding season (generally September 1 through January 31), a 50-foot buffer zone shall be maintained around the occupied burrow(s).

Unoccupied Burrows: Once a burrow has been determined by a qualified wildlife biologist to be unoccupied by burrowing owls, the biologist shall excavate the burrow using hand tools. Sections of flexible plastic pipe or burlap bag shall be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow. One-way doors shall be installed at the entrance to the active burrow and other potentially active burrows within 100 feet of the active burrow and monitored for at least 48 hours after installation.

Breeding Season (February 1 – August 31):

The following avoidance measures shall be implemented for all burrows identified during surveys:

1. Occupied burrows shall not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist verifies through non-invasive methods that either the birds have not begun egg-laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Burrowing owls present on-site after February 1 shall be assumed to be nesting unless evidence indicates otherwise.
2. A 100-foot buffer shall be maintained between project activities and nesting burrowing owls. No activity or entry by personnel or equipment will be allowed within the buffer area.
    a. Physical (temporary fencing) and visual (hay bales or similar) barriers shall be installed to delineate the buffer zone. Installation of the exclusionary material will be completed by construction personnel under the supervision of a qualified biologist prior to initiation of construction activities.
    b. The buffer shall be maintained until August 31 or until the young owls are foraging independently or the nest is no longer active, based upon monitoring evidence.
3. If there is danger that owls will be injured or killed as a result of construction activity, the birds may be passively relocated but only during the non-breeding season; relocation shall require coordination with and approval from the CDFW prior to relocation activities. Relocation of owls during the non-breeding season will be performed by a qualified biologist in coordination with the CDFW.
4. Any damaged or collapsed active burrowing owl burrows will be replaced with artificial burrows in adjacent habitat at a 2:1 ratio.

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APPENDIX A

Site Photos

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Figure 1. Parcel 1 - fallow field in southern area (viewing north).

Figure 2. Parcel 1 - active agricultural land in northern area (viewing northeast).

Figure 3. Parcel 2 - creosote-dominated habitat.

Figure 4. East Highline Canal Lateral Eleven north/south extension, between parcels 1 (to east; photo right) and 2 & 3 (viewing north).

Figure 5. Parcel 2 – typical desert upland vegetation.	Figure 6. Parcel 3 - abandoned reservoir.

Figure 7. Parcel 1 - burrowing owl perched on concrete standpipe (viewing east).

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APPENDIX B

Flora

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Vikings Solar Energy Storage Project Site Flora
December 1-3, 2020

	Latin Name & Taxonomic Reference	Vernacular Name
FAMILY		
DICOTS - Flowering Plants		
Asteraceae	**Sunflower Family**	
	Ambrosia dumosa	white bursage
	Ambrosia [*Hymenoclea*] *salsola*	burrobush
	*Atriplex semibaccata**	Australian saltbush
	Baccharis sarothroides	desertbroom baccharis
	Baccharis sergiloides	desert baccharis
	Isocoma acradenia	alkali goldenbush
	*Lactuca serriola**	prickly lettuce
	Pluchea odorata	saltmarsh fleabane
	Pluchea sericea	arow weed
	Sonchus oleraceus	common sow thistle
Chenopodiaceae	**Goosefoot Family**	
	Atriplex canescens	four-wing saltbush
	Atriplex lentiformis	big saltbush
	*Salsola tragus**	Russian thistle, tumbleweed
	Suaeda nigra	bush seepweed
Euphorbiaceae	**Spurge Family**	
	Euphorbia polycarpa	smallseed sandmat
Plantaginacea	**Plantain Family**	
Plantago ovata	desert plantain	
Salicaceae	**Willow Family**	
	Salix exigua	Narrow-leaf willow
Solanaceae	**Nightshade Family**	
	Datura wrightii	Jimson weed
Tamaricaceae	**Tamarix Family**	
	*Tamarix aphylla**	athel tamarisk
	*Tamarix ramosissima**	saltcedar
Zygophyllaceae	**Caltrop Family**	
	Larrea tridentata	creosote bush
MONOCOTS - Grasses and Allies		
Arecaceae	**Palm Family**	
	*Phoenix sp.**	non-native palm
	Washingtonia filifera	California fan palm
Cyperaceae	**Sedge Family**	
	Cyperus odoratus	fragrant flatsedge
Poaceae	**Grass Family**	
	*Avena fatua**	common wild oats
	*Arundo donax**	giant reed
	*Bromus tectorum**	cheatgrass
	Hilaria rigida	big galleta
	Phragmites australis	common reed
	*Schismus barbatus**	Mediterranean grass
Typhaceae	**Cattail Family**	
	Typha latifolia	broadleaf cattail

* Non-Native Species

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APPENDIX C

Fauna

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Vertebrate Species Observed or Detected on the Vikings Solar Energy Storage Project Site
December 1-3, 2020

SCIENTIFIC NAME	COMMON NAME	NOTES
Reptiles		
Uta stansburiana	side-blotched lizard	
Birds		
Athene cunicularia	burrowing owl	SSC – burrowing sites & some overwintering sites
Buteo jamaicensis	red-tailed hawk	Fly-over
Callipepla gambelii	Gambel's quail	
Charadrius vociferus	killdeer	
Circus hudsonius	Northern harrier	Fly-over
Corvus corax	common raven	Fly-over
Falco sparverius	American kestrel	
Fulica americana	American coot	
Megaceryle alcyon	belted kingfisher	
Zenaida macroura	mourning dove	
Mammals		
Canis latrans	coyote	Scat
Canis lupus familiaris	domestic dog	Tracks; scat (non-native)

SSC: Species of Special Concern; refer to Appendix D, Special Status Species

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APPENDIX D

Special-Status Flora & Fauna

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Table D-1. Plant Species with Local* Records in the California Natural Diversity Database or California Native Plant Society Rare Plant Inventory and Preliminary Potential for Occurrence

Common Name ***Scientific Name***	**Status[1]**	**Habitat Description**	**Elevation Range; Life Form; Flowering Period**	**Most Recent Record Date**	**Occurrence Potential**
chaparral sand-verbena *Abronia villosa* var. *aurita*	CRPR 1B.1	Sandy areas in chaparral, coastal scrub, desert dunes; full sun. Requires barren ground; does not compete well with weedy species.	60–1570 m AH Jan–Sep	1912	**Unlikely.** Record is historic (>75 years).
Peirson's milk-vetch *Astragalus magdalenae var. peirsonii*	FT; SE; CRPR 1B.2	Slopes & hollows in mobile dunes with desert psammophytic scrub, usually alee of prevailing winds.	60-225 m PH Mar–May	2018	**Low.** Suitable dune habitat is not present.
gravel milk-vetch *Astragalus sabulonum*	CRPR 2B.2	Sandy/gravelly flats, washes & roadsides	60-885 m Jan–Aug AH	1902	**Unlikely.** Record is historic (>75 years).
Wiggin's croton *Croton wigginsii*	SR; CRPR 2B.2	Sand dunes & sandy arroyos with desert psammophytic scrub in Sonoran Desert Scrub.	0-155 m May–Jul S	2019	**Low.** Suitable dune habitat is not present.
Abrams' spurge *Euphorbia abramsiana*	CRPR 2B.2	Sandy sites in Mojavean desert Scrub; Sonoran Desert Scrub habitats.	45-1445 m AH Mar–Sep	1912	**Unlikely.** Record is historic (>75 years).
Algodones Dunes sunflower *Helianthus niveus ssp. tephrodes*	SE; CRPR 1B.2	Partially stabilized sand dunes with desert psammophytic scrub.	90-300 m PH Mar–Sept	2018	**Unlikely.** Suitable dune habitat is not present.
Darlington's blazing star *Mentzelia puberula*	CRPR 2B.2	Sandy crevices in cliffs or on rocky slopes in Mojave Desert Scrub, Sonoran Desert Scrub habitats.	70-1280 m PH Mar-May	1960	**Low.** Suitable habitat is not present.
giant Spanish-needle *Palafoxia arida var. gigantea*	CRPR 1B.3	Active & stabilized sand dunes with desert psammophytic scrub.	20-95 m A/PH Feb-May	2013	**Unlikely.** Suitable dune habitat is not present.
sand food *Pholisma sonorae*	CRPR 1B.2	Loose, deep sand dunes, usually on more stable, windward faces.	0-125 m PH (parasite) Apr–Jun	2018	**Unlikely.** Suitable dune habitat is not present.

*Nine-quad search area included: Alamorio; Holtville NE; Glamis NW; Holtville West; Holtville East (site location); Glamis SW; Calexico; Bonds Corner; and Midway Well NW.

[1]Status:

E =: Endangered	CNPS	Rare Plant Rank	AH	Annual Herb
T =: Threatened	1A	Plants presumed extirpated in California and either rare or extinct elsewhere	AG	Annual Grass
PE =: Proposed Endangered	1B	Plants rare, threatened, or endangered in California and elsewhere	PG	Perennial Grass
PT =: Proposed Threatened	2A	Plants presumed extirpated in California, but more common elsewhere	PH	Perennial Herb
C =: Candidate	2B	Plants rare, threatened, or endangered in California but more common elsewhere	PC	Perennial Cactus
R = Rare		Threat Rank	S	Shrub
	0.1	Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)	Ss	Subshrub
	0.2	Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)	T	Tree
	0.3	Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)		

Table D-2. Wildlife Species with Local* Records in the California Natural Diversity Database and Preliminary Potential for Occurrence

Common Name Scientific Name	Status[1]	Habitat Description	Most Recent Record Date	Occurrence Potential
AMPHIBIANS & REPTILES				
Sonoran Desert toad *Incilius alvarius*	SSC	Found near washes, canals, irrigation ditches, stock ponds, river bottoms, streams, springs; also occurs away from aquatic habitats. Breeds in temporary pools and irrigation ditches.	1912	**Unlikely.** Records (2) are historic (>75 years); however, suitable habitat is present on-site in the two reservoirs, the East Highline Canal, and the East Highline Lateral Eleven.
Sonoran mud turtle *Kinosternon sonoriense*	SSC	Permanent slackwater habitats along intermittent or perennial streams with abundant submergent vegetation & benthic invertebrates.	1941	**Absent.** Record is historic (>75 years); extirpated.
flat-tailed horned lizard *Phrynosoma mcallii*	SSC	Restricted to desert washes & desert flats. Critical habitat element is fine sand into which lizards burrow to avoid temperature extremes. Requires vegetative cover and native harvester ants occur (primary prey).	2017	**Absent.** No suitable habitat is present on the subject property; and native ants were not seen.
Colorado Desert fringe-toed lizard *Uma notata*	SSC	Sand dunes, dry lake beds, sandy beaches/riverbanks, desert washes, sparse desert scrub. Requires fine, loose, windblown sand for burrowing; shrubs or annuals for prey (arthropod) production.	2018	**Unlikely.** No suitable habitat is present on the subject property; and native ants were not seen.
BIRDS				
burrowing owl *Athene cunicularia*	SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	2020	**Present**. One adult was observed during the December 2020 field survey. Suitable habitat is present and they are known to occur in the immediate vicinity.
ferruginous hawk *Buteo regalis*	WL (wintering)	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice.	CNDDB -2003; eBird 2/2014	**Unlikely.** May forage over the site but abundant prey is required for this large raptor, which does not appear to be present on-site.
mountain plover *Charadrius montanus*	SSC	Short grasslands, freshly plowed fields, newly sprouting grain fields; sometimes sod farms. Short vegetation, bare ground, & flat topography; prefers grazed areas & area with burrowing rodents.	2011	**Unlikely.** Record is from the American Canal, about 17 miles NW of project site; suitable habitat is not present.
California black rail *Laterallus jamaicensis coturniculus*	ST; FP	Freshwater marshes, wet meadows shallow margins of saltwater marshes bordering larger bays. Requires water depth of about 1 inch that does not fluctuate during the year and dense vegetation for nesting habitat.	2008	**Unlikely.** Record is from the American Canal, about 6.75 miles south of project site; suitable habitat is not present.
Yuma Ridgway's rail *Rallus obsoletus yumaensis*	FE; ST; FP	Nests in freshwater marshes along Colorado River and south and east ends of Salton Sea. Prefers cattails and tules dissected by narrow channels of flowing water. Primary food is crayfish.	2008	**Unlikely.** Record is from the American Canal, about 7 miles south of project site; suitable habitat is not present.

Common Name **Scientific Name**	**Status**[1]	**Habitat Description**	**Most Recent Record Date**	**Occurrence Potential**
yellow warbler *Setophaga petechia*	SSC	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	1921	**Absent.** Record is historic (>75 years); suitable habitat is not present.
MAMMALS				
western mastiff bat *Eumops perotis californicus*	SSC	Utilizes many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral, etc. Roosts in crevices in cliff faces, high buildings, trees, and tunnels.	1996	**Unlikely.** Suitable habitat is not present.
western yellow bat *Lasiurus xanthinus*	SSC	Valley foothill riparian, desert riparian, desert wash, & palm oasis habitats. Roosts in trees, particularly palms; forages over water and among trees.	1993	**Unlikely.** Suitable habitat is not present.
pocketed free-tailed bat *Nyctinomops femorosaccus*	SSC	Variety of arid areas in Southern California; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian, etc. Rocky areas with high cliffs.	1995	**Unlikely.** Suitable habitat is not present.
Yuma hispid cotton rat *Sigmodon hispidus eremicus*	SSC	Along Colorado River & in grass, agricultural areas near irrigation waters. Wetlands & uplands with dense grass & herbaceous plants. Makes runways through vegetation; nests on surface and in burrows. Two adult males found in 2007 in tamarisk scrub adjacent to an irrigation canal, about 0.55 mile NW of project site in similar habitat; 2009 record about 4.7 miles NNW of site.	2009	**Unlikely (on-site). Moderate off-site.** No suitable habitat is present on the project site. Suitable habitat appears to be present in the aquatic resource areas immediately adjacent to the site.
American badger *Taxidea taxus*	SSC	Drier open stages of most shrub, forest & herbaceous habitats with friable soils. Need sufficient food, friable soils & open, uncultivated ground. Preys on burrowing rodents; digs burrows.	1922	**Absent.** Record is historic (>75 years); suitable habitat is not present.

*Nine-quad search area included: Alamorio; Holtville NE; Glamis NW; Holtville West; Holtville East (site location); Glamis SW; Calexico; Bonds Corner; and Midway Well NW.

[1]Status Key

Federal (USFWS) Status
- FE: Federally Endangered
- FT: Federally Threatened

State (CDFW) Status
- SE: State Endangered
- ST: State Threatened
- SC: State Candidate
- FP: Fully Protected
- SSC: Species of Special Concern
- WL: Watch List

G-2 Aquatic Resources Delineation Report

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AQUATIC RESOURCES DELINEATION REPORT

VIKINGS SOLAR ENERGY STORAGE PROJECT

IMPERIAL COUNTY, CALIFORNIA

JANUARY 2022

PREPARED FOR

Vikings Energy Farm, LLC

PREPARED BY

SWCA Environmental Consultants

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AQUATIC RESOURCES DELINEATION REPORT FOR THE VIKINGS SOLAR ENERGY STORAGE PROJECT, IMPERIAL COUNTY, CALIFORNIA

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SWCA Project No. 64085

January 2022

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1 INTRODUCTION

This aquatic resources delineation report was prepared by SWCA Environmental Consultants (SWCA) for Vikings Energy Farm, LLC, for the Vikings Solar Energy Storage Project (Project). The Project site is located approximately 5.5 miles east of the city of Holtville on assessor's parcel numbers (APNs) 050-070-018-000 (approximately 480.00 acres), 050-070-019-000 (approximately 80.00 acres), and 050-070-021-000 (approximately 43.61 acres) in Imperial County, California. The approximate center of the Project site is located at coordinates 32.803209°N, 115.271484°W within Section 36, Township 15 South, Range 16 East, on the U.S. Geological Survey (USGS) Holtville East, California, 7.5-minute quadrangle (Appendix A, Figures A-1 and A-2).

1.1 Project Description

Vikings Energy Farm, LLC, proposes to develop a nominal 150-megawatt (MW) alternating current solar photovoltaic energy generation project with an integrated 300-MW battery storage facility. Construction activities would primarily involve demolition and grubbing, grading to establish access roads and pads for electrical equipment (inverters and step-up transformers), trenching for underground electrical collection lines, and the installation of solar equipment and security fencing.

1.2 Environmental Setting

Current land use of APN 050-070-018-000 consists of actively farmed agricultural land in the northern and northwestern portions of the parcel, and fallow fields along the southern and eastern edges. Two separate irrigation ponds are located along the western parcel boundary (Irrigation Ponds 03 and 04) (Figures A-3 and A-4). Most of APN 050-070-019-000 is undeveloped and not previously farmed, with vegetation dominated by upland desert species with the exception of riparian-dominated areas near the western canals. APN 050-070-021-000 is also primarily undeveloped and unfarmed with predominantly upland desert vegetation and riparian vegetation surrounding two small agricultural ponds along the southwestern parcel boundary. The upland vegetation cover type is the same as that found on APN 050-070-019-000.

The National Wetlands Inventory shows several mapped features on the Project site , including two freshwater ponds on APN 050-070-018, two freshwater emergent wetlands and one riverine feature on APN 050-070-021, and one freshwater forested/shrub wetland on the southeast corner of APN 050-070-019 (U.S. Fish and Wildlife Service [USFWS] 2021a).

2 Regulatory Overview

Activities within inland streams, wetlands, and riparian areas in California are regulated by agencies at the federal, state, and regional levels. At the federal level, the U.S. Army Corps of Engineers (USACE) Regulatory Program regulates activities within wetlands and waters of the U.S. pursuant to Section 404 of the federal Clean Water Act (CWA). At the state level, the CDFW regulates activities within the bed, bank, and associated habitat of a stream under the Fish and Game Code §§ 1600–1616. At the regional level, the California Regional Water Quality Control Board regulates discharge into waters of the U.S. under Section 401 of the federal CWA and waters of the State under the California Porter-Cologne Water Quality Act.

2.1 Clean Water Act – Section 404

Under provisions of the CWA, the USACE administers the day-to-day activities required by Section 404. These include the individual permit decisions, jurisdictional determinations, developing policy and guidance, and enforcing provisions of Section 404. Waters of the U.S. are defined in section 33 Code of Federal Regulations (CFR) 328.3, implementing the CWA, as follows:

328.3 - Definitions.

For the purpose of this regulation these terms are defined as follows:

(a) The term waters of the United States means:

(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(2) All interstate waters including interstate wetlands;

(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

(i) which are or could be used by interstate or foreign travelers for recreational or other purposes; or

(ii) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(iii) which are used or could be used for industrial purpose by industries in interstate commerce.

(4) All impoundments of waters otherwise defined as waters of the United States under the definition;

(5) Tributaries of waters identified in paragraphs (a) (1) through (4) of this section;

(6) The territorial seas;

(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1) through (6) of this section.

(8) Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with U.S. Environmental Protection Agency (EPA).

2.1.1 Supreme Court Decisions

2.1.1.1 SOLID WASTE AGENCY OF NORTH COOK COUNTY

On January 9, 2001, the Supreme Court of the United States issued a decision on *Solid Waste Agency of Northern Cook County* v. *United States Army Corps of Engineers* (*SWANCC*), et al. with respect to whether the USACE could assert jurisdiction over isolated waters. The *SWANCC* ruling stated that the USACE does not have jurisdiction over "non-navigable, isolated, intrastate" waters.

2.1.1.2 RAPANOS/CARABELL

In 2006, the Supreme Court addressed the jurisdictional scope of Section 404 of the CWA, specifically the term "the waters of the U.S.," in their consolidated decision in *Rapanos* v. *United States* and in *Carabell* v. *United States* (hereafter referred to as *Rapanos*), the purpose of which was to provide guidance on determining what constitutes "waters of the U.S."

The following is taken from the Jurisdictional Determination Form Instructional Guidebook publish in 2007:

> The Rapanos decision provides two new analytical standards for determining whether water bodies that are not traditional navigable waters (TNWs), including wetlands adjacent to those non-TNWs, are subject to CWA jurisdiction:
>
> if the water body is relatively permanent, or if the water body is a wetland that directly abuts (e.g., the wetland is not separated from the tributary by uplands, a berm, dike, or similar feature) a relatively permanent water body (RPW), or
>
> if a water body, in combination with all wetlands adjacent to that water body, has a significant nexus with TNWs.

CWA jurisdiction over TNWs and their adjacent wetlands was not in question in *Rapanos*, and, therefore, was not affected by the *Rapanos* decision. In addition, at least five of the justices in *Rapanos* agreed that CWA jurisdiction exists over all TNWs and over all wetlands adjacent to TNWs. As a consequence of the U.S. Supreme Court decision in *Rapanos*, the EPA and the USACE in coordination with the Office of Management and Budget and the President's Council on Environmental Quality, developed the *Memorandum Regarding CWA Jurisdiction Following Rapanos v. United States* (USEPA 2008). This guidance requires the application of the two new standards described above, as well as a greater level of documentation, to support an agency jurisdictional determination for a particular water body. Furthermore, this guidance required the USACE and EPA to develop a revised jurisdictional delineation form to be used by field staff for documenting assertion or declination of CWA jurisdiction.

The memo states that the agencies will assert jurisdiction over the following categories of water bodies:

- TNWs;
- all wetlands adjacent to TNWs;
- non-navigable tributaries of TNWs that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally); and
- wetlands that directly abut such tributaries.

In addition, the agencies will assert jurisdiction over every water body that is not an RPW if that water body is determined (on the basis of a fact-specific analysis) to have a significant nexus with a TNW. The classes of water body that are subject to CWA jurisdiction only if such a significant nexus is demonstrated are:

- non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally;
- wetlands adjacent to such tributaries; and
- wetlands adjacent to but that do not directly abut a relatively permanent, non-navigable tributary.

A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, and/or biological integrity of a TNW. Principal considerations when evaluating a significant nexus include the volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a TNW, plus the hydrologic, ecologic, and other functions performed by the tributary and all of its adjacent wetlands.

2.1.1.3 DEFINING THE SCOPE OF WATERS PROTECTED UNDER THE CLEAN WATER ACT

On April 21, 2020, the EPA and the USACE published (85 Fed. Reg. 77 [21 April 2020]) a rule (Navigable Waters Protection Rule) to finalize a revised definition of "waters of the United States" under the CWA. The agencies have clarified the definition so that it includes four categories of jurisdictional waters and provides exclusions for many water features that traditionally have not been regulated and defines terms in the regulatory text that have never been defined before. The Navigable Waters Protection Rule regulates the nation's navigable waters and the core tributary systems that provide perennial or intermittent flow into them.

The Navigable Waters Protection Rule is the second step in a two-step process to review and revise the definition of "waters of the United States" consistent with the February 2017 Presidential Executive Order entitled "Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the 'Waters of the United States.'" This final rule became effective on June 22, 2020. On June 19, 2020, the District Court for the District of Colorado stayed the effective date of the Rule only in the State of Colorado. The rule is being implemented by EPA and USACE in all other states and jurisdictions.

Under the final Navigable Waters Protection Rule, four clear categories of waters are federally regulated:

- The territorial seas and traditional navigable waters,
- Perennial and intermittent tributaries to those waters,
- Certain lakes, ponds, and impoundments, and
- Wetlands adjacent to jurisdictional waters.

The final rule also details 12 categories of exclusions (i.e., features that are not "waters of the United States"), such as features that only contain water in direct response to rainfall (e.g., ephemeral features), groundwater, many ditches, prior converted cropland, and waste treatment systems.

2.2 Clean Water Act Section 401 and the California Porter-Cologne Water Quality Act

The California State Water Resources Control Board (SWRCB) and its Regional Water Quality Control Boards (RWQCBs) regulate discharge of waste in any region that could affect the waters of the State under the California Porter-Cologne Water Quality Act, or waters of the U.S. under Section 401 of the federal CWA. Under the Porter-Cologne Act, a Report of Waste Discharge must be submitted prior to discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the State (California Water Code § 13260). Waste Discharge Requirements (WDRs) or a waiver of WDRs will then be issued by the RWQCB. Waters of the State are defined as "Any surface water or groundwater, including saline waters that are within the boundaries of the state" (California Water Code § 13050). This differs from the CWA definition of waters of the U.S. by its inclusion of groundwater and waters outside the ordinary high water mark in its jurisdiction.

Although all waters of the U.S. also fall under the category of waters of the State, some waters of the State may be identified beyond the delineation of waters of the U.S., and the RWQCB may exert authority to regulate waste discharge into these waters even if the waters do not fall under USACE federal jurisdiction. All projects that have a federal component and may affect waters of the U.S., including those that require a Section 404 Permit from the USACE, must also comply with Section 401 of the CWA. If

discharge into waters of the U.S. is proposed, a 401 Water Quality Certification from the RWQCB is required (23 California Code of Regulations (CCR) §§ 3830–3869) in addition to obtaining WDRs for impacts to waters of the State.

The federal CWA prohibits certain discharges of stormwater containing pollutants except in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit (33 United States Code [USC] §§ 1311 and 1342[p]; also referred to as CWA §§ 301 and 402[p]). The EPA promulgates federal regulations to implement the CWA's mandate to control pollutants in stormwater runoff discharges (40 CFR Parts 122, 123, and 124). The federal statutes and regulations require discharges to surface waters composed of stormwater associated with construction activity, including demolition, clearing, grading, and excavation, and other land disturbance activities (except operations that result in disturbance of less than one acre of total land area and that are not part of a larger common plan of development or sale), to obtain coverage under an NPDES Permit. The NPDES Permit must require implementation of best available technology economically achievable and best conventional pollutant control technology to reduce or eliminate pollutants in stormwater runoff. The NPDES Permit must also include additional requirements necessary to implement applicable water quality standards.

SWRCB may extend authority throughout the state to regulate waters with beneficial use as defined by SWRCB (California Water Code § 6659). RWQCB may have variations of these definitions that apply to specified RWQCBs throughout the state of California. Beneficial use definitions vary and may include waters that support habitat necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered (RARE).

2.3 California Fish and Game Code Sections 1600-1616: Streambeds, Banks and Riparian Habitats

The CDFW asserts jurisdiction over the bed and bank of a stream and associated wildlife and habitats as established in California Fish and Game Code (FGC) Sections 1600–1616. In accordance with Section 1602 of the FGC (Streambed Alteration), the CDFW regulates activities that will "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake" and requires notification prior to such activities. In addition, Section 1603 of the FGC states that "after the notification is complete, the department shall determine whether the activity may substantially adversely affect an existing fish and wildlife resource," and a Lake and Streambed Alteration Agreement may be pursued. These regulations were established to protect the wildlife resources that are associated with the riparian habitats that occur within and adjacent to ephemeral or year-round drainage systems. The CDFW jurisdiction area is often defined in practice as the top of bank of the stream or to the limit (outer dripline) of the adjacent riparian vegetation.

3 JURISDICTIONAL DELINEATION

3.1 Methods

A jurisdictional delineation was conducted by SWCA to determine the presence/absence and potential limits of jurisdictional resources. Prior to the field efforts, a literature review was conducted to determine the potential type of jurisdictional resources within the Project site.

3.1.1 Literature and Data Review

Relevant literature and materials were reviewed to preliminarily identify areas that may fall under agency jurisdiction. The following resources were reviewed or used prior to the field surveys:

- *Wetlands Delineation Manual* (U.S. Army Corps of Engineers [USACE] 1987)
- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (USACE 2008)
- National Wetlands Inventory Wetland Geodatabase (USFWS 2021a)
- The National Wetland Plant List: 2016 Wetland Ratings (Lichvar et al. 2016)
- California Soil Resource Lab's Soil Web Google Earth interface (Natural Resources Conservation Service [NRCS] 2021)
- National Hydrography Dataset (USGS 2021)

3.1.2 Jurisdictional Delineation

SWCA wetland delineator, Malek Al-Marayati, and SWCA biologist, Marshall Webb, conducted the jurisdictional delineation survey on December 1 through 3, 2020, to determine potential jurisdictional resources under Section 404/401 of the Clean Water Act, Section 1600-1616 of the California Fish and Game Code, and the Porter-Cologne Water Quality Control Act. Current USACE delineation procedures and guidance were used to identify and delineate any wetlands or waters of the U.S. (WoUS) or both that may be subject to USACE and Regional Water Quality Control Board (RWQCB) jurisdiction (Lichvar et al. 2016; USACE 1987, 2008). Likewise, current California Department of Fish and Wildlife (CDFW) procedures and guidance were used to identify and delineate any streambeds, rivers, or associated riparian habitat potentially subject to CDFW jurisdiction (California Fish and Game Code 2019).

4 RESULTS

Eight wetland sampling points (WSP) were examined in support of this jurisdictional delineation, illustrated on Figures A-4 and A-5a–A-5c:

- WSP01 was examined at the western edge of the Project site in an area dominated by hydrophytic vegetation. Wetland hydrology and a dominance of hydrophytic vegetation were observed at WSP01; however, hydric soils were not observed. Therefore, WSP01 was determined to be upland.
- WSP02 was examined in a ditch where ponding was observed. All three wetland parameters were met at WSP02, including the presence of hydrogen sulfide. WSP02 was determined to be within wetland waters of the U.S. (wWoUS).
- WSP03 was paired with WSP02 adjacent to the ditch on a dirt road. Based on the lack of hydrophytic vegetation at this location, WSP03 was determined to be upland.
- WSP04 was examined at the northwestern edge of the Project site in an area dominated by hydrophytic vegetation; however, wetland hydrology and hydric soils were not observed. Therefore, WSP04 was determined to be upland.
- WSP05 was examined in a depressional area where hydrophytic vegetation was observed. Wetland hydrology was present, although a dominance of hydrophytic vegetation and hydric soils was not observed. Therefore, WSP05 was determined to be upland.

- WSP06 was examined adjacent to an irrigation pond where hydrophytic vegetation was present. WSP06 demonstrated a dominance of hydrophytic vegetation and wetland hydrology, but hydric soils were not observed. Therefore, WSP06 was determined to be upland.
- WSP07 was examined within a ditch at the southwestern edge of the Project site. All three wetland parameters were met at WSP07, including the presence of hydrogen sulfide. WSP07 was determined to be within wWoUS.
- WSP08 was examined outside of the ditch near WSP07. Due to the lack of dominant hydrophytic vegetation at this location, WSP08 was determined to be upland.

Representative photographs of the Project site are presented in Appendix B, Site Photographs. Datasheets, including three Wetland Determination Data Forms, are presented in Appendix C, Datasheets.

The results of this jurisdictional delineation are based on the best professional judgement of the qualified delineators; however, all conclusions regarding potential jurisdiction in this report should be considered preliminary and at the final discretion of the regulatory agencies.

The Project site is not located within USFWS-designated critical habitat (USFWS 2021b).

4.1 Topography and Hydrology

All aquatic resources on the Project site receive flow from the East Highline Canal. Hydrology on the Project site is manipulated via a system of manufactured canals and irrigation ponds used for irrigation of adjacent croplands. Flow from the East Highline Canal is conveyed northward and pumped into several lateral canals that direct flow throughout the Project site. East Highline Lateral Eleven captures flow from the East Highline Canal at the south end of the Project site and conveys it westward for approximately 800 feet, at which point flow is conveyed northward via a concrete-lined V-ditch for approximately 0.75 mile. The V-ditch connects to two active irrigation ponds (Irrigation Ponds 03 and 04; see Figures A-3 and A-4) via underground culverts and terminates at the northern portion of the site where flow is collected from the V-ditch by an irrigation system along the edges of croplands. Additionally, two abandoned irrigation ponds (Irrigation Ponds 01 and 02) are situated north of the East Highline Lateral Eleven at the southwestern end of the site. Hydrologic connectivity between the East Highland Canal and irrigation ponds 01 and 02 was not evident; however, the robust riparian vegetation and surface waters within irrigation ponds 01 and 02 suggest hydrologic connectivity, likely via obscured culverts, between ponds 01 and 02 and the East Highland Canal. Consequently, it is anticipated that irrigation ponds 01 and 02 are wWoUS. Another concrete-lined V-ditch (East Highline Lateral Twelve) pumps water from the East Highline Canal at the western edge of the site and conveys the flow westward. A vegetated ditch (Holtville Main Drain) is situated north of East Highline Lateral Twelve and was determined to be wWoUS. The Project site is within the Salton Sea Hydrologic Unit Code watershed (HUC12 181002040405) (USGS 2021).

4.2 Vegetation

Native vegetation cover types are not present in most of the actively used agricultural fields; however, creosote bush (*Larrea tridentata*) [UPL] is present as the predominant species in fallow agricultural fields. Upland vegetation in the Project site includes creosote bush, alkali goldenbush (*Isocoma acradenia*) [FACU], common Mediterranean grass (*Schismus barbatus*) [UPL], and sparsely scattered California fan palm (*Washingtonia filifera*) [FAC]. Riparian vegetation within and along the margins of drainages consists of broadleaf cattail (*Typha latifolia*) [OBL], arrowweed (*Pluchea sericea*) [FACW], giant reed (*Arundo donax*) [FACW], and salt cedar (*Tamarix* sp.) [FAC].

Wetland plant indicator codes were determined using *The National Wetland Plant List: 2016 Wetland Ratings* (Lichvar et al. 2016).[1]

4.3 Soils

Soils in the Project site are within the Imperial County, California, Imperial Valley Area (CA683) and include the following mapped soil types (NRCS 2021):

- Carsitas gravelly sand, 0 to 5 percent slopes
- Glenbar complex
- Meloland very fine sandy loam, wet
- Meloland and Holtville loams, wet
- Niland gravelly sand, wet
- Pits
- Rositas sand, 0 to 2 percent slopes
- Rositas fine sand, 0 to 2 percent slopes
- Rositas fine sand, 2 to 9 percent slopes
- Rositas fine sand, wet, 0 to 2 percent slopes
- Superstition loamy fine sand
- Torriorthents and Orthids, 5 to 30 percent slopes
- Vint loamy very fine sand, wet

Sediment textures observed in undeveloped portions of the Project site include silty clay, sandy loam, sandy clay loam, and loamy sand. The substrates of water features on the site include manufactured materials such as concrete and geotextile matting.

4.3.1 U.S. Army Corps of Engineers Non-Wetland Waters of the U.S.

The East Highline Canal has significant nexus to the Salton Sea—a traditionally navigable water—and was, therefore, determined to be non-wetland waters of the U.S. (WoUS). The Project site contains 8.453 acres (5,350 linear feet) of non-wetland WoUS (Table 1; Figure A-5a).

4.3.2 U.S. Army Corps of Engineers Wetland Waters of the U.S.

Irrigation Ponds 01 and 02, as well as the Holtville Main Ditch, were determined to be wetland waters and are adjacent to the East Highline Canal. Therefore, these features were determined to be wWoUS. Additionally, the southwestern-most portion of the East Highline Lateral Eleven was assumed to be wetland and is also adjacent to the East Highline Canal. Therefore, these features were determined to be wWoUS. The Project site contains 2.872 acres (2,420 linear feet) of wWoUS (see Table 1; Figures A-5a and 5-4c).

[1] Indicator codes are defined as follows: UPL = upland; Found 99% of the time in uplands, FACU = facultative upland, FAC = facultative; Found 36-66% of the time in wetlands., FACW = facultative wetland; Found 67-99% of the time in wetlands., and OBL = obligate; Found 99% of the time in wetlands. Plant species with no indicator status were assumed upland (UPL).

4.3.3 Regional Water Quality Control Board Non-Wetland Waters of the State

Both East Highline Lateral Eleven and East Highline Lateral Twelve are concrete lined and receive flow from the East Highline Canal; however, these features terminate into irrigation systems for nearby croplands and were, therefore, determined to be non-wetland Waters of the State (WoS). The Project site cumulatively contains 0.660 acre (4,440 linear feet) of non-wetland WoS (see Table 1; Figures A-5a–A-5c).

4.3.4 California Department of Fish and Wildlife Jurisdiction

The Project site includes CDFW jurisdictional streambeds that include the USACE and RWQCB jurisdiction described above with additional areas where the limits of riparian vegetation extend beyond the ordinary high-water mark. East Highline Lateral Eleven supports riparian vegetation that extends westward beyond the limits of RWQCB jurisdictional resources at two distinct locations. East Highline Eleven supports a stand of CDFW jurisdictional riparian vegetation (approximately 0.28 acre) comprised primarily of tamarix and arroweed at approximate coordinates 32.802736°, -115.276445°, immediately south of the East Highline Lateral Eleven and East Nelson Pit Road intersection. East Highline Lateral Eleven supports a stand of riparian vegetation which parallels the V-ditch for approximately 1,200 linear feet (0.87 acre) from 32.803671°, -115.276398° on the south end to 32.806957°, -115.276281° on the north end. Additionally, irrigation ponds 03 and 04 support CDFW jurisdictional resources. The Project site contains 6.508 acres (3,020 linear feet) of CDFW jurisdictional streambed.

Table 1. Mapped Jurisdiction within the Project site

Feature ID	Wetland Waters of the U.S. (wWoUS)		Non-wetland Waters of the U.S. (WoUS)		Non-wetland Waters of the State (WoS)		CDFW Jurisdictional Streambed	
	Acres	Linear Feet	Acres	Linear Feet	Acres	Linear Feet	Acres	Linear Feet
East Highline Canal	0	0	8.453	5,350	0	0	0	0
Holtville Main Drain	0.884	840	0	0	0	0	0	0
East Highline Lateral Eleven	0.355	480	0	0	0.611	4,210	1.147	1,480
East Highline Lateral Twelve	0	0	0	0	0.049	230	0	0
Irrigation Pond 01	0.856	570	0	0	0	0	0	0
Irrigation Pond 02	0.777	530	0	0	0	0	0	0
Irrigation Pond 03	0	0	0	0	0	0	0.836	440
Irrigation Pond 04	0	0	0	0	0	0	4.525	1,100
Total	**2.872**	**2,420**	**8.453**	**5,350**	**0.660**	**4,440**	**6.508**	**3,020**

5 IMPACT ASSESSMENT

The Project layout has been designed to avoid all drainages, wetlands, and riparian habitats in the immediate vicinity (see Figure A-6). Therefore, there would be no direct impacts to jurisdictional waters or riparian habitats as a result of the implementation of the Project. Indirect impacts to drainages may result from erosion and stormwater flows from the Project site into drainages below the Project elevation.

However, the Project proponent will be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) which will include best management practices (BMPs) to avoid and/or control site runoff, sedimentation and erosion. These measures should be sufficient to prevent impacts to aquatic resources.

Potential impacts to biological resources associated with riparian habitats and proposed mitigation measures are discussed further in the Biological Resources Assessment.

6 RECOMMENDATIONS

It is anticipated that project activities may proceed without permits from the USACE, RWQCB, or CDFW provided the project layout incorporates avoidance of permanent and temporary impacts to aquatic resources. The following avoidance BMPs are recommended to avoid impacts to potential USACE/RWQCB/CDFW jurisdictional resources.

6.1 Avoidance Measures (BMPs)

Avoid Drainages: All debris (i.e., spoils), vehicles and equipment, and construction materials must be kept from entering drainage features.

Materials Management: Storage of equipment or stockpiling of fuels, lubricants, cement, or other materials is not authorized inside washes, wetlands, waterways, or any other drainage features.

Spill Release/Prevention: Vehicles/equipment must be inspected for leaks (e.g., fuel, oil, hydraulic fluids, etc.) and repaired prior to work. Storing, fueling, and maintenance should not occur near a drainage, wetland, or other water feature. Spill kits/absorbent clean-up materials shall be available on-site and if used, disposed of properly.

Erosion Control BMPs: Crews will utilize soil erosion control BMPs as needed in order to reduce/control sedimentation/erosion potential.

Flagging: Prior to construction, aquatic resources within the Project parcels will be delineated with brightly colored fencing or other methods to ensure impacts do not exceed the limits of the proposed scope.

The findings and conclusions presented in this report, including the location and extent of areas subject to regulatory jurisdiction, represent the professional opinion of SWCA. These findings and conclusions should be considered preliminary and at the final discretion of the applicable resource agency.

7 LITERATURE CITED

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APPENDIX A

Figures

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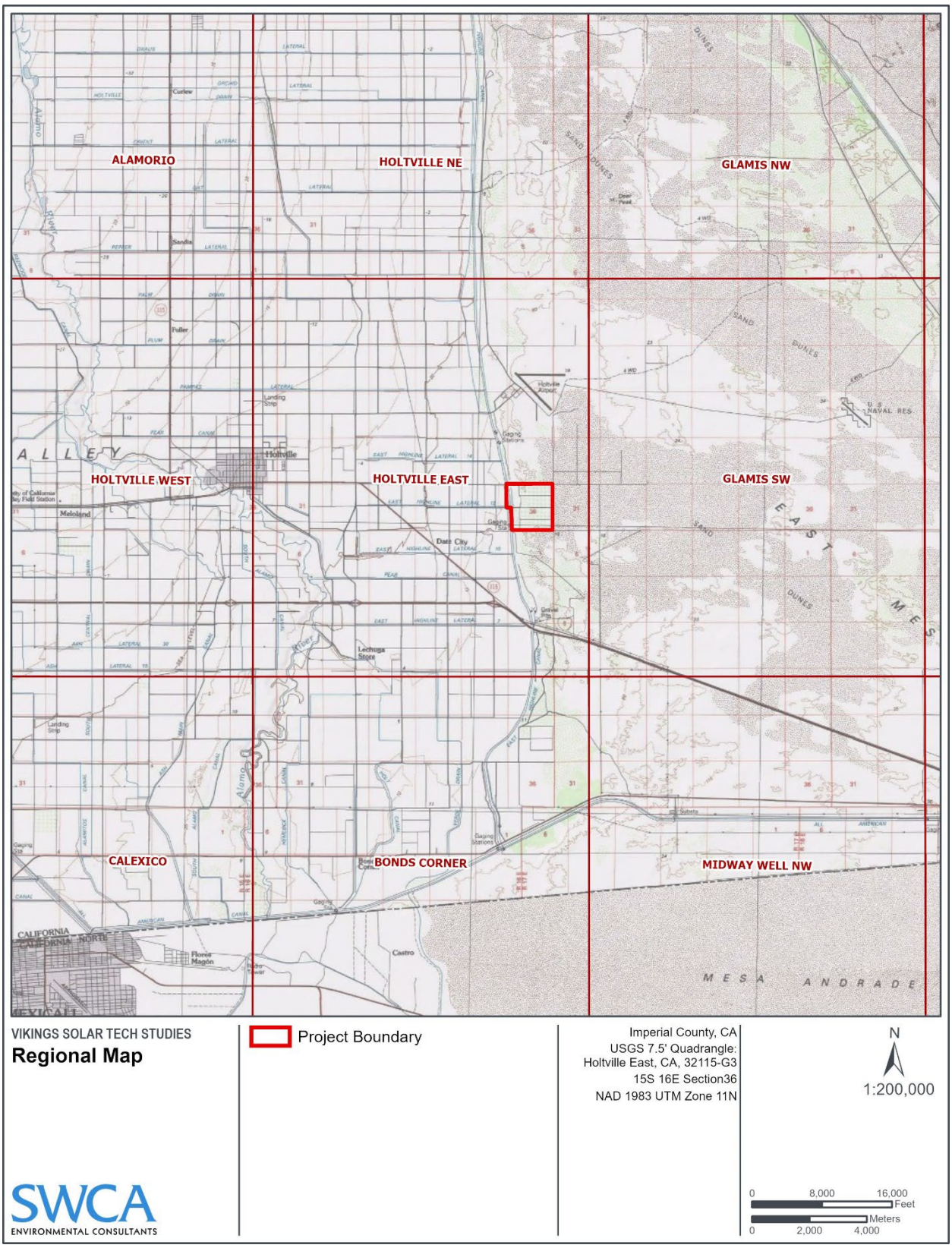

Figure A-1. Project location.

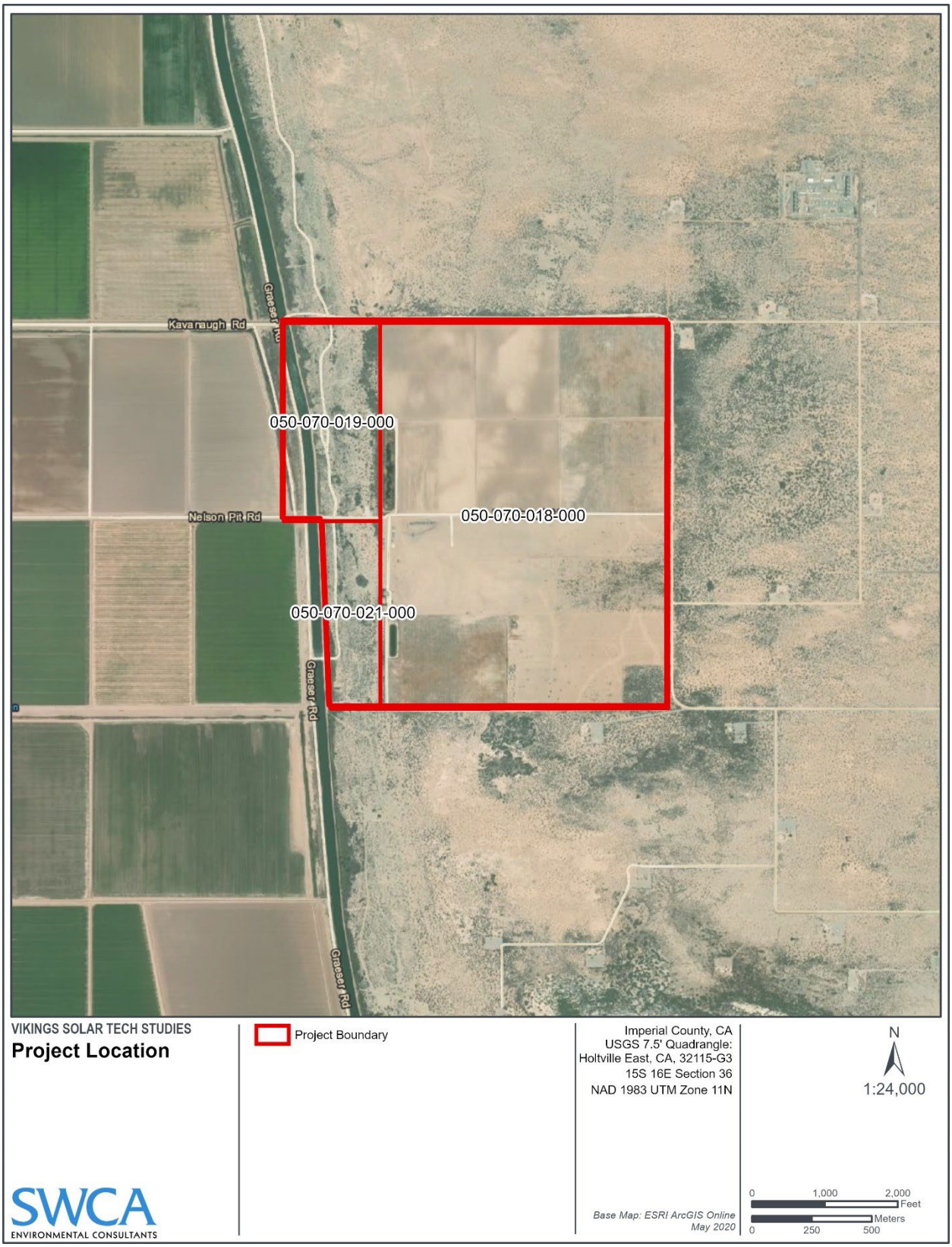

Figure A-2. Project vicinity.

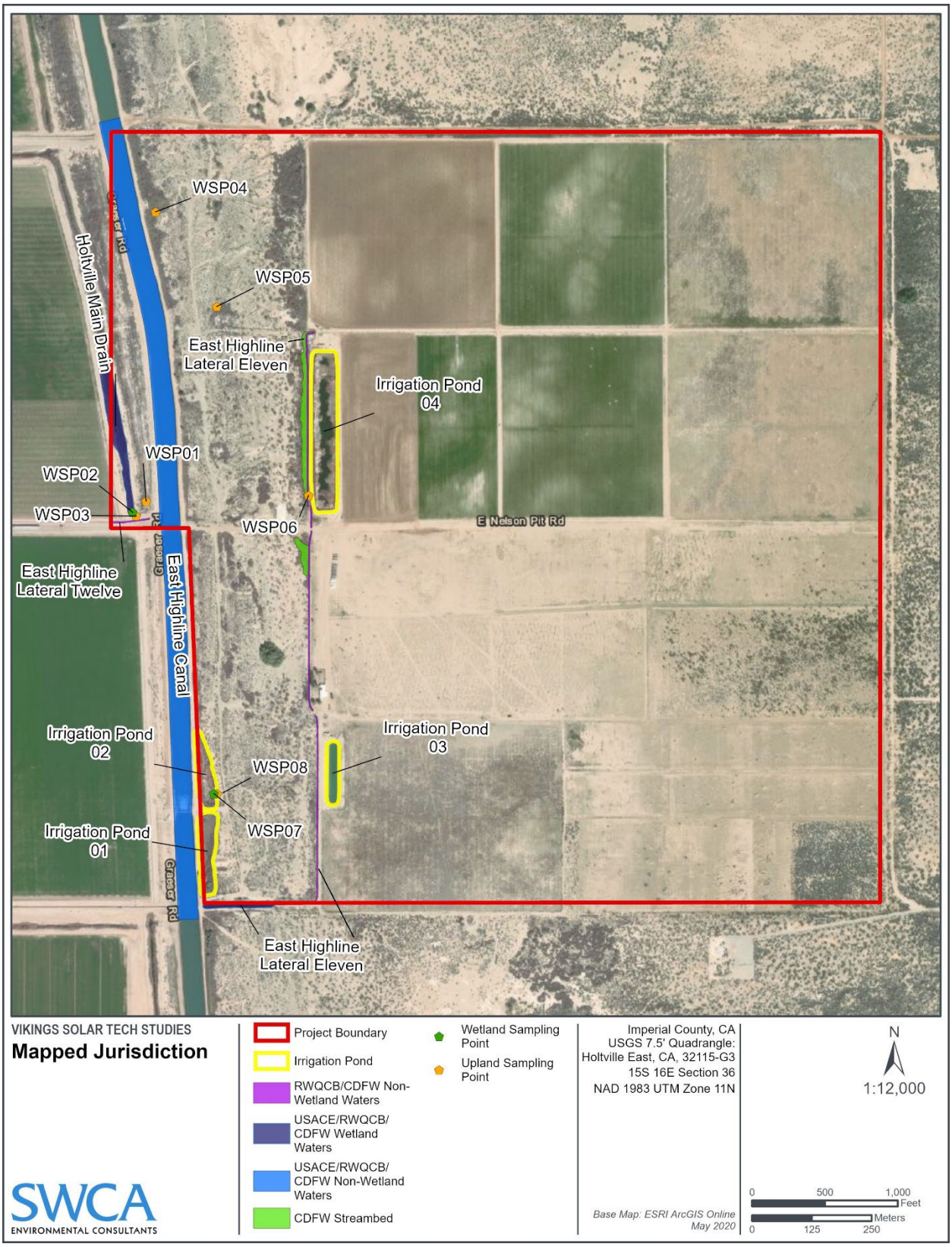

Figure A-3. Jurisdictional Features.

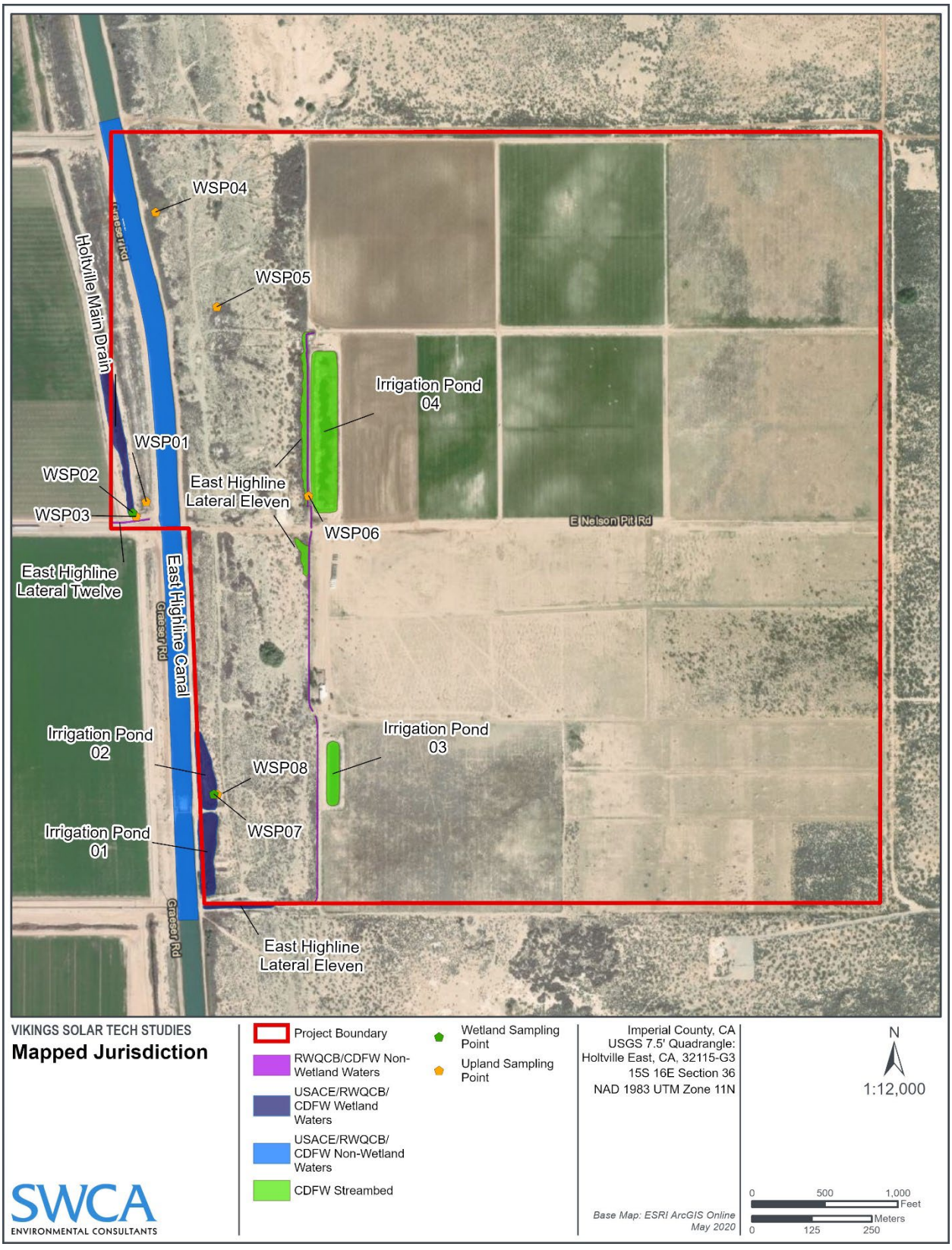

Figure A-4. Mapped jurisdiction.

Figure A-5a. Mapped jurisdiction (western section).

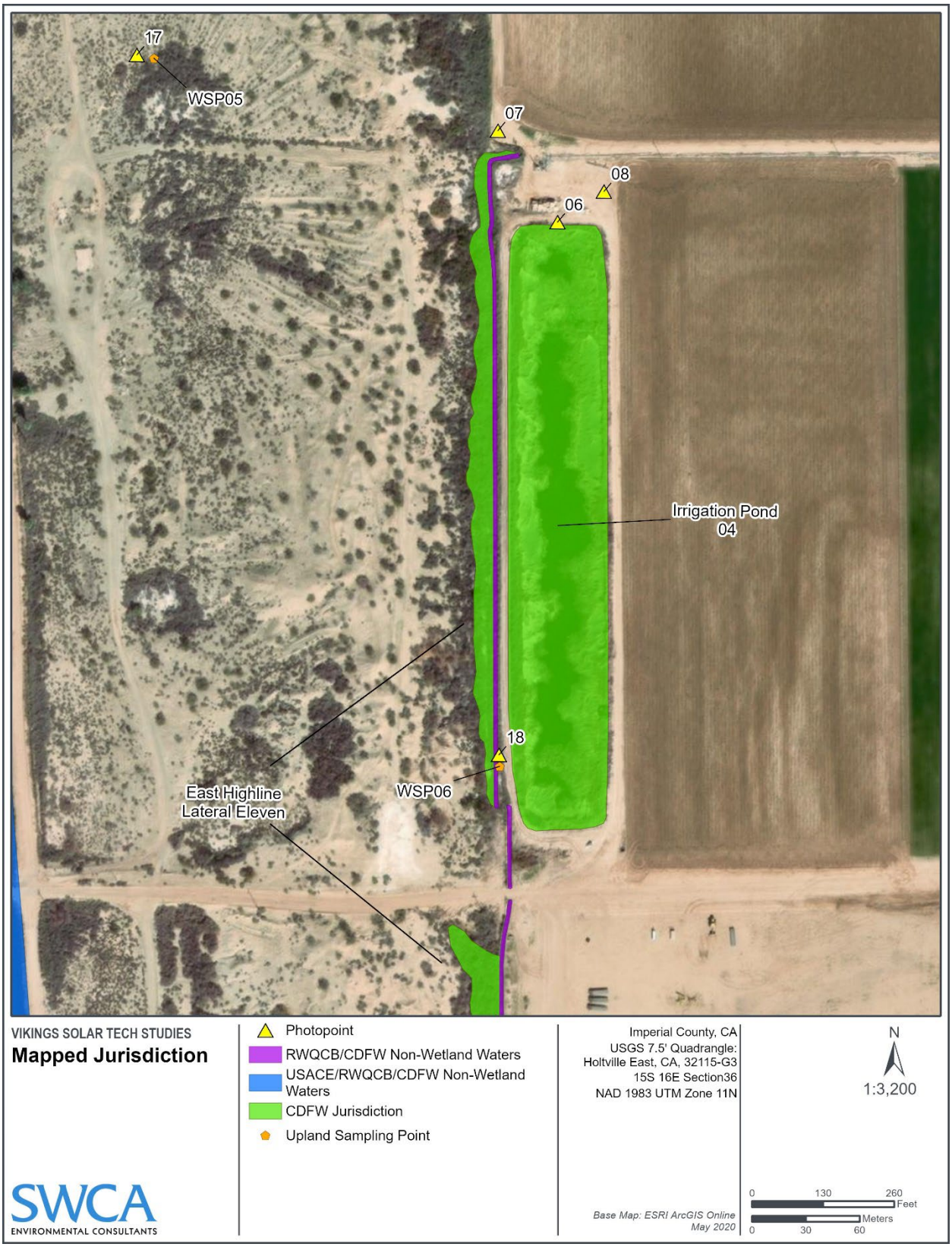

Figure A-5b. Mapped jurisdiction (northern section).

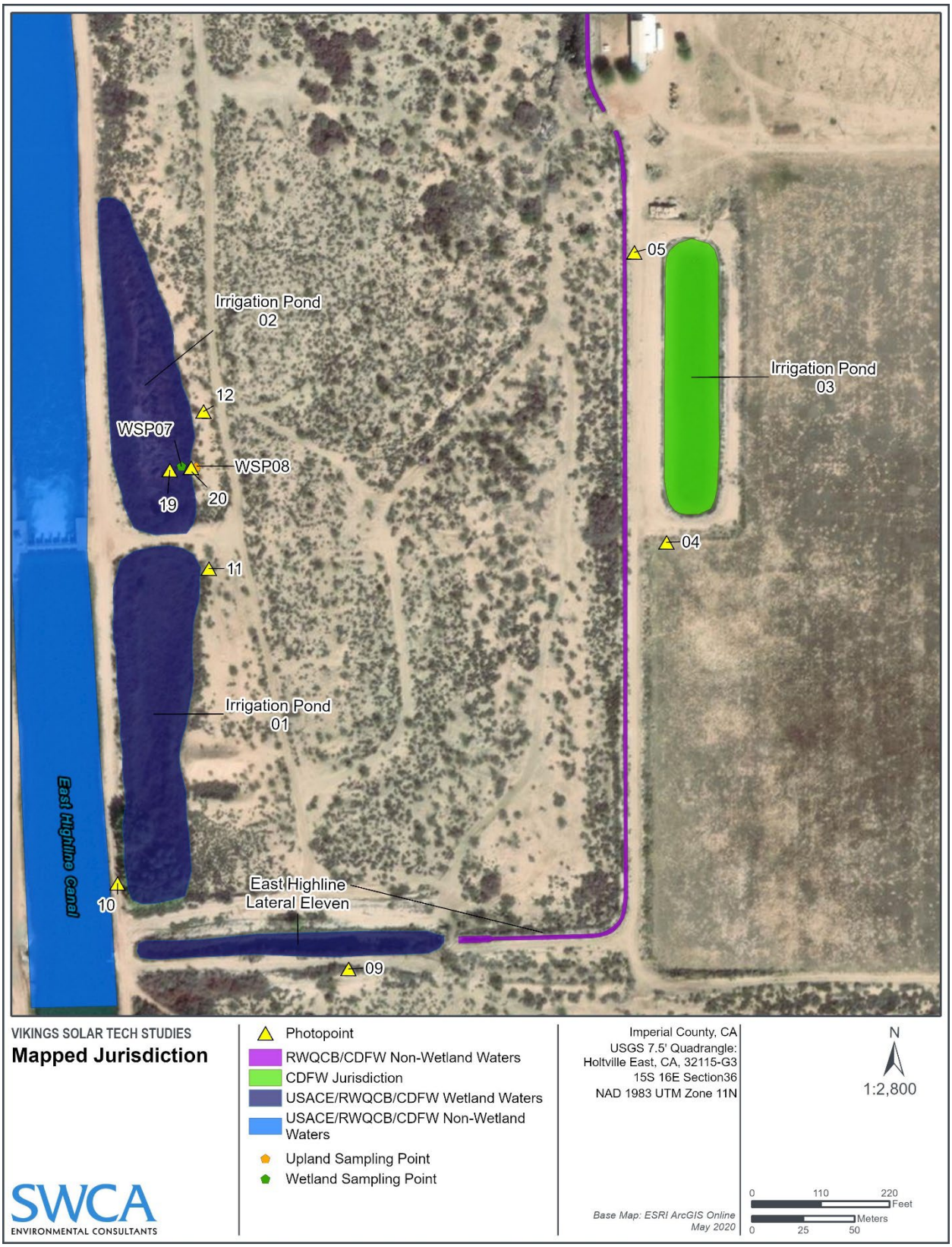

Figure A-5c. Mapped jurisdiction (southern section).

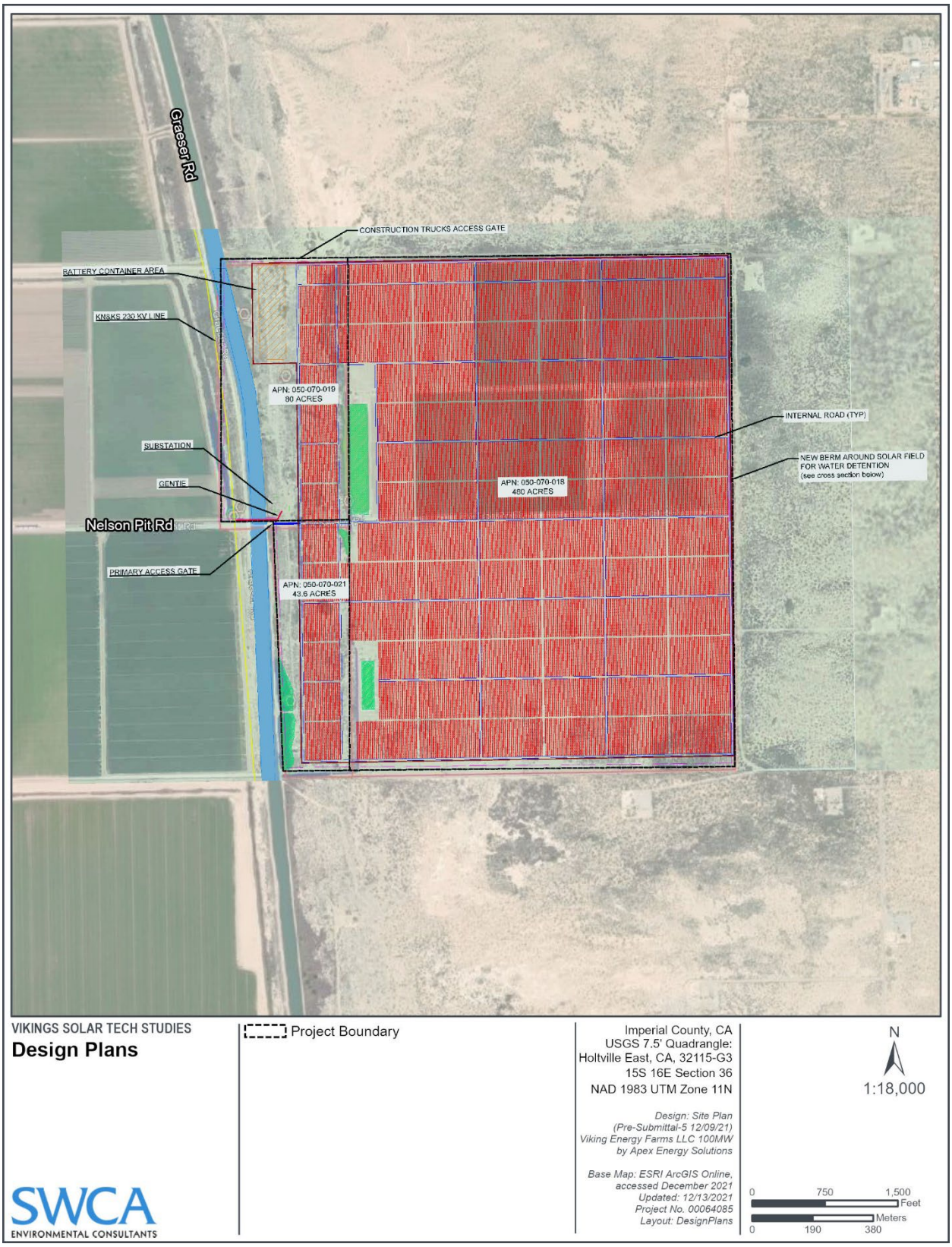

Figure A-6. Design Plans.

APPENDIX B

Site Photographs

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Photograph B-1. Vegetated banks of East Highline Canal, view facing southeast (upstream).

Photograph B-2. Pump feeding into East Highline Lateral Twelve, view facing east (upstream).

Photograph B-3. Riparian vegetation dominated by broadleaf cattail in Holtville Main Drain, view facing southeast.

Photograph B-4. Geotextile lining along bank and inundated bed of Irrigation Pond 03, view facing northwest.

Photograph B-5. Concrete-lined channel East Lateral Eleven, view facing south (upstream).

Photograph B-6. Vegetated banks and inundated bed of Irrigation Pond 04, view facing south.

Photograph B-7. Extent of riparian vegetation dominated by arrowweed along western boundary of East Highline Lateral Eleven, view facing south.

Photograph B-8. Irrigation pipe fed by East Highline Lateral Eleven used for watering adjacent croplands, view facing north.

Photograph B-9. Portion of East Highline Lateral Eleven inundated with riparian vegetation along banks dominated by giant reed, view facing northwest.

Photograph B-10. Dense riparian vegetation of Irrigation Pond 01 with banks dominated by tamarisk, view facing north.

Photograph B-11. Dense herbaceous growth of giant reed in bed of Irrigation Pond 01, view facing southwest.

Photograph B-12. Dense herbaceous growth dominated by broadleaf cattail in bed of Irrigation Pond 02, view facing west.

Photograph B-13. WSP01, view facing south.

Photograph B-14. WSP02, view facing west.

Photograph B-15. WSP03, view facing north.

Photograph B-16. WSP04, view facing northwest.

Photograph B-17. WSP05, view facing southeast.

Photograph B-18. WSP06, view facing south.

Photograph B-19. WSP07, view facing east.

Photograph B-20. WSP08, view facing east.

APPENDIX C

Datasheets

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WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 64085 Vikings Solar City/County: Date/Imperial Sampling Date: 12/2/2020

Applicant/Owner: Apex Energy Solutions, LLC State: CA Sampling Point: WSP01

Investigator(s): Malek Al-Marayati, Section, Township, Range: S36 T15S R16E

Landform (hillslope, terrace, etc.): ditch Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRR D Lat: 32.803774° Long: -115.279997° Datum: WGS 84

Soil Map Unit Name: Rositas fine sand, wet, 0 to 2 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

vegetation dominated by non-native species.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft)			
1. Pluchea sericea	30	Y	FACW
2.			
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Arundo donax	30	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: 15ft)			
1. N/A			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WSP01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-1.5	7.5yr 4/4	100					SiC	
1.5-4	7.5yr 5/4	100					SiC	
4-9	7.5yr 4/4	98	10YR 8/3	2	D	M	SiC	
9-20	7.5yr 4/4	98	7.5YR 6/8	2	C	PL	SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Layer 1.5-4" --> pH=6.5-7.0 (not alkaline)
AAD+ reaction negative.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

US Army Corps of Engineers

Arid West – Version 2.0

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 64085 Vikings Solar City/County: Date/Imperial Sampling Date: 12/2/2020

Applicant/Owner: Apex Energy Solutions, LLC State: CA Sampling Point: WSP02

Investigator(s): Malek Al-Marayati Section, Township, Range: S36 T15S R16E

Landform (hillslope, terrace, etc.): embankment Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): LRR D Lat: 32.803563° Long: -115.280297° Datum: WGS 84

Soil Map Unit Name: Rositas fine sand, wet, 0 to 2 percent slopes NWI classification: R4SBCx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

ditch associated with irrigation canal for adjacent farmlands.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix aphylla	5	Y	FAC
2.			
3.			
4.			
	5	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. N/A			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. Typha latifolia	60	Y	OBL
2. Cyperus odoratus	20	Y	FACW
3. Pluchea odorata	5	N	FACW
4.			
5.			
6.			
7.			
8.			
	85	= Total Cover	
Woody Vine Stratum (Plot size: 15ft)			
1. N/A			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WSP02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

Hydrogen Sulfide detected upon contact with topsoil, which satisfies primary soil indicator, therefore no soil sample collected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 64085 Vikings Solar City/County: Date/Imperial Sampling Date: 12/2/2020

Applicant/Owner: Apex Energy Solutions, LLC State: CA Sampling Point: WSP03

Investigator(s): Malek Al-Marayati Section, Township, Range: S36 T15S R16E

Landform (hillslope, terrace, etc.): dirt road Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): LRR D Lat: 32.803498° Long: -115.280220° Datum: WGS 84

Soil Map Unit Name: Rositas fine sand, wet, 0 to 2 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

Sampling point is on the compacted soil of an actively used dirt road.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft)			
1. N/A			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5ft)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: 15ft)			
1. N/A			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: N/A (A)

Total Number of Dominant Species Across All Strata: N/A (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: N/A (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WSP03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

No soil sample collected due to lack of dominant hydrophytic vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

no hydrologic indicators present

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 64085 Vikings Solar City/County: Date/Imperial Sampling Date: 12/2/2020

Applicant/Owner: Apex Energy Solutions, LLC State: CA Sampling Point: WSP04

Investigator(s): Malek Al-Marayati Section, Township, Range: S36 T15S R16E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): LRR D Lat: 32.809226° Long: -115.279789° Datum: WGS 84

Soil Map Unit Name: Rositas fine sand, wet, 0 to 2 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix aphylla	20	Y	FAC
2.			
3.			
4.			
	20 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft)			
1. Pluchea sericea	80	Y	FACW
2.			
3.			
4.			
5.			
	80 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Arundo donax	5	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
Woody Vine Stratum (Plot size: 15ft)			
1. N/A			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 95 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WSP04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	10YR 4/3	100					SCL	
2-5.5	10YR 3/4	100					SL	
5.5-20	10YR 4/4	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

2-5.5" Depth the pH=6.5-7.0 -->not alkaline

AAD+ reaction negative for same layer

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 64085 Vikings Solar City/County: Date/Imperial Sampling Date: 12/2/2020

Applicant/Owner: Apex Energy Solutions, LLC State: CA Sampling Point: WSP05

Investigator(s): Malek Al-Marayati Section, Township, Range: S36 T15S R16E

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): LRR D Lat: 32.807443° Long: -115.278419° Datum: WGS 84

Soil Map Unit Name: 129: Pits NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix aphylla	10	Y	FAC
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft)			
1. Pluchea sericea	15	Y	FACW
2. Isocoma acradenia	20	Y	FACW
3.			
4.			
5.			
	35 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Schismus barbatus	3	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	3 = Total Cover		
Woody Vine Stratum (Plot size: 15ft)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 97 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WSP05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 4/3	100					SL	
2-7	10YR 3/4	100					LS	
7-15	7.5YR 5/4	100					SCL	
15-20	10YR 3/4	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

2-7" layer the pH = 7.0 (not alkaline)

same layer AAD+ test negative

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 64085 Vikings Solar City/County: Date/Imperial Sampling Date: 12/2/2020

Applicant/Owner: Apex Energy Solutions, LLC State: CA Sampling Point: WSP06

Investigator(s): Malek Al-Marayati Section, Township, Range: S36 T15S R16E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 20

Subregion (LRR): LRR D Lat: 32.803882° Long: -115.276369° Datum: WGS 84

Soil Map Unit Name: Meloland very fine sandy loam, wet NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

Hillslope is adjacent to a concrete-lined canal used for irrigation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft)			
1. Pluchea sericea	100		
2.			
3.			
4.			
5.			
	100 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Typha latifolia	20	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
Woody Vine Stratum (Plot size: 15ft)			
1. N/A			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WSP06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/4	100					SiC	
4-7	7.5YR 4/4	100					SiC	
7-15	7.5YR 5/4	100					SiC	
15-20	7.5YR 5/4	97	7.5YR 6/8	3	C	M	SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ✓ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? **Yes** ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 64085 Vikings Solar City/County: Date/Imperial Sampling Date: 12/2/2020

Applicant/Owner: Apex Energy Solutions, LLC State: CA Sampling Point: WSP07

Investigator(s): Malek Al-Marayati Section, Township, Range: S36 T15S R16E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 25

Subregion (LRR): LRR D Lat: 32.798262° Long: -115.278482° Datum: WGS 84

Soil Map Unit Name: Rositas fine sand, wet, 0 to 2 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Sampling point is within an abandoned reservoir.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix aphylla	10	Y	FAC
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15ft)			
1. Pluchea sericea	50	Y	FACW
2.			
3.			
4.			
5.			
	50 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Typha latifolia	50	Y	OBL
2. Phragmites australis	2	N	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	52 = Total Cover		
Woody Vine Stratum (Plot size: 15ft)			
1. N/A			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 48 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WSP07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

Hydrogen sulfide odor detected @ 10 inches depth. No further examination of soil layers needed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 64085 Vikings Solar City/County: Date/Imperial Sampling Date: 12/2/2020

Applicant/Owner: Apex Energy Solutions, LLC State: CA Sampling Point: WSP08

Investigator(s): Malek Al-Marayati Section, Township, Range: S36 T15S R16E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): LRR D Lat: 32.798259° Long: -115.278406° Datum: WGS 84

Soil Map Unit Name: Rositas fine sand, wet, 0 to 2 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix aphylla	12	Y	FAC
2.			
3.			
4.			
	12	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15ft)			
1. Larrea tridentata	15	Y	UPL
2. Isocoma acradenia	25	Y	FACU
3. Pluchea sericea	10	Y	FACW
4.			
5.			
	50	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. Schismus barbatus	17	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	17	= Total Cover	
Woody Vine Stratum (Plot size: 15ft)			
1.			
2.			
	17	= Total Cover	

% Bare Ground in Herb Stratum 83 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: WSP08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** _____

Remarks:

Dominant vegetation was not hydrophytic, therefore no soil sample collected.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No surface indicators observed.

H Cultural Resources

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H-1 Cultural Resource Technical Report

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Cultural Resources Technical Report for the Vikings Solar Energy Storage Project, Imperial County, California

JANUARY 2022

PREPARED FOR

Vikings Energy Farm, LLC

PREPARED BY

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CULTURAL RESOURCES TECHNICAL REPORT FOR THE VIKINGS SOLAR ENERGY STORAGE PROJECT, IMPERIAL COUNTY, CALIFORNIA

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SWCA Project No. 64085

SWCA Cultural Resources Report No. 21-248

January 2022

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ABSTRACT

Purpose and Scope: Vikings Energy Farm, LLC, retained SWCA Environmental Consultants (SWCA) to conduct an archaeological cultural resource review in support of the proposed Viking Solar Energy Storage project. The project is located east of the city of Holtville within an unincorporated portion of Imperial County, California. The client proposes to develop a solar energy generation and integrated battery storage facility on a 604-acre parcel (project area). The following study was conducted to analyze any potential impacts this project may have on archaeological resources located in the project area for purposes of compliance with the California Environmental Quality Act (CEQA), including Assembly Bill 52 (AB 52) and relevant portions of Public Resources Code (PRC) Sections 5024.1, 15064.5, 21074, 21083.2, 21084.1, and 21084.2. The lead agency responsible for compliance with CEQA is Imperial County (the County). This report documents the methods and results of a confidential records search of the California Historical Resources Information System (CHRIS), a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC), archival research, and a pedestrian field survey used to evaluate the presence or likelihood of the presence of cultural resources within the project area.

Dates of Investigation: SWCA received the results of a CHRIS records search for the project area plus a 0.8-km (0.5-mile) radius on December 9, 2020, at the South Coastal Information System (SCIC) located at San Diego State University. SWCA received the results of a SLF search from the NAHC on January 11, 2021.

Results: A record search conducted by the SCIC identified 50 previously recorded resources within a 0.8- km (0.5-mile) radius of the project area. Of these 50 resources, three are mapped within the project area itself. The search of the SLF maintained by the NAHC was negative within the project area. The NAHC noted that negative results may not indicate the absence of Native American cultural resources in the area and provided a contact list of 16 Native American individuals and tribal organizations that may have knowledge of cultural resources in or near the study area. The County, as lead agency, will conduct its own Native American consultation for the project, as part of its AB 52 responsibilities.

The project area is near natural resources that were important to Native Americans, particularly the shoreline of Lake Cahuilla during its highest stand, such that Native Americans would have been active within the general vicinity. However, background research did not identify any substantial evidence to suggest the project area was a specific area of concentrated Native American activity, such as a seasonal camp or resource gathering site. Furthermore, given the subsequent agricultural use of the project area, it is unlikely that any artifacts or features associated Native American activities that may have once been present on the surface would have been preserved. Archival research documents the use of the project area for agriculture at least as far back as 1950, with established agricultural fields present at that time. This does not, however, preclude the possibility of disturbed or scattered archaeological materials on the ground surface, or intact buried archaeological deposits. Available historical records do not indicate what type of agriculture has been practiced in the project area so exact or approximate depths of potential buried archaeological deposits cannot be provided here.

SWCA archaeologists conducted an intensive-level pedestrian survey of the project area. As part of the fieldwork, SWCA archaeologists revisited the locations of the three previously recorded resources but were unable to re-locate two of them (P-13-000304/CA-IMP-304, recorded in 1974, and P-13-003213/CA-INY-3213, recorded in 2009). Both are presumed either misplotted or destroyed. As a consequence, the two resources will not be impacted by the project.

The third previously recorded resource (P-13-008333/CA-INY-7835) is the East Highline Canal, which was recorded in 2009 and was recommended eligible for the National Register of Historic Places (NRHP)

and the California Register of Historical Resources (CRHR). It therefore qualifies as a historical resource under CEQA, and any adverse impacts to the resources could constitute a significant impact on the environment. This resource will be left in place and avoided and as a consequence will not be impacted by the project.

SWCA archaeologists also documented six new archaeological resources: five historic-era refuse scatters (SWCA-64085-S-001 through SWCA-64085-S-005) and one historic-era isolated find (SWCA-64085-ISO-001). SWCA evaluated each of these newly recorded resource for CRHR eligibility, based on surface indicators, and none of the newly identified resources are recommended eligible for the CRHR under any criteria. Since the resources are not considered historical resources for the purposes of CEQA, they need not be considered further.

As a result of this assessment, SWCA concludes that the project as proposed will not have a significant impact on cultural resources. Further, a buried site sensitivity assessment suggests that the potential for buried archaeological resources within the project site appears to be low, particularly in light of the decades of agricultural activity across most of the site. However, there is always a possibility that currently unknown resources could be identified during ground-disturbing activities. In the event that previously unidentified cultural resources are exposed during ground disturbance, work in the immediate vicinity (designated as any area within 50-feet of the newly uncovered cultural resource) of the find must stop until a qualified archaeologist can evaluate the significance of the find according to the CRHR. Ground-disturbing activities may continue in areas more that 50-feet from the newly uncovered cultural resource. If the discovery proves significant under CEQA (Section 15064.5f; PRC 21082) and cannot be avoided by the project, additional work such as archaeological and Native American monitoring, archaeological testing, or data recovery excavation may be warranted. Should any prehistoric or historic-era Native American artifacts be encountered, additional consultation with NAHC-listed Native American tribal groups should be conducted immediately.

The discovery of human remains is always a possibility during ground disturbance; Section 7050.5 of the State of California Health and Safety Code states that no further disturbance shall occur until the Imperial County Coroner has made a determination of origin and disposition pursuant to PRC 5097.98. The Imperial County Coroner must be notified of the find immediately. If the human remains are determined to be prehistoric, the Coroner will notify the NAHC, which will designate and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

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INTRODUCTION

Vikings Energy Farm, LLC (client), retained SWCA Environmental Consultants (SWCA) to conduct an intensive archaeological pedestrian survey to assess the presence or absence of cultural resources in support of the proposed Vikings Solar Energy Storage project. The project is located east of the city of Holtville within an unincorporated portion of Imperial County, California (County) (Figure 1). The client is proposing to develop the Vikings Solar Energy Storage (project), a nominal 150-megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation Project with an integrated up to 300 megawatts (MW) battery storage system on approximately 604 acres of land in the County of Imperial, California (project area).The following study was conducted to analyze any potential impacts this project may have on archaeological resources located in the project area for purposes of compliance with the California Environmental Quality Act (CEQA), including Assembly Bill 52 (AB 52) and relevant portions of Public Resources Code (PRC) Sections 5024.1, 15064.5, 21074, 21083.2, 21084.1, and 21084.2. The lead agency responsible for compliance with CEQA. This report documents the methods and results of a confidential records search of the California Historical Resources Information System (CHRIS), a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC), archival research, and a pedestrian field survey used to evaluate the presence or likelihood of the presence of cultural resources within the project area.

SWCA Cultural Resources Project Manager Wayne Glenny, M.S., Registered Professional Archaeologist (RPA), served as Project Manager for the project. SWCA Assistant Cultural Resources Project Manager Trevor Gittelhough, M.A., RPA, conducted background research and authored the report. Cultural Resources Assistant Project Manager Omar Rice, B.A., led the field work with William Kendig, B.A., Christina Peterson, B.A., and Yareli Lopez, B.A. Anna Belk B.A., GIS specialist, prepared the figures. This report was reviewed for quality assurance/quality control by SWCA Principal Investigator Michael Bever, Ph.D., RPA. Both Wayne Glenny and Michael Bever exceed the Secretary of the Interior's (SOI) Professional Qualification Standards in archaeology. Copies of the final report will be filed with the project applicant and the South Coastal Information Center (SCIC), and will remain on files at SWCA's Pasadena Office.

PROJECT DESCRIPTION

The project proposes to develop a solar energy generation and integrated battery storage facility, with a new generator intertie (gen-tie) to transport the electricity generated on-site to an existing Imperial Irrigation District (IID) transmission line. The approximately 604-acre project area is located at the intersection of East Nelson Pit Road and Graeser Road, in an unincorporated portion of the County, and is composed of three parcels (Assessor's Parcel Numbers 050-070-018-000, 050-070-019-000, and 050- 070-021-000), currently or formerly used for agriculture.

The surrounding area contains a mixture of both agricultural and rural/undeveloped lands. The project area is bounded by agricultural lands to the west and undeveloped land to north, south, and east, and is bisected by Nelson Pit Road. This location is plotted in Section 36, Township 15 South, Range 16 East as depicted on the U.S. Geological Survey (USGS) Holtville East, California 7.5-minute topographic quadrangles (Figure 2). The project area is bounded by unnamed dirt roads to the north, east, and south, and by the East Highline Canal and Graeser Road to the west (Figure 3).

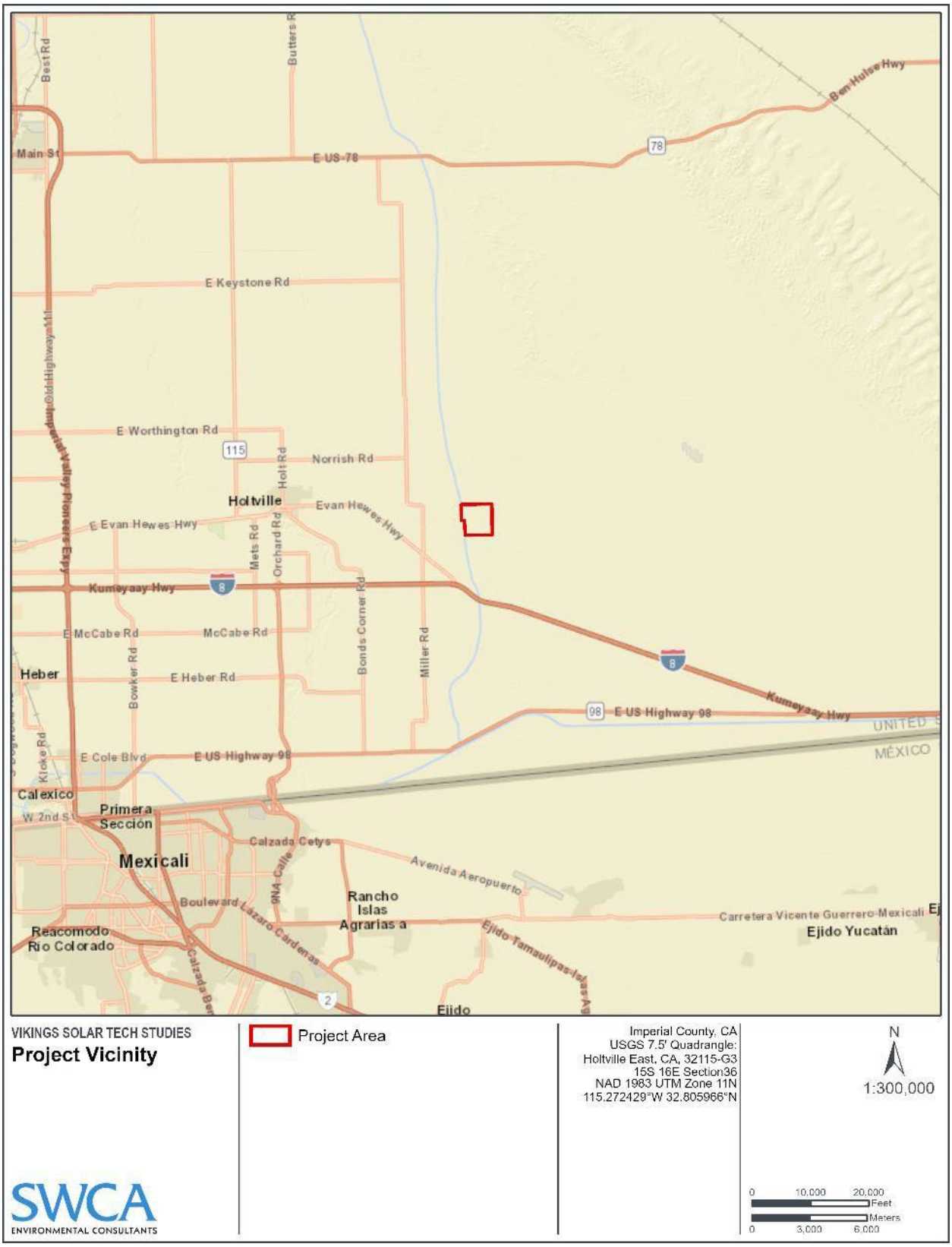

Figure 1. Vicinity

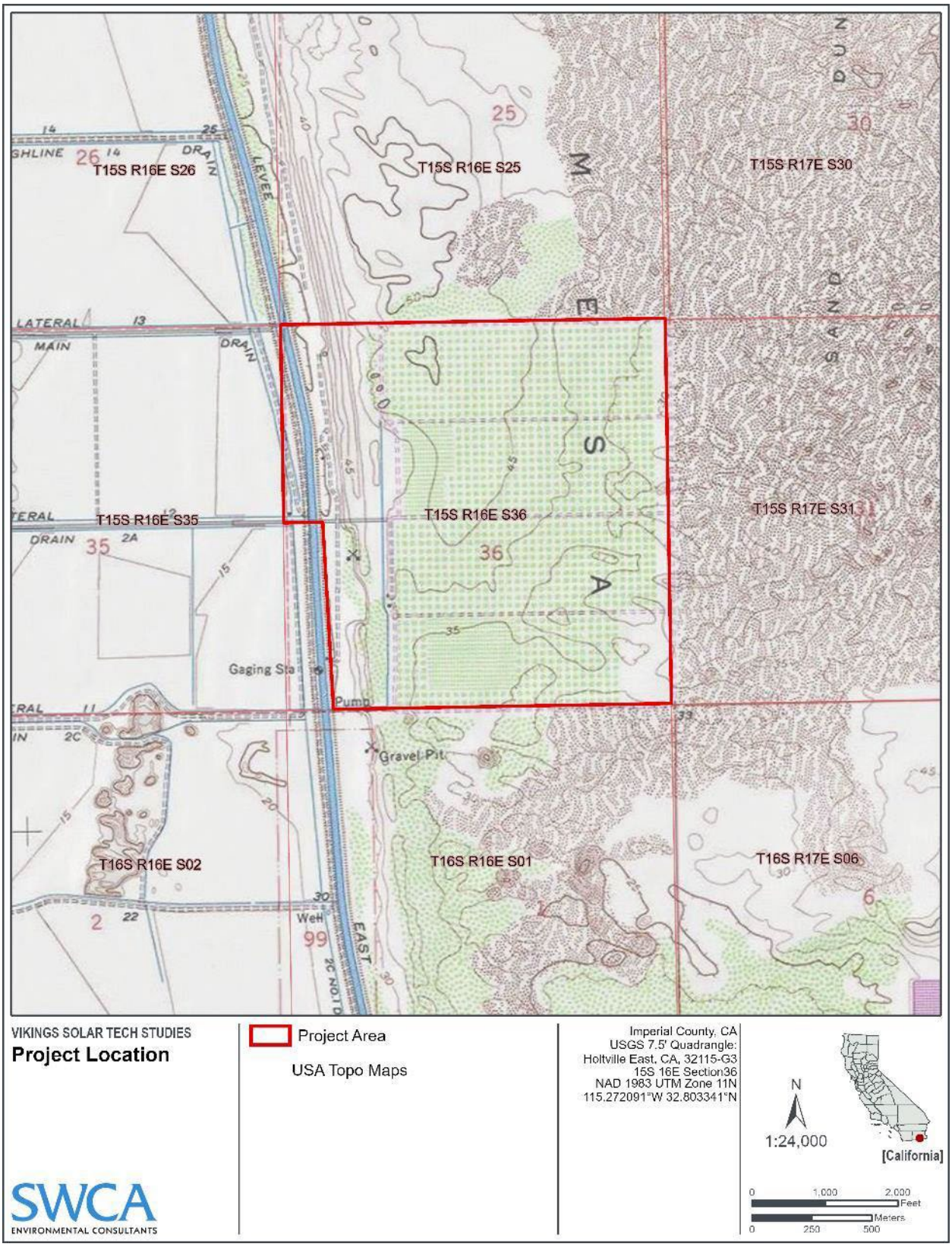

Figure 2. Location

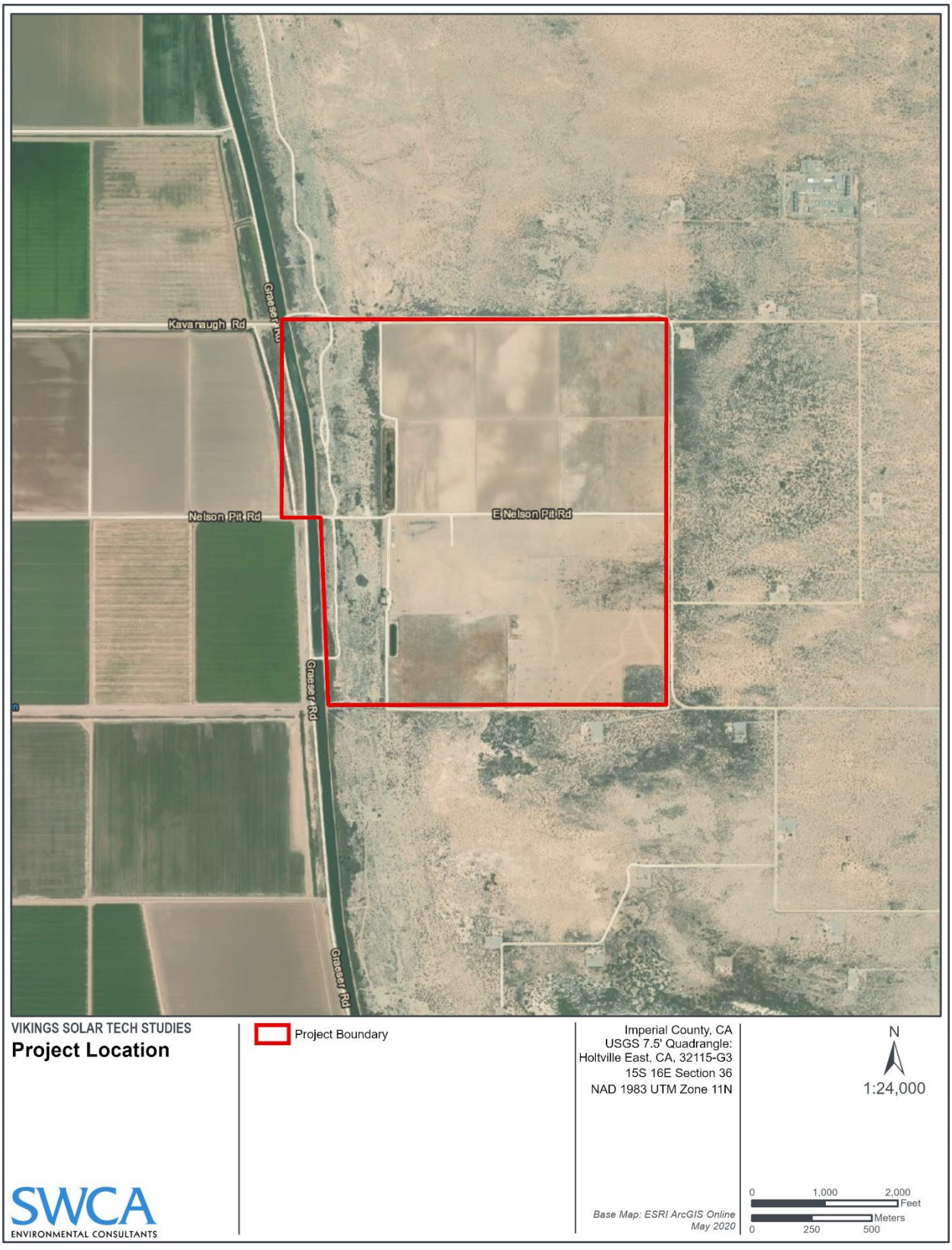

Figure 3. Project Area Map

REGULATORY SETTING

State Regulations

The California Office of Historic Preservation (OHP), a division of the California Department of Parks and Recreation, is responsible for carrying out the duties described in the PRC and maintaining the California Register of Historical Resources (CRHR). The state-level regulatory framework also includes CEQA, which requires the identification and mitigation of substantial adverse impacts that may affect the significance of eligible historical and archaeological resources.

California Environmental Quality Act

CEQA requires a lead agency to analyze whether historic and/or archaeological resources may be adversely affected by a proposed project. Under CEQA, a "project that may cause a substantial adverse change in the significance of a historic resource is a project that may have a significant effect on the environment" (PRC 21084.1). Answering this question is a two-part process: first, the determination must be made as to whether the proposed project involves cultural resources. Second, if cultural resources are present, the proposed project must be analyzed for a potential "substantial adverse change in the significance" of the resource.

HISTORICAL RESOURCES

According to CEQA Guidelines Section 15064.5, for the purposes of CEQA, historical resources are as follows:

- A resource listed in, or formally determined eligible…for listing in the CRHR (PRC 5024.1, Title 14 California Code of Regulations [CCR], Section 4850 et seq.).
- A resource included in a local register of historical resources, as defined in PRC 5020.1(k), or identified as significant in a historic resources survey meeting the requirements of PRC 5024.1(g).
- Any object, building, structure, site, area, place, record, or manuscript that the lead agency determines to be eligible for national, state, or local landmark listing; generally, a resource shall be considered by the lead agency to be historically significant (and therefore a historic resource under CEQA) if the resource meets the criteria for listing in the CRHR (as defined in PRC 5024.1, 14 CCR 4852).

Resources nominated for the CRHR must retain enough of their historic character or appearance to convey the reasons for their significance. Resources whose historic integrity (as defined above) does not meet the NRHP criteria may still be eligible for listing in the CRHR.

According to CEQA, the fact that a resource is not listed in or determined eligible for listing in the CRHR or is not included in a local register or survey shall not preclude the lead agency from determining that the resource may be a historical resource (PRC 5024.1). Pursuant to CEQA, a project with an effect that may cause a substantial adverse change in the significance of a historical resource may have a significant effect on the environment (CEQA Guidelines Section 15064.5[b]).

Substantial Adverse Change and Indirect Impacts to Historical Resources

CEQA Guidelines specify that a "substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate

surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines Section 15064.5). Material impairment occurs when a project alters in an adverse manner or demolishes "those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion" or eligibility for the NRHP, CRHR, or local register. In addition, pursuant to CEQA Guidelines Section 15126.2, the "direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects."

The following guides and requirements are of particular relevance to this study's analysis of indirect impacts to historic resources. Pursuant to CEQA Guidelines (Section 15378), study of a project under CEQA requires consideration of "the whole of an action, which has the potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment." CEQA Guidelines (Section 15064[d]) further defines direct and indirect impacts as follows:

(1) A direct physical change in the environment is a physical change in the environment which is caused by and immediately related to the project.

(2) An indirect physical change in the environment is a physical change in the environment which is not immediately related to the project, but which is caused indirectly by the project. If a direct physical change in the environment in turn causes another change in the environment, then the other change is an indirect physical change in the environment.

(3) An indirect physical change is to be considered only if that change is a reasonably foreseeable impact which may be caused by the project.

ARCHAEOLOGICAL RESOURCES

In terms of archaeological resources, PRC 21083.2(g) defines a "unique archaeological resource" as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

(1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

(2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.

(3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.

If it can be demonstrated that a proposed project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (PRC Sections 21083.2[a], [b], and [c]). CEQA notes that, if an archaeological resource is neither a unique archaeological resource nor an historical resource, the effects of the project on those resources shall not be considered to be a significant effect on the environment (CEQA Guidelines Section 15064.5[c][4]).

CALIFORNIA STATE ASSEMBLY BILL 52

AB 52 of 2014 amended PRC 5097.94 and added PRC 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3.

Consultation with Native Americans

AB 52 formalizes the lead agency–tribal consultation process, requiring the lead agency to initiate consultation with California Native American groups that are traditionally and culturally affiliated with a project, including Tribes that may not be federally recognized. Lead agencies are required to begin consultation prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report.

Tribal Cultural Resources

Section 4 of AB 52 adds Sections 21074(a) and 21074(b) to the PRC, which address tribal cultural resources and cultural landscapes. Section 21074(a) defines "tribal cultural resources" as one of the following:

(1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
   (A) Included or determined to be eligible for the CRHR.
   (B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

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

Section 1(a)(9) of AB 52 establishes that "a substantial adverse change to a tribal cultural resource has a significant effect on the environment." Effects on tribal cultural resources should be considered under CEQA. Section 6 of AB 52 adds Section 21080.3.2 to the PRC, which states that parties may propose mitigation measures "capable of avoiding or substantially lessening potential significant impacts to a tribal cultural resource or alternatives that would avoid significant impacts to a tribal cultural resource." Further, if a California Native American tribe requests consultation regarding project alternatives, mitigation measures, or significant effects to tribal cultural resources, the consultation shall include those topics (PRC Section 21080.3.2[a]). The environmental document and the mitigation monitoring and reporting program (where applicable) shall include any mitigation measures that are adopted (PRC Section 21082.3[a]).

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

Created in 1992 and implemented in 1998, the CRHR is "an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Sections 21083.2 and 21084.1). Certain properties, including those listed in or formally determined eligible for listing in the NRHP and California Historical Landmarks numbered 770 and higher, are automatically included in the CRHR. Other properties recognized under the California Points of Historical Interest program, identified as significant in historical resources surveys, or designated by local landmarks programs may be nominated for the CRHR. According to PRC 5024.1(c), a resource, either an individual property or a contributing element of a historic district, may be listed in the CRHR if the State Historical Resources Commission determines that it meets one or more of the following criteria, which are modeled on NRHP criteria:

- **Criterion 1:** It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

- **Criterion 2:** It is associated with the lives of persons important in our past.
- **Criterion 3:** It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- **Criterion 4:** It has yielded, or may be likely to yield, information important in history or prehistory.

Resources nominated for the CRHR must retain enough of their historic character or appearance to convey the reasons for their significance. Resources whose historic integrity does not meet NRHP criteria may still be eligible for listing in the CRHR.

Treatment of Human Remains

The disposition of human remains falls first under the general prohibition on disturbing or removing human remains under California Health and Safety Code Section 7050.5. More specifically, remains suspected to be Native American are treated under CEQA in CCR 15064.5; PRC 5097.98 illustrates the process to be followed in the event that human remains are discovered. In the event that human remains are discovered during excavation activities, the following procedure shall be observed:

- Stop immediately and contact the County Coroner:

  Imperial County Coroner
  328 Applestill Road
  El Centro, California
  (760) 339-6311

- If the remains are determined to be of Native American descent, the Coroner has 24 hours to notify the NAHC.
- The NAHC will designate and notify the person it believes to be the most likely descendant (MLD) of the deceased Native American.
- The MLD has 48 hours to make recommendations to the landowner or representative for the treatment or disposition, with proper dignity, of the human remains and grave goods.
- If the owner does not accept the MLD's recommendations, the owner or the MLD may request mediation by the NAHC.

ENVIRONMENTAL SETTING

The project vicinity is generally characterized by agricultural and rural/undeveloped land uses, located within an alluvial plain with an open aspect. The project area consists of three parcels, with the largest of the three, Parcel 1 (APN 050-070-018-000), stretching from Kavanaugh Road in the north to East Highline Lateral Eleven in the south. This parcel is composed of several agricultural fields, with active fields in the northern portion and fallow fields in the south and east. Parcel 2 (APN 05-070-019-000) is located in the northwest portion of the project and is bounded by the East Highline Canal to the west, Kavanaugh Road to the north, Parcel 1 to the east, and East Nelson Pit Road to the south. This area consists of a mixture of riparian and high desert vegetation, including creosote and arrowweed. Parcel 3 (APN 050-070-021-000) is located in the southwestern portion of the project area and is bounded by East Nelson Pit Road to the north, Parcel 1 to the east, Highline Lateral Eleven Canal on the south, and East Highline Canal to the west. Vegetation in this area is similar to that in Parcel 2.

CULTURAL SETTING

Prehistory

The project is in the Colorado River subregion of the Desert Archaeological Region, one of eight arbitrary organizational divisions of the state (Moratto 1984). This subregion includes the Colorado and Mojave Deserts in the southeastern corner of the state east of the Peninsular and Traverse Ranges and south of the Sierra Nevada and Great Basin provinces. The subregion includes the Salton Trough, all of Imperial County, and most of Riverside, southern San Bernardino, and eastern San Diego Counties.

The region's cultural chronology can be divided into five primary developmental periods: Paleoindian (pre-6000 BCE), Early Archaic/Pinto complex (6000 to 2000 BCE), Late Archaic/Gypsum Period (2000 BCE to CE 900), Late Prehistoric/Patayan Period (CE 500 to Spanish contact [1769]), and the Historic Period (AD 1769 to 1950). The four prehistoric periods are summarized below in Table 1.

Although now an arid region, at different periods during the Holocene a lake, collectively referred to as Lake Cahuilla (Lake LeConte, Blake's Sea), covered the Salton Sea basin of the Colorado Desert area. Lake Cahuilla was formed by the western diversion of the Colorado River into the Salton Trough when natural sediment barriers blocked the river's flow south to the Gulf of California. Today's Salton Sea is technically an agricultural drainage reservoir that receives 90 percent of its inflow from runoff originating in the Imperial, Coachella, and Mexicali Valleys. After periodic episodes of infilling and recession, Lake Cahuilla is believed to have receded for the last time around A.D. 1580, with a brief inundation in the mid- to late 1600s (Buckles and Krantz 2005; Laylander 1995; Waters 1983). As discussed below, the resources associated with the lake were key factors in human subsistence and settlement patterns during most of the Prehistoric Period.

A cultural sequence for the Colorado Desert was summarized by Schaefer (1994) under three major periods: Paleoindian, Archaic, and Late Prehistoric. These periods date between ca. 10,000– 6000 B.C., 6000 B.C.–A.D. 500, and A.D. 500–Historic Contact, respectively. The introduction of pottery in this area separates the Archaic from the Late Prehistoric Period. The Archaic Period is divided here into Early and Late, dating between ca. 6000–2000 B.C. and 2000 B.C.–A.D. 500. In the Great Basin, the Archaic is also referred to as the Desert Culture (Jennings 1964; Moratto 1984; Warren 1967). Following numerous elements of earlier syntheses for California's desert region (e.g., Rogers 1929, 1966, 1989; Warren 1980, 1984), the cultural patterns within these broad periods are defined in this area as the San Dieguito Complex, Pinto Period, Gypsum Period, and Patayan Period. The Patayan Period is further subdivided into three periods, Patayan I–III (Rogers 1945; Waters 1982).

Within the Colorado Desert, there are no documented Paleoindian sites, and scant evidence relating to the Early Archaic. As noted by Schaefer (1994:65), few stratified archaeological sites within the Colorado Desert, such as Indian Hill Rockshelter in Anza-Borrego Desert State Park, have been dated to the Late Archaic, although excavations within the Coachella Valley added to our knowledge of the Late Archaic in this area (Love and Dahdul 2002).

Paleoindian Period (ca. 10,000–6000 B.C.)

In contrast to the dry climate of today, during the Paleoindian Period, California's desert regions during the late Pleistocene and the early Holocene contained a series of large, pluvial lakes. Archaeological evidence suggests that early Holocene hunter-gathers of the desert region were well adapted to the wetland environments supported by these lakes. Sites were typically located on or near the shores of former pluvial lakes and marshes, and have artifact assemblages marked by their diversity of flaked-stone

artifacts. Such sites, however, have not been documented for the Colorado Desert region, including for the nearly 10,000-year-old pluvial shoreline of Lake Cahuilla (Moratto 1984:96).

The San Dieguito Complex is a well-defined expression or cultural pattern of the Paleoindian Period in the California desert region. Although named for the cultural sequence in western San Diego County (Rogers 1929, 1989), the complex now incorporates additional local patterns and covers the Colorado and Mojave Deserts and the western Great Basin (referred to as the "Central Aspect") (Rogers 1966; Warren 1967). Leaf-shaped points and knives, crescents, and scrapers characterize the artifact assemblages throughout the region. To reduce terminological confusion, Moratto (1984:92) subsumed the numerous local patterns (including the Lake Mojave Period of Warren [1967]) under the overarching Western Pluvial Lakes Tradition (WPLT), first defined by Bedwell (1970). Recent literature on the prehistory of the Colorado Desert, however, typically references the Paleoindian Period or San Dieguito Complex, rather than the WPLT.

Early Archaic/Pinto Period (6000–2000 B.C.)

As the environment transitioned from the pluvial conditions of the Pleistocene to the more arid Holocene climate, many of the lakes and wetlands present during the Paleoindian Period began to dry up. By the Early Archaic or Pinto Period, many of these wetlands had disappeared. Desert populations appear to have adapted to these more arid conditions by withdrawing to the margins of the desert or concentrating around the few oases still present within it (Warren 1984:413–414). A brief period of moister conditions may have led to a temporary reoccupation of the desert region between 4500 and 3500 B.C. However, evidence from the Mojave Desert and western Great Basin sites suggests that most Pinto Period sites were temporary, seasonal camps of small, highly mobile groups. Slab metates and handstones (a milling stone set used to process hard seeds), shaped scrapers, and the Pinto projectile point characterize the artifact assemblages of the Pinto Basin Complex.

Late Archaic/Gypsum Period (2000 B.C.–A.D. 500)

The beginning of the Late Archaic or Gypsum Period coincides with the beginning of the Little Pluvial, a brief period of moister climatic conditions. By the second half of the Gypsum Period, arid conditions returned. Desert peoples appear to have been well adapted to these conditions by this time, however, and there was no notable drop in population. Gypsum Period sites are characterized by a wider range of diagnostic projectile points, such as the Gypsum and Elko types, as well as split-twig figurines, the latter typically preserved in caves (Warren 1984:416–417). While handstones and metates continued to be employed, a new milling stone technology tool set, mortars and pestles, was introduced during this period of time. Based on ethnographic analogy and site location, Warren (1984:419) suggests that mortars and pestles were used to process mesquite pods. Near the end of this period, the bow and arrow also appear to have been introduced. In addition, this period is marked by an increased presence of exotic trade goods, including shell ornaments from the Pacific Coast.

Recent excavations at a dozen Late Archaic Period sites in the Colorado Desert indicate occupation on the shores of Holocene Lake Cahuilla was restricted to specialized temporary camps, used for fishing, trapping, and gathering resources (Love and Dahdul 2002:81). In contrast, the range of types and density of artifacts at a site north of La Quinta (CA-RIV-2936) suggested that the permanent or semipermanent occupation there was not dependent on lacustrine resources (Love and Dahdul 2002). Long-distance trade is evidenced in these assemblages by the presence of obsidian from the Coso volcanic field in Inyo County and shell beads from the Gulf of California.

Late Prehistoric/Patayan Period (A.D. 500–Historic Contact)

The period from the end of the Archaic Period to European contact was a time of complex and ongoing change in material culture, burial practices, and subsistence focus. These changes most likely reflect both in situ cultural adaptations in response to shifts in environmental conditions, as well as influences from outside the area. The Late Prehistoric is identified with the introduction of pottery and is marked by stronger regional differentiation. While the artifact assemblages are similar to those of the Gypsum Period, there are some notable differences. In addition to ceramics, the period is distinguished by the introduction of cremation in the archaeological record. In general, projectile points are smaller and triangular in shape. Regional differentiation in the distribution of projectile point and pottery types was due, in part, to trade and influences of neighboring cultures in the Lower Colorado River and Great Basin. Such influence includes the major migration into southern California of Takic-speaking people (Uto- Aztecan language group) from the Great Basin region (Nevada, Utah, and eastern California) (Warren 1968).

Within the Colorado Desert region, the Patayan sequence cultural pattern is divided into three periods with different pottery types and regional site distributions. Cottonwood Triangular and Desert-Side Notched projectile points, the change from extended inhumations to cremations, the introduction of pottery, networks of trail systems (with pot-drops and trail-side shrines), and the late introduction of small-scale agriculture characterize the Patayan period in general. Pottery is increasingly common throughout the period, including brown wares manufactured from upland clay sources (e.g., Tizon Brown Ware) and buff wares made from lowland clays (e.g., Colorado Buff Ware). Material culture also included clay figurines and pipes, bedrock grinding slicks and mortars, worked bone tools, and rock art. Exchange networks are indicated by shell beads from the coast and Gulf of California, wonderstone from Rainbow Rock near today's Imperial City, and obsidian from the Obsidian Butte source at the southern end of today's Salton Sea, which at times was covered by the waters of Holocene Lake Cahuilla. As discussed further below, the cyclical filling and desiccation of Lake Cahuilla dictated the settlement patterns in the Salton Trough and Coachella Valley during this period.

During Patayan I (ca. A.D. 800–1050), mobile groups settled seasonally along the Lower Colorado River, practicing a mixed hunter-gatherer and horticultural economy. Their tool kit included pottery and Cottonwood Triangular and Desert-Side Notched projectile points. The agricultural-based Hohokam on the upper Gila River likely influenced this cultural pattern. Patayan II (ca. A.D. 950–1500) is characterized by the spread of these cultural traits from the Colorado River into the Colorado and Mojave Deserts. It also coincides with the infilling of Lake Cahuilla, as well as locally manufactured new ceramic types, such as Tizon Brown Ware. Patayan III (A.D. 1500 to European contact) is marked by the recession of Lake Cahuilla, the occurrence of specific pottery types (Colorado Buff Ware and painted pottery), and the practice of small-scale agriculture.

Ethnographic Overview

The project area is most closely associated with the Kumeyaay, although other groups, such as the Quechan, are known to have visited the region to access the abundant resources associated with Lake Cahuilla or its associated rivers, or passed through the area during travel between the coast and the lower Colorado River.

Native Americans who lived in the vicinity of Mission San Diego de Alcalá were given the name Diegueño by Spanish missionaries. Today, Native names have supplanted the European-derived term. The people who traditionally occupied the region along the Pacific Coast from central San Diego County southward into Baja California and eastward into Imperial County, refer to themselves as Kumeyaay

(Shipek 1987). Linguistic studies support the division of these people into northern (Ipai) and southern (Tipai) dialect groups (Luomala 1978). Although the term Kumeyaay is restricted by some scholars to part or all of the southern dialect group (e.g., Carrico 1987; Mithun 2001), this report uses the name in its broader sense. The eastern (Imperial County) bands of Tipai speakers were formerly known as the Kamia (Gifford 1931). The boundary between the northern and southern Kumeyaay was not fixed prior to European contact and it is likely that the distinction between them existed as a gradient rather than a clearly divided and separate cultural and political unit (Carrico 1987). These groups were united by their closely related Yuman languages, as well as their customs, beliefs, and material culture.

The Kumeyaay occupied the Pacific Coast from around Agua Hedionda Lagoon, south to a point below Ensenada and Todos Santos Bay in Baja California, Mexico. Their territory stretched inland throughout the Cuyamaca and Laguna Mountains into the Yuha and Anza Borrego deserts of Imperial County (Carrico 1987; Luomala 1978). Consequently, residents of this region had access to an extremely varied set of environments. Neighboring groups included the Luiseño and Cupeño to the northwest, the Cahuilla to the northeast, the Quechan to the east, and the Pai-pai to the south (Kroeber 1976).

Kumeyaay winter villages were located in sheltered valleys near reliable sources of water with the entire band present. Dwellings in the relatively permanent winter villages were semisubterranean and roughly circular, with a wooden pole framework covered with brush thatch. The main entrance had a mat covering to keep out the wind and ensure privacy, and ritually faced the east (Luomala 1978:597). Other structures in the village consisted of family-owned platform granaries, a village-owned brush ceremonial enclosure, and sweat lodges. A semicircular enclosure was used for the keruk mourning ceremony, and rock walls sometimes surrounded ceremonial and dance areas. At their summer camps, ramadas and windbreaks were common, built into trees or rock shelters. Granaries and more permanent housing would sometimes be constructed within frequently visited oak groves. The dead were cremated, the ashes buried or placed in ceramic urns that were then buried or placed in caves.

Kumeyaay territory was divided among bands that generally controlled 10 to 30 miles within a drainage system (Shipek 1982:297). Each band was composed of five to 15 kinship groups (sibs or shiimul) (Kroeber 1976:719; Shipek 1987:8), some of which were divided among more than one band. There were approximately 50 to 75 named sibs throughout the territory. Each band had a chief or kwaaypaay who lived in its central village. The chief was responsible for the bulk of intra- and inter-band affairs, directing ceremonies, giving advice, resolving disputes, etc. The position of chief was hereditary and commonly was passed on to the eldest son, but he also had to meet with the approval of neighboring kwaaypaay (Shipek 1982:298). Other specialists within the band included an assistant chief, singers, and dancers, whose roles were similar to the roster of ceremonialists within the neighboring Luiseño and Cahuilla.

All of the Ipai and many of the Tipai camped in coastal valleys at certain times of the year and gathered coastal resources. Fish were taken with hooks, nets, and bows, often from tule reed boats. Abundant shellfish were gathered from the sandy beaches (e.g., Chione spp., scallops, and Donax spp.) and rocky shores (e.g., mussels and abalone). Common game birds included doves and quail; migratory birds included geese. Most meat was from rabbits, woodrats, and other small game living along the mesas and foothills, caught mainly with throwing sticks, bow and arrow, or in nets during community drives. Hunting large game such as deer and mountain sheep was the role of expert hunters trained in specialized lore (Luomala 1978:601). Land resources generally belonged to the bands; few areas were considered "tribal" and open to anyone (Shipek 1982:301).

Small game and seasonal herbs flourished during the winter rainy season in the valleys. Fresh greens included miner's lettuce, clover, pigweed, and grasses. Seeds were harvested from buckwheat, chia and other salvias, *Atriplex* spp., peppergrass, and a variety of grasses. In the mountains and foothills, yucca was gathered for its stalks, flowers, and leaves. Elderberry, manzanita, cholla and prickly-pear cactus,

and juniper shrubs provided berries and fruit. People heavily depended on the acorns from several species of oak that were gathered during the late summer and stored in family and village granaries. For those Kumeyaay in the desert areas, mesquite replaced acorns as the primary staple. Mesquite pods and seeds would be gathered in large quantities and pounded into flour. During the late spring and summer, small groups foraged in favored spots, usually at progressively higher elevations as various resources ripened. In the early fall, people would move to the mountain oak groves, returning to the primary encampment just prior to the onset of winter.

Members of the Tribe who lived in the eastern deserts had access to tributaries of the Colorado River. Following the example of their River Yuman farming cousins, they planted maize, beans, teparies, and melons in newly flooded lands (Luomala 1978:600). Members of the Kumeyaay practiced plant husbandry to "maintain and increase supplies of native foods" (Shipek 1987:12). This included sowing grass seed on burned fields, transplanting wild onions and tobacco, planting cuttings of prickly-pear cactus near village sites, and clearing lands for planting seeds of greens, shrubs, and specific trees. Like members of many coastal California Native American groups, they burned grasslands to improve the grass and to keep the chaparral from encroaching. Along with bettering the seed harvest, this practice also maintained more forage for the deer and antelope that they hunted.

The clothing of the Tipai and Ipai was minimal. Robes of rabbit, willow bark, or deerskin were worn in the winter and also served as bedding. Men and children wore utilitarian belt sashes and pouches designed to hold tools and small game, while women wore a one- or two-piece apron made of shredded bark, and a round, twined cap. When traveling long distances, sandals woven from agave fibers were used (Luomala 1978:599).

Kumeyaay baskets were of the same weave, forms, and high quality found elsewhere in southern California. Carrying nets and sacks were also produced. Pottery was commonly manufactured. Along with decorated cooking pots, water jars, and storage pots (Kroeber 1976:722), pots were also commonly used as cremation urns. The Kumeyaay made and traded curved clay pipes, stone pipes, and medicine sucking tubes. Along with a variety of hunting gear, the Kumeyaay made tule watercraft with a double-bladed paddle (Kroeber 1976:723). For warfare, along with bows and arrows, they made a war club of mesquite. Both gourd and turtle-shell rattles were made; deer-hoof rattles were used in a mourning ceremony.

The religious mythologies of the Tipai-Ipai were locally variable. The most common world creation myth is closely tied to the Colorado River and Desert region (Luomala 1978:604). In this myth, the major geographic points are mountains beside the Colorado River, suggestive of the close ties and origins the Kumeyaay had with the other Yuman peoples. Other holy places recognized by all the Kumeyaay were Kuuchama or Tecate Peak, and Wee'ishpa or Signal Mountain (Shipek 1987:14). Ceremonies among the Kumeyaay are similar to those of other southern California Native peoples (Kroeber 1976:712–717), including puberty rites, marriage, naming, cremation of the dead, and the annual mourning ceremony (keruk) for all those of the sib who had died the previous year. The ceremonial leader, an inherited religious position, conducted these rituals. Other specialists, shamans (kuseyaay), or healers performed other more private rituals for themselves or others (Shipek 1982:299).

After the establishment in A.D. 1769 of the presidio at San Diego and the Mission San Diego de Alcalá, the conversion and physical removal from their territory (through the reduccion process) and the loss of land by the local Kumeyaay negatively impacted their lifeways and traditional subsistence strategies (Carrico 1987). Many of the Native inhabitants of the valley eventually worked for the mission, but there was a feeling of nationality among the Kumeyaay, a level of federation seen among other southern California native groups (Shipek 1987:5). This was dramatically expressed in a revolt against the Spanish soldiers and priests in A.D. 1775 when hundreds of warriors from a score of villages reaching

from the Pacific Coast well into the Yuha Desert combined forces and coordinated a night attack. Afterward, the inland kwaaypaay jointly organized lookouts to warn of Spanish reprisal expeditions. There was also a kuuchult kwaataay, a leader who, when the need arose, was responsible for interaction with other Tribes (Shipek 1982:301).

Unrest among the local Native Americans, the threat of foreign invasion and political dissatisfaction kept local growth around the San Diego Mission to a minimum until Mexico gained freedom from Spain in 1822. Only then did development occur beyond the walls of the presidio in the area known as Old Town. As the missionaries had civil as well as religious authority over their converts, title to the land passed from the clans to the priests to hold in trust until such time the missionaries felt the Indians had sufficiently learned Spanish European ways of living and governing themselves. Before repatriation might have occurred, however, the colonial population of Mexican California had grown and the settlers demanded more and more of the "mission" lands. Many Indian neophytes left the mission grounds when in 1825 the Mexican government freed the Native Americans from mission control. When the missions were fully secularized in 1834–1836, more people left for work on the large cattle ranchos being carved out of the mission lands that were not needed for the support of the dwindling neophyte population.

As a result of the Mexican-American War in 1846, California officially became a part of the United States in 1848 with the signing of the Treaty of Guadalupe Hidalgo. Several Kumeyaay leaders signed the statewide 1852 treaty, but Congress never ratified it. Several reservations were formed after the mid-1870s in the Cuyama and Palomar Mountains and nearby valleys from Kumeyaay lands. These include Barona Ranch, Campo, Cuyapaipe, Inaja and Cosmit, Los Coyotes (shared with Mountain Cahuilla), Manzanita, Mesa Grande, Santa Ysabel, Sycuan, and Viejas (California Indian Assistance Program 2003). No lands were allowed for the remaining coastal people–these flatter, richer lands had already been taken over by the Mexican rancheros. There had been other Ipai settlements, such as San Pasqual and the outer edge of San Diego (now Balboa Park), but these were given to the general public for homesteading. Additional Ipai lands were lost with the creation of water reservoirs, such as at Capitan Grande. Over the four decades following United States control, many of the ranchos became small farms and towns. The Kumeyaay who remained around the mission grounds associated with the ranches, working cattle and sheep, and maintained their own subsistence gardens.

During the 1920s, many Kumeyaay became members of the Mission Indian Federation, which was organized to fight for self-rule on southern California reservations. During World War II many people moved off the reservations to work in war-related industries in the Los Angeles and San Diego urban areas, and after the war, local Native American veterans took advantage of educational benefits. The next generation thus saw fewer people working on the ranches and farms. As of 2003, there were more than 2,570 enrolled members on 10 of the Kumeyaay reservations (California Indian Assistance Program 2003).

There is no Kumeyaay reservation in the vicinity of the project area, but the tribal people from the Anza-Borrego Desert region joined with others and resettled on the Campo and Manzanita Reservations. Campo was established by an act of Congress in 1891, with 1,890 acres, but more land was set aside in the 1910s for a total of 15,480 acres. Manzanita was established by an act of Congress in 1893, with 4,579 acres in the Jacumba Mountains. In 2003, there were 390 people enrolled at these two reservations, 350 of them living there (California Indian Assistance Program 2003:76, 116).

Historical Overview

The post-contact history of California is divided into three periods: the Spanish (1769–1822), Mexican (1822–1848), and American (1848–present) Periods. The Spanish Period began with the establishment of a mission and presidio (fort) in San Diego in 1769 by the Spanish, and included the construction of

21 missions between 1769 and 1822. The Mexican Period began with independence from Spain and ended with the signing of the Treaty of Guadalupe Hidalgo in 1848. The American Period began with the end of the Mexican-American War and included California becoming a territory of the United States. The following sections provide a brief overview of each period and are followed by a discussion of the regional history of Imperial County.

Spanish Period (1769–1822)

Some of the first expeditions by Spanish explorers along the southern coast of California occurred between the mid-1500s and the mid-1700s. One explorer, Juan Rodríquez Cabrílllo, was searching for the legendary Northwest Passage when he stopped in 1542 in what is known today as San Diego Bay. Franciscan missionary Father Junípero Serra established the Mission San Diego de Alcalá at Presidio Hill, following the directive of the King of Spain that the Franciscan Order would direct religious and colonial matters in the American territories. The Mission San Diego de Alcalá was the first of 21 missions established in Alta California between 1769 and 1823.

Captain Juan Bautista de Anza was the first to establish overland connections between California and Mexico. In 1774, he led a group of 34 padres, soldiers, and others across the Colorado River into the present-day Imperial Valley. Father Francisco Garcés charted the route in 1770, and led de Anza through present-day Imperial County along the Alamo River drainage (National Park Service 2018). The expedition continued northwest, traveling into present-day Riverside County through the Cahuilla Valley, following the Santa Rosa Mountains and continuing through Coyote Canyon and San Jacinto Valley, eventually ending up in Monterey Bay (Brown 1985). De Anza led another expedition along the same route in 1775 with a larger group and continued all the way to San Francisco Bay (Guerrero 2006).

After the expeditions of de Anza, several missions were established in the 1770s as far north as San Francisco. The 21 missions were parallel to the California coastline between present-day San Diego and Sonoma, with the coastline positions easy to defend and supply by ships. The missions were also placed near large populations of Native Americans, their potential converts. The roadway connecting the missions became known as “El Camino Real,” with the current Interstate 5 and U.S. Highway 101 generally following the old road’s footprint. Three fortified posts were established in Alta California in addition to the Presidio of San Diego: the Presidio of Monterey was established in 1770, the Presidio of San Francisco in 1776, and the Presidio of Santa Barbara in 1782.

Mexican Period (1822–1848)

A major emphasis during the Spanish Period in California was the construction of missions and associated presidios to integrate the Native American population into Christianity and communal enterprise. Incentives were also provided to bring settlers to pueblos or towns, but just three pueblos were established during the Spanish period, only two of which were successful and remain as California cities (San José and Los Angeles). Several factors kept growth within Alta California to a minimum, including the threat of foreign invasion, political dissatisfaction, and unrest among the Indigenous population. After more than a decade of intermittent rebellion and warfare, New Spain (Mexico and the California territory) won independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants.

Extensive land grants were established in the interior during the Mexican period, in part to increase the population inland from the more settled coastal areas where the Spanish had first concentrated their colonization efforts. The secularization of the missions following Mexico’s independence from Spain resulted in the subdivision of former mission lands and establishment of many additional ranchos.

During the supremacy of the ranchos (1834–1848), landowners largely focused on the cattle industry and devoted large tracts to grazing. Cattle hides became a primary southern California export, providing a commodity to trade for goods from the east and other areas in the United States and Mexico. The number of non-Native inhabitants increased during this period because of the influx of explorers, trappers, and ranchers associated with the land grants. The rising California population contributed to the introduction and rise of diseases foreign to the Native American population, who had no associated immunities.

American Period (1848–Present)

War in 1846 between Mexico and the United States began at the Battle of Chino, a clash between resident Californios and Americans in present-day San Bernardino County, California. This battle was a defeat for the Americans and bolstered the Californios' resolve against American rule, emboldening them to continue the offensive in later battles at Dominguez Field and in San Gabriel. However, this early skirmish was not a sign of things to come, and the Americans were ultimately the victors of this two year war.

The United States took control of California in 1846, seizing Monterey, San Francisco, San Diego, and Los Angeles with little resistance. Los Angeles soon slipped from American control, however, and needed to be retaken in 1847. Approximately 600 U.S. sailors, marines, Army dragoons, and mountain men converged under the leadership of Colonel Stephen W. Kearney and Commodore Robert F. Stockton in early January of that year to challenge the California resistance, which was led by General Jose Maria Flores. The American party scored a decisive victory over the Californios in the Battle of the Rio San Gabriel and at the Battle of La Mesa on January 9, 1847, effectively ending the war and opening the door for increased American immigration (Harlow 1992:193–218). Hostilities officially ended with the signing of the Treaty of Guadalupe Hidalgo in 1848, in which the United States agreed to pay Mexico $15 million for the conquered territory, including California, Nevada, Utah, and parts of Colorado, Arizona, New Mexico, and Wyoming and representing nearly half of Mexico's pre-1846 holdings.

California officially became the 31st state with the Compromise of 1850, which also designated Utah and New Mexico (with present-day Arizona) as U.S. territories (Wilkman and Wilkman 2006:15). Horticulture and livestock, based primarily on cattle as the currency and staple of the rancho system, continued to dominate the southern California economy through 1850s. The Gold Rush began in 1848, and with the influx of people seeking gold, cattle were no longer desired mainly for their hides but also as a source of meat. During the 1850s cattle boom, rancho vaqueros drove large herds from southern to northern California to feed that region's burgeoning mining and commercial boom. Cattle were at first driven along major trails or roads such as the Gila Trail or Southern Overland Trail, then were transported by trains when available. The cattle boom ended for southern California as neighbor states and territories drove herds to northern California at reduced prices. Flooding that began in the Central Valley of California in December 1861 was followed by two years of severe drought and also played a role in ending the cattle boom. Operation of the huge ranchos became increasingly difficult, and droughts severely reduced their productivity (Cleland 1941).

Imperial County

Imperial County was created on August 15, 1907, from the eastern half of San Diego County (O'Dell 1957:8). With an area of 4,087 square miles, the county abuts Mexico to the south, the Colorado River and Arizona to the east, Riverside County to the north, and San Diego County to the west. Imperial County remained largely undeveloped with few settlers during the Spanish, Mexican, and American Periods until the waters of the Colorado River were diverted to this arid Colorado Desert area. With the availability of irrigation, the impetus for Imperial County development was agriculture.

Dr. O. M. Wozencraft first proposed plans for bringing water to the Imperial Valley in the late 1850s, but it was irrigation engineer Charles Robinson Rockwood whose 1892 survey and design for a single canal capable of irrigating about two million acres in the Imperial Valley and northern Baja California eventually succeeded (Hendricks 1971:2; O'Dell 1957:87). In 1896, Rockwood, A. H. Heber, and G. Chaffey formed the California Development Company. With financial backing, the company built a canal that directed water from the Colorado River at Yuma into Mexico and back into California (Hendricks 1971:6; O'Dell 1957:87–88).

On May 14, 1901, the canal delivered the first water to fields in the Calexico area. The successful California Development Company, planning for settlers, named the newly reclaimed desert area Imperial Valley (Bright 1985:70; Hendricks 1971:8). Agricultural pursuits proved to be very profitable within the first two decades after the start of irrigation. An influx of people with the ever-growing agricultural production also spurred growth of allied industries, including beekeeping and dairy and poultry farming. By 1905, the area had 80 miles of canals and 700 miles of distribution canals with an estimated 67,000 irrigated acres (City of El Centro 2021). Soon there were 12 water districts in the Imperial Valley that obtained most of their water from the Colorado River. Ten of these districts obtained water from the California Development Company.

The Imperial Land Company, a promotional associate of the water company, placed ads throughout the country to lure people to Imperial Valley (O'Dell 1957:88). Thousands of people arrived and settled in the area, and vast tracts of land were cleared for farming. In 1902, only a single school was present in the Imperial Valley. By 1914, there were five high schools and 41 elementary schools in the valley. In 1910, the population of Imperial County was 13,591; four years later it exceeded 50,000 (McGroarty 1914:30).

Several major floods occurred between 1904 and 1907 along the Colorado River. Breaches along the riverbank allowed the water to spill into Imperial Valley, caused by the high level of siltation in the river and main canals. Numerous attempts to stop the flooding failed until early 1907 when the river was diverted back to its natural course (O'Dell 1957:90). The series of floods left a large lake in the middle of the Salton Basin, covering an area 50 by 15 miles and encompassing 285,000 acres. This newly formed body of water was named the Salton Sea. In 1922, legislation was introduced requesting the construction of a dam at Boulder Canyon, which would prevent future large-scale flooding. Hoover Dam, at Black Canyon, was completed by 1936, and the All American Canal was constructed during the 1930s and completed in 1940 (Imperial Irrigation District 2021).

Almost every type of vegetable, fruit, and other crops thrive in the Imperial Valley. Cotton was first grown and ginned in 1909, with 50,000 acres devoted to this crop by 1914 (McGroarty 1914:27). Alfalfa was a major crop in the Imperial Valley and although horses and mules were used for canal construction, hauling freight, and clearing land, production exceeded demand (Anderholt 1989:7). The development of daily farming in the valley was one result of it being too expensive to export the surplus alfalfa. Dairying soon became the "greatest industry in the development of the Imperial Valley"; by the late 1910s and early 1920s, there were about 2,000 dairies operating in the area at the same time (Anderholt 1989:53). Imperial County is also rich in mineral resources, including large deposits of fine clays, gypsum, and marble, among others (Morton 1977).

Holtville

The small city of Holtville is located approximately 10.4 km (6.5 miles) west of the project area. Founded in 1903 by W. F. Holton under the name of Holton, it was incorporated on June 20, 1908, as Holtville (City of Holtville 2020). Originally one of the largest dairy producers in the country, it was also a large agricultural hub for asparagus, okra, lettuce, spinach, and carrots, even being graced with the title of "Carrot Capital of the World" (Farr 1918). Importantly, W. F. Holton incorporated the Holton Power

Company, with a power plant in Holtville, that powered Holtville, Imperial, Brawley, Calexico, and eventually El Centro (Burdette 1912). He later constructed a water-power plant in Holtville, established the Imperial Valley Gas Company, and constructed a railroad to connect Holtville to El Centro.

Project Site

The project site covers three parcels in unincorporated imperial county, including 2910 E Nelson Pitt Road (parcel number 050-070-019), 3000 E Nelson Pit Road (parcel number 050-070-018), and an unaddressed parcel numbered 050-070-021. The history of the location of the project area likely begins with the history of Holtville and the construction of the All American Canal. This region was not part of the Spanish land grant system, and available written records of this exact location do not extend back past the mid-20th Century. Online General Land Office (GLO) records are not available for the project site. The first available historic topographic map for the location dates to 1945, at which point E. Nelson Pit Road is shown to terminate at Graeser Road (historicaerials.com 2021). The extension of E. Nelson Pit Road and the other dirt roads within the project site only show up on a 1979 topographic map. The project site itself is shown as undeveloped (historicareals.com) throughout, though this is not supported by the aerial photographs, which show that the roads and evidence of cultivation appear earlier. On 1958 and more recent topographic maps, a gravel quarry is shown in the west-central portion of the site (visible on Figure 2), just east of the canal and south of E. Nelson Road in an area not under cultivation. The first available aerial photograph dates to 1953, by which time most of the project area was fully cultivated (historicaerials.com 2021), and it has generally remained so. However, the southern half of the project site south of E. Nelson Pit Road appear to have lain fallow since before 2009 but after 2005. The north-south strip of the project site that runs along and just east of the All American Canal has remained largely undeveloped, as it is today, though it has been impacted by construction of the canal itself and associated roads. Aside from the canal and the dirt roads that currently pass through the site, no buildings or structures are evident in historic aerial images or topographic maps.

METHODS

The following section presents an overview of the methodology used to identify cultural resources within the project area.

CHRIS Records Search

On November 11, 2020, SWCA requested a confidential search of the CHRIS records at the SCIC, located on the campus of San Diego State University. The SCIC maintains records of previously documented cultural resources and technical studies; it also maintains copies of the OHP's portion of the Historic Resources Inventory. The search included any previously recorded archaeological resources (i.e., excluding historic buildings) within the project area and surrounding 0.8-km (0.5-mile) area. The purpose of the CHRIS records search is to identify whether any archaeological resources have been documented in the project area and assess the potential for undocumented resources to be present by comparison to adjacent areas. Confidential CHRIS results include specific information on the nature and location of sensitive archaeological sites, which should not be disclosed to the public or unauthorized persons and are exempt from the Freedom of Information Act. Appendix A includes a summary of previous studies conducted in the project area and records search radius, but site records and copies of reports have been excluded.

Archival Research and Sensitivity Analysis

Concurrent with the confidential CHRIS records search, SWCA also reviewed any available property-specific historical and ethnographic documents to identify information relevant to the project area. Research focused on a variety of primary and secondary materials related to the history and development of the project area, including historical maps, historical aerial and ground photographs, ethnographic reports, geologic maps, and technical reports filed at the SCIC pertaining to the project area. The goal was to collect available historical information pertinent to the project area and assess the sensitivity of the project site for subsurface archaeological resources.

Native American Contact Program

On behalf of the client, SWCA contacted the NAHC requesting an SLF search for cultural resources in the project area. SWCA submitted the request to the NAHC via email on December 29, 2020. The NAHC responded to the request in a letter dated January 11, 2021, received via email, indicating that no known resources occur within the search area.

Intensive Pedestrian Survey

SWCA Archaeologists Omar Rice, B.A.; William Kendig, B.A.; Yareli Lopez, B.A.; and Christina Peterson, M.A., conducted an intensive-level archaeological and built environment survey of the 604-acre project area between December 15 and December 20, 2020. The intensive-level survey consisted of systematic surface inspection of all areas with transects walked at 15-m intervals or less to ensure that any surface-exposed artifacts and sites could be identified. SWCA examined the ground surface for the presence of prehistoric artifacts (e.g., flaked stone tools, tool-making debris, or stone milling tools); historic-era artifacts (e.g., metal, glass, or ceramics); sediment discoloration that might indicate the presence of a cultural midden; roads and trails; and depressions and other features that might indicate the former presence of structures or buildings (e.g., post holes or foundations).

A reconnaissance-level survey was undertaken of any areas deemed inaccessible (e.g., steep slopes or private property); professional judgment was used to assess whether areas were safe for pedestrian survey. In areas that were inaccessible, the reconnaissance survey consisted of inspecting the area from a safe distance, looking for indications that cultural resources were present. The project area was photographed using a digital camera and resource data were recorded with a handheld tablet with a submeter-accurate global positioning system (GPS) antenna using the Collector for ArcGIS application. Newly identified resources were documented on appropriate California Department of Parks and Recreation Series 523 forms, and all previously recorded resources were updated. All site records will be filed with the SCIC. All field notes, photographs, and records related to the current study are on file at the SWCA Pasadena, California, office.

RESULTS

CHRIS Records Search

Previously Conducted Cultural Resource Studies

Results of the cultural resources records search at the SCIC indicate that 34 cultural resource studies have been conducted in and within 0.8 km (0.5 mile) of the project area (see Appendix A). Of these, 20 intersect some portion of the project area. Details of the reports are described below in Table 1.

Table 1. Previous Cultural Resources Studies within 0.5 mile of the Project Area

Report No.	Author / Affiliation	Year	Study Title	Relationship to Project Area
IM-00010	Ellis, Robert R., and Robert H Crabtree / Archaeological Research, Inc.	1974	Archaeological Impact Statement on East Mesa Areas 1 and 2, Imperial Valley, California	Within
IM-00011	Barker, Michael A. / Imperial Valley College Museum	1974	Preliminary Archaeological Assessment of the East Mesa, Imperial County, California	Within
IM-00053	Von Werlhof, Jay, and Sherilee Von Werlhof / Imperial Valley College Museum	1975	Archaeological Examinations of Certain Geothermal Test Well Sites in East Mesa Area, Imperial County, Report #2	Outside (within 0.5 mile)
IM-00098	Cupples, Sue Ann / Office Of Environmental Planning	1977	Archaeological Survey Report for a Proposed Material Site (Long)	Within
IM-00110	Von Werlhof, Jay, and Sherilee Von Werlhof / Imperial Valley College Museum	1977	Archaeological Examinations of Certain Geothermal Test Wells and Access Roads at East Mesa	Outside (within 0.5 mile)
IM-00112	Von Werlhof, Jay, and Sherilee Von Werlhof / Imperial Valley College Museum	1977	Archaeological Examination of Certain Test Bore Sites and Access Roads: East Mesa, Imperial County	Within
IM-00121	Swenson, James, and Don Lipp / UC Riverside Archaeological Research Unit	1977	Environmental Impact Evaluation: Assessment of Portions 0f East Mesa Geothermal Testing Area, Imperial County, California	Outside (within 0.5 mile)
IM-00142	Atlantis Scientific / Atlantis Scientific	1978	Draft Environmental Impact Report, Proposed 10 Mw Geothermal Power Plant, East Mesa Kgra Imperial County (Republic Geothermal, Inc.)	Within
IM-00144	Von Werlhof, Jay, and Sherilee Von Werlhof / Imperial Valley College Museum	1978	Archaeological Examinations of the Republic Geothermal Inc., Test Field	Within
IM-00147	Von Werlhof, Jay, and Sherilee Von Werlhof / Imperial Valley College Museum	1978	Archaeological Examinations of the Republic Geothermal Field, East Mesa	Outside (within 0.5 mile)
IM-00166	Pritchett, Lorraine / Imperial Valley College Museum	1978	Botanical Survey of Republic Geothermal Inc.'s Proposed 84 Mw Geothermal Generating Plant and Associated Field Development Operations	Outside (within 0.5 mile)
IM-00171	Von Werlhof, Jay, and Lorraine Pritchett / Imperial Valley College Museum	1979	Archaeological Examinations of the Sperry-Republic Geothermal Project, East Mesa	Outside (within 0.5 mile)
IM-00187	Eckhardt, William T. / Westec Services, Inc.	1979	Cultural Resource Inventory of Areas Affected by Reject Stream Replacement Projects	Within

Report No.	Author / Affiliation	Year	Study Title	Relationship to Project Area
IM-00189	Eckhardt, William / Westec Services, Inc.	1979	Cultural Resource Inventory of Areas Affected by Reject Stream Replacement Projects	Within
IM-00201	Von Werlhof, Jay, Karen Mcnitt, and Lorrain Pritchett / Imperial Valley College Museum	1979	Archaeological Examinations of the Republic Geothermal Field, East Mesa, Imperial County	Outside (within 0.5 mile)
IM-00203	Gallegos, Dennis / Westec Services, Inc.	1979	Class II Cultural Resource Inventory East Mesa and West Mesa Regions Imperial Valley, California, Volume I	Within
IM-00207	Davis, Emma Lou / Westec Services, Inc.	1980	Class II Cultural Resource Inventory East Mesa and West Mesa Regions Imperial Valley, California	Within
IM-00210	Von Werlhof, Jay, and Karen Mcnitt / Imperial Valley College Museum	1980	Archaeological Examinations of the Republic Geothermal Field, East Mesa, Imperial County	Within
IM-00224	Bureau of Land Management	1980	Draft Environmental Assessment Record East Mesa Non-Competitive Leases for Geothermal Exploration/Development	Within
IM-00240	Pritchett, Lorraine / Imperial Valley College Barker Museum	1981	Botanical Survey on Republic Geothermal, Inc. Leaseholds on East Mesa, Imperial County, Calif.	Outside (within 0.5 mile)
IM-00242	Von Werlhof, Jay / Imperial Valley College Barker Museum	1981	Archaeological Examinations of The Republic Geothermal, Inc., Study Area, East Mesa, Volume Viii	Outside (within 0.5 mile)
IM-00378	Schaefer, Jerry / Mooney-Levine And Associates	1987	The Ormesa - Iid Transmission Line and Ormesa Geothermal Pipeline Network Cultural Resources Survey and Testing Program, East Mesa, Imperial County, California	Within
IM-00383	Elling, C. Michael / Brian F. Mooney Associates	1987	An Intensive Archaeological Inventory in Sections 1, 4, 5, And 6 For the Ormesalli Geothermal Project, East Mesa, Imperial County, California	Within
IM-00388	Elling, C. Michael / Mooney-Levine And Associates	1987	An Intensive, Class III Cultural Resources Inventory for The Ormesa II Geothermal Project, East Mesa, Imperial County, California	Within
IM-00577	Gallegos, Dennis / Westec Services, Inc.	1986	Lake Cahuilla Prehistoric Occupation at Imp-4434 And Imp-5167, Imperial Valley, California	Outside (within 0.5 mile)
IM-00616	Von Werlhof, Jay / Imperial Valley College	1984	Archaeological Examinations for CBM Rancho Frontera Project, Calexico	Within
IM-00674	Bureau of Land Management	1994	Southern Arizona Transmission Project Preliminary Draft Environmental Impact Statement, Draft Environmental Impact Report, Draft Plan Amendment, DEIS/DEIR/DPA	Within
IM-00677	Dames & Moore / Dames & Moore	1993	Southern Arizona Transmission Project EIS/EIR, Cultural Resources Inventory Report, Draft	Within
IM-00682	Bureau of Land Management	1978	Cultural Resources Report for Republic Geothermal	Outside (within 0.5 mile)
IM-00718	York, Andrew L., and Tanya Wahoff / Kea Environmental	1999	Cultural Resources Survey Report for Proposed Geothermal Resource Pipelines 1 and 5, Ormesa Geothermal, Holtville, Imperial County, California	Outside (within 0.5 mile)

Report No.	Author / Affiliation	Year	Study Title	Relationship to Project Area
IM-01195	Imperial County Planning Department	2008	Procalamos Residential Subdivision Specific Plan (#07-0003) and Tentative Tract Map (Ttm #00972) - Assessor's Parcel Numbers 059-140-007-000, Et Al.	Outside (within 0.5 mile)
IM-01217	Mcginnis, Patrick, and Micahel Baksh / Tierra Environmental Services, Inc.	2006	Cultural Resource Survey for the Ormesa Geothermal Production Well 58-31 Project East Mesa, Imperial County, California	Outside (within 0.5 mile)
IM-01288	Ellis, Robert / Archaeological Research, Inc.	1973	Archaeological Impact Report on East Mesa - Area 1, Imperial Valley, California	Within
IM-01306	Wirth Associates, Inc / Wirth Associates, Inc	1980	Aps/SDG&E Interconnection Project Environmental Study Phase II Corridor Studies - Native American Cultural Resources Appendices	Within

Previously Recorded Cultural Resources

A total of 50 previously recorded cultural resources have been documented within a 0.8-km (0.5- mile) radius of the project area, three of which are located within the project area (P-13-008333, P-13-003213, and P-13-000304). These sites are summarized in Table 2. P-13-008333 (CA-IMP-7835) is the East Highline Canal; P-13-003213 (CA-IMP-35H) is a historic wagon trail; and site P-13-000304 (CA-IMP-304) is as temporary prehistoric campsite, likely present at the high stand of Lake Cahuilla. Details of the sites are presented below.

Table 2. Previously Recorded Resources within 0.5-mile of the Project Area.

Primary Number	Trinomial Number	Period	Resource Description	Recorded By, Affiliation	Year	Relationship to Project Area
P-13-000124	CA-IMP-000124	Prehistoric	Site composed of lithics, ceramics, and hearths	Malcolm Rogers	1930	Outside (Within 0.5-mile)
P-13-000280	CA-IMP-000280	Prehistoric	Site consisting of a temporary campsite with lithic scatter and ceramic scatter	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.; Ray Wilcox	1974; 1981	Outside (Within 0.5-mile)
P-13-000281	CA-IMP-000281	Prehistoric	Site consisting of a lithic scatter	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.	1974	Outside (Within 0.5-mile)
P-13-000283	CA-IMP-000283	Prehistoric	Site consisting of a temporary campsite and manufacturing area	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.	1974	Outside (Within 0.5-mile)
P-13-000284	CA-IMP-000284	Prehistoric	Site consisting of a temporary campsite and manufacturing area	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.	1974	Outside (Within 0.5-mile)
P-13-000285	CA-IMP-000285	Prehistoric, Historic	Multi-component site consisting of refuse scatter, lithic scatter, ceramic scatter, burials, and habitation debris	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.; Ed Collins, IVCM; J. Schaefer, Mooney-LeVine and Associates	1974; 1979; 1986	Outside (Within 0.5-mile)
P-13-000286	CA-IMP-000286	Prehistoric	Site consisting of habitation debris	Ellis, Crabtree, Arch. Research Inc.	1974	Outside (Within 0.5-mile)
P-13-000287	CA-IMP-000287	Prehistoric	Site consisting of a prehistoric campsite	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.	1974	Outside (Within 0.5-mile)

Primary Number	Trinomial Number	Period	Resource Description	Recorded By, Affiliation	Year	Relationship to Project Area
P-13-000288	CA-IMP-000288	Prehistoric	Site consisting of a campsite and process area	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.	1974	Outside (Within 0.5-mile)
P-13-000289	CA-IMP-000289	Prehistoric	Site consisting of a lithic scatter and campsite	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.	1974	Outside (Within 0.5-mile)
P-13-000290	CA-IMP-000290	Prehistoric	Site consisting of a lithic scatter and ceramic scatter	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.; Ed Collins	1974; 1981	Outside (Within 0.5-mile)
P-13-000292	CA-IMP-000292	Prehistoric	Site consisting of habitation debris, lithic scatter, ceramic scatter, and burials	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.; S. A. Cupples	1974; 1977	Outside (Within 0.5-mile)
P-13-000304	CA-IMP-000304	Prehistoric	Site consisting of a temporary campsite	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.	1974	Within
P-13-000306	CA-IMP-000306	Prehistoric	Site consisting of lithic scatter and ceramic scatter	Robert R. Ellis, Robert Crabtree, Arch. Research Inc.	1974	Outside (Within 0.5-mile)
P-13-002393	CA-IMP-002393	Prehistoric	Site consisting of ceramic sherds	Bill Nolta	1978	Outside (Within 0.5-mile)
P-13-002394	CA-IMP-002394	Prehistoric	Site consisting of ceramic sherds	Bill Nolta	1978	Outside (Within 0.5-mile)
P-13-002395	CA-IMP-002395	Prehistoric	Isolated Find	Bill Nolta	1978	Outside (Within 0.5-mile)
P-13-002396	CA-IMP-002396	Prehistoric	Site consisting of ceramic sherds and manos	Joe A. Vogel	1978	Outside (Within 0.5-mile)
P-13-002397	CA-IMP-002397	Prehistoric	Site consisting of ceramic sherds	Joe A. Vogel	1978	Outside (Within 0.5-mile)
P-13-002398	CA-IMP-002398	Prehistoric	Isolated Find	Bill Nolta	1978	Outside (Within 0.5-mile)
P-13-002399	CA-IMP-002399	Prehistoric	Site consisting of ceramic sherds and lithics	Joe A. Vogel	1978	Outside (Within 0.5-mile)
P-13-002400	CA-IMP-002400	Prehistoric	Isolated Find	Bill Nolta	1978	Outside (Within 0.5-mile)
P-13-002401	CA-IMP-002401	Prehistoric	Site consisting of ceramic sherds (fully collected)	Joe A. Vogel	1978	Outside (Within 0.5-mile)
P-13-002472	CA-IMP-002472	Prehistoric	Site consisting of ceramic sherds and lithics	Jay Von Werlhof	1978	Outside (Within 0.5-mile)
P-13-003071	CA-IMP-003071	Prehistoric	Site consisting of ceramic sherds	B. Hunter	2009	Outside (Within 0.5-mile)
P-13-003072	CA-IMP-003072	Prehistoric	Site consisting of ceramic sherds	W. McManus	2009	Outside (Within 0.5-mile)
P-13-003213	CA-IMP-003213	Historic	Site consisting of wagon trail	W. McManus	2009	Within
P-13-003827	CA-IMP-003827	Prehistoric	Site consisting of a lithic scatter	Imperial Valley College Museum	2009	Outside (Within 0.5-mile)
P-13-003828	CA-IMP-003828	Prehistoric	Site consisting of a temporary habitation area	Imperial Valley College Museum	2009	Outside (Within 0.5-mile)

Primary Number	Trinomial Number	Period	Resource Description	Recorded By, Affiliation	Year	Relationship to Project Area
P-13-003829	CA-IMP-003829	Prehistoric	Site consisting of a lithic scatter	Imperial Valley College Museum	2009	Outside (Within 0.5-mile)
P-13-003843	CA-IMP-003843	Prehistoric	Site consisting of ceramic sherds and lithics	Imperial Valley College Museum	2009	Outside (Within 0.5-mile)
P-13-003844	CA-IMP-003844	Prehistoric	Site consisting of a lithic scatter	Imperial Valley College Museum	2009	Outside (Within 0.5-mile)
P-13-003845	CA-IMP-003845	Prehistoric	Site consisting of a temporary habitation area	Imperial Valley College Museum	2009	Outside (Within 0.5-mile)
P-13-004430	CA-IMP-004430	Prehistoric	Isolated Find	Ed Collins	2009	Outside (Within 0.5-mile)
P-13-004431	CA-IMP-004431	Prehistoric	Site consisting of ceramic sherds and lithic scatter	Ed Collins	2009	Outside (Within 0.5-mile)
P-13-004432	CA-IMP-004432	Prehistoric	Site consisting of a habitation area	Ed Collins	2009	Outside (Within 0.5-mile)
P-13-004435	CA-IMP-004435	Prehistoric	Site consisting of ceramic sherds and lithics	Ed Collins	2009	Outside (Within 0.5-mile)
P-13-004436	CA-IMP-004436	Prehistoric	Site consisting of ceramic sherds and lithics	Ed Collins	2009	Outside (Within 0.5-mile)
P-13-004451	CA-IMP-004451	Prehistoric	Site consisting of a geoglyph	Ray Wilcox	2009	Outside (Within 0.5-mile)
P-13-004452	CA-IMP-004452	Prehistoric	Site consisting of ceramic sherds	Ray Wilcox	2009	Outside (Within 0.5-mile)
P-13-004457	CA-IMP-004457	Prehistoric	Isolated Find	Ray Wilcox	2009	Outside (Within 0.5-mile)
P-13-004458	CA-IMP-004458	Prehistoric	Site consisting of ceramic sherds	Ray Wilcox	2009	Outside (Within 0.5-mile)
P-13-004459	CA-IMP-004459	Prehistoric	Isolated Find	Ray Wilcox	2009	Outside (Within 0.5-mile)
P-13-004460	CA-IMP-004460	Prehistoric	Site consisting of ceramic sherds	Ray Wilcox	2009	Outside (Within 0.5-mile)
P-13-004465	CA-IMP-004465	Prehistoric	Isolated Find	A. Noah	2009	Outside (Within 0.5-mile)
P-13-005167	CA-IMP-005167	Prehistoric	Site consisting of a habitation area	IVC Barker Museum	2009	Outside (Within 0.5-mile)
P-13-005490	CA-IMP-005490	Prehistoric	Site consisting of ceramic sherds	Brian F. Mooney Associates	2009	Outside (Within 0.5-mile)
P-13-006071	CA-IMP-006071	Prehistoric	Site consisting of a temporary habitation area	ERC Environmental	2009	Outside (Within 0.5-mile)
P-13-008333	CA-IMP-007835	Historic	East Highline Canal	KEA Environmental, Inc.	2009	Within
P-13-011390	CA-IMP-010330	Prehistoric	Site consisting of ceramic sherds and lithics	Tierra Environmental Services	2010	Outside (Within 0.5-mile)

P-13-000304/CA-IMP-304

Site P-13-000304/CA-IMP-304 was recorded in 1974 by Robert R. Ellis and Robert Crabtree of Archaeological Research Inc., who described it as a prehistoric archaeological site representing a temporary campsite. This determination was made due to similar sites being found at similar elevations elsewhere in the region, which would have placed them adjacent to Lake Cahuilla during its highest stand. No further information or description is available for this resource. It is unknown whether the site has been previously evaluated for eligibility for the NRHP or CRHR.

P-13-003213/CA-IMP-3213

Site P-13-003213/CA-IMP-3213 was recorded in 2009 based on a reference in the General Land Office (GLO). The site is a portion of a north-south-running wagon trail, presumably dating to the historic period. No further information or description is available for this resource, and its location on the ground, and whether it actually exists, does not appear to have been confirmed. Indeed, its location in the site record is identified by coordinates rather than a map, indicating uncertainty in its location. It is not known whether the site has been previously evaluated for eligibility for the NRHP or CRHR, but it seems unlikely.

P-13-008333/CA-IMP-7835

Site P-13-008333/CA-IMP-785, the East Highline Canal, was first recorded by KEA Environmental, Inc., in 1998, and was described as a dirt irrigation canal segment that had been recently lined with cement segments. It was revisited by HDR Engineering in 2000, by EDAW Inc. in 2005 and 2008, and by the Chambers Group in 2012, before being last updated in 2016 by ASM Affiliates.

Built prior to 1914, the East Highline Canal was part of the All American Canal System (CA-IMP-7130H), an extensive system of irrigation canals that opened in 1940. The site is a linear canal feature that runs from the Alamo River to Niland and varies between 42 and 105 feet in width. It is contained within earthen berms, and while originally the entire length was earthen, several portions have been lined with concrete during the past century. This resource, and associated segments, has been previously recommended eligible for the NRHP and CRHR under Criteria A/1 and C/3 with a status code of 3D, indicating that it appears eligible as a contributing element of a CRHR-eligible district, based on survey evaluation.

Archival Research and Sensitivity Analysis

As noted, historic aerial imagery indicates that the majority of the project site, with the exception of a north-south portion east of and alongside the All American Canal, has been under cultivation since at least 1953 (the date of the earliest available photograph) (historicaerials.com 2021). The depth of disturbance caused by cultivation is unknown. These agricultural activities have no doubt impacted any archaeological resources that might once have occurred there, and may explain why the known resources, all historic-era trash scatters (discussed below), occur within the western, undeveloped portion of the project site. The same can be said of the gravel quarry seen on the topographic maps in the west-central portion of the project site, at the edge of the East Mesa, a broad, elevated, and generally flat expanse extending eastward from the trough of the Salton Sea. Any quarrying operations would have destroyed archaeological resources in this location. The records search shows that 50 previously recorded resources occur within 0.5-mile of the project site. Two of these are historic-era resources, one is a multicomponent site, and the remaining 47 are prehistoric sites or isolates. However, many of these occur to the west of the site, in the vicinity of Holtville and the floodplain of the Alamo River and its many branches, which would have had more water and associated resources historically and prehistorically. The project site

itself sits at the edge of the East Mesa, which is an area generally lacking in water, and would have been situated just beyond the last high stand of Lake Cahuilla. Previously recorded sites within the vicinity of the project site and also within the East Mesa typically are sparse, surficial lithic or ceramic scatters. Interestingly, the site record for the single known prehistoric site within the project site (P-13-000304) is plotted in the southern half of the site, within as area of cultivation, but the site record itself notes that no artifacts or features were identified. It is unclear why this is the case. The search of the SLF at the NAHC returned negative results.

The geology in the project area has been mapped by Strand (1962) at a scale of 1:250,000. Extending in broad north-south bands, the surficial geology of the project area consists of lacustrine sediments (Ql) in the western third of the project site, younger alluvial sediments (Qal) through the central portion, and dune deposits (Qs) along the eastern edge. Based on surface evidence, however, the younger alluvial sediments actually appear to extend further west, in which case the lacustrine sediments occupy only a very small portion of the western edge of the projects site. Both the surficial younger alluvial sediments and lacustrine sediments date from the late Pleistocene through the Holocene, and so could potentially contain buried archaeological resources, though at greater (but unknown) depths the sediments increase in age to the point where they would be too old to contain archaeological resources. The dune deposits are recent, typically are active, and can often obscure both buried and surficial archaeological resources. Within the project site, however, they occur within an area of cultivation and likely have been removed or displaced. While the geologic mapping indicates that there is a potential for buried archaeological resources within the project site, all know resources within the same landforms, as identified through the records search, appear to be sparse surface manifestations. Further, it would be expected that tilling for agricultural activities would have brought to the surface any evidence of an extensive buried deposit, but this is not the case. Given these factors, as well as the generally excellent surface visibility within the project site (discussed below), the potential for buried resources is considered low.

Intensive Pedestrian Survey

Conducted between December 15 and 20, 2020, the intensive-level archaeological and built environment survey covered the full project area (Figure 4) with the exception of a small portion of private land that was determined unsafe to survey due to aggressive dogs, and two separate portions of land that were plastic-lined reservoirs. In all three locations reconnaissance survey techniques were used. Visibility over the whole project area varied between poor (0%–25%) and great (51%–75%) (Figure 5 through Figure 8). The project area consisted primarily of flat open space. Sediments were a light brown coarse silty sand formed from alluvial deposits. Vegetation consisted of shrubs and seasonal grasses and forbs consistent with East Mesa-Yuha Desert habitat, including creosote, bursage, and saltbush. In addition, large parts of the project area consisted of agricultural fields. One previously recorded archaeological site (P-13-008333/CA-IMP-785) was re-located, and one new historic-era isolated find and five new historic-era archaeological sites were identified and recorded. These are described below. Two previously recorded sites (P-13-003213/CA-IMP-003213 and P-13-000304/CA-IMP-000304) were not re-located during the survey.

Figure 4: Results Map
(Confidential)*

***Contains confidential information. A copy is on file with the Imperial County Development Services Department.**

Figure 5. Overview of project area, view to the northwest, 12/16/2020.

Figure 6. Overview of project area, view to the north, 12/17/2020.

Figure 7. Overview of project area, view to the south, 12/20/2020.

Figure 8. Overview of project area, view to the north, 12/20/2020.

Newly Documented Resources

SWCA identified five historic-era archaeological sites and one historic-era isolated find. Each is described below, followed by an evaluation of each sites' eligibility for the CRHR.

SWCA-64085-S-001

SWCA-64085-S-001 was recorded on December 15, 2020, by SWCA archaeologists as a historic-era refuse scatter consisting mainly of cans and glass bottle fragments, with modern refuse throughout the site. The site contains two features, Features 1001 and 1002, which are both refuse concentrations. Located 250 feet east of East Highline Canal and 2.5 miles north of Interstate 8 (I-8), just east of Date City within Imperial Country, the site measures 290 feet (E-W) × 229 feet (N-S). It is on an alluvial plain with an open aspect. Sediments are pink (Munsell 7.5YR 7/3) silty sandy loam with subrounded granitic clasts. Visibility is fair excellent (76-100%) with vegetation consisting primarily of creosote bush, saltbush, and fiddleneck.

Feature 1001 consists of a discrete historic-era refuse concentration composed primarily of cans and bottles (Figure 9). In total, 94 cans were documented, including church-key opened cans, food cans, rotary-opened food cans, tear-tab food cans, and sanitary cans. Glass artifacts include more than 100 glass fragments which are primarily colorless glass, but include green and amber glass as well. Also recorded were two glass bottle bases with maker's marks: one from the Brockway Glass Company manufactured between 1933 and 1996, and the other from the Madera Glass Company manufactured between 1971 and 2000 (Lindsey, 2021).

Feature 1002 consists of a discrete historic-era refuse concentration near the center of the site and is composed primarily of cans and bottles, with some miscellaneous metal objects and ceramics also present (Figure 10). Ceramics include Fiestaware cups and plate fragments, and ironstone. Various metal objects include barbed wire, metal fragments, and wire. In total, 42 cans were recorded, consisting of tobacco tins, sanitary cans, and fuel cans. Glass artifacts include more than 120 glass fragments which are primarily colorless and amber glass, but also include cobalt, aqua, green, and milk glass. Also recorded were six glass bottle bases: one with a W.J. Latchford Glass Company maker's mark dating to between 1957 and 1989; one with a Latchford-Marble Glass Company maker's mark dating to between 1939 and 1957; one with a Obear-Nestor Glass Company maker's mark dating between to 1915 and 1978; one with a 1942 Owens-Illinois Glass Company maker's mark; one with a 1943 Owens-Illinois Glass Company maker mark; and one with a Hazel-Atlas Glass Company maker's mark dating to between 1923 and 1982 (Lindsey, 2021).

The scatter likely is a product of multiple dumping episodes and may be associated with Graeser Road, which passes near the site, or with a nearby ranch house located approximately 820 feet southeast of the site and outside the project area. Based on overlap in manufacturing dates, artifacts provide a most likely age range of the late 1950s to late 1960s, while modern refuse across the site dates from the late 1970s to early 2000s, both within and outside the site boundary.

Figure 9. Overview of WCA-64085-S-001, Feature 1001, view to the north 12/15/2020.

Figure 10. Overview of SWCA-64085-S-001, Feature 1002, view to the west 12/15/2020.

CRHR Eligibility Recommendation

SWCA recommends this resource ineligible for the CRHR under Criterion 1, as it is not associated with local or regional history or the cultural heritage of California or the United States. As a historic-era refuse scatter consisting mainly of cans and glass bottle fragments and lacking significant historic features or intra-site patterning, this site cannot be reasonably associated with events in history. The refuse scatter likely is the result of episodic dumping next to the road, and does not provide any additional data. SWCA recommends SWCA-64085-S-001 ineligible for the CRHR under Criterion 2, as is not associated with the lives of persons important to local, California, or national history; as a roadside refuse deposit consisting of multiple dumping episodes spanning several decades, and mixed with modern trash, the refuse scatter cannot be linked to specific people. SWCA recommends this resource ineligible for the CRHR under Criterion 3, as it does not embody distinctive characteristics of a type, period, region, or method of construction, does not represent the work of a master, and does not possess high artistic values; rather, it is an unstructured refuse deposit. The site is a surficial can scatter and the current recordation has captured the information value of this resource. In addition, according to field observations of the ground surface and the context of the artifacts, the potential for subsurface deposits is low in this location. As such, the site is not likely to yield additional information important to the history of the local area, California, or the nation. Therefore, SWCA recommends SWCA-64085-S-001 ineligible for the CRHR under Criterion 4.

Site SWCA-64085-S-001 is recommended ineligible for the CRHR under any criteria. Furthermore, SWCA recommends that the site does not meet the criteria for a "unique archaeological resource" for the purposes of CEQA.

SWCA-64085-S-002

SWCA-64085-S-002 was recorded on December 15, 2020, by SWCA archaeologists as a historic-era refuse scatter consisting mainly of cans and glass bottle fragments, with modern refuse scattered throughout the site (Figure 11). The site contains two features, Features 1013 and 1014, both of which are refuse concentrations. Located 700 feet east of East Highline Canal and 2.3 miles north of I-8, just east of Date City within Imperial Country, the site measures 275 feet (N-S) × 150 feet (E-W). It is on an alluvial plain with an open aspect, and sediments are pink (Munsell 7.5YR 7/3) silty sandy loam with subrounded granitic clasts. Visibility is excellent (76-100%) with vegetation consisting primarily of creosote bush, saltbush, and fiddleneck.

Feature 1013 consists of a large historic-era refuse concentration, primarily composed of cans and glass bottle fragments. Due to the size and artifact density of the feature, a smaller area within the larger feature was selected to serve as a representative sample (PD 1015). PD 1015 measured 3 m (E-W) × 2 m (N-S). In total, 125 cans were recorded within the sample, consisting of sardine cans, paint cans, rotary-opened food cans, church key–opened beverage cans, bimetal beverage cans, aerosol cans, and spice tins. More than 200 glass artifacts were recorded in the sample, primarily colorless glass fragments but also amber, green, and milk glass fragments, as well as complete colorless and amber glass bottles. Six maker's marks on bottle bases were identified: three with Owens-Illinois Glass Company maker's marks manufactured since 1954; one with a Latchford Glass Company maker's mark manufactured between 1930 and 1989; and one with a Thatcher Manufacturing Company maker's marks manufactured between 1944 and 1985 (Lindsey, 2021).

Feature 1014 consists of a discrete historic-era refuse concentration composed primarily of cans and bottles (Figure 12). Due to the size and density of the feature, an area was delineated to serve as a representative sample (PD 1016). PD 1016 measured 1 m (E-W) × 1 m (N-S) and contained a total of 28 cans, consisting of church key–opened beverage cans, sanitary cans, an oil filter, and a spice tin.

Nineteen glass artifacts were recorded within the sample, including colorless glass bottle fragments, milk glass bottle fragments, and a complete colorless glass bottle with a Kerr Glass Manufacturing Company maker's mark dating between 1969 and 1996 (Lindsay, 2021).

This refuse scatter appears to be a product of multiple dumping episodes associated with Graeser Road, which passes by the site Based on overlap in manufacturing dates, artifacts provide a most likely age range for the site of the late 1930s to late 1960s, while modern refuse across the site dates from the late 1970s to early 2000s, within and outside the site boundary. This indicates decades of repeated dumping events.

CRHR Eligibility Recommendation

SWCA recommends this resource ineligible for the CRHR under Criterion 1, as it is not associated with local or regional history or the cultural heritage of California or the United States. As a historic-era refuse scatter consisting mainly of cans and glass bottle fragments and lacking significant historic features or intra-site patterning this site cannot be reasonably associated with events in history. The refuse scatter likely is the result of episodic dumping next to the road and does not provide any additional data. SWCA recommends SWCA-64085-S-002 ineligible for the CRHR under Criterion 2, as is not associated with the lives of persons important to local, California, or national history; as a roadside refuse deposit consisting of multiple dumping episodes spanning several decades, and mixed with modern trash, the refuse scatter cannot be linked to specific people. SWCA recommends this resource ineligible for the CRHR under Criterion 3, as it does not embody distinctive characteristics of a type, period, region, or method of construction, does not represent the work of a master, and does not possess high artistic values; rather, it is a refuse deposit lacking in meaningful features or structure. The site is a surficial can scatter and the current recordation has captured the information value of this resource. In addition, according to field observations of the ground surface and the context of the artifacts, the potential for subsurface deposits is low in this location. As such, the site is not likely to yield additional information important to the history of the local area, California, or the nation. Therefore, SWCA recommends SWCA-64085-S-002 ineligible for the CRHR under Criterion 4.

Site SWCA-64085-S-002 is recommended ineligible for the CRHR under any criteria. Furthermore, SWCA recommends that the site does not meet the criteria for a "unique archaeological resource" for the purposes of CEQA.

Figure 11. Overview of SWCA-64085-S-002, view to the northwest.

Figure 12. Overview of SWCA-64085-S-002, sample unit PD 1016, view to the north-northwest.

SWCA-64085-S-003

SWCA-64085-S-003 was recorded on December 16, 2020, by SWCA archaeologists as a historic-era refuse scatter consisting mainly of cans and glass bottle fragments, with modern refuse noted throughout the site (Figure 13). The site contains two features, Features 1024 and 1027, both of which are refuse

concentrations. The site is located 600 feet east of East Highline Canal and 2.3 miles north of I-8, just east of Date City within Imperial Country, measuring 260 feet (N-S) × 220 feet (E-W). It is on an alluvial plain with an open aspect. Sediments are pink (Munsell 7.5YR 7/3) silty sandy loam with subrounded granitic clasts. Visibility is excellent (76-100%), with vegetation consisting primarily of creosote bush, saltbush, and fiddleneck.

Feature 1024 consists of a large historic refuse concentration, composed primarily of cans and bottles. Due to the size and artifact density of the feature, two 1 × 1–m areas within the larger feature were selected as a representative sample (PDs 1025 and 1026). PD 1025 contained 97 cans, consisting of beverage cans, fruit cans, and paint cans (Figure 14). Also recorded was a single orange juice bottle with a Ball Brothers Glass Manufacturing Company maker's mark manufactured between 1933 and 1936, along with plastic buttons, rubber hose fragments, construction debris, and miscellaneous metal fragments. PD 1026 contained 68 cans, consisting of pull-tab bimetal beverage cans, milk cans, and rotary-opened fruit cans. Also recorded were glass cup fragments, partial bottles, and bottle fragments. Of these glass artifacts, four maker's marks were identified on bottle bases: one E. & J. Gallo maker's mark manufactured from 1958 to the present; one amber glass bottle with an Owens-Illinois Glass Company maker's mark manufactured beginning in 1954; and a clear flask bottle with a Fairmont Glass Works maker's mark manufactured between 1933 and 1968 (Lindsey, 2021).

Feature 1027 consists of a discrete historic-era refuse concentration, composed primarily of cans and bottles. Due to the size and density of the feature, a 1 × 1–m area was delineated as a representative sample (PD 1028). More than 75 cans were recorded within the sample, consisting primarily of bimetal pull tab beverage cans, but also including fruit cans, milk cans, and meat tins. Nine complete bottle bases were also recorded, all of colorless or amber glass, with three having identifiable maker's marks: one amber glass bottle with an Owens-Illinois Glass Company maker's mark manufactured beginning in 1954; one colorless glass bottle base with a Latchford Glass Company maker's mark manufactured between 1957 and 1989; and one amber glass bottle base with a Northwestern Glass Company maker's mark manufactured between 1931 and 1987 (Lindsey, 2021). Other artifacts recorded include construction debris, oil filters, and miscellaneous metal fragments.

The refuse scatter is likely a product of multiple dumping episodes, possibly associated with Graeser Road, which passes near the site, or with the nearby ranch house located 275 feet northeast of site and outside the project area. The likely date range for the site is the late 1950s to late 1960s, although there is evidence of modern agricultural and household refuse dating to the late 1970s to early 2000s within and outside the site boundary.

Figure 13. Overview of SWCA-64085-S-003, view to the south.

Figure 14. Overview of SWCA-64085-S-003, sample unit PD 1025, view to the southwest.

CRHR Eligibility Recommendation

SWCA-64085-S-003 was recorded on December 16, 2020, by SWCA archaeologists as a historic-era refuse scatter consisting mainly of cans and glass bottle fragments, with modern refuse throughout the site. SWCA recommends this resource ineligible for the CRHR under Criterion 1, as it is not associated with local or regional history or the cultural heritage of California or the United States. As a historic-era refuse scatter consisting mainly of cans and glass fragments and lacking historic features or intra-site patterning, this site cannot be reasonably associated with events in history. While the site contains a large amount of refuse and is possibly linked in a general way to a ranch house nearby (episodic refuse dumping), the association is uncertain, and the refuse scatter does not provide any additional data beyond what was recorded during the survey. SWCA recommends SWCA-64085-S-003 ineligible for the CRHR under Criterion 2, as it is not associated with the lives of persons important to local, California, or national history; as a roadside refuse deposit consisting of multiple dumping episodes spanning several decades, and mixed with modern trash, the refuse scatter cannot be linked to specific people. SWCA recommends this resource ineligible for the CRHR under Criterion 3, as it does not embody distinctive characteristics of a type, period, region, or method of construction, does not represent the work of a master, and does not possess high artistic values; rather, it is an unstructured refuse deposit. The site is a surficial can scatter and the current recordation has captured the information value of this resource. In addition, according to field observations of the ground surface and the context of the artifacts, the potential for subsurface deposits is low in this location. As such, the site is not likely to yield additional information important to the history of the local area, California, or the nation. Therefore, SWCA recommends SWCA-64085-S-003 ineligible for the CRHR under Criterion 4.

Site SWCA-64085-S-003 is recommended ineligible for the CRHR under any criteria. Furthermore, SWCA recommends that the site does not meet the criteria for a "unique archaeological resource" for the purposes of CEQA.

SWCA-64085-S-004

SWCA-64085-S-004 was recorded on December 17, 2020, by SWCA archaeologists as a historic-era refuse scatter consisting mainly of cans and glass bottle fragments with modern refuse noted throughout the site (Figure 15). The site contains one feature, Feature 1043, which is a refuse concentration. The site is located 200 feet east of East Highline Canal and 2.4 miles north of I-8, just east of Date City within Imperial Country. It measures 410 feet (N-S) × 120 feet (E-W) and is on an alluvial plain with an open aspect. Sediments are pink (Munsell 7.5YR 7/3) silty sandy loam with subrounded granitic clasts. Visibility is excellent (76-100%), with vegetation consisting primarily of creosote bush, saltbush, and fiddleneck.

Feature 1024 consists of a large domestic refuse concentration (Figure 16). Due to the size and artifact density of the feature, a 1 × 1–m area within the larger feature was selected as a representative sample (PD 1025). Materials observed within the sample include more than 150 rotary-opened sanitary meat cans, more than 20 large church key–opened sanitary juice cans, more than 50 rotary-opened food cans, four aerosol cans, and three bimetal pull-tab beverage cans. Glass artifacts included six external thread finish condiment bottles, two perfume bottles with spray tops, and six food jars. Nine complete glass bottles with maker's marks were identified: one colorless glass bottle with a Ball Brothers Glass Manufacturing Company maker's mark manufactured between 1933 and 1936; one colorless flask bottle with a Ball Brothers Glass Manufacturing Company maker's mark manufactured between 1933 and 1936; four bottles (three colorless and one green) with Owens-Illinois Glass Company maker's marks manufactured beginning in 1954; one colorless bottle with a Pierce Glass Company maker's mark manufactured between 1905 and 1987; one colorless glass bottle with a Glass Containers Corporation maker's mark manufactured between 1967 and 1987 (Lindsey, 2021); and a cobalt blue Noxzema bottle

first sold in 1914. Additional materials observed within the sample area include five fragments of cut mammal bones (likely cow), aluminum foil fragments, four aluminum food trays, a colorless decorative glass stem, a plastic hypodermic cap, miscellaneous plastic fragments, a plastic lipstick case, a plastic detergent bottle, and three aluminum pull-tab beer cans.

The refuse scatter is likely a product of multiple dumping episodes, possibly associated with Graeser Road, which passes near the site, or with the nearby ranch house located 275 feet northeast of site and outside the project area. The site likely dates from the early 1900s to the late 1960s, though there is evidence of modern agricultural and household refuse that dates from the late 1970s to the early 2000s, both within and outside the site boundary. The presence of modern materials intermixed within the site and within the feature indicate continued use as a dump to the present day.

Figure 15. Overview of SWCA-64085-S-004, view to the north.

Figure 16. Overview of SWCA-64085-S-004, sample unit PD 1044, view to the northeast.

CRHR Eligibility Recommendation

SWCA-64085-S-004 was recorded on December 16, 2020, by SWCA archaeologists as a historic-era refuse scatter consisting mainly of cans and glass bottle fragments, with modern refuse intermixed throughout the site. SWCA recommends this resource ineligible for the CRHR under Criterion 1, as it is not associated with local or regional history, or the cultural heritage of California or the United States. As a historic-era refuse scatter consisting of more than 200 cans and at least 18 glass bottle fragments that lacks historic features or intra-site patterning, the site cannot be reasonably associated with events in history. While the site is possibly linked in a general way to a nearby ranch house through episodic refuse dumping, the association is uncertain, and the refuse scatter does not provide any additional data beyond what was recorded during the survey. SWCA recommends SWCA-64085-S-004 ineligible for the CRHR under Criterion 2, as it is not associated with the lives of persons important to local, California, or national history; as a roadside refuse deposit consisting of multiple dumping episodes spanning several decades, and mixed with modern trash, the refuse scatter cannot be linked to specific people. SWCA recommends this resource ineligible for the CRHR under Criterion 3, as it does not embody distinctive characteristics of a type, period, region, or method of construction, does not represent the work of a master, and does not possess high artistic values; rather, it is an unstructured refuse deposit. The site is a surficial can scatter and the current recordation has captured the information value of this resource. According to field observations of the ground surface and the context of the artifacts, the potential for subsurface deposits is low in this location. As such, the site is not likely to yield additional information important to the history of the local area, California, or the nation. Therefore, SWCA recommends SWCA-64085-S-004 ineligible for the CRHR under Criterion 4.

Site SWCA-64085-S-004 is recommended ineligible for the CRHR under any criteria. Furthermore, SWCA recommends that the site does not meet the criteria for a “unique archaeological resource” for the purposes of CEQA.

SWCA-64085-S-005

SWCA-64085-S-005 was recorded on December 17, 2020, by SWCA as a historic-era refuse scatter consisting primarily of cans and glass bottle fragments (Figure 17). The site is located 750 feet east of East Highline Canal, 200 feet west of an agricultural field, and 2.6 miles north of I-8, just east of Date City within Imperial Country. It measures 50 feet (E-W) × 36 feet (N-S). It is on an alluvial plain with an open aspect. Sediments are pink (Munsell 7.5YR 7/3) silty sandy loam with subrounded granitic clasts. Visibility is good (51%–75%) with vegetation consisting primarily of creosote bush, saltbush, and fiddleneck.

Recorded artifacts include 76 cans consisting of bimetal pull-tab beverage cans, rotary-opened fruit cans, meat tins, paint cans, and rotary-opened other food cans. Also recorded were 17 colorless and amber glass bottle fragments. In addition, four bottle base fragments with maker's marks were recorded: one colorless and one amber bottle base fragment, both with Owens-Illinois Glass Company maker's marks manufactured beginning in 1954; one colorless glass bottle base fragment with a Latchford Glass Company maker's mark manufactured between 1957 and 1989; and one colorless glass bottle base with a Thatcher Manufacturing Company maker's mark manufactured between 1944 and 1985 (Lindsey, 2021).

This refuse scatter dates to the mid-1940s at the earliest, and appears to be the result of a single dumping episode probably associated with the agricultural use of the area.

Figure 17. Overview of SWCA-64085-S-005, view to the north.

CRHR Eligibility Recommendation

SWCA-64085-S-005 was recorded on December 16, 2020, by SWCA archaeologists as a historic-era refuse scatter consisting of mainly cans and glass bottle fragments. SWCA recommends this resource ineligible for the CRHR under Criterion 1, as it is not associated with local or regional history or the cultural heritage of California or the United States. As a historic-era refuse scatter consisting of more than

75 cans and more than 20 glass bottle fragments that lacks historic features or intra-site patterning, the site cannot be reasonably associated with events in history. SWCA recommends SWCA-64085-S-005 ineligible for the CRHR under Criterion 2, as it is not associated with the lives of persons important to local, California, or national history; as a roadside refuse deposit, the refuse scatter cannot be linked to specific people. As a historic-era refuse scatter, SWCA recommends this resource ineligible for the CRHR under Criterion 3, as it does not embody distinctive characteristics of a type, period, region, or method of construction, does not represent the work of a master, and does not possess high artistic values; rather, it is an unstructured refuse deposit. The historic-era deposit is a surficial can and glass scatter, and the current recording has captured its information value. The site is a surficial can scatter and the current recordation has captured the information value of this resource. According to field observations of the ground surface and the context of the artifacts, the potential for subsurface deposits is low in this location and the refuse scatter does not provide any additional data beyond what was recorded during the survey. As such, the site is not likely to yield additional information important to the history of the local area, California, or the nation. Therefore, SWCA recommends SWCA-64085-S-005 ineligible for the CRHR under Criterion 4.

Site SWCA-64085-S-005 is recommended ineligible for the CRHR under any criteria. Furthermore, SWCA recommends that the site does not meet the criteria for a "unique archaeological resource" for the purposes of CEQA.

SWCA-64085-ISO-001

Historic-era isolated find SWCA-64085-ISO-001 was recorded on December 16, 2020, by SWCA archaeologists. This isolated find consists of two church key–opened cans, one with a crimped lap seam measuring 4-12/16 inches high by 2-10/16 inches in diameter, and one with an interlocking seam measuring 4-12/16 inches high by 2-10/16 inches in diameter. Located 288 m east of the East Highline Canal, it is on an alluvial plain with an open aspect. Sediments are pink (Munsell 7.5YR 7/3) silty sandy loam with subrounded granitic clasts (Figure 18). Visibility is excellent (76-100%) with vegetation consisting primarily of creosote bush.

CRHR Eligibility Recommendation

Given their lack of context and association, isolates are categorically considered ineligible for the CRHR.

Figure 18. Overview of SWCA-64085-ISO-001, view to the east.

Previously Documented Resources

SWCA re-located one previously recorded historic-era site, described below. The two previously recorded resources that were not re-located are also discussed below.

P-13-000304/CA-IMP-304

Site P-13-000304/CA-IMP-304 is a prehistoric archaeological site, described as a temporary campsite, recorded in 1974 by Robert R. Ellis and Robert Crabtree of Archaeological Research Inc. This determination was made due to similar sites being found at similar elevations elsewhere in the region, which would have placed them adjacent to Lake Cahuilla during its highest stand. Otherwise, no information is provided regarding the size or archaeological contents of the site. SWCA revisited the mapped location for this site on December 18, 2020. The site was not found and it likely that the site was destroyed during the project area's past use for agricultural purposes. While the presence of subsurface deposits could not be verified, it seems unlikely given the degree of disturbance from past agricultural use, and the older age of the underlying geologic sediments

CRHR Eligibility Recommendation

The resource appears to have been destroyed and was not evaluated for the CRHR.

P-13-003213/CA-IMP-3213

P-13-003213/CA-IMP-3213 was recorded in 2009 based on the GLO Survey Notes of R. C. Matthewson (1856). The resource is a portion of a north-south-running wagon trail. SWCA revisited the mapped location for this site on December 18, 2020. The site was not found. Considering the surficial nature of this type of resource it is likely that the site was destroyed during the project area's past use for

agriculture. It may also be the case that its location, taken as it was from notes over 150 years old, has not been precisely plotted and so does not occur within the project area.

CRHR Eligibility Recommendation

The resource appears to no longer exist or is incorrectly plotted within the project area. It was not evaluated for the CRHR.

P-13-008333/CA-IMP-7835

P-13-008333/CA-IMP-7835, the East Highline Canal, was first recorded by KEA Environmental, Inc., in 1998 as a dirt irrigation canal segment that had been recently lined with cement segments. It was revisited in 2000 by HDR Engineering, by EDAW Inc. in 2005 and 2008, by Chambers Group in 2012, before being last updated in 2016 by ASM Affiliates. SWCA revisited a segment of the East Highline Canal that crosses through project area. The segment of the canal is 0.5 mile long, 130 feet wide, and 7 feet deep and contains one structure, an all-wood bridge (PD 1059) for Nelson Pit Road. The canal runs north-south along the western edge of the northern half of the project site and the bridge is located at the southern end of the portion within the project area.

This half-mile segment documented in the project area is a concrete-lined earthen canal and is used as the primary source of water for irrigation in the region. SWCA identified no changes to the canal itself from previous recordings, but updated the site with a description of the Nelson Pit Road bridge as part of the site (Figure 19 and Figure 20). The bridge crosses the canal and is used primarily as an access road for a nearby agricultural field and is associated with the establishment of the agricultural fields in the 1950s. The bridge is composed of 12-inch-diameter beams used as the main footings along with wood beams of 12 inches wide, 12 inches thick, and 16 feet long, and 6 to 8 inches wide, 4 inches thick, and 20 feet long (Figure 21). Asphalt has been added to the top of the bridge, likely when Nelson Pit Road was repaved.

CRHR Eligibility Recommendation

P-13-008333/CA-IMP-7835 has been previously recommended eligible for the NRHP and CRHR under Criteria A/1 and C/3, with a status code of 3D, indicating that it appears eligible as a contributing element of a CRHR-eligible district, based on survey evaluation.

Figure 19. Overview of P-13/008333/CA-IMP-7835, view to the north.

Figure 20. Overview of East Highline Canal, view to the west.

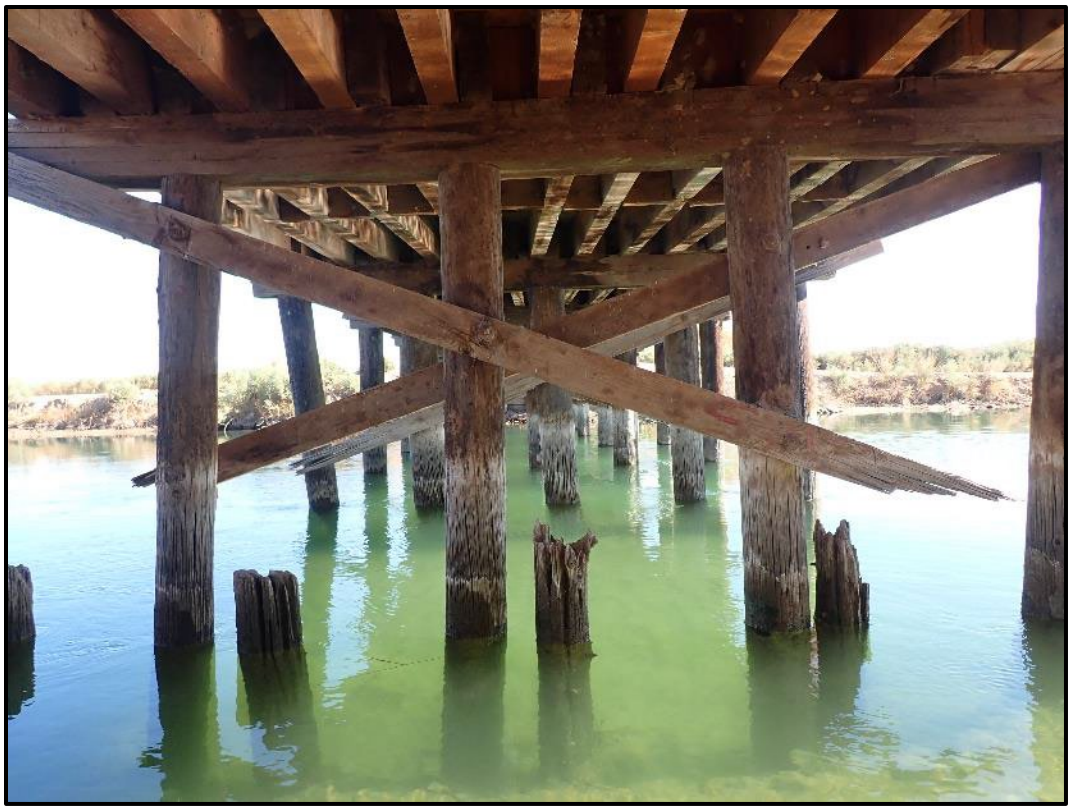

Figure 21. Detail of bridge construction, view to the west.

SUMMARY AND RECOMMENDATIONS

The goal of this study was to identify archaeological resources that could be affected by ground-disturbing activities associated with the proposed Viking Solar Energy Storage project. A record search conducted by the SCIC identified 50 previously recorded resources in and within a 0.8-km (0.5-mile) radius of the project area. Of these 50 resources, three are mapped within the project area itself. The search of the SLF maintained by the NAHC was negative within the project area. The NAHC noted that negative results may not indicate the absence of Native American cultural resources in the area and provided a contact list of 16 Native American tribal organizations that may have knowledge of cultural resources in or near the study area. The County, as lead agency, will conduct its own Native American consultation for the project, as part of its AB 52 responsibilities.

SWCA staff conducted an intensive-level pedestrian survey of the project area. As part of the fieldwork, SWCA archaeologists revisited the locations of the three previously recorded resources but were unable to find two of them (P-13-000304/CA-IMP-304 and P-13-003213/CA-INY-3213). Both are presumed either misplotted or destroyed. As a consequence, the two resources will not be impacted by the project.

The third previously recorded resource (P-13-008333/CA-INY-7835) is the East Highline Canal, which has been previously recommended eligible for the CRHR. It therefore qualifies as a historical resource under CEQA, and any adverse impacts to the resources could constitute a significant impact on the environment. This resource will be left in place and avoided and as a consequence will not be impacted by the project.

SWCA archaeologists also documented six new archaeological resources: five historic-era refuse scatters (SWCA-64085-S-001 through SWCA-64085-S-005) and one historic-era isolated find (SWCA-64085-ISO-001). SWCA evaluated each of these newly recorded resources for CRHR eligibility, based on surface indicators, and none of the newly identified resources are recommended eligible for the CRHR under any criteria. Since the resources are not considered historical resources for the purposes of CEQA, they need not be considered further.

As a result of this assessment, SWCA concludes that the project as proposed will not have a significant impact on known cultural resources. Further, a buried site sensitivity assessment suggests that the potential for buried archaeological resources within the project site appears to be low, particularly in light of the decades of agricultural activity across most of the site. However, there is always a possibility that currently unknown resources could be identified during ground-disturbing activities. In the event that previously unidentified resources are exposed during ground disturbance, work in the immediate vicinity of the find must stop until a qualified archaeologist can evaluate the significance of the find according to the CRHR. Ground-disturbing activities may continue in other areas. If the discovery proves significant under CEQA (Section 15064.5f; PRC 21082) and cannot be avoided by the project, additional work such as archaeological and Native American monitoring, archaeological testing, or data recovery excavation may be warranted. Should any prehistoric or historic-era Native American artifacts be encountered, additional consultation with NAHC-listed Native American tribal groups should be conducted immediately.

The discovery of human remains is always a possibility during ground disturbance; Section 7050.5 of the State of California Health and Safety Code states that no further disturbance shall occur until the Imperial County Coroner has made a determination of origin and disposition of the remains pursuant to PRC 5097.98. The Imperial County Coroner must be notified of the find immediately. If the human remains are determined to be prehistoric, the Coroner will notify the NAHC, which will determine and notify an MLD. The MLD shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

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1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity* 32(2):168–185.

1968 Cultural Tradition and Ecological Adaptation on the Southern California Coast. In *Archaic Prehistory in the Western United States: Symposium of the Society for American Archaeology, Santa Fe, 1968*. Eastern New Mexico University Contributions in Anthropology Vol. 1, No. 3. Eastern New Mexico University, Portales.

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Waters, Michael R.

1982 The Lowland Patayan Ceramic Typology. In *Hohokam and Patayan*, edited by R. H. McGuire and M. B. Schiffer, pp. 537–570. Academic Press, New York.

1983 Late Holocene Lacustrine Chronology and Archaeology of Ancient Lake Cahuilla, California. *Quaternary Research* 19:373–387.

Wilkman, Jon, and Nancy Wilkman

2006 *Picturing Los Angeles*. Gibbs Smith, Salt Lake City, Utah.

APPENDIX A
California Department of Parks and Recreation Forms (Confidential)*

***On file with the Imperial County Development Services Department**

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H-2

AB-52 Consultation Letters and Responses

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Local Government Tribal Consultation List Request

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

Type of List Requested

■ **CEQA Tribal Consultation List (AB 52)** – ***Per Public Resources Code § 21080.3.1, subs. (b), (d), (e) and 21080.3.2***

☐ **General Plan (SB 18)** - ***Per Government Code § 65352.3.***

Local Action Type:

☐ **General Plan** ☐ **General Plan Element** ☐ **General Plan Amendment**

☐ **Specific Plan** ☐ **Specific Plan Amendment** ☐ **Pre-planning Outreach Activity**

Required Information

Project Title: Vikings Solar Energy & Battery Storage Project

Local Government/Lead Agency: Imperial County Planning & Devlopment Services Department

Contact Person: Diana Robinson, Planner III

Street Address: 801 Main Street

City: El Centro **Zip:** 92243

Phone: (442) 265-1736 **Fax:** (442) 265-1735

Email: DianaRobinson@co.imperial.ca.us

Specific Area Subject to Proposed Action

County: Imperial **City/Community:** Holtville (nearest City)

Project Description:

Construction of a 150 MW PV solar energy facility with an integrated battery storage system not to exceed 300 MW on approximately 604 acres of land located 5.5 miles east of the City of Holtville within the County of Imperial. The Project site is designated and zoned for agricultural and recreation/open space use within the County of Imperial's Renewable Energy Overlay Zone. The Project includes a ground mounted PV solar power generating system, supporting structures, on-site substation, battery storage system, and internal access roads. The Electrical energy produced would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District's 230 kV "KN & KS" line via a single overhead gen-tie line 120 feet in height. The Project proposes to utilize either thin film or crystalline solar PV technology modules mounted either on fixed frames or horizontal single-axis tracker systems. The proposed battery energy storage system would be constructed on the Project site and consist of either lithium ion or flow batteries. The batteries would either be housed in storage containers or buildings with a maximum height of 10 feet.

Additional Request

■ **Sacred Lands File Search** - ***Required Information:***

USGS Quadrangle Name(s): Holtville East

Township: 15 South **Range:** 16 East **Section(s):** 36

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NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

SECRETARY
Merri Lopez-Keifer
Luiseño

PARLIAMENTARIAN
Russell Attebery
Karuk

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Julie Tumamait-Stenslie
Chumash

COMMISSIONER
[**Vacant**]

COMMISSIONER
[**Vacant**]

COMMISSIONER
[**Vacant**]

EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

May 19, 2021

Diana Robinson
Imperial County Planning & Development Services Department

Via Email to: DianaRobinson@co.imperial.ca.us

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Vikings Solar Energy & Battery Storage Project, Imperial County

Dear Ms. Robinson:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

    - Any report that may contain site forms, site significance, and suggested mitigation measures.

      All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Tribal Consultation List
Imperial County
5/19/2021

Barona Group of the Capitan Grande
Edwin Romero, Chairperson
1095 Barona Road — Diegueno
Lakeside, CA, 92040
Phone: (619) 443 - 6612
Fax: (619) 443-0681
cloyd@barona-nsn.gov

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Diegueno
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Band of Kumeyaay Indians
Robert Pinto, Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net

Ewiiaapaayp Band of Kumeyaay Indians
Michael Garcia, Vice Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 765 - 0845
Fax: (760) 765-0320

Inaja-Cosmit Band of Indians
Rebecca Osuna, Chairperson
2005 S. Escondido Blvd. — Diegueno
Escondido, CA, 92025
Phone: (760) 737 - 7628
Fax: (760) 747-8568

Jamul Indian Village
Lisa Cumper, Tribal Historic Preservation Officer
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4855
lcumper@jiv-nsn.gov

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
epinto@jiv-nsn.gov

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas,
P.O. Box 775 — Diegueno
Pine Valley, CA, 91962 — Kwaaymii
Phone: (619) 709 - 4207

La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Diegueno
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Vikings Solar Energy & Battery Storage Project, Imperial County.

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270 Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 782 - 3818
Fax: (760) 782-9092
mesagrandeband@msn.com

Quechan Tribe of the Fort Yuma Reservation
Jill McCormick, Historic Preservation Officer
P.O. Box 1899 Quechan
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
P.O. Box 365 Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

Sycuan Band of the Kumeyaay Nation
Cody Martinez, Chairperson
1 Kwaaypaay Court Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

Viejas Band of Kumeyaay Indians
John Christman, Chairperson
1 Viejas Grade Road Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Vikings Solar Energy & Battery Storage Project, Imperial County.

Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

March 26, 2021

Certified Mail No.
7016 2140 0000 2121 4401

Mr. Jordan D. Joaquin, President
Quechan Indian Tribe
Fort Yuma Indian Reservation
P.O. Box 1899
Yuma, AZ 85366-1899

RE: Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000

Dear Mr. Joaquin,

The proposed VIKINGS Solar Energy Project site comprises approximately 603.61 acres and is located approximately 5.5 miles east of the City of Holtville in Section 36 all within Township 15 South, and Range 16 East of the San Bernardino Base and Meridian of the "Holtville East" topographic quadrangles 7.5-minute quadrangle. The electrical energy produced by the Project would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District (IID) 230 kV "KN & KS" line.

Project location maps are enclosed for your information.

The proposed VIKINGS Solar Energy Generation & Storage Project would involve the construction and operation of a 100 Megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project with an integrated 100 MW/450 megawatt hour (MWh) battery storage project located on approximately 603.61 acres of land in the County of Imperial.

In accordance with Assembly Bill 52 (AB 52) and Section 21080.3.1(d) of the California Public Resources Code (PRC), we are responding to your request to be notified of projects in our jurisdiction that will be reviewed under CEQA. Your name was provided to us as the point of contact for your tribe. We are hereby notifying you of an opportunity to consult with the County regarding the potential for this project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purposes of tribal consultation under AB 52 are to determine, as part of the CEQA review process, whether or not Tribal Cultural Resources are present within the project area, and if so, whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the most appropriate way to avoid or mitigate those impacts.

In accordance with Section 21080.3.1(d) of the PRC, you have 30 days from the receipt of this letter to either request or decline consultation in writing for this project. Please send your written response before April 26, 2021 to Imperial County Planning & Development Services Department, 801 Main Street, El Centro, CA 92243, attn. Diana Robinson, Planner III or by e-mail to ICPDSCommentLetters@co.imperial.ca.us. If the County does not receive a response within 30 days, the County will proceed with the project. Thank you and we look forward to your response.

Sincerely,

Jim Minnick, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc: H. Jill McCormick, Fort Yuma-Quechan Indian Tribe
Jim Minnick, Director, ICPDS
Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS

S:\AllUsers\APN\050\070\018\CUP20-0025\AB52\CUP20-0025 AB2 letter.docx

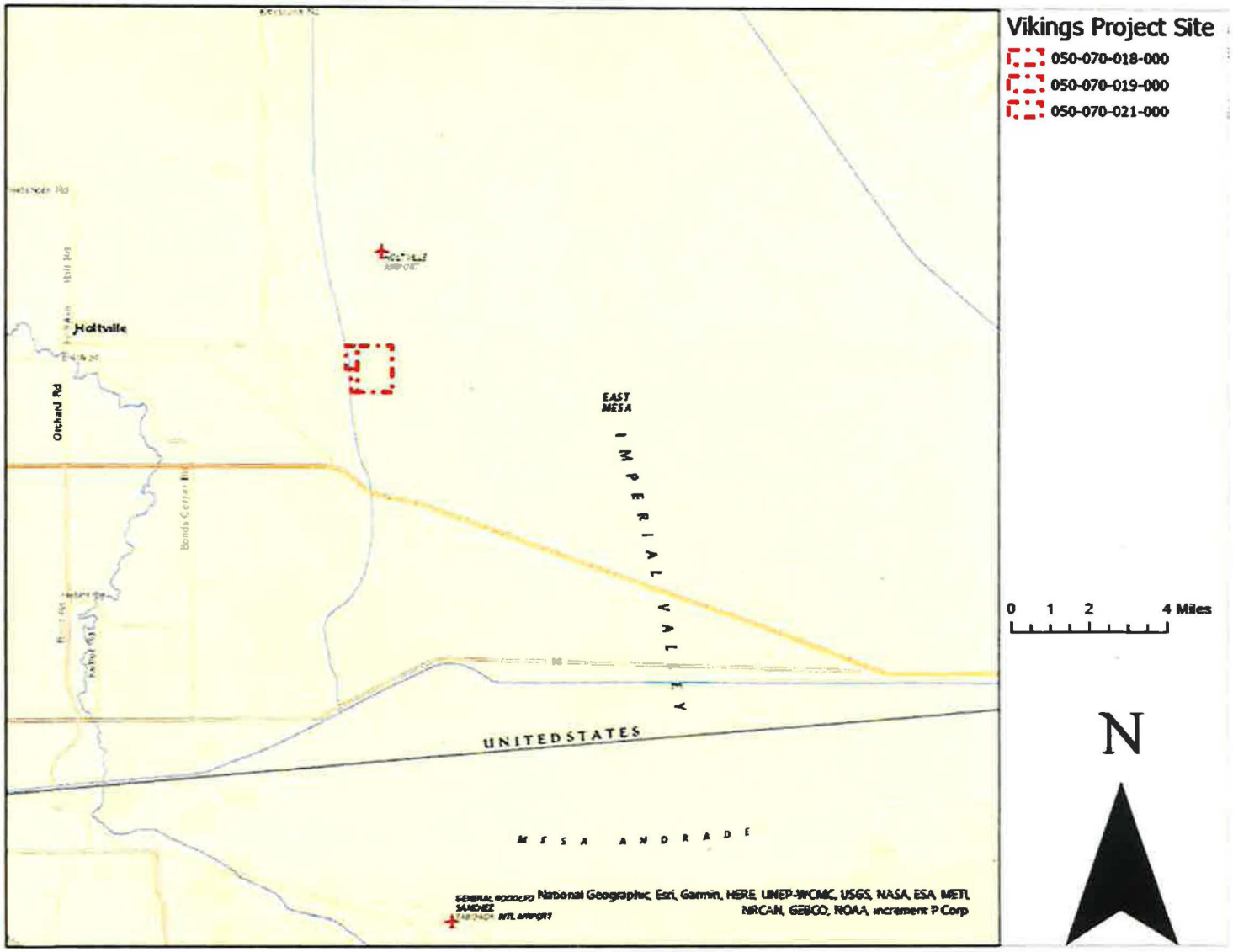

Figure 1 Project Location Map

Figure 2 Project Vicinity Map

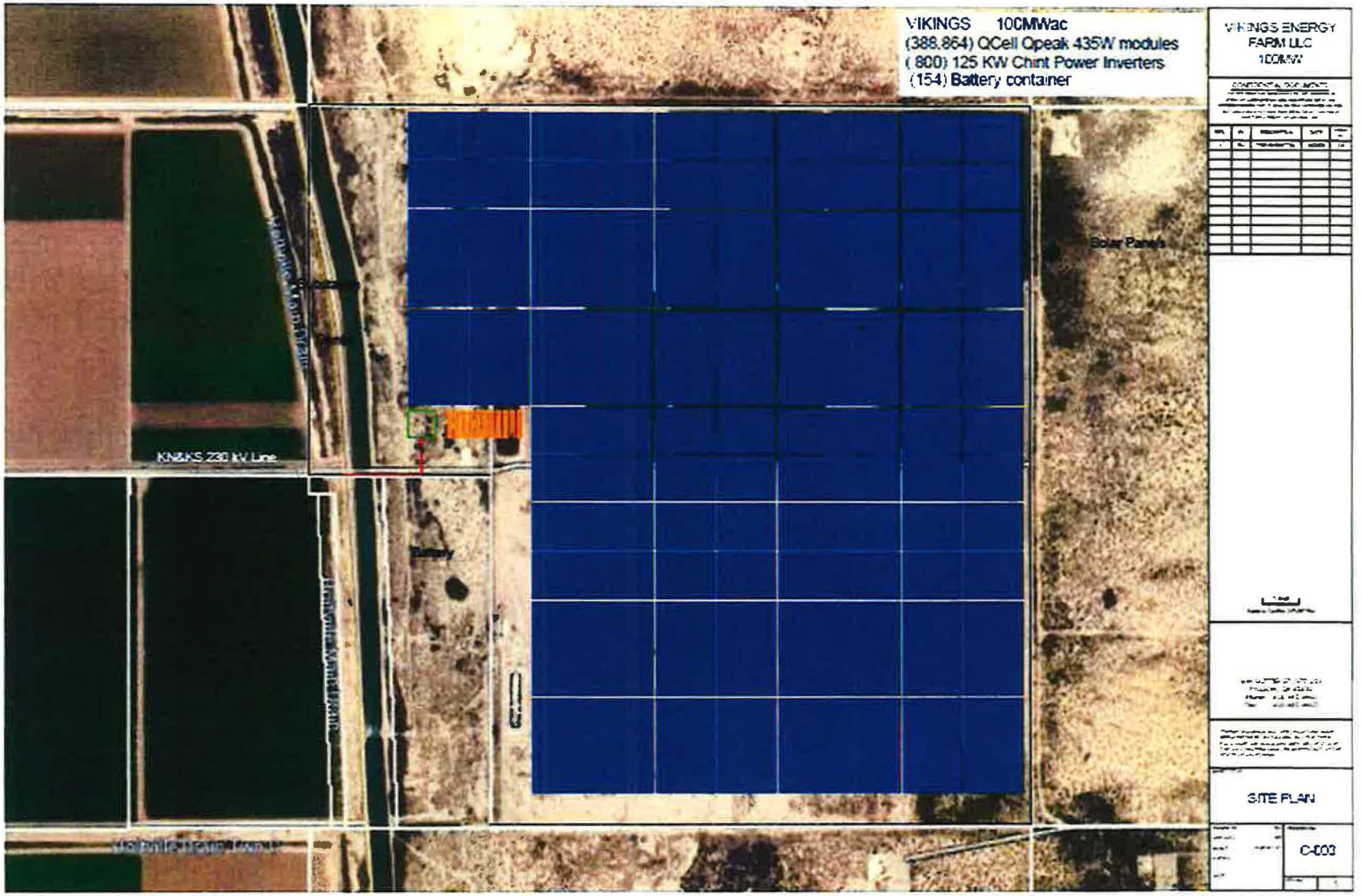

Figure 3 Project Site Map

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Kimberly Noriega

From: Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>
Sent: Thursday, April 8, 2021 8:48 AM
To: Kimberly Noriega
Cc: ICPDSCommentLetters
Subject: FW: CUP20-0025 AB52 Letter

CAUTION: This email originated outside our organization; please use caution.

This email serves as notification that the Quechan Tribe HPO is requesting consultation on this project.

From: Quechan Historic Preservation Officer [mailto:historicpreservation@quechantribe.com]
Sent: Thursday, April 08, 2021 8:33 AM
To: 'Quechan Historic Preservation '
Cc: icpdscommentletters@co.imperial.ca.us
Subject: RE: CUP20-0025 AB52 Letter

This email serves as notification that the Quechan Tribe HPO is requesting consultation on this project.

From: Quechan Historic Preservation [mailto:historicpreservation@quechantribe.com]
Sent: Thursday, April 01, 2021 10:42 AM
To: historicpreservation@quechantribe.com
Subject: FW: CUP20-0025 AB52 Letter

From: Kimberly Noriega [mailto:KimberlyNoriega@co.imperial.ca.us]
Sent: Friday, March 26, 2021 2:23 PM
To: Quechan Indian Tribe ; Quechan Historic Preservation Officer
Cc: Michael Abraham; Diana Robinson; Carina Gomez; Gabriela Robb; John Robb; Maria Scoville; Rosa Soto; Valerie Grijalva
Subject: CUP20-0025 AB52 Letter

Good morning,

Please find attached CUP20-0025 letter for formal notification of determination and notification of consultation opportunity.

Kind Regards,

RECEIVED
APR 08 2021
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Kimberly Noriega
Office Assistant III

Imperial County
Planning and Development Services

801 Main St.
El Centro, CA 92243
☎ **Phone**: (442) 265-1736
☎ **Fax**: (442) 265-1735

The preceding e-mail message (including any attachments) contains information that may be confidential, be protected by the attorney-client or other applicable privileges, or constitute non-public information. It is intended to be conveyed only to the designated recipient(s). If you are not an intended recipient of this message, please notify the sender by replying to this message and then delete it from your system. Use, dissemination, distribution, or reproduction of this message by unintended recipients is not authorized and may be unlawful.

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From: David McIntyre
To: historicpreservation@quechantribe.com
Cc: Diana Robinson; Christina Willis; Patricia Valenzuela; Mariela Moran
Subject: Viking Solar Generation and Storage Project
Date: Wednesday, April 28, 2021 3:47:03 PM

Hello

My name is David McIntyre and I am a contractor working for Imperial County on the Viking Solar Generation and Storage Project. The County would like to meet with the Quechan Tribe at your convenience to discuss this project. The County is able to meet with the Quechan Tribe in person or remotely depending on your preferences. We can also provide the cultural resources technical report prepared as part of this project if you would like to review this in advance of the meeting.

Thank you.

--
David L McIntyre
Principal

McIntyre Environmental LLC
1900 West Desert Highlands Dr
Oro Valley AZ
85737
www.mcintyre-environmental.com
520 775 1490
david@mcintyre-environmental.com

From:	Quechan Historic Preservation Officer
To:	"David McIntyre"
Cc:	"Diana Robinson"; Christina Willis; "Patricia Valenzuela"; "Mariela Moran"
Subject:	RE: Viking Solar Generation and Storage Project
Date:	Thursday, April 29, 2021 6:53:49 AM

Good morning,
I will discuss the possibility of a meeting with our Cultural Committee and get back with you on our availability to meet. Can you please send the cultural resources technical report to me.

Jill

From: David McIntyre [mailto:david@mcintyre-environmental.com]
Sent: Wednesday, April 28, 2021 3:46 PM
To: historicpreservation@quechantribe.com
Cc: Diana Robinson; Christina Willis; Patricia Valenzuela; Mariela Moran
Subject: Viking Solar Generation and Storage Project

Hello

My name is David McIntyre and I am a contractor working for Imperial County on the Viking Solar Generation and Storage Project. The County would like to meet with the Quechan Tribe at your convenience to discuss this project. The County is able to meet with the Quechan Tribe in person or remotely depending on your preferences. We can also provide the cultural resources technical report prepared as part of this project if you would like to review this in advance of the meeting.

Thank you.
--
David L McIntyre
Principal

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1900 West Desert Highlands Dr
Oro Valley AZ
85737
www.mcintyre-environmental.com
520 775 1490
david@mcintyre-environmental.com

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From: David McIntyre
To: Quechan Historic Preservation Officer
Cc: Diana Robinson; Christina Willis; Patricia Valenzuela; Mariela Moran
Subject: Re: Viking Solar Generation and Storage Project
Date: Thursday, April 29, 2021 8:50:36 AM
Attachments: DPR Forms 03292021.pdf
Vikings Solar Project_Cultural Resources Technical Report 03262021.pdf

---

Jill

See attached.

Thank you. Diana Robinson, who is included in this email chain, is the Project Manager for Imperial County.

David

On Thu, Apr 29, 2021 at 6:53 AM Quechan Historic Preservation Officer <historicpreservation@quechantribe.com> wrote:

> Good morning,
>
> I will discuss the possibility of a meeting with our Cultural Committee and get back with you on our availability to meet. Can you please send the cultural resources technical report to me.
>
> Jill
>
> **From:** David McIntyre [mailto:david@mcintyre-environmental.com]
> **Sent:** Wednesday, April 28, 2021 3:46 PM
> **To:** historicpreservation@quechantribe.com
> **Cc:** Diana Robinson; Christina Willis; Patricia Valenzuela; Mariela Moran
> **Subject:** Viking Solar Generation and Storage Project
>
> Hello
>
> My name is David McIntyre and I am a contractor working for Imperial County on the Viking Solar Generation and Storage Project. The County would like to meet with the Quechan Tribe at your convenience to discuss this project. The County is able to meet with the Quechan Tribe in person or remotely depending on your preferences. We can also provide the cultural resources technical report prepared as part of this project if you would like to review this in advance of the meeting.
>
> Thank you.

--

David L McIntyre

Principal

McIntyre Environmental LLC

1900 West Desert Highlands Dr

Oro Valley AZ

85737

www.mcintyre-environmental.com

520 775 1490

david@mcintyre-environmental.com

Virus-free. www.avast.com

--
David L McIntyre
Principal

McIntyre Environmental LLC
1900 West Desert Highlands Dr
Oro Valley AZ
85737
www.mcintyre-environmental.com
520 775 1490
david@mcintyre-environmental.com

Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1357

Raymond Welch, Chairperson
1095 Barona Road,
Lakeside, CA 92040

RE: Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000

Dear Ms. Welch,

The proposed VIKINGS Solar Energy Project site comprises approximately 603.61 acres and is located approximately 5.5 miles east of the City of Holtville in Section 36 all within Township 15 South, and Range 16 East of the San Bernardino Base and Meridian of the "Holtville East" topographic quadrangles 7.5-minute quadrangle. The electrical energy produced by the Project would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District (IID) 230 kV "KN & KS" line.

Project location maps are enclosed for your information.

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In accordance with Assembly Bill 52 (AB 52) and Section 21080.3.1(d) of the California Public Resources Code (PRC), we are responding to your request to be notified of projects in our jurisdiction that will be reviewed under CEQA. Your name was provided to us as the point of contact for your tribe. We are hereby notifying you of an opportunity to consult with the County regarding the potential for this project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purposes of tribal consultation under AB 52 are to determine, as part of the CEQA review process, whether or not Tribal Cultural Resources are present within the project area, and if so, whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the most appropriate way to avoid or mitigate those impacts.

In accordance with Section 21080.3.1(d) of the PRC, you have 30 days from the receipt of this letter to either request or decline consultation in writing for this project. Please send your written response before July 23, 2021 to Imperial County Planning & Development Services Department, 801 Main Street, El Centro, CA 92243, attn. Diana Robinson, Planner III or by e-mail to ICPDSCommentLetters@co.imperial.ca.us. If the County does not receive a response within 30 days, the County will proceed with the project. Thank you and we look forward to your response.

Sincerely,

JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc:

Jim Minnick, Director, ICPDS
Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS
cloyd@barona-nsn.gov

S:\AllUsers\APN\050\070\018\CUP20-0025\AB52\CUP20-0025 AB2 letter Barona.docx

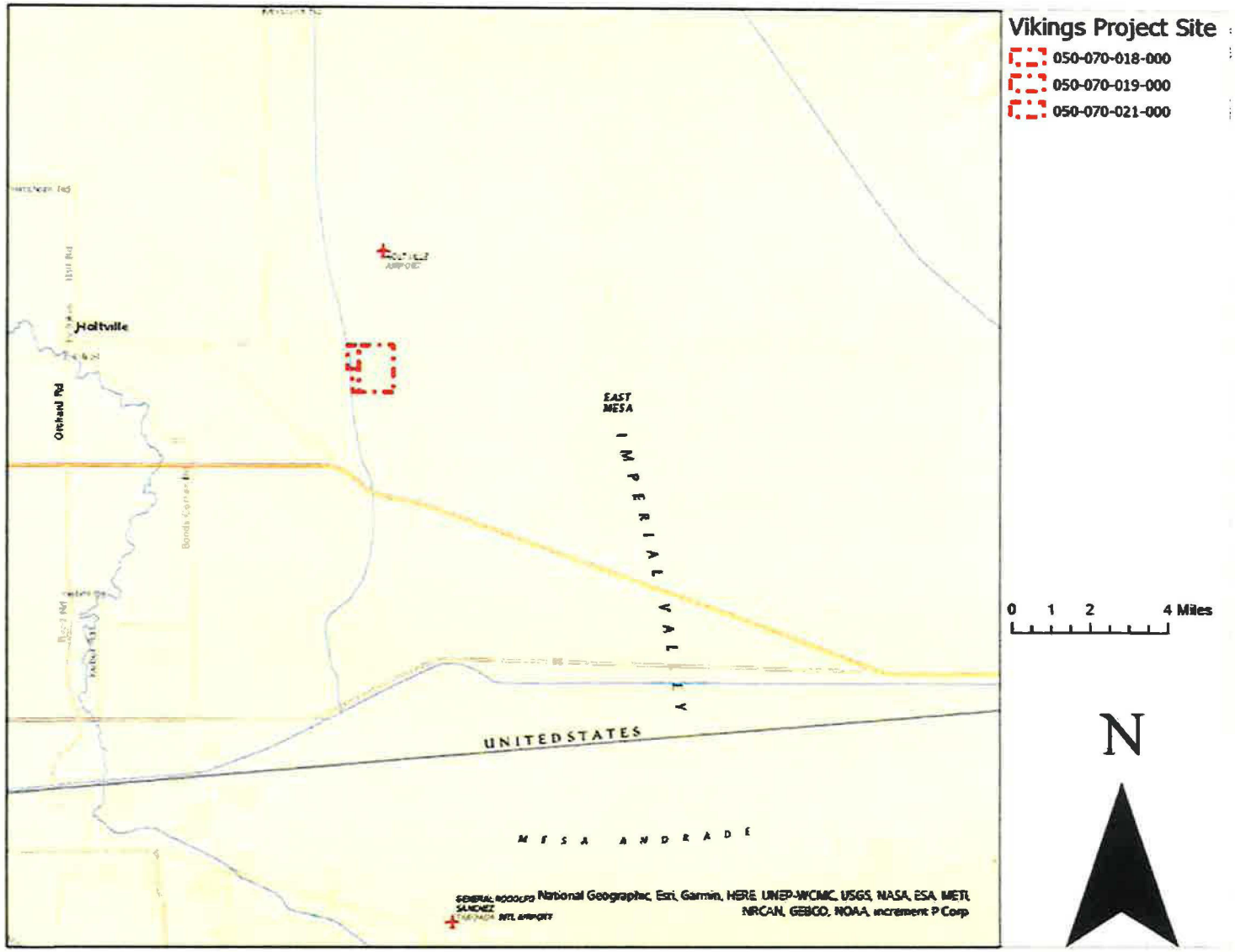

Figure 1 Project Location Map

Figure 2 Project Vicinity Map

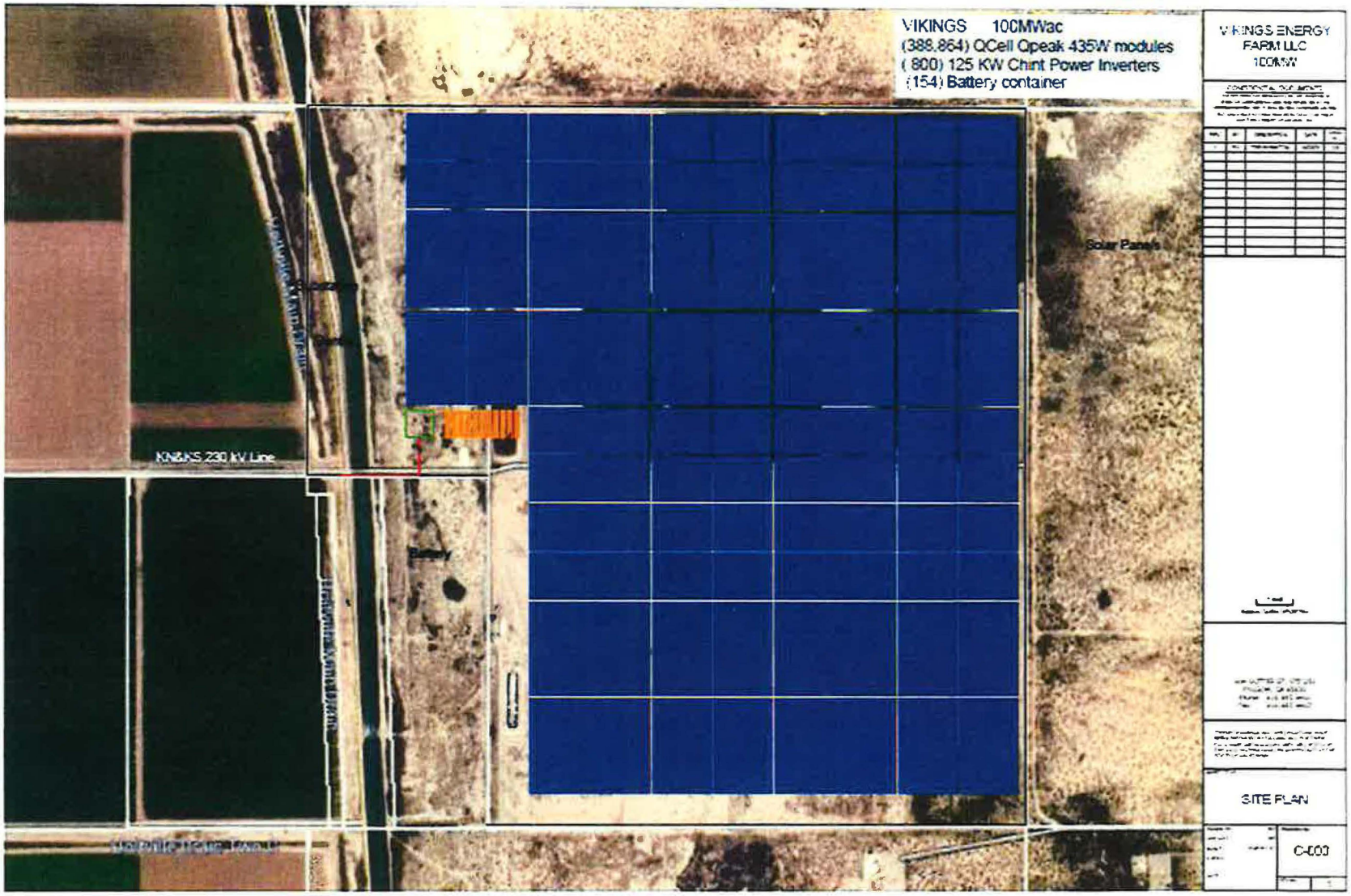

Figure 3 Project Site Map

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Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1340

Marcus Cuero, Chairperson
36190 Church Road, Suite 1
Campo, CA 91906

RE: **Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000**

Dear Mr. Cuero,

The proposed VIKINGS Solar Energy Project site comprises approximately 603.61 acres and is located approximately 5.5 miles east of the City of Holtville in Section 36 all within Township 15 South, and Range 16 East of the San Bernardino Base and Meridian of the "Holtville East" topographic quadrangles 7.5-minute quadrangle. The electrical energy produced by the Project would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District (IID) 230 kV "KN & KS" line.

Project location maps are enclosed for your information.

The proposed VIKINGS Solar Energy Generation & Storage Project would involve the construction and operation of a 150 Megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project with an integrated battery storage not to exceed 300 MW project located on approximately 603.61 acres of land in the County of Imperial.

In accordance with Assembly Bill 52 (AB 52) and Section 21080.3.1(d) of the California Public Resources Code (PRC), we are responding to your request to be notified of projects in our jurisdiction that will be reviewed under CEQA. Your name was provided to us as the point of contact for your tribe. We are hereby notifying you of an opportunity to consult with the County regarding the potential for this project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purposes of tribal consultation under AB 52 are to determine, as part of the CEQA review process, whether or not Tribal Cultural Resources are present within the project area, and if so, whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the most appropriate way to avoid or mitigate those impacts.

In accordance with Section 21080.3.1(d) of the PRC, you have 30 days from the receipt of this letter to either request or decline consultation in writing for this project. Please send your written response before July 23, 2021 to Imperial County Planning & Development Services Department, 801 Main Street, El Centro, CA 92243, attn. Diana Robinson, Planner III or by e-mail to ICPDSCommentLetters@co.imperial.ca.us. If the County does not receive a response within 30 days, the County will proceed with the project. Thank you and we look forward to your response.

Sincerely,

JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc:

Jim Minnick, Director, ICPDS
Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS
rgoff@campo-nsn.gov

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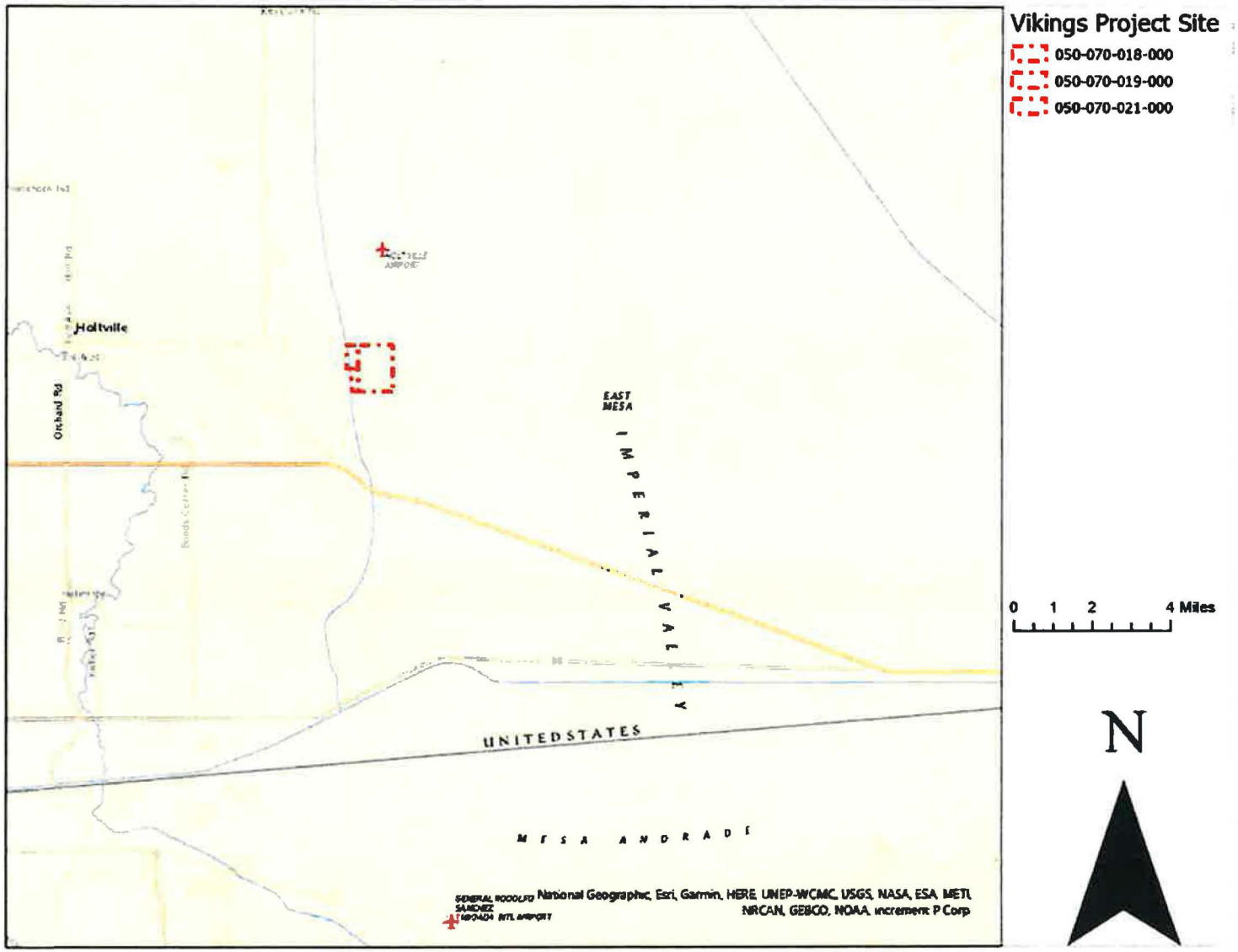

Figure 1 Project Location Map

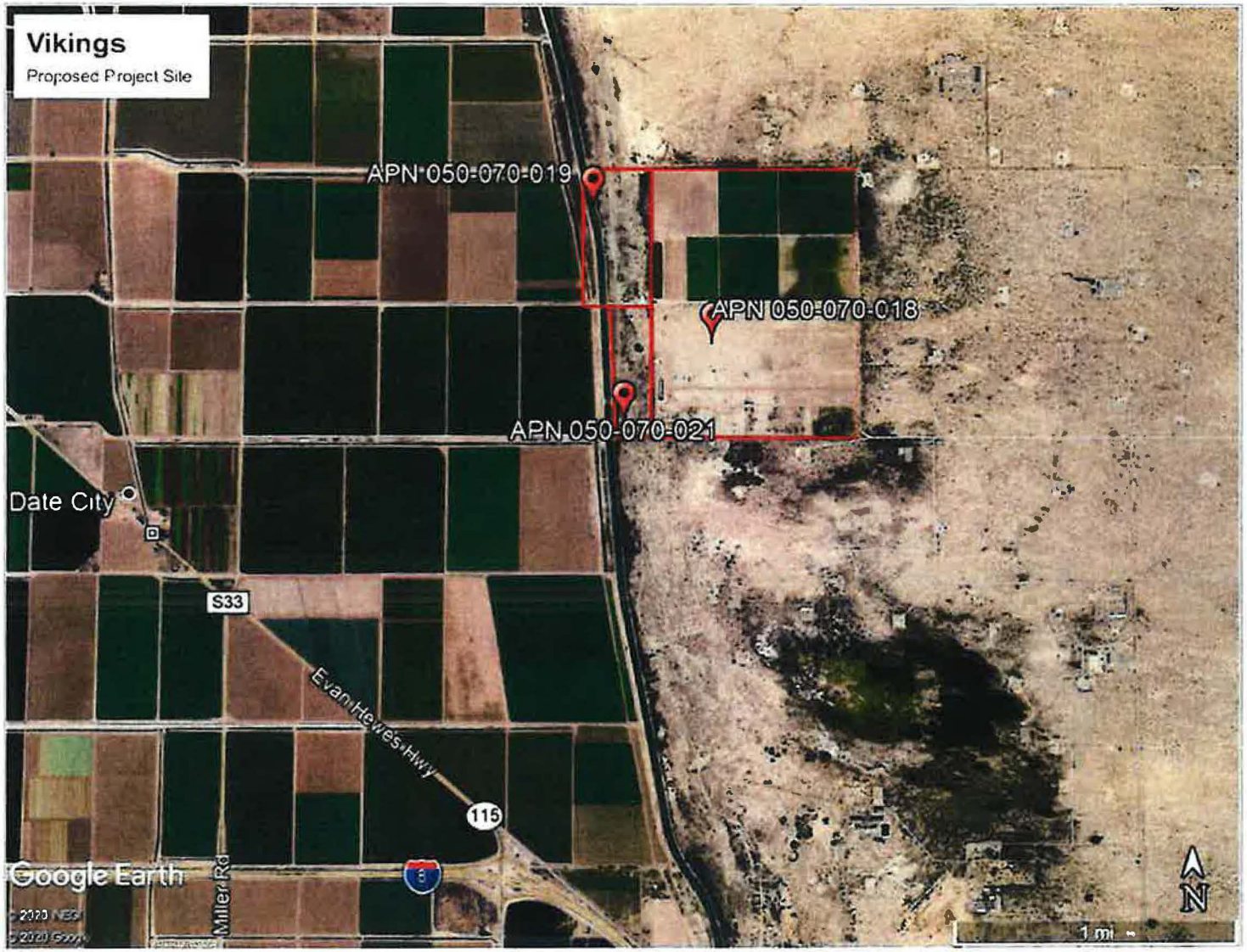

Figure 2 Project Vicinity Map

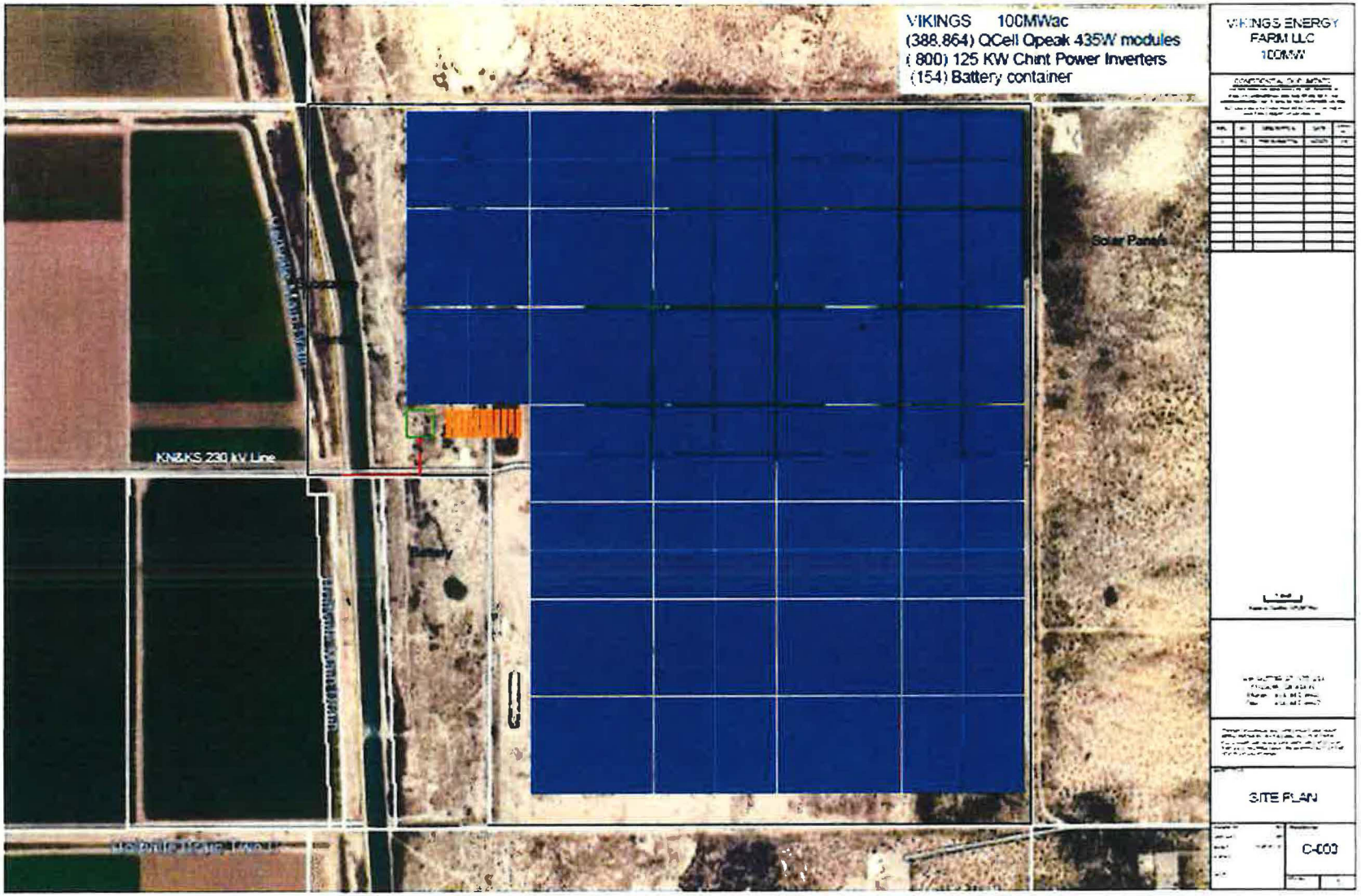

Figure 3 Project Site Map

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Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1333

Will Micklin, Chairperson
4054 Willows Road,
Alpine, CA 91901

RE: **Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000**

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Sincerely,

JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc:

Jim Minnick, Director, ICPDS
Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS
michaelg@leaningrock.net

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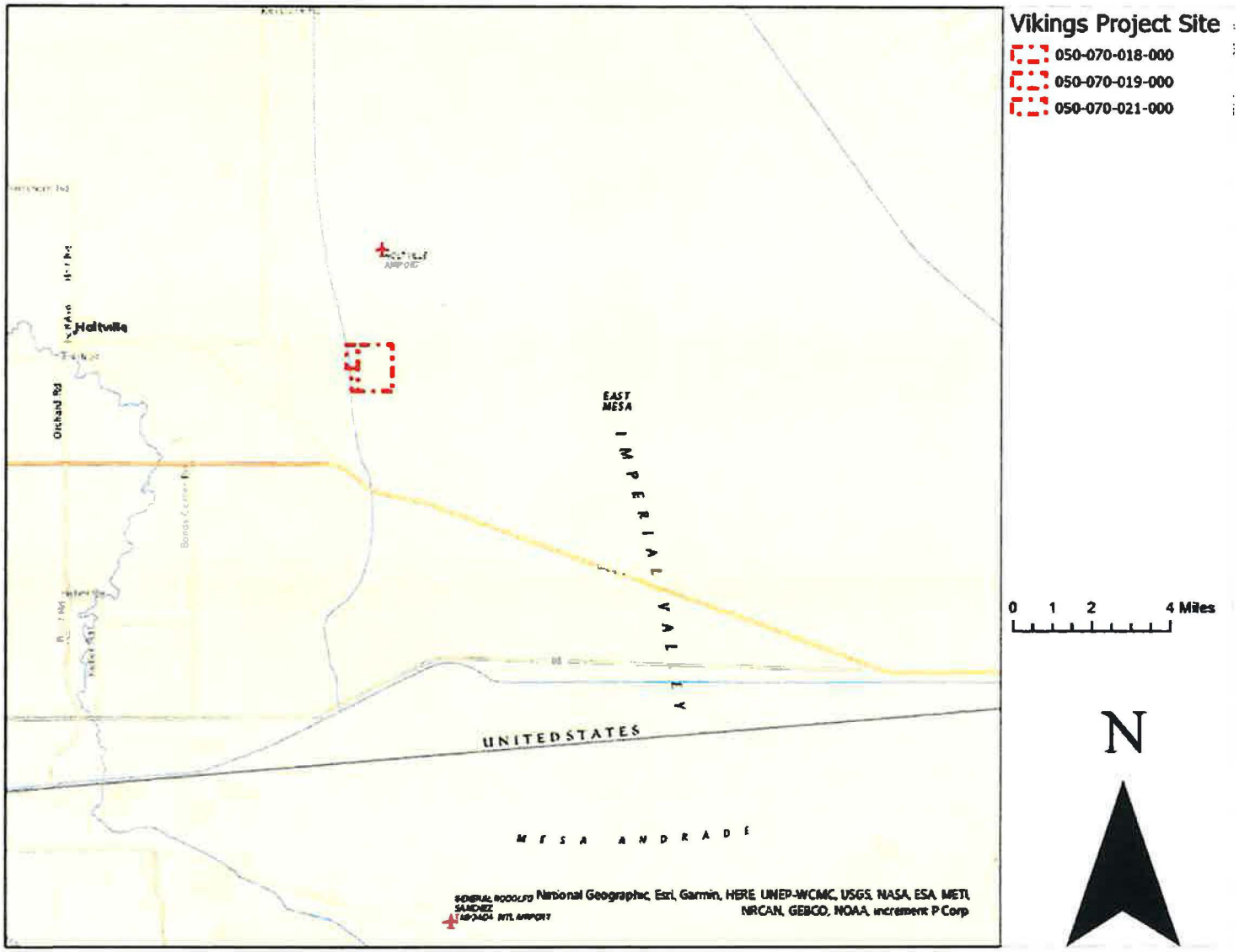

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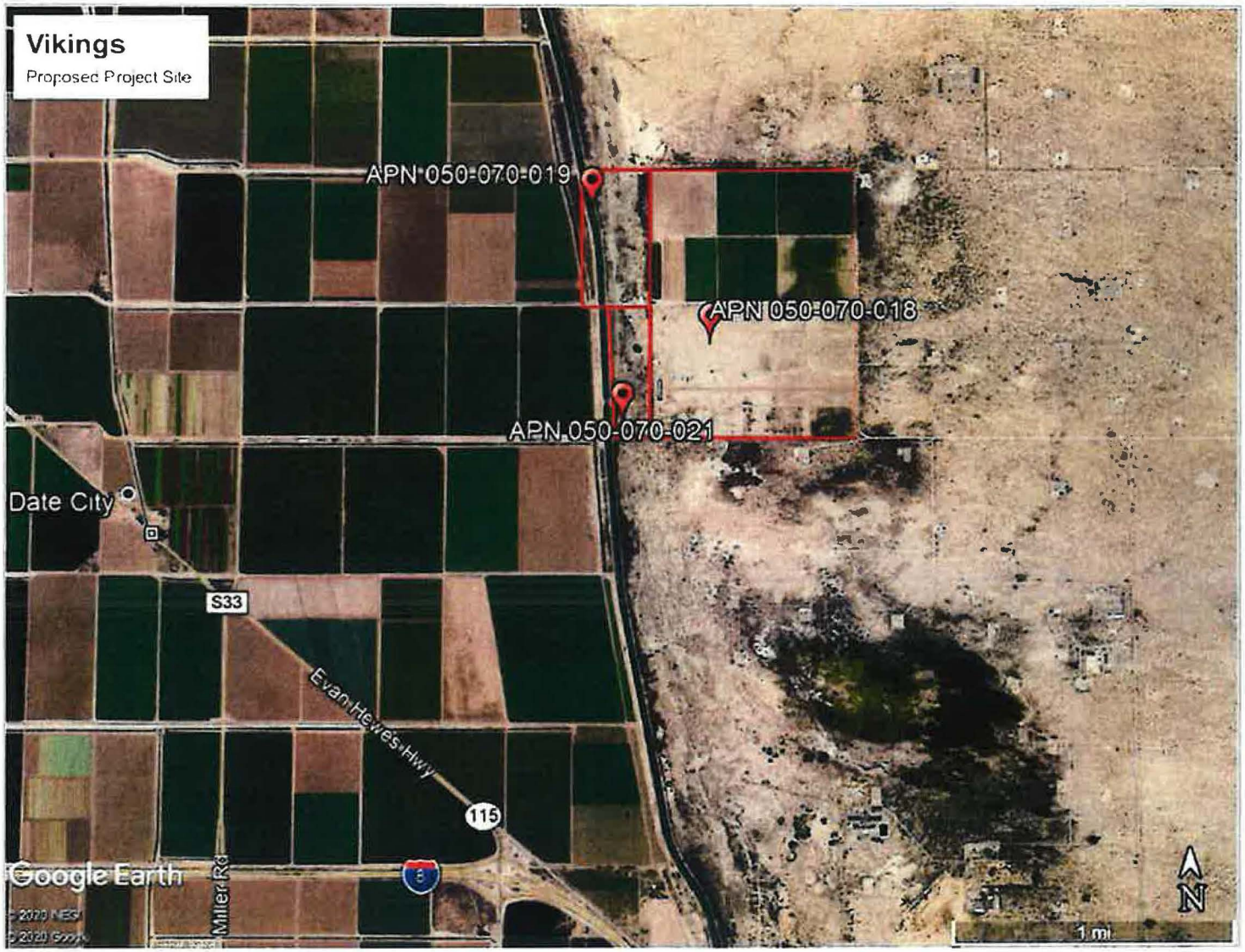

Figure 2 Project Vicinity Map

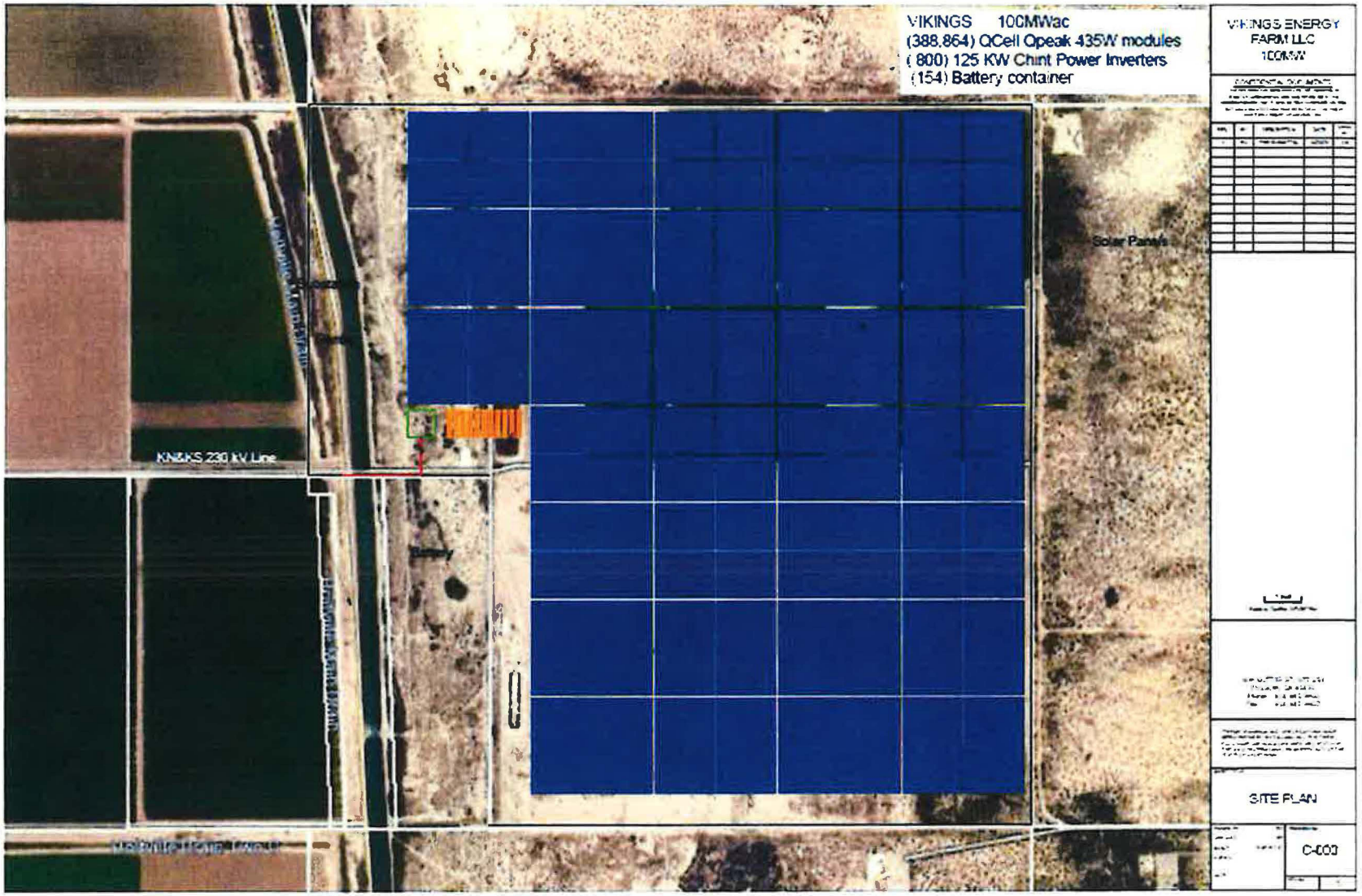

Figure 3 Project Site Map

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Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1326

Rebecca Osuna, Chairperson
2005 S. Escondido Blvd.
Escondido, CA 92025

RE: **Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000**

Dear Ms. Osuna,

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Sincerely,

JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc:

Jim Minnick, Director, ICPDS
Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS

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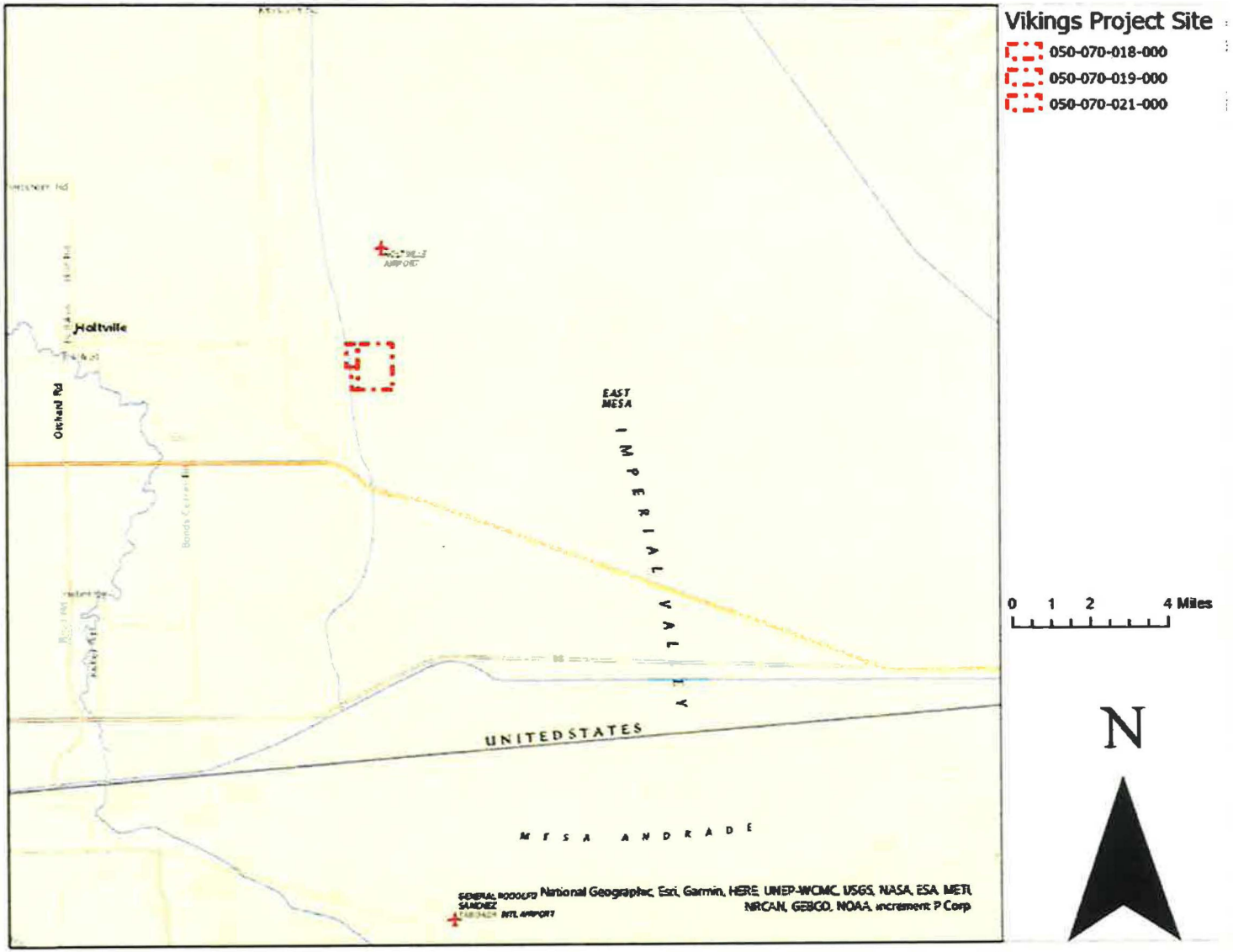

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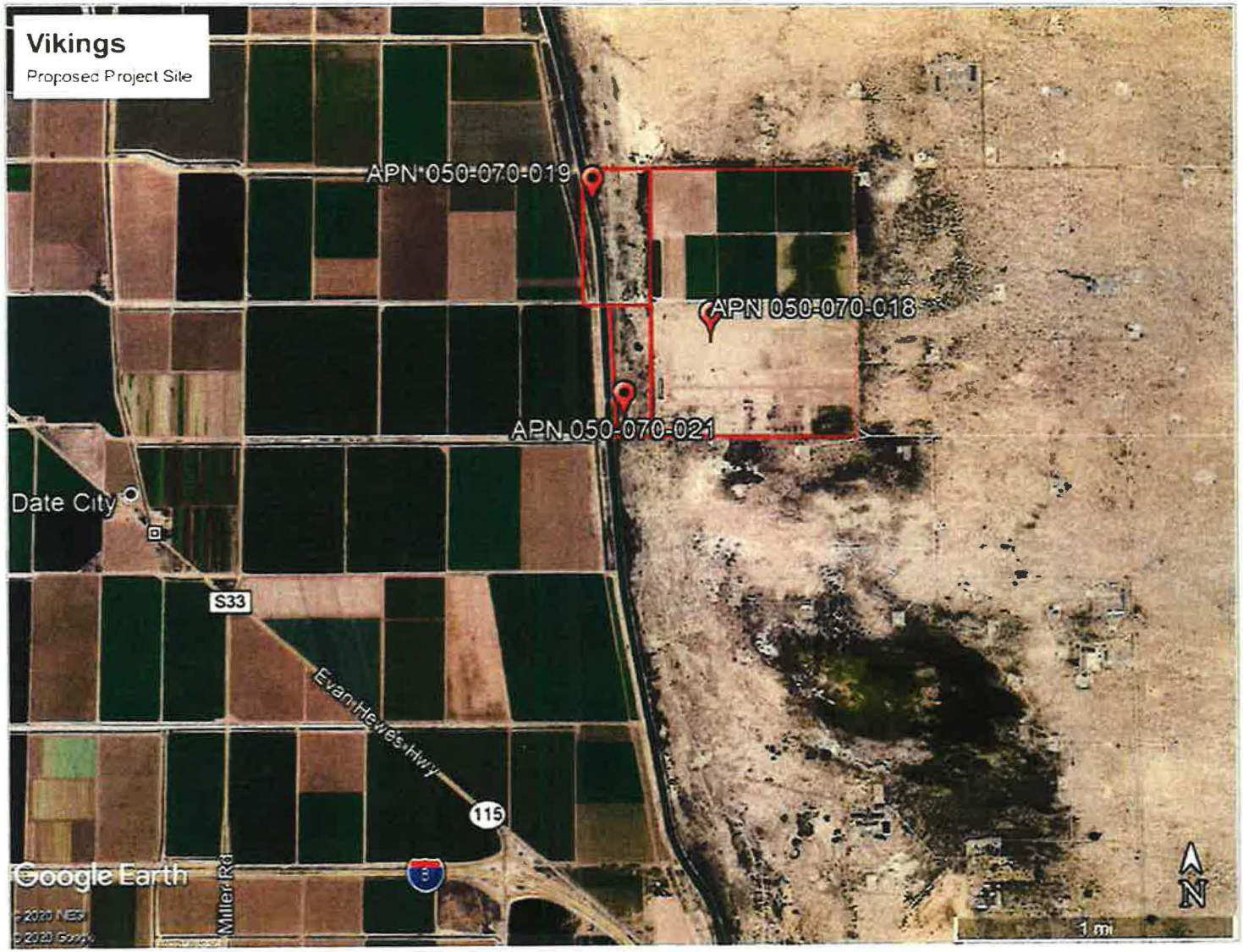

Figure 2 Project Vicinity Map

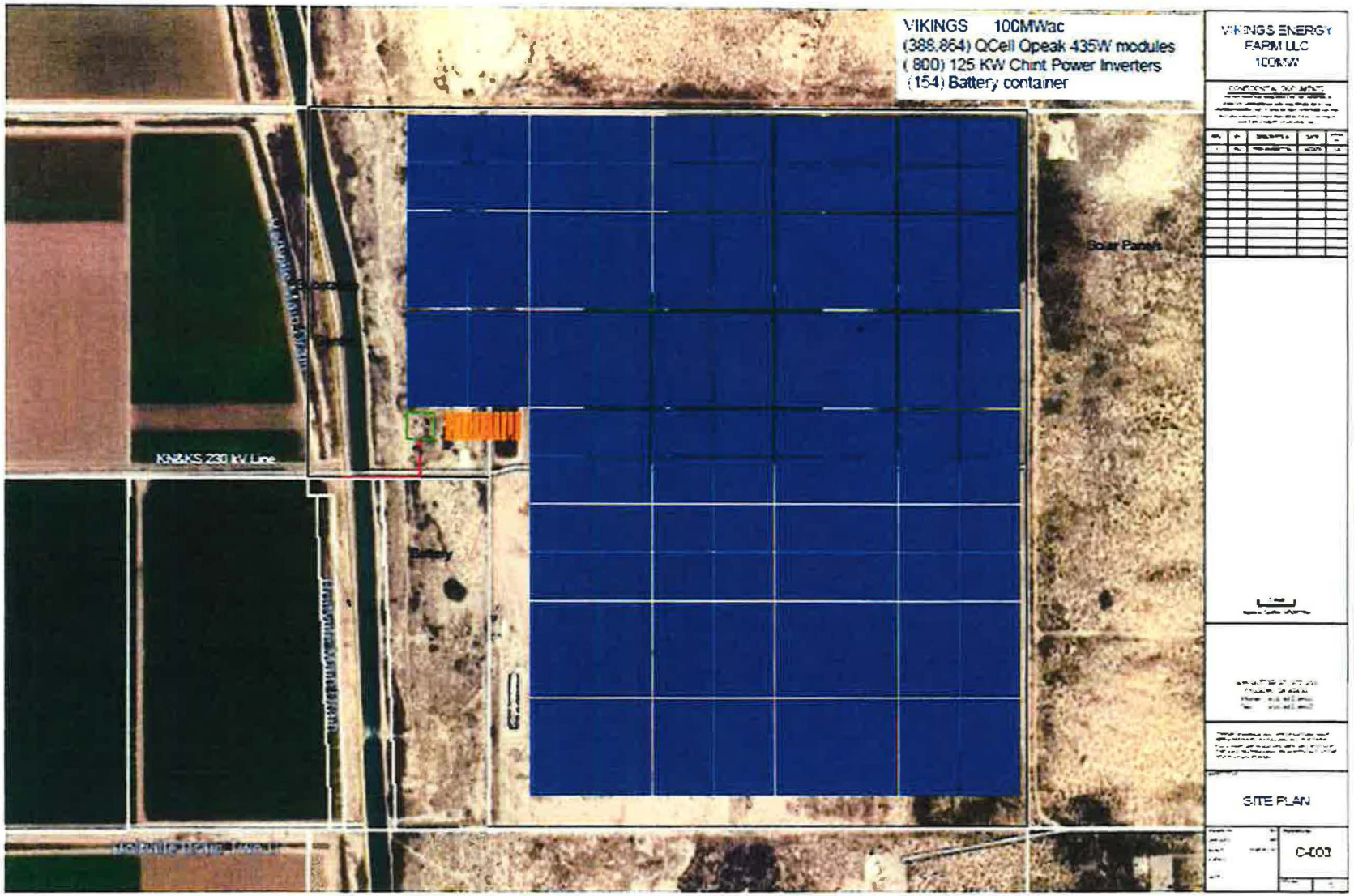

Figure 3 Project Site Map

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Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1296

Lisa Cumper, Tribal Historic
Preservation Officer
And Erica Pinto, Chairperson
P.O. Box 612
Jamul, CA 91935

RE: Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000

Dear Ms. Cumper and Ms. Pinto,

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JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc:

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Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS
lcumper@jiv-nsn.gov
epinto@jiv-nsn.gov

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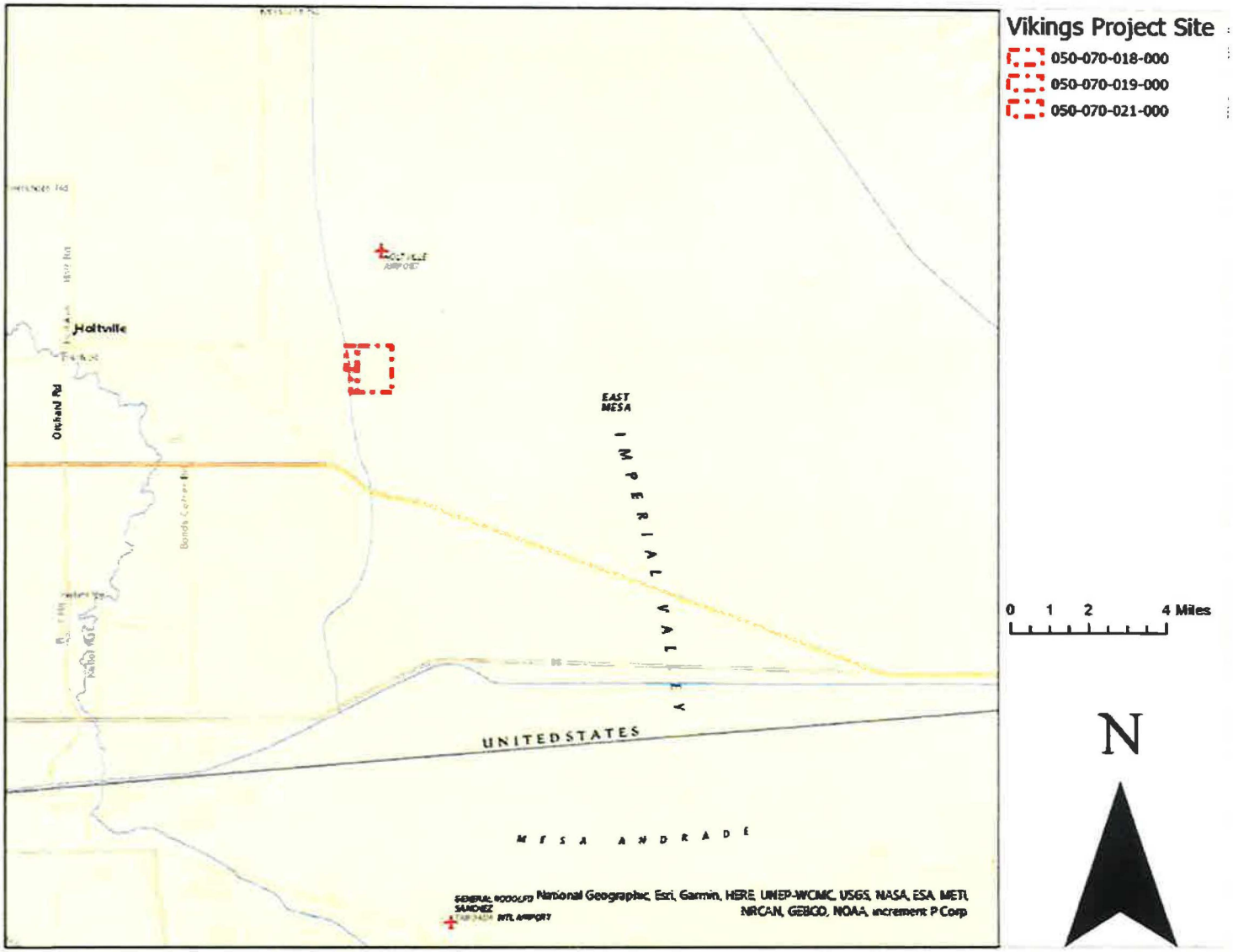

Figure 1 Project Location Map

Figure 2 Project Vicinity Map

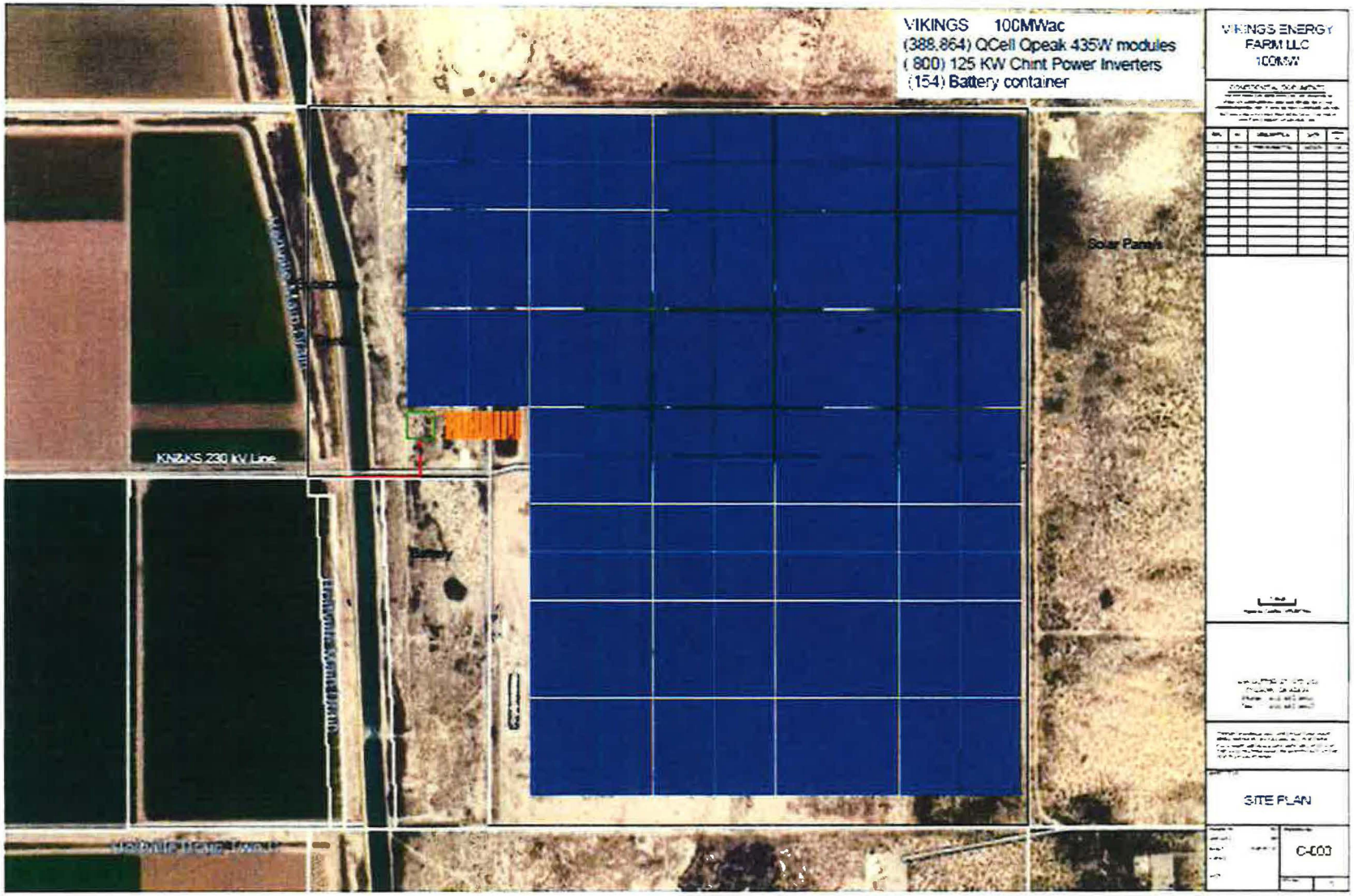

Figure 3 Project Site Map

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From: Diana Robinson <DianaRobinson@co.imperial.ca.us>
Sent: Friday, November 19, 2021 4:06 PM
To: lcumper@jiv-nsn.gov
Cc: Michael Abraham; David McIntyre; Christina Willis; Mariela Moran
Subject: RE: Vikings Solar Energy Project in Imperial County Conditional Use permit CUP 20-0025
Attachments: 01_Vikings Cultural Resources Report (Aug 2021).pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Good afternoon Ms. Cumper,

Please see attached Cultural Report prepared for the Vikings project. The EIR will include cultural resource monitoring during construction by a Qualified Archaeologist and a Tribal Culturally Affiliated (TCA) Native American monitor during all initial ground disturbing activities. The EIR will also require a copy of the Monitoring Report and/or Evaluation Report, describing the results, analysis and conclusions of the mitigation monitoring efforts to be submitted by the Qualified Archaeologist, along with the TCA Native American Monitor's notes and comments, to the County Planning and Development Services Department for approval.

Please let us know if you have any questions.
Thank you,
Diana

From: Diana Robinson
Sent: Friday, November 19, 2021 10:35 AM
To: lcumper@jiv-nsn.gov
Cc: Michael Abraham <MichaelAbraham@co.imperial.ca.us>; David McIntyre <david@mcintyre-environmental.com>; Christina Willis <Christina@brginc.net>; Mariela Moran <MarielaMoran@co.imperial.ca.us>
Subject: RE: Vikings Solar Energy Project in Imperial County Conditional Use permit CUP 20-0025

Good morning Ms. Cumper,

I tried to reach you again this morning but was sent to voice mail so I left you a message. Please let me know when would be a good time to call.

Thank you,
Diana

From: Diana Robinson <DianaRobinson@co.imperial.ca.us>
Sent: Wednesday, September 29, 2021 2:50 PM
To: lcumper@jiv-nsn.gov
Cc: Michael Abraham <MichaelAbraham@co.imperial.ca.us>; David McIntyre <david@mcintyre-environmental.com>; Christina Willis <Christina@brginc.net>; Mariela Moran <MarielaMoran@co.imperial.ca.us>
Subject: Fw: Vikings Solar Energy Project in Imperial County Conditional Use permit CUP 20-0025

Good afternoon Ms. Cumper,

This is the email I was referring to on my voice message. Please let me know when would be a good time to reach you regarding your request for consultation on the CUP20-0025 Vikings Solar Project.

My office phone number is 442-265-1751 but I will be available at 442-200-7378 today until Friday.

Thank you,
Diana Robinson

From: Lisa Cumper <lcumper@jiv-nsn.gov>
Sent: Wednesday, July 21, 2021 3:11 PM
To: ICPDSCommentLetters <ICPDSCommentLetters@co.imperial.ca.us>
Cc: Erica Pinto <epinto@jiv-nsn.gov>; Jewel Tellow <jtellow@jiv-nsn.gov>
Subject: Vikings Solar Energy Project in Imperial County Conditional Use permit CUP 20-0025

CAUTION: This email originated outside our organization; please use caution.

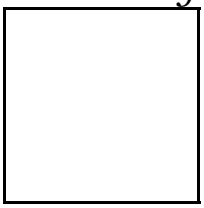
Hi Diana,

The Jamul Indian Village of California Tribal Historic Preservation Office has received your notification of the project referenced above. This letter constitutes our response on behalf of Erica M. Pinto, Tribal Chairwoman.

We have consulted our maps and determined that the project as described is not within the boundaries of the recognized Jamul Indian Reservation. It is, however, within the boundaries of the territory that the tribe considers its Traditional Use Area (TUA). Therefore, we request to be kept in the information loop as the project progresses and would appreciate being maintained on the receiving list for project updates, reports of investigations, and/or any documentation that might be generated regarding previously reported or newly discovered sites. Further, we may recommend archaeological monitoring pending the results of site surveys and records searches associated with the project. If the project boundaries are modified to extend beyond the currently proposed limits, we request updated information and the opportunity to respond to your changes. We would also like to enter into formal consultation for this project.

We appreciate involvement with your initiative and look forward to working with you on future efforts. If you have questions or need additional information, please do not hesitate to contact me by telephone at 619-928-8689 or by e-mail at lcumper@jiv-nsn.gov .

Kindest Regards,



Lisa K. Cumper, THPO

Tribal Historic Preservation Officer
Cultural Resources Manager,
The Jamul Indian Village of California
Secretary, Kumeyaay Cultural Repatriation Committee
KCRC, Kumeyaay Nation

P.O. Box 612, Jamul CA 91935
desk: 619.669.4855
cell: 619.928.8689
fax: 619.669.4817

email: lcumper@jiv-nsn.gov
web: www.jamulindianvillage.com

The ground on which we stand is sacred ground, it is the blood of our ancestors. Chief Plenty Coups, Crow.

Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1302

Carmen Lucas,
P.O. Box 775
Pine Valley, CA 91962

RE: Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000

Dear Ms. Lucas,

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Sincerely,

JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc:

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Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
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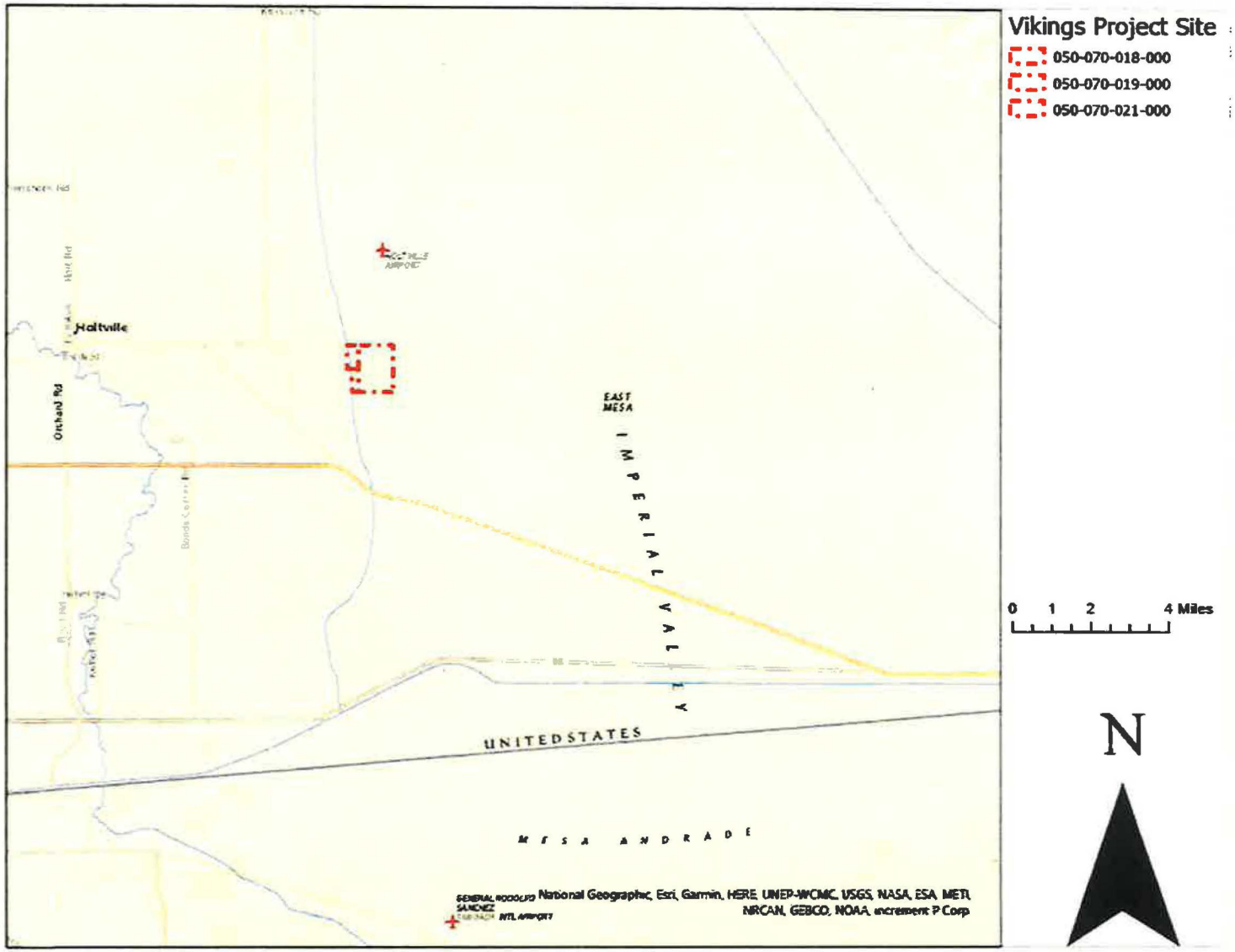

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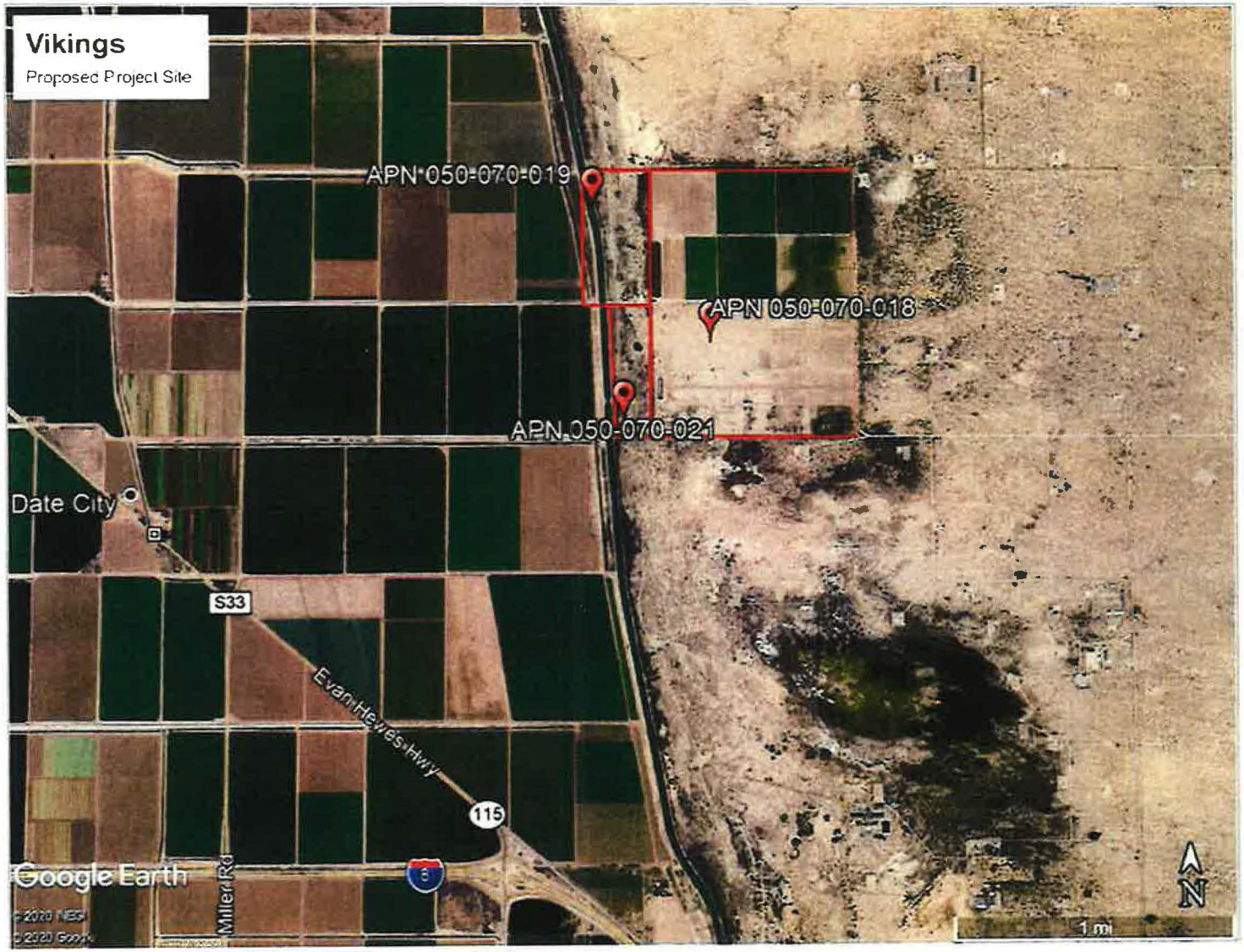

Figure 2 Project Vicinity Map

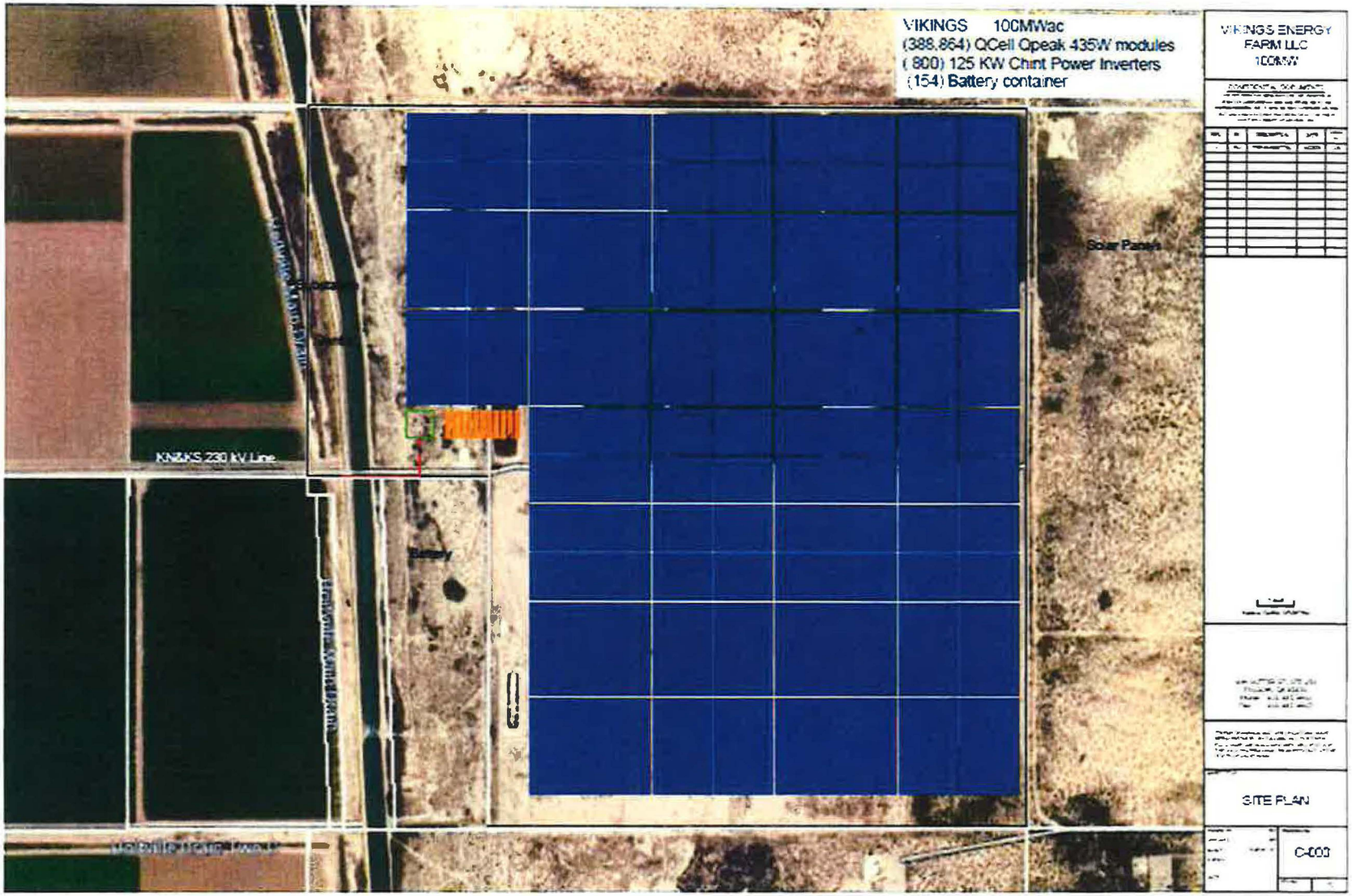

Figure 3 Project Site Map

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Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1289

Javaughn Miller, Tribal
8 Crestwood Road,
Boulevard, CA 91905

RE: Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000

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Sincerely,

JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc:

Jim Minnick, Director, ICPDS
Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS
jmiller@lptribe.net

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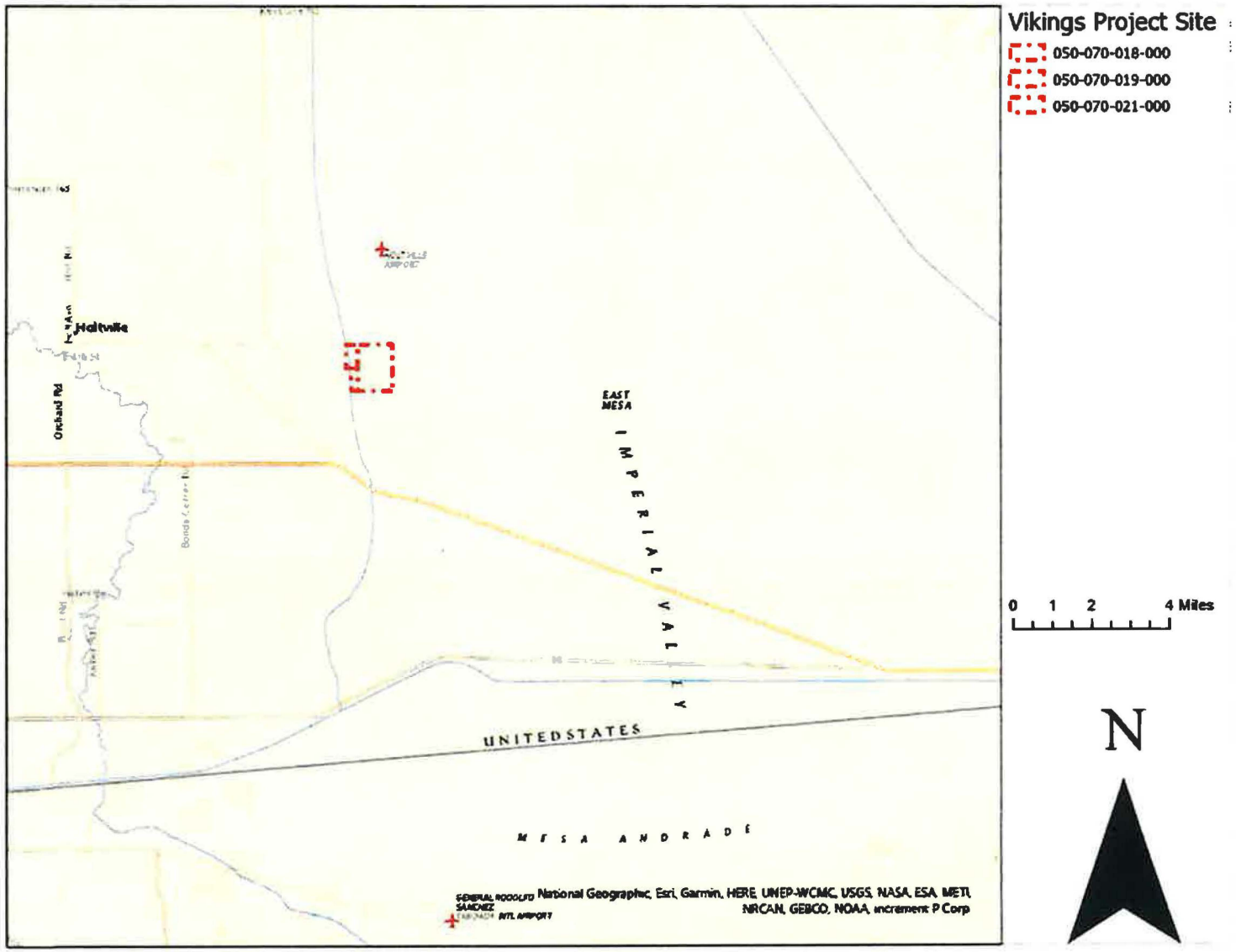

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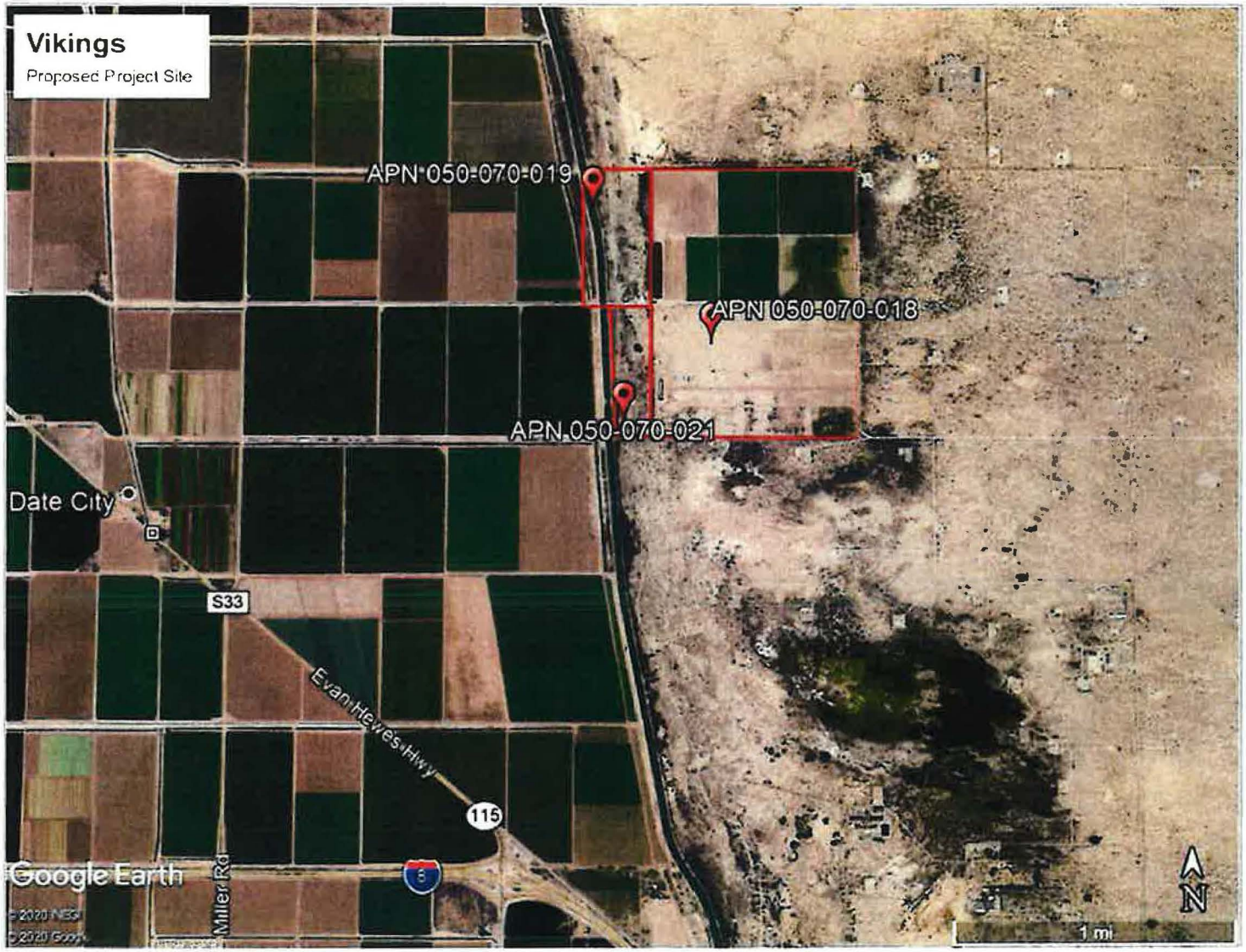

Figure 2 Project Vicinity Map

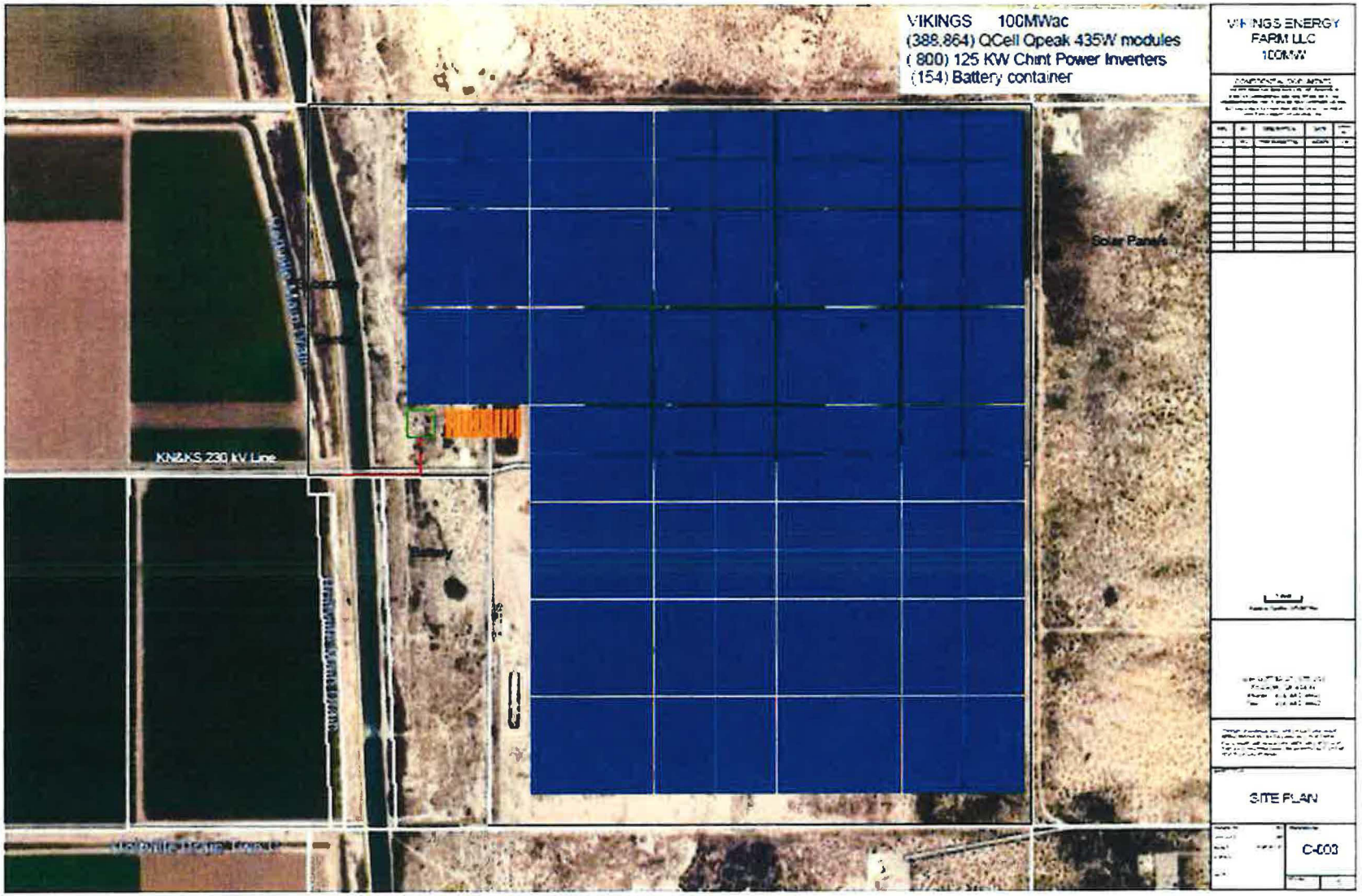

Figure 3 Project Site Map

Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1319

Berenice Paipa, Chairperson
P.O. Box 130
Santa Ysabel, CA 92070

RE: Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000

Dear Ms. Paipa,

The proposed VIKINGS Solar Energy Project site comprises approximately 603.61 acres and is located approximately 5.5 miles east of the City of Holtville in Section 36 all within Township 15 South, and Range 16 East of the San Bernardino Base and Meridian of the "Holtville East" topographic quadrangles 7.5-minute quadrangle. The electrical energy produced by the Project would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District (IID) 230 kV "KN & KS" line.

Project location maps are enclosed for your information.

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Sincerely,

JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc:

Jim Minnick, Director, ICPDS
Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS

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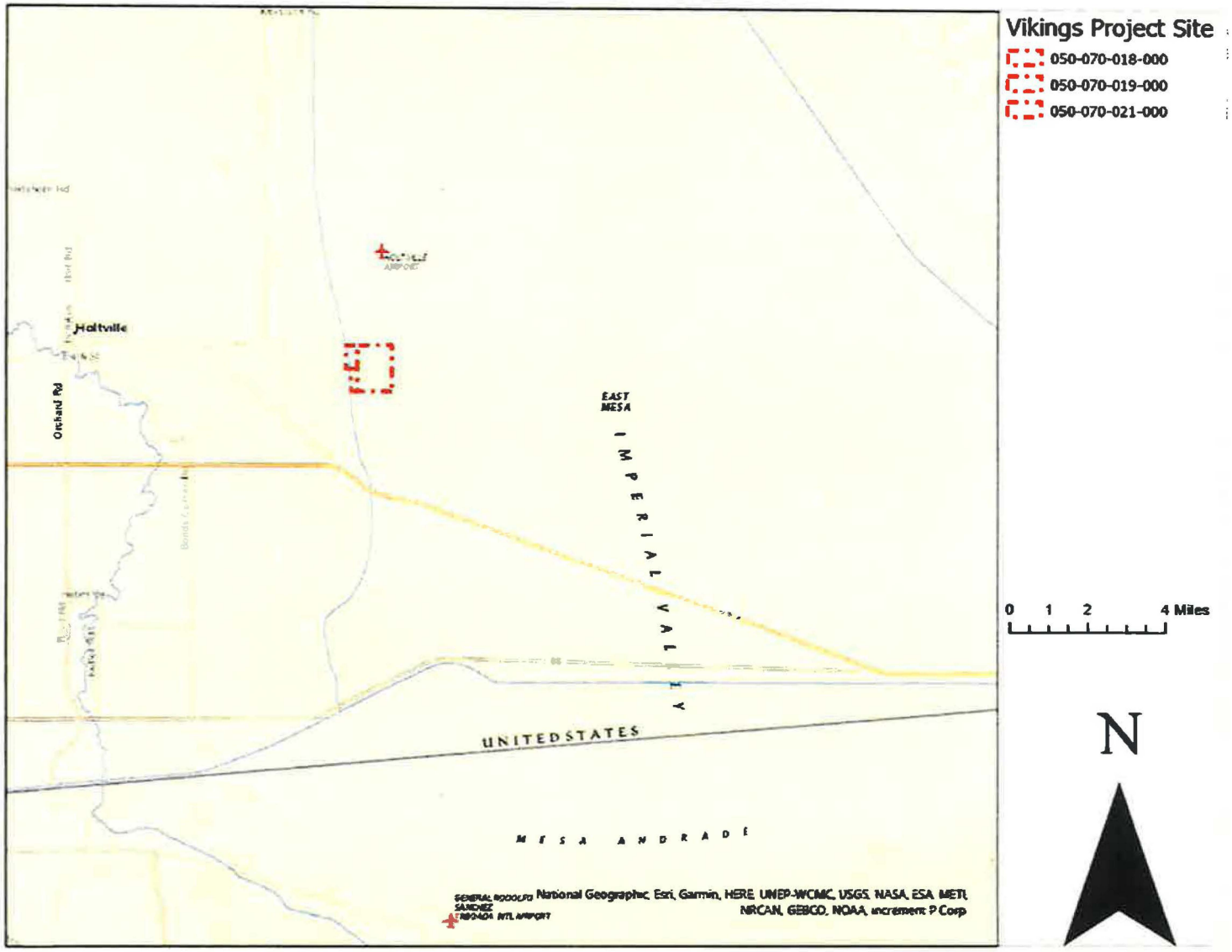

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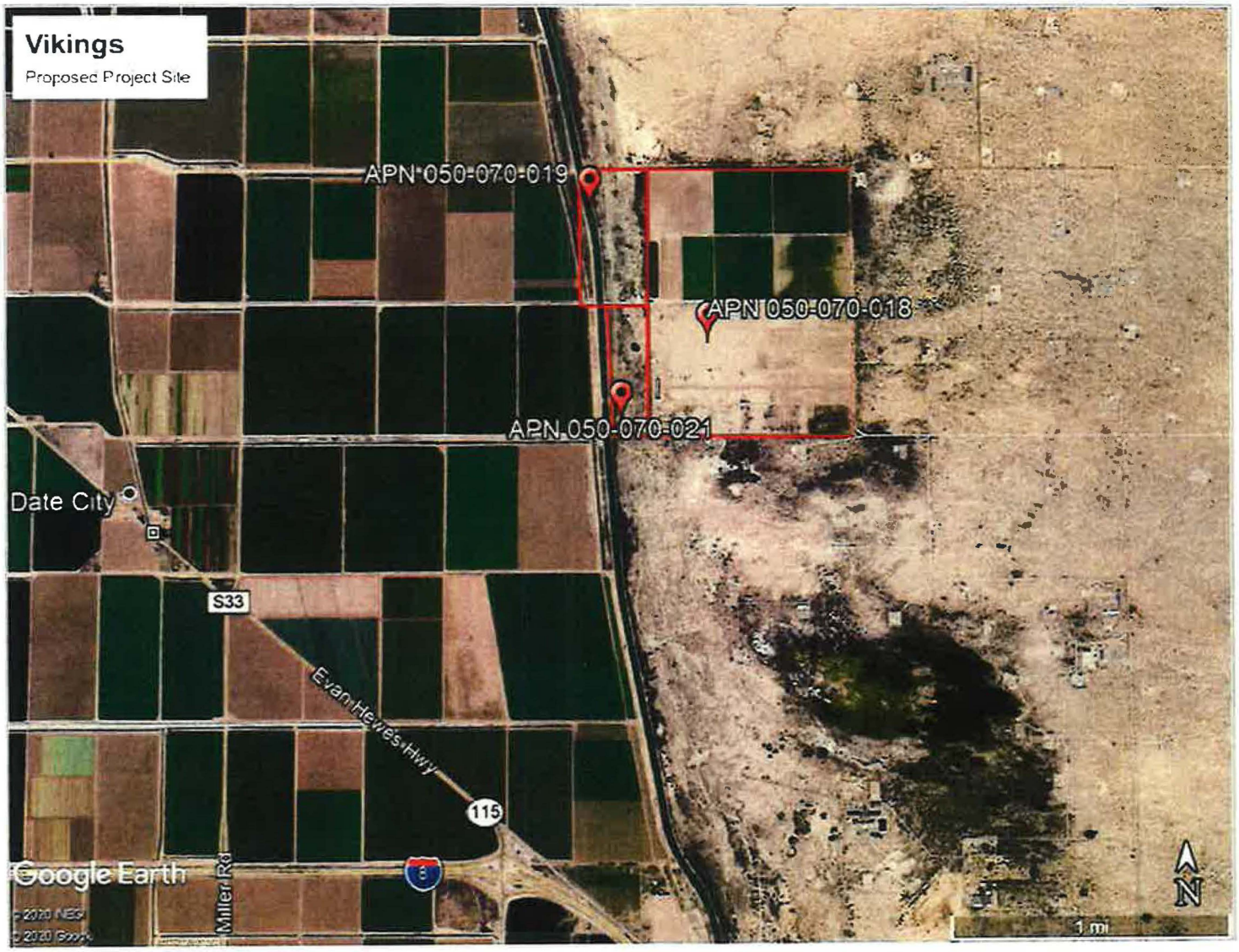

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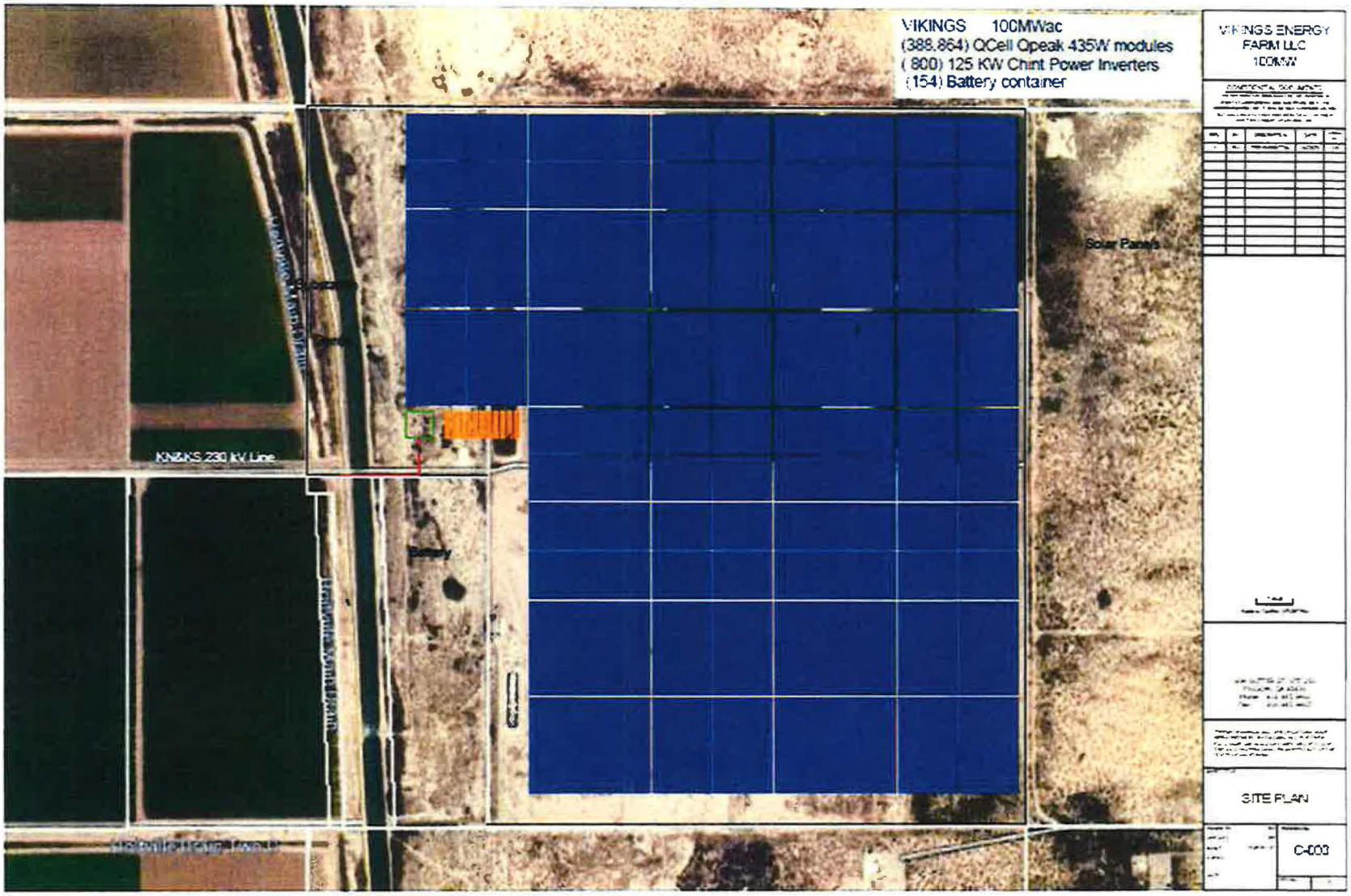

Figure 3 Project Site Map

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Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1272

Angela Elliott Santos, Chairperson
P.O. Box 1302
Boulevard, CA 91905

RE: **Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000**

Dear Ms. Santos,

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Planning & Development Services

BY:

Diana Robinson
Planner III

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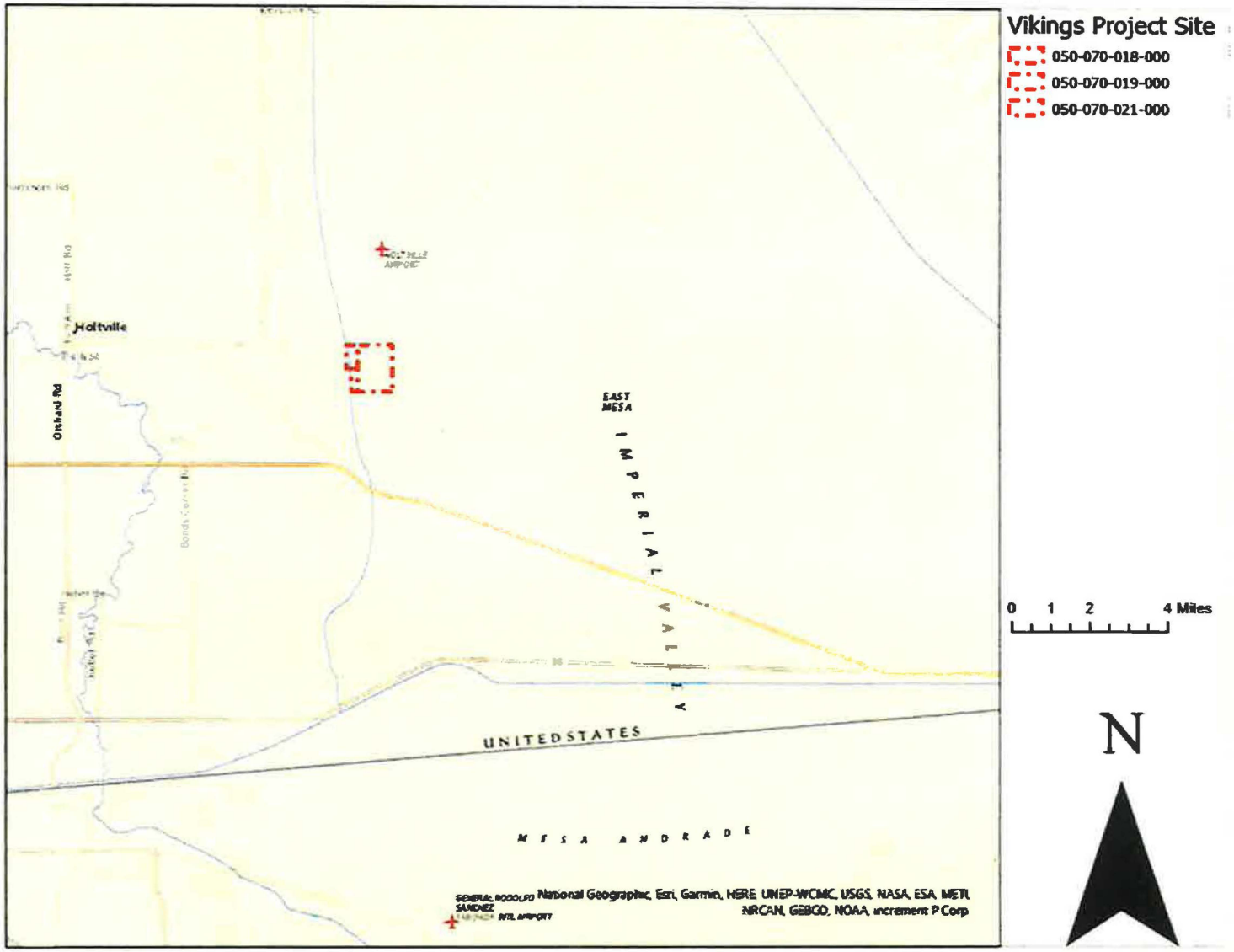

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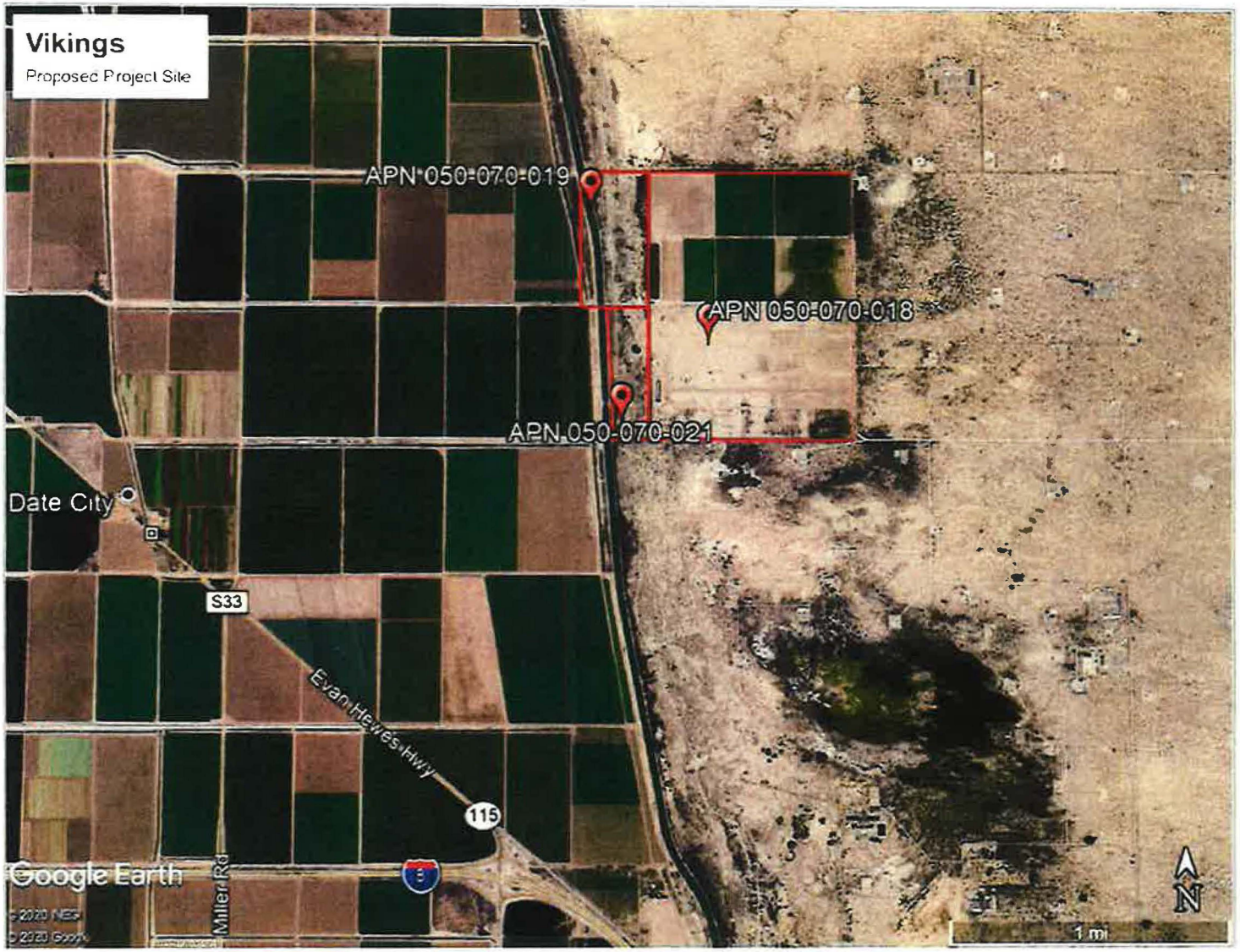

Figure 2 Project Vicinity Map

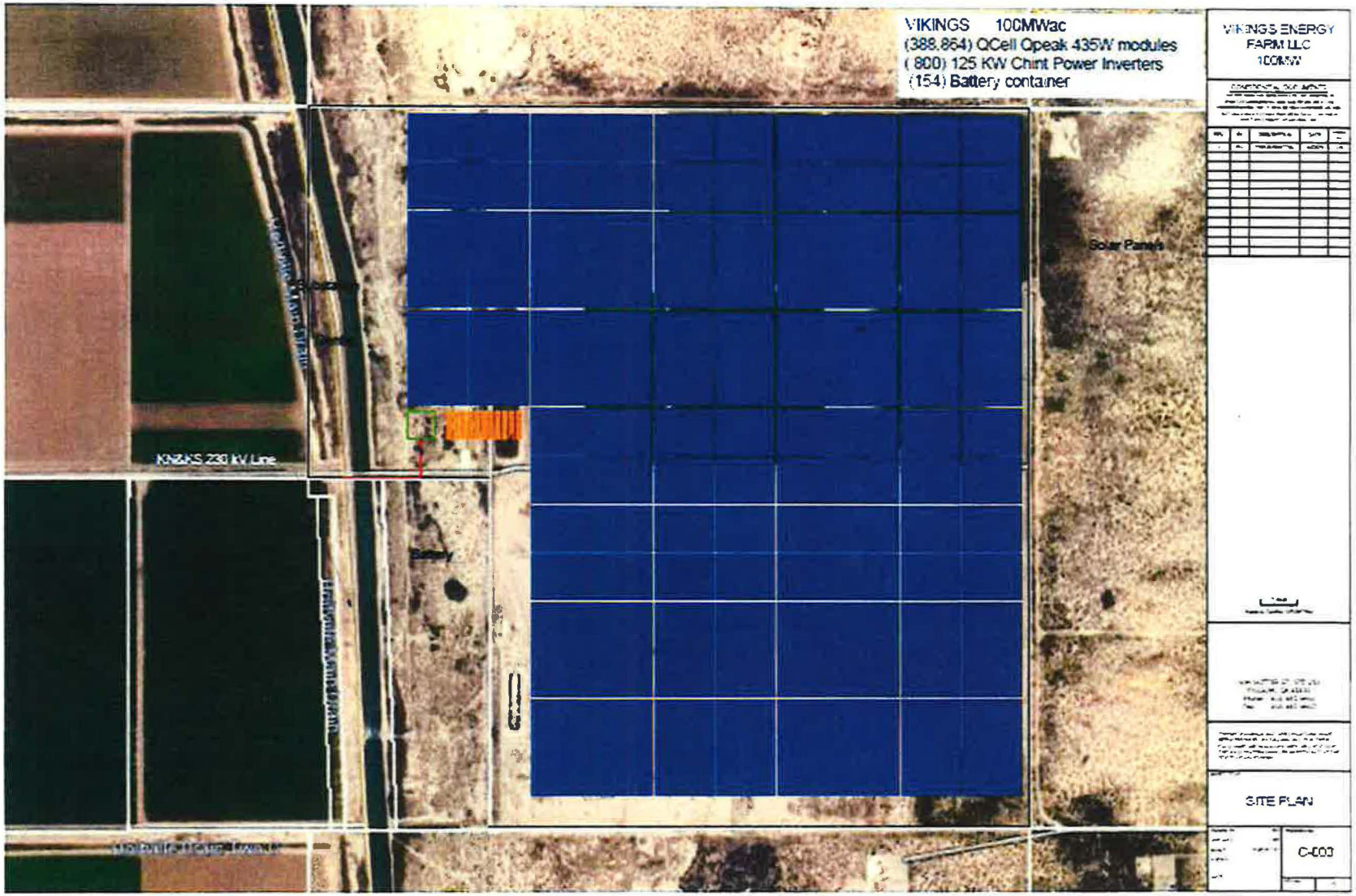

Figure 3 Project Site Map

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Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1265

Michael Linton, Chairperson
P.O. Box 270
Santa Ysabel, CA 92070

RE: Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000

Dear Mr. Linton,

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JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

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Cc:

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Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS
mesagrandeband@msn.com

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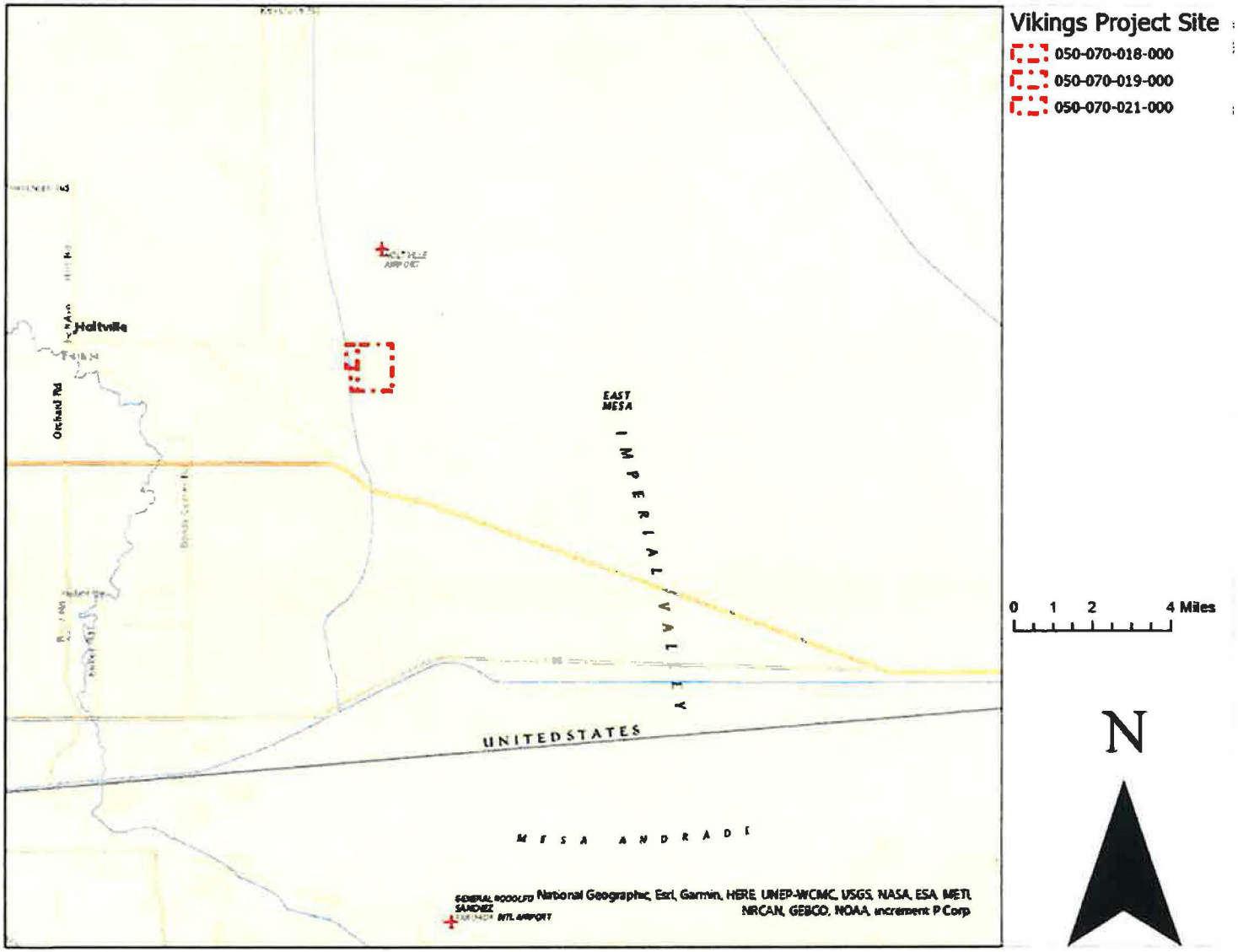

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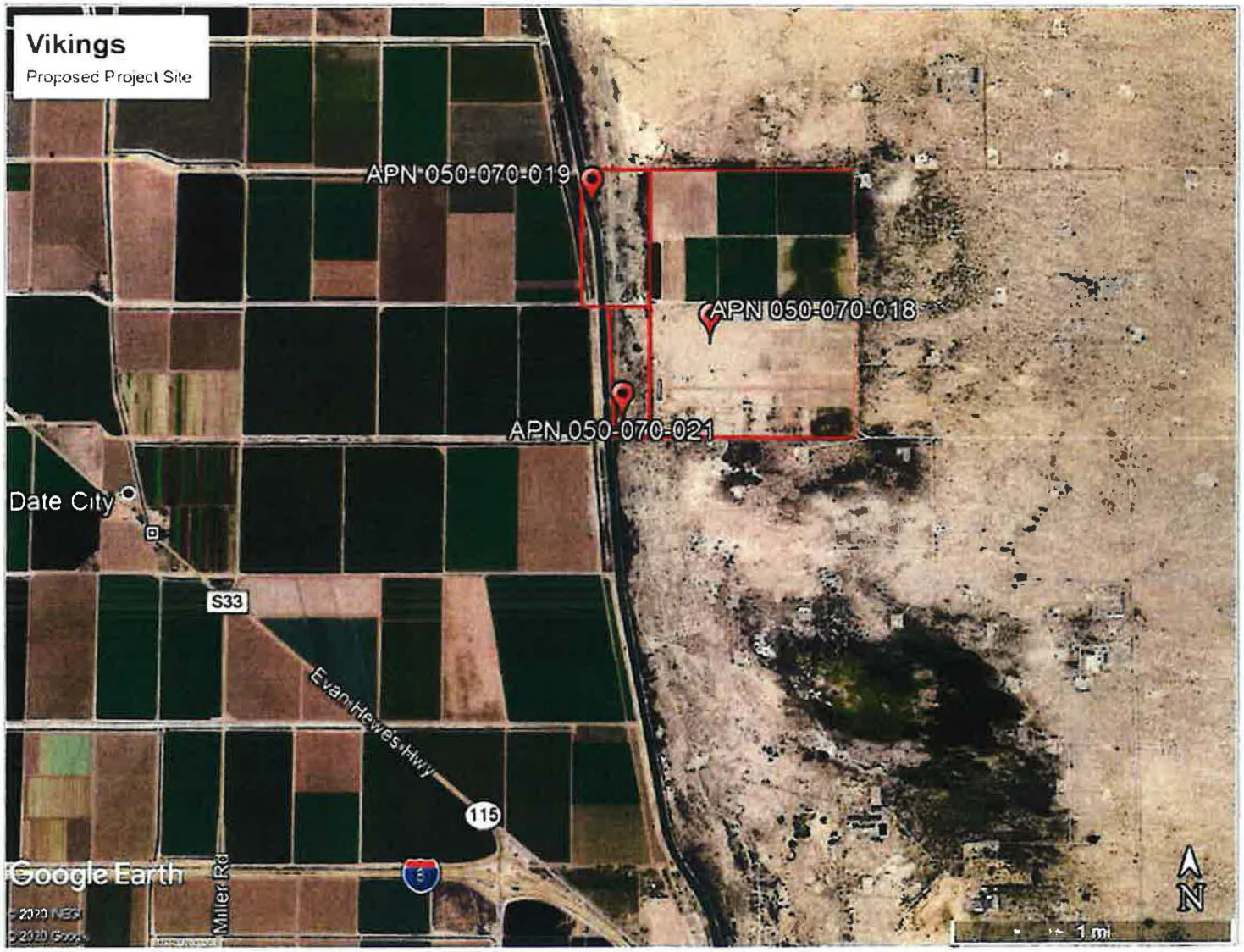

Figure 2 Project Vicinity Map

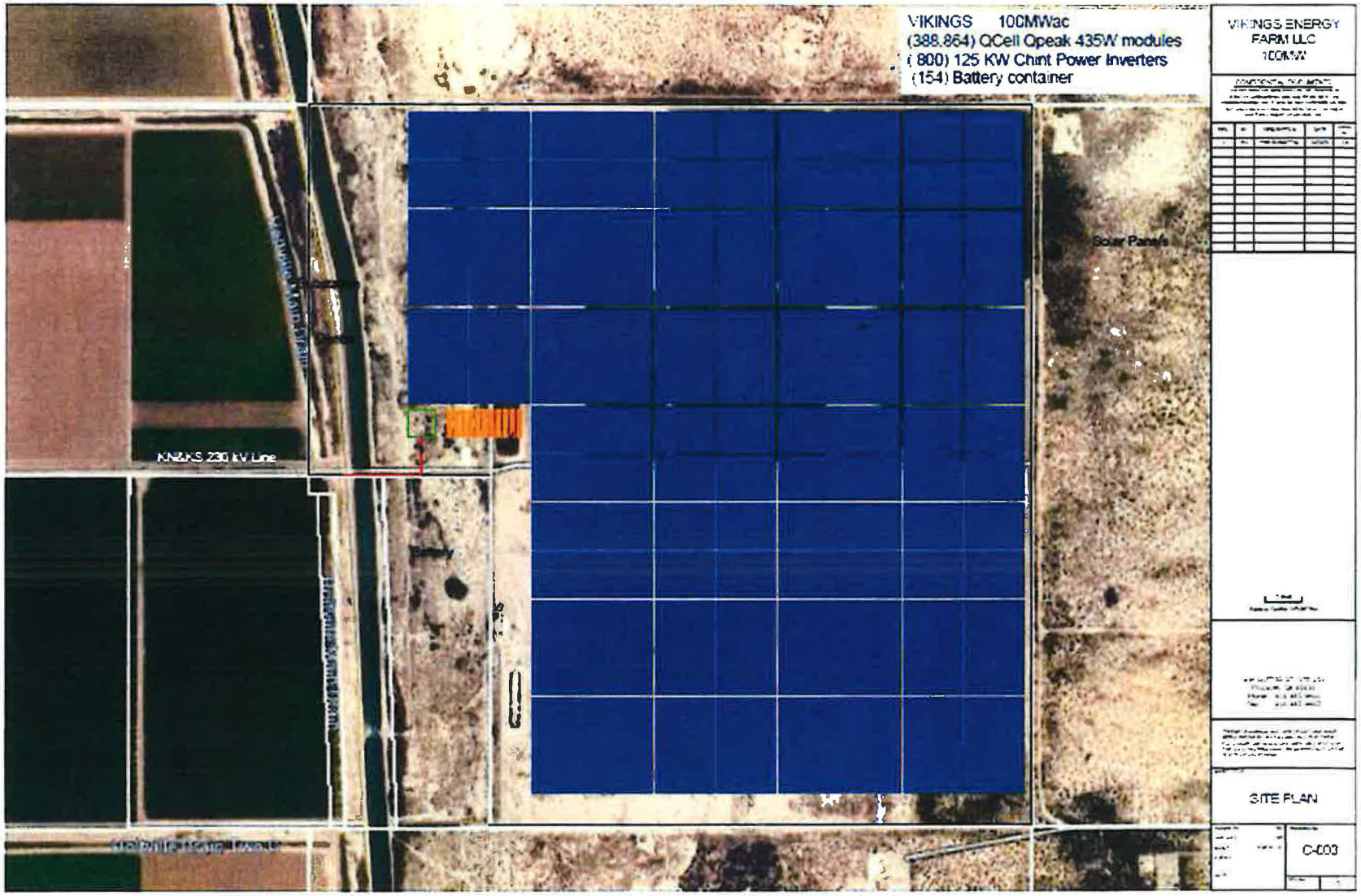

Figure 3 Project Site Map

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Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1258

Stephen W Cope, Chairperson
P.O. Box 365
Valley Center, CA 92082

RE: **Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000**

Dear Mr. Cope,

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Sincerely,

JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc:

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Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS
alleni@sanpasqualtribe.org

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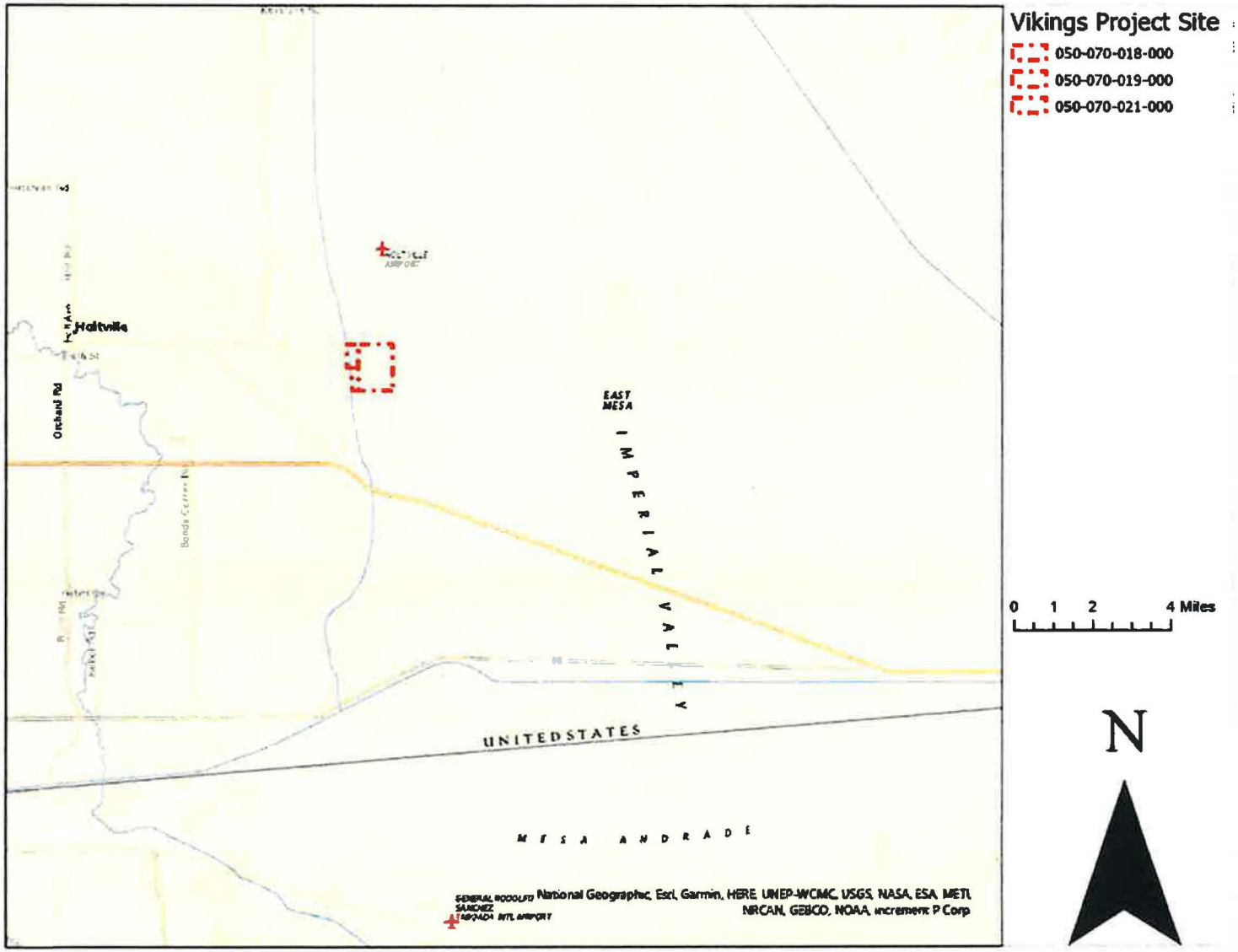

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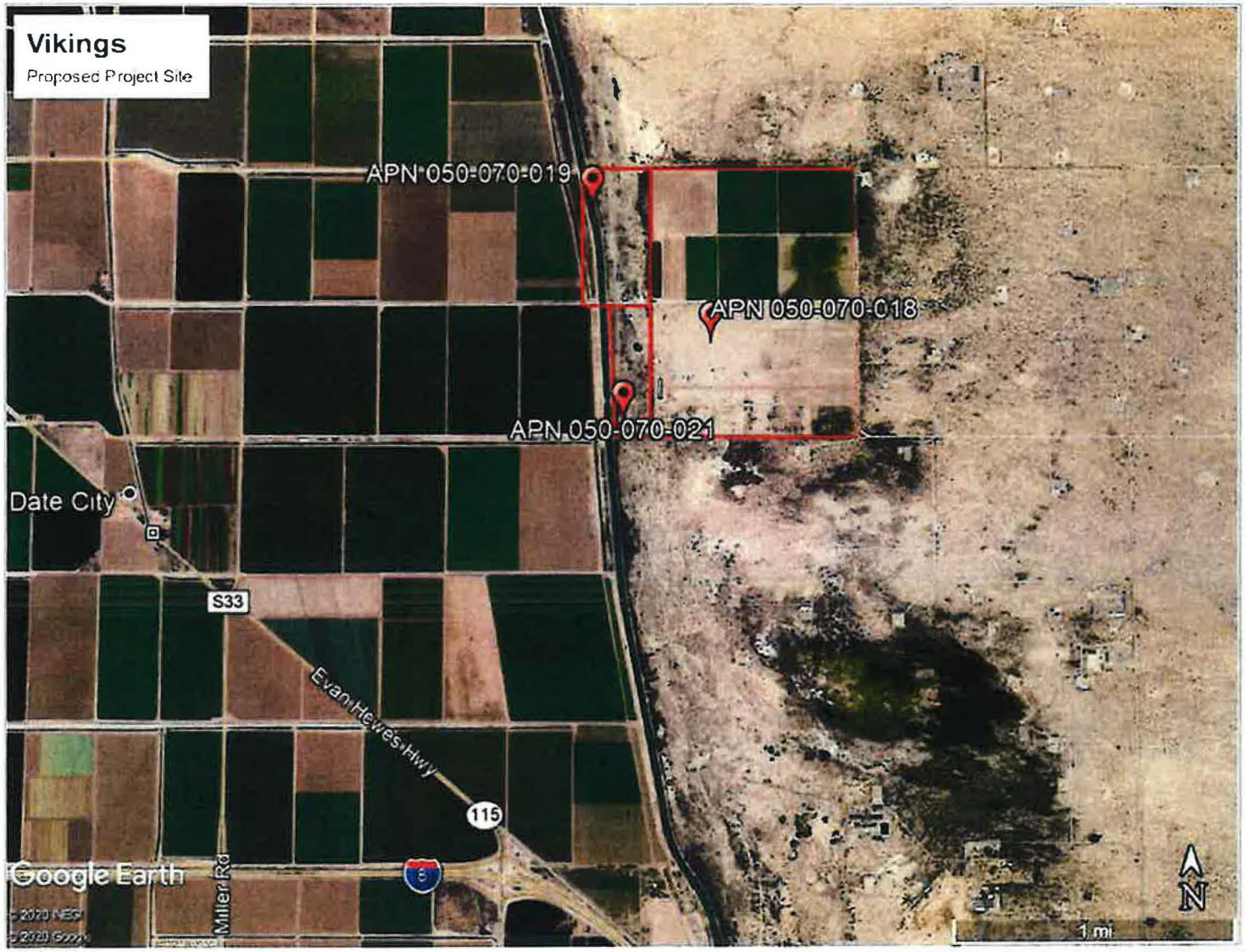

Figure 2 Project Vicinity Map

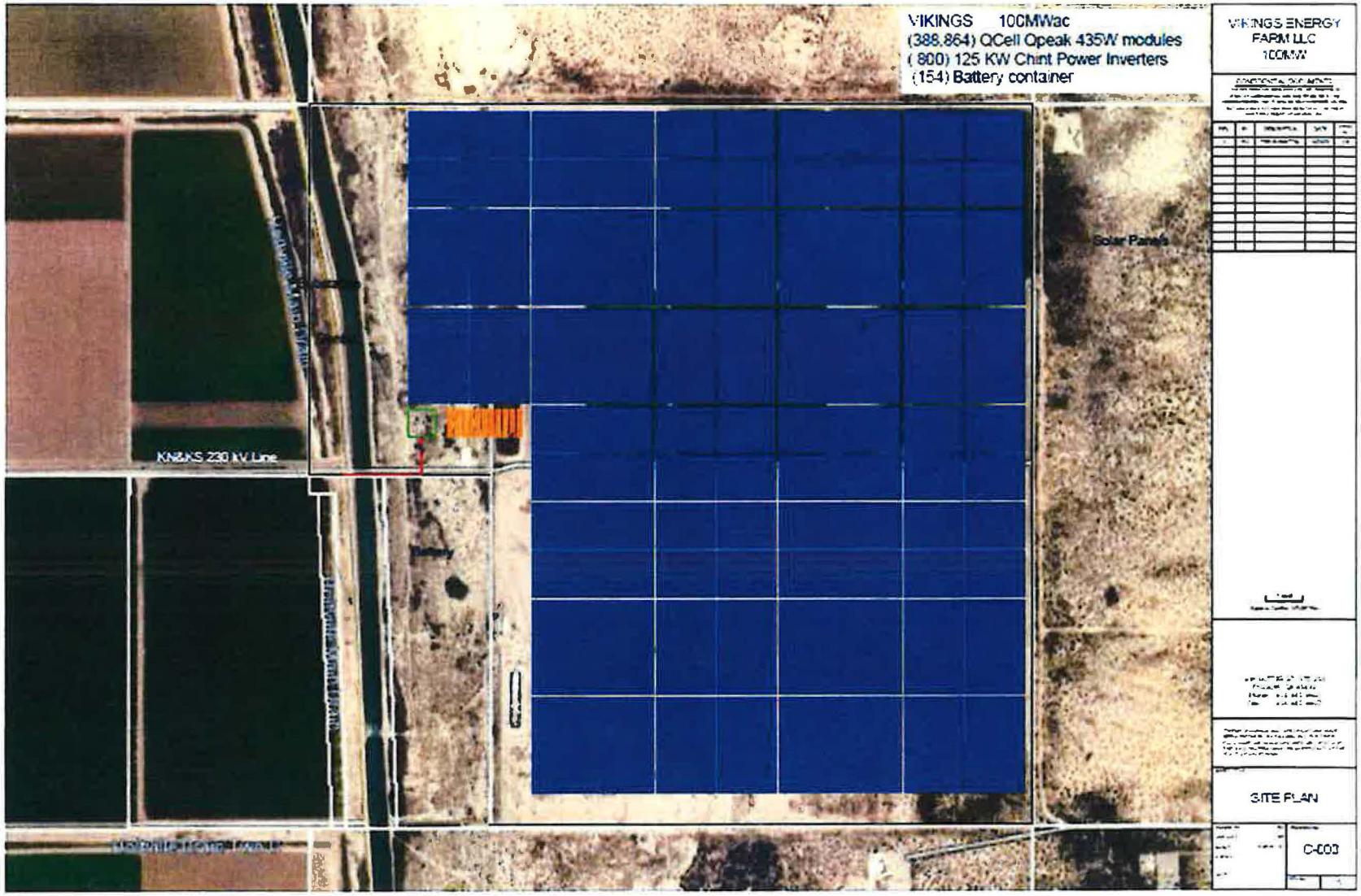

Figure 3 Project Site Map

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Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1241

Cody Martinez, Chairperson
1 Kwaaypaay Court
El Cajon, CA 92019

RE: Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000

Dear Mr. Martinez,

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Sincerely,

JIM MINNICK, Director

Planning & Development Services

BY:

Diana Robinson
Planner III

Attachment: Location Maps (2)

Cc:

Jim Minnick, Director, ICPDS
Michael Abraham, AICP, Asst. Director of ICPDS
Diana Robinson, Planner III, ICPDS
Mariela Moran, Planner II, ICPDS
ssilva@sycuan-nsn.gov

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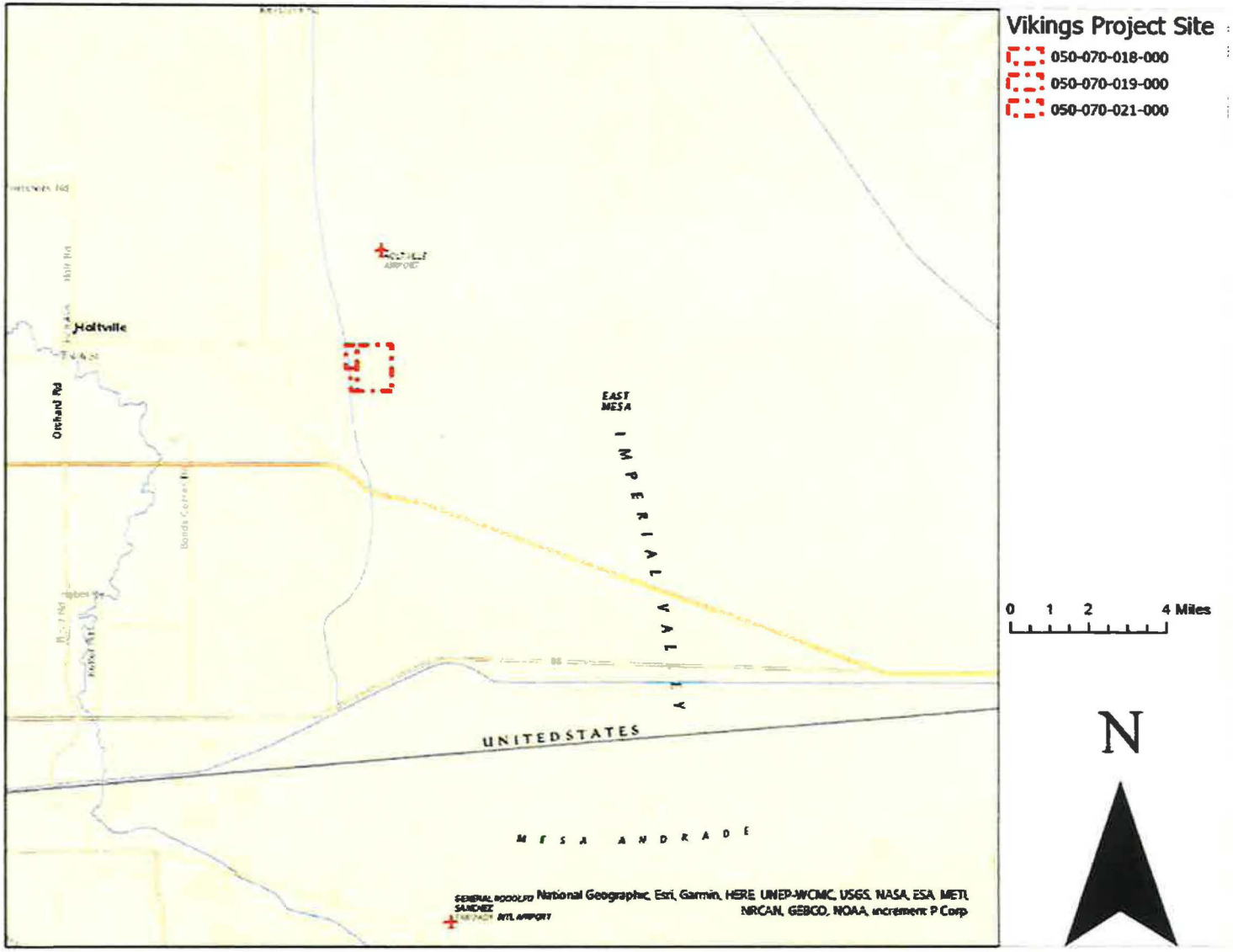

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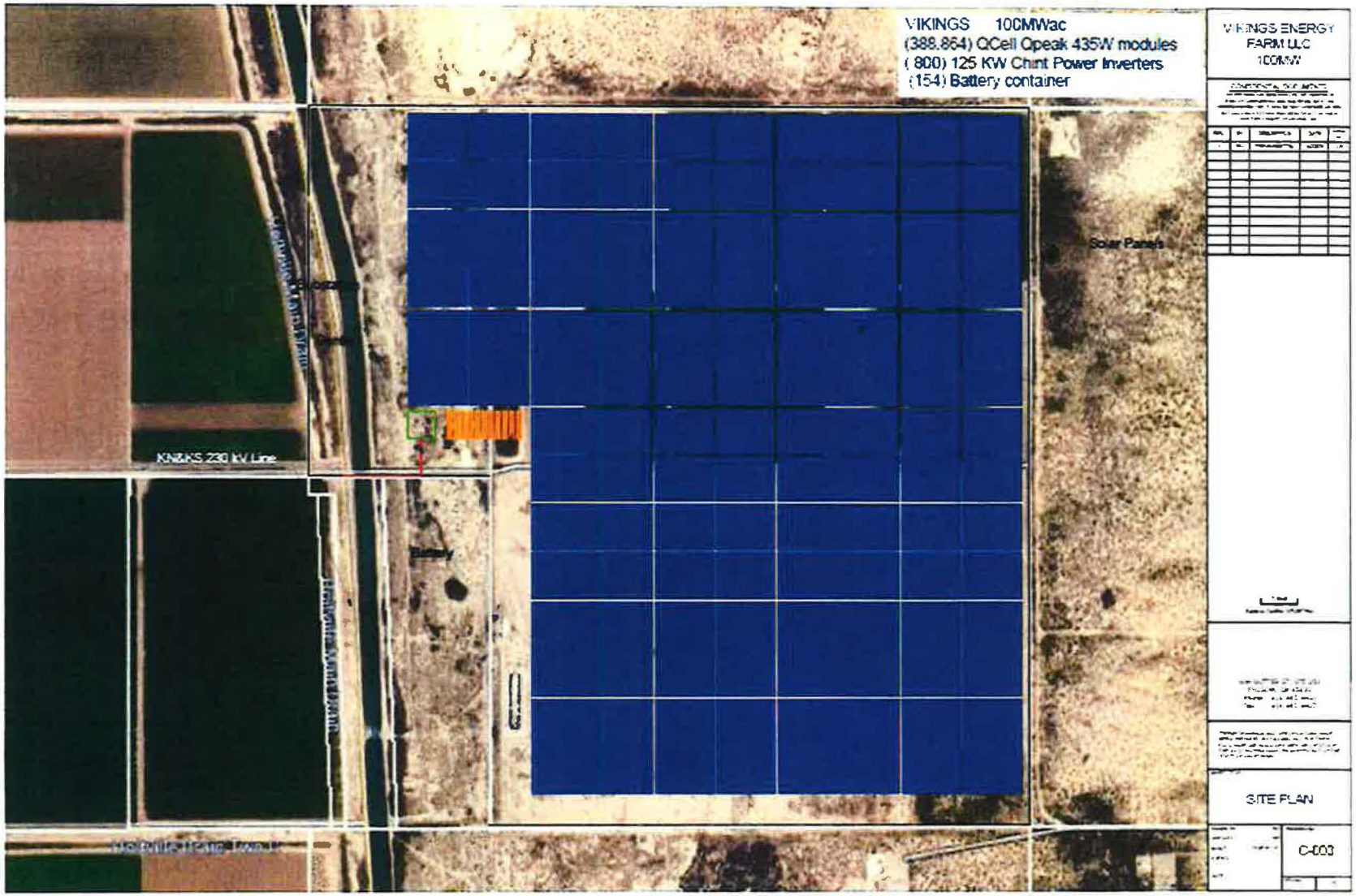

Figure 3 Project Site Map

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Imperial County Planning & Development Services
Planning / Building

Jim Minnick
DIRECTOR

June 23, 2021

Certified Mail No.
7016 2140 0000 2120 1234

John Christman, Chairperson
1 Viejas Grade Road
Alpine, CA 91901

RE: Notice of Opportunity to Consult for the VIKINGS Solar Energy Project in Imperial County; Conditional Use Permit (CUP 20-0025); APN. #050-070-018-000, 050-070-019-000, and 050-070-021-000

Dear Mr. Christman,

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Planning & Development Services

BY:

Diana Robinson
Planner III

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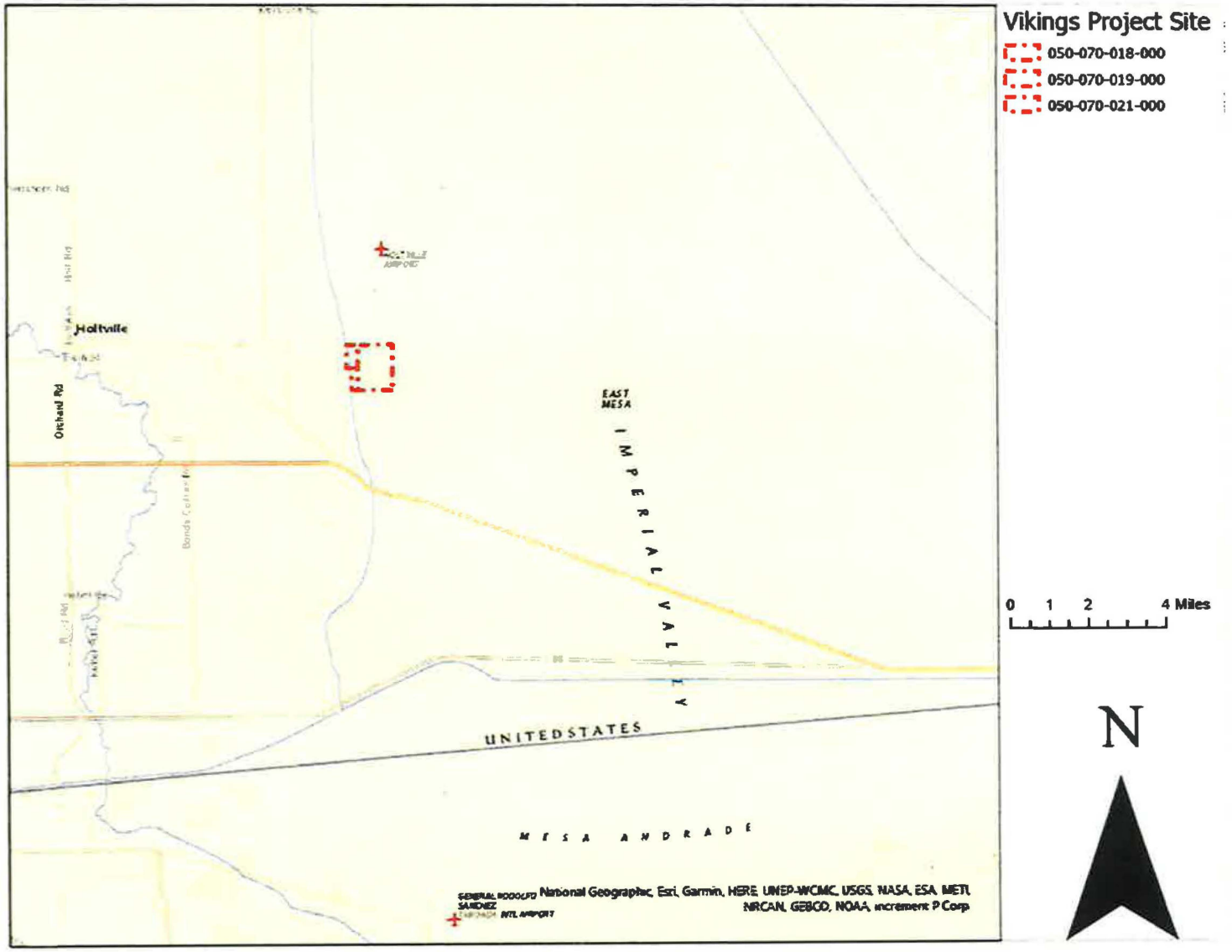

Figure 1 Project Location Map

Figure 2 Project Vicinity Map

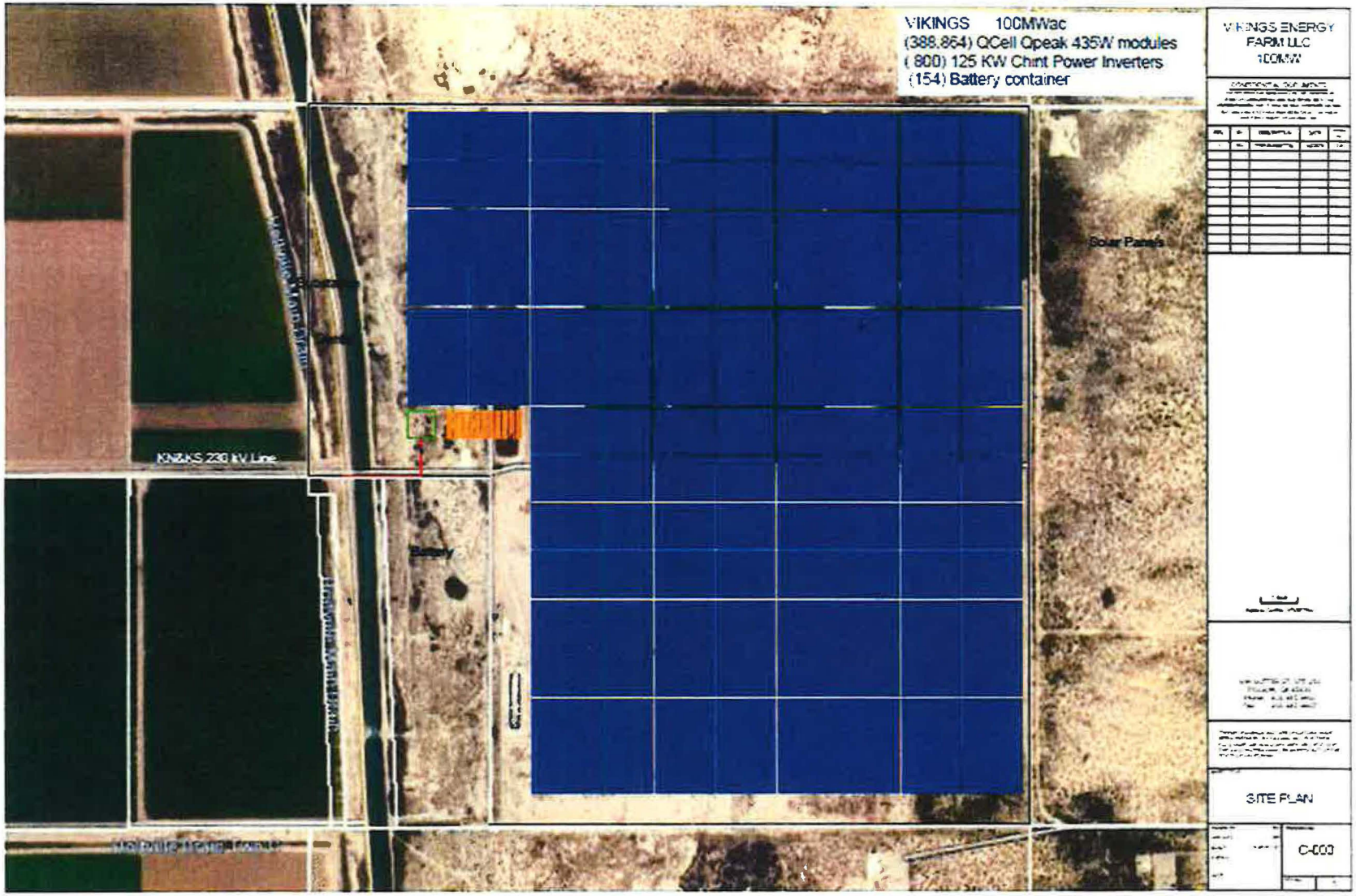

Figure 3 Project Site Map

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From: Ray Teran <rteran@viejas-nsn.gov>
Sent: Thursday, July 1, 2021 12:38 PM
To: ICPDSCommentLetters <ICPDSCommentLetters@co.imperial.ca.us>
Subject: VIKINGS Solar Energy Project

CAUTION: This email originated outside our organization; please use caution.

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has cultural significance or ties to Viejas. Cultural resources have been located within or adjacent to the APE-DE of the proposed project.

Viejas Band request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities and to inform us of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains.

If you wish to utilize Viejas cultural monitors (Viejas rate is $54.15/hr. plus GSA mileage), please call Ernest Pingleton at 619-655-0410 or email, epingleton@viejas-nsn.gov, for contracting and scheduling. Thank you.

If a Tribe, having a closer proximity to the Project, requests to perform cultural monitoring, Viejas will differ to them.

Ray Teran
Viejas Tribal Government
Resource Management Director
619-659-2312
rteran@viejas-nsn.gov

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I Geotechnical Report

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Geotechnical Report

Viking Solar Facility
Nelson Pit Road
Holtville, California

Prepared for:

APEX Energy Solutions
750 W. Main Street
El Centro, CA 92243

LANDMARK
Geo-Engineers and Geologists

Prepared by:

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January 2021

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January 13, 2021

Ms. Jamie Nagel
APEX Energy Solutions
750 W. Main Street
El Centro, CA 92243

Geotechnical Report
Viking Solar Facility
Nelson Pit Road
Holtville, California
LCI Report No. LE20189

Dear Ms. Nagel:

This geotechnical report is provided for design and construction of the proposed development of a 150 MW PV solar power generation facility at the approximately 600-acre project site located at the east end of Nelson Pit Road east of the Highline Canal approximately six miles east to southeast of Holtville, California. The Viking Solar Facility will include a substation and battery storage containers. Our geotechnical exploration was conducted in response to your request for our services. The enclosed report describes our soil engineering site evaluation and presents our professional opinions regarding geotechnical conditions at the site to be considered in the design and construction of the project.

Based on the geotechnical conditions encountered at the points of exploration, the project site appears suitable for the proposed construction provided the professional opinions contained in this report are considered in the design and construction of this project.

We appreciate the opportunity to provide our findings and professional opinions regarding geotechnical conditions at the site. Please provide our office with a set of the foundation plans and civil plans for review to insure that the geotechnical site constraints have been included in the design documents. If you have any questions or comments regarding our findings, please call our office at (760) 370-3000.

Respectfully Submitted,
Landmark Consultants, Inc.

REGISTERED PROFESSIONAL ENGINEER
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EXECUTIVE SUMMARY

This executive summary presents ***selected*** elements of our findings and professional opinions. This summary ***may not*** present all details needed for the proper application of our findings and professional opinions. Our findings, professional opinions, and application options are ***best related through reading the full report***, and are best evaluated with the active participation of the engineer of record who developed them. The findings of this study are summarized below:

- The project site consists predominantly of medium dense to very dense sands (SP) and silty sands (SM) with minor interbedded clay layers encountered sporadically throughout the project site.

- Special foundation designs to mitigate expansive soil conditions are not required.

- The foundations may be designed using an allowable soil bearing pressure of 2,000 psf with standard increases allowed by the California Building Code when foundations are supported on imported or native compacted sands (extending a minimum of 1.0 feet below footings).

- The risk of liquefaction induced settlement is low at the electrical substation area (CPT-11). Liquefaction may occur in isolated silt and sand layers encountered at depths of 15 to 42 feet below ground surface. Potential liquefaction induced settlements of ½ inch have been estimated for the substation area. There is a very low risk of ground rupture and/or sand boil formation should liquefaction occur.

- Low sulfate and moderate chloride levels were encountered in the soil samples tested for this study. However, in consideration of general corrosive environment in the vicinity, it is recommended that concrete should use Type V cement with a maximum water-cement ratio of 0.50 and a minimum compressive strength of 4,000 psi.

- All reinforcing bars, anchor bolts and hold down bolts shall have a minimum concrete cover of 3.0 inches unless epoxy coated (ASTM D3963/A934).

- All-weather accessways should consist of a minimum of 6 inches of Caltrans Class 2 aggregate base material placed over 12 inches of compacted native sand (95%).

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Section 1
INTRODUCTION

1.1 Project Description

This report presents the findings of our geotechnical exploration for the proposed development of a 150 MW PV solar power generation facility at the approximately 600-acre site located at the east end of Nelson Pit Road east of the East Highline Canal approximately six miles east to southeast of Holtville, California (See Vicinity Map, Plate A-1). The solar power generation facility will consist of installing PV solar panels mounted on steel racks supported by short piers, shallow driven posts or shallow spread footings. The proposed solar energy facility will have an electrical substation with step-up transformers and dead-end A-frames for overhead power line connections and battery storage containers near the middle of the west boundary of the site. The photovoltaic modules are planned to be ground mounted on single-axis tracker frames or fixed-tilt frames. A proposed site layout was provided by the client.

Footing loads at exterior bearing walls are estimated at 1 to 5 kips per lineal foot. Column loads are estimated to range from 5 to 30 kips. Site development will include minimal site grading for the PV panel areas, building pad preparation for the battery containers, underground utility installation, site paving and all weather road surfacing.

1.2 Purpose and Scope of Work

The purpose of this geotechnical study was to investigate the upper 50 feet of subsurface soil at selected locations within the site for evaluation of physical/engineering properties, liquefaction potential during seismic events, field testing for steel post capacities and soil electrical/thermal resistivity parameters. Professional opinions were developed from field and laboratory test data and are provided in this report regarding geotechnical conditions at this site and the effect on design and construction. The scope of our services consisted of the following:

- Field exploration and in-situ testing of the site soils at selected locations and depths.
- Laboratory testing for physical and/or chemical properties of selected samples.
- Review of the available literature and publications pertaining to local geology, faulting, and seismicity.
- Engineering analysis and evaluation of the data collected.
- Preparation of this report presenting our findings and professional opinions regarding the geotechnical aspects of project design and construction.

This report addresses the following geotechnical parameters:

- Subsurface soil and groundwater conditions
- Site geology, regional faulting and seismicity, near source factors, and site seismic accelerations
- Liquefaction potential and its mitigation
- Existence of expansive soils
- Aggressive soil conditions to metals and concrete

Professional opinions with regard to the above parameters are provided for the following:

- Site grading and earthwork
- Building pad and foundation subgrade preparation
- Allowable soil bearing pressures and expected settlements
- Capacities for drilled piers and/or driven steel posts
- Soil parameters for L-Pile program determined by steel post load tests
- Concrete slabs-on-grade
- Excavation conditions and buried utility installations
- Mitigation of the potential effects of salt concentrations in native soil to concrete mixes and steel reinforcement
- Seismic design parameters
- Structural section for unpaved roadways and construction laydown areas

Our scope of work for this report did not include an evaluation of the site for the presence of environmentally hazardous materials or conditions, groundwater mounding, soil infiltration rates (storm water basins), soil percolation rates (septic systems), or landscape suitability of the soil.

1.3 Authorization

Ziad Alaynan, PE of APEX Energy Solutions, LLC provided authorization by written agreement to proceed with our work on November 9, 2020. We conducted our work according to our written proposal dated November 3, 2020.

Section 2
METHODS OF INVESTIGATION

2.1 Field Exploration

Subsurface exploration was performed on November 23, 2020 using 2R Drilling of Ontario, California to advance three (3) borings to depths of 16.5 to 21.5 feet below existing ground surface. The borings were advanced with a truck-mounted, CME 75 drill rig using 8-inch diameter, hollow-stem, continuous-flight augers. The approximate boring locations were established in the field and plotted on the site map by sighting to discernible site features. The boring locations are shown on the Site and Exploration Plan (Plate A-2).

A professional engineer observed the drilling operations and maintained logs of the soil encountered with sampling depths. Soils were visually classified during drilling according to the Unified Soil Classification System and relatively undisturbed and bulk samples of the subsurface materials were obtained at selected intervals. The relatively undisturbed soil samples were retrieved using a 2-inch outside diameter (OD) split-spoon sampler or a 3-inch OD Modified California Split-Barrel (ring) sampler. In addition, Standard Penetration Tests (SPT) were performed in accordance with ASTM D1586. The samples were obtained by driving the samplers ahead of the auger tip at selected depths using a 140-pound CME automatic hammer with a 30-inch drop. The number of blows required to drive the samplers the last 12 inches of an 18-inch drive depth into the soil is recorded on the boring logs as "blows per foot". Blow counts (N values) reported on the boring logs represent the field blow counts. No corrections have been applied to the blow counts shown on the boring logs for effects of overburden pressure, automatic hammer drive energy, drill rod lengths, liners, and sampler diameter.

After logging and sampling the soil, the exploratory borings were backfilled with the excavated material. The backfill was loosely placed and was not compacted to the requirements specified for engineered fill.

Additional subsurface exploration was also performed on November 24 and 25, 2020 using Middle Earth Geo Testing, Inc. of Orange, California to advance eleven (11) electric cone penetrometer (CPT) soundings to approximate depths of 20 to 50 feet below existing ground surface. The soundings were made at the locations shown on the Site and Exploration Plan (Plate A-2). The approximate sounding locations were established in the field and plotted on the site map by sighting to discernible site features.

CPT soundings provide a continuous profile of the soil stratigraphy with readings every 2.5cm (1 inch) in depth. Direct sampling for visual and physical confirmation of soil properties has been used by our firm to establish direct correlations with CPT exploration in this geographical region.

The CPT exploration was conducted by hydraulically advancing an instrumented Hogentogler $15cm^2$ conical probe into the ground at a rate of 2cm per second using a 25-ton truck as a reaction mass. An electronic data acquisition system recorded a nearly continuous log of the resistance of the soil against the cone tip (Qc) and soil friction against the cone sleeve (Fs) as the probe was advanced. Empirical relationships (Robertson and Campanella, 1989) were then applied to the data to give a continuous profile of the soil stratigraphy. Interpretation of CPT data provides correlations for SPT blow count, phi (ϕ) angle (soil friction angle), undrained shear strength (S_u) of clays and over-consolidation ratio (OCR). These correlations may then be used to evaluate vertical and lateral soil bearing capacities and consolidation characteristics of the subsurface soil.

Interpretive logs of the CPT soundings and subsurface logs are presented on Plates B-1 through B-14 in Appendix B. A key to the interpretation of CPT soundings and log symbols are presented on Plates B-15 and 16. The stratification lines shown on the subsurface logs represent the approximate boundaries between the various strata. However, the transition from one stratum to another may be gradual over some range of depth.

2.2 Field Electrical Resistivity Testing

Wenner 4-pin field resistivity testing was conducted by RF Yeager Engineering of Lakeside, California under sub-contract to Landmark at three (3) locations within the proposed solar array site in accordance with ASTM G57 standards. Tests were conducted with both North-South and East-West pin orientations. The tests were conducted at pin spacings of 2.5, 5, 10, 15 and 20 feet. Additionally, near surface soil samples (upper 5 feet) ware obtained for laboratory soil corrosivity testing at the select location. The results of the electrical resistivity and soil corrosivity testing are presented in Appendix E.

2.3 Thermal Resistivity Testing

Laboratory soil thermal resistivity testing was conducted by RF Yeager Engineering at three (3) locations within the project site. The tests were conducted at the locations shown on Figure 1 in Appendix E. The testing was conducted in accordance with ASTM D5334. Near surface soil samples were obtained from Borings B-1, B-2, and B-3 as shown on Figure 1 in Appendix E.

The thermal resistivity testing consisted of determining a thermal dry-out curve at each test location. The results of the thermal resistivity testing are presented in Appendix E.

2.4 Laboratory Testing

Laboratory tests were conducted on selected bulk (auger cuttings) and relatively undisturbed soil samples obtained from the soil borings to aid in classification and evaluation of selected engineering properties of the site soils. The tests were conducted in general conformance to the procedures of the American Society for Testing and Materials (ASTM) or other standardized methods as referenced below. The laboratory testing program consisted of the following tests:

- Particle Size Analyses (ASTM D422) – used for soil classification
- Chemical Analyses (soluble sulfates & chlorides, pH, and resistivity) (Caltrans Method)

The laboratory test results are presented on the subsurface logs (Appendix B) and in Appendix C and E. Engineering parameters of soil strength, compressibility and relative density utilized for developing design criteria provided within this report were either extrapolated from correlations with the subsurface CPT data or from data obtained from the field laboratory testing program.

Section 3
DISCUSSION

3.1 Site Conditions

The approximately 600-acre project site located at the east end of Nelson Pit Road east of the East Highline Canal approximately 6 miles east to southeast of Holtville, California. The project consists of three (3) parcels (APN 050-070-019, 050-070-021, 050-070-018). The project site is currently a combination of a fallow agricultural field, active agricultural fields and vacant desert land.

The two western parcels are currently vacant with overgrown brush and multiple piles of debris. These two parcels parallel the East Highline Canal and are channel shaped in the north-south direction. The larger agricultural parcel that makes up approximately 480 acres is fallowed south of Nelson Pit Road and in agricultural production north of the road. A residential farm house and shop are located along the southwest end of this parcel. Two fresh water ponds are located along the western boundary of this parcel. Water is supplied by a private ditch that pumps water from canal that comes off of the East Highline Canal. The north portion of this parcel is sprinkler irrigated with signs of old underground piping with standpipes. The southern fallowed portion of the eastern parcel has underground transit water pipelines.

The project site lies at an elevation of approximately 25 to 45 feet above mean sea level (MSL) (El. 1025 to 1045 local datum) in the northwestern region of the Imperial Valley in the California low desert. The surrounding properties lie on terrain which is flat (planar), part of a large agricultural valley, which was previously an ancient lake bed covered with fresh water (about 300 years ago) to an elevation of 43± feet above MSL. Annual rainfall in this arid region is less than 3 inches per year with four months of average summertime temperatures above 100 ºF. Winter temperatures are mild, seldom reaching freezing.

3.2 Geologic Setting

The project site is located in the East Mesa portion of the Salton Trough physiographic province. The Salton Trough is a topographic and geologic structural depression resulting from large scale regional faulting. The trough is bounded on the northeast by the San Andreas Fault and Chocolate Mountains and the southwest by the Peninsular Range and faults of the San Jacinto Fault Zone. The Salton Trough represents the northward extension of the Gulf of California, containing both marine and non-marine sediments deposited since the Miocene Epoch (Morton, 1977). Tectonic activity that formed the trough continues at a high rate as evidenced by deformed young sedimentary deposits and high levels of seismicity. Figure 1 shows the location of the site in relation to regional faults and physiographic features.

The East Mesa lies east of the Imperial Valley, which is underlain by lacustrine deposits consisting of interbedded lenticular and tabular silt, sand, and clay, and west of the Algodones Sand Dunes. The East Mesa is underlain by deep sand deposits derived from eolian deposition along the eastern margin of the Imperial Valley.

The Late Pleistocene to Holocene lake deposits of the Imperial Valley are probably less than 100 feet thick and derived from periodic flooding of the Colorado River which intermittently formed Lake Cahuilla. Older deposits consist of Miocene to Pleistocene non-marine and marine sediments deposited during intrusions of the Gulf of California. Basement rock consisting of Mesozoic granite and Paleozoic metamorphic rocks are estimated to exist at depths between 15,000 - 20,000 feet

3.3 Subsurface Soil

The UC Davis California Soil Resource Lab “SoilWeb Earth” computer application (UC Davis, 2020) for Google Earth indicates that surficial deposits at the project site consist predominantly of silty sand loams of the Rositas, Vint, Niland, Carsitas and Meloland (see Plate A-3). These loams and sands are formed in sediment and alluvium of mixed origin (Colorado River overflows, Mountain run-off and fresh-water lake-bed sediments).

Subsurface soils encountered during the field exploration of the proposed solar array areas conducted on November 23 thru 25, 2020 consist of predominantly medium dense to very dense sand and silty sands to a depth of 20 feet below ground surface. Thin (2 to 5 feet thick) clay layers were encountered sporadically throughout the project site below depths of 6 feet. The subsurface soils at the proposed electrical substation area located near the middle of the western boundary of the project site are predominately dense to very dense sands and gravely sands to a depth 50 feet below ground surface, the maximum depth of exploration. The subsurface logs (Plates B-1 through B-14) depict the stratigraphic relationships of the various soil types.

3.4 Groundwater

Groundwater was encountered in Boring B-3, proposed electrical substation area, (Plate B-14) at about 9.0 feet at the time of exploration. Groundwater was encountered between 18 and 20 feet in Boring B-2 and B-1 respectively. Groundwater is likely to be present at the interface between surface sands and underlying clays.

There is uncertainty in the accuracy of short-term water level measurements, particularly in fine-grained soil. The referenced groundwater levels should not be interpreted to represent permanent condition. Groundwater levels may fluctuate with precipitation, EHL Canal water stage, site watering, drainage, and site grading.

3.5 Faulting

The project site is located in the seismically active Imperial Valley of southern California with numerous mapped faults traversing the region including the San Andreas, San Jacinto, and Elsinore Fault Zones in southern California. The Imperial fault represents a transition from the more continuous San Andreas fault to a more nearly echelon pattern characteristic of the faults under the Gulf of California (USGS, 1990). We have performed a computer-aided search of known faults or seismic zones that lie within a 62 mile (100 kilometer) radius of the project site (Table 1).

A fault map illustrating known active faults relative to the site is presented on Figure 1, *Regional Fault Map*. Figure 2 shows the project site in relation to local faults. The criterion for fault classification adopted by the California Geological Survey defines Earthquake Fault Zones along Holocene-active or pre-Holocene faults (CGS, 2019b). Earthquake Fault Zones are regulatory zones that address the hazard of surface fault rupture. A Holocene-active fault is one that has ruptured during Holocene time (within the last 11,700 years). A pre-Holocene fault is a fault that has not ruptured in the last 11,700 years. Pre-Holocene faults may still be capable of surface rupture in the future, but are not regulated by the A-P act.

Review of the current Earthquake Fault Zone maps (CGS, 2019a) indicates that the nearest zoned fault is the Rico fault located approximately 7.1 miles west of the project site and the Imperial fault located approximately 7.9 miles west to southwest of the project site.

3.6 General Ground Motion Analysis

The project site is considered likely to be subjected to moderate to strong ground motion from earthquakes in the region. Ground motions are dependent primarily on the earthquake magnitude and distance to the seismogenic (rupture) zone. Acceleration magnitudes also are dependent upon attenuation by rock and soil deposits, direction of rupture and type of fault; therefore, ground motions may vary considerably in the same general area.

2019 CBC General Ground Motion Parameters: The California Building Code (CBC) requires that a site-specific ground motion hazard analysis be performed in accordance with ASCE 7-16 Section 11.4.8 for structures on Site Class D and E sites with S_1 greater than or equal to 0.2 and Site Class E sites with S_s greater than or equal to 1.0. **This project site has been classified as Site Class D and has a S_1 value of 0.6, which would require a site-specific ground motion hazard analysis**. However, ASCE 7-16 Section 11.4.8 provides three exceptions which permit the use of conservative values of design parameters for certain conditions for Site Class D and E sites in lieu of a site specific hazard analysis.

The exceptions are:

- Exception 1: Structures on Site Class E sites with S_s greater than or equal to 1.0, provided the site coefficient F_a is taken as equal to that of Site Class C.
- Exception 2: Structures on Site Class D sites with S_1 greater than or equal to 0.2, provided the value of the seismic response coefficient C_s is determined by Equations 12.8-2 for values of $T \leq 1.5T_S$ and taken as equal to 1.5 times the value computed in accordance with either Equation 12.8-3 for $T_L \geq T > 1.5T_S$ or Equation 12.8-4 for $T > T_L$.
- Exception 3: Structures on Site Class E sites with S_1 greater than or equal to 0.2, provided that T is less than or equal to T_S and the equivalent static force procedure is used for design.

The project design engineer should confirm that an exception applies to the project. If none of the exceptions apply, our office should be consulted to perform a site-specific ground motion hazard analysis.

The 2019 CBC general ground motion parameters are based on the Risk-Targeted Maximum Considered Earthquake (MCE_R). The Structural Engineers Association of California (SEAOC) and Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps Web Application (SEAOC, 2020) was used to obtain the site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters. Design spectral response acceleration parameters are defined as the earthquake ground motions that are two-thirds (2/3) of the corresponding MCE_R ground motions. The Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration adjusted for soil site class effects (PGA_M) value to be used for liquefaction and seismic settlement analysis in accordance with 2019 CBC Section 1803.5.12 ($PGA_M = F_{PGA}$*PGA) is estimated at 0.55g for the project site. **Design earthquake ground motion parameters are provided in Table 2.**

3.7 Seismic and Other Hazards

- **Groundshaking.** The primary seismic hazard at the project site is the potential for strong groundshaking during earthquakes along the Rico, Imperial and Brawley Faults.
- **Surface Rupture.** The California Geological Survey (2016) has established Earthquake Fault Zones in accordance with the 1972 Alquist-Priolo Earthquake Fault Zone Act. The Earthquake Fault Zones consists of boundary zones surrounding well defined, active faults or fault segments. The project site does not lie within an A-P Earthquake Fault Zone; therefore, surface fault rupture is considered to be low at the project site. However, because of the high tectonic activity and deep alluvium of the region, we cannot preclude the potential for surface rupture on undiscovered or new faults that may underlie the site.
- **Liquefaction.** Liquefaction is a potential design consideration because of underlying saturated sandy substrata. Although the Imperial Valley has not yet been evaluated for seismic hazards by the California Geological Survey seismic hazards zonation program, liquefaction is well documented in the Imperial Valley after strong seismic events (McCrink, et al, 2011 and Rymer et al, 2011). The potential for liquefaction at the site is discussed in more detail in Section 3.8. Liquefaction induced lateral spreading is not expected to occur at this site due to the planar topography.

Other Potential Geologic Hazards.

- **Landsliding.** The hazard of landsliding is unlikely due to the regional planar topography. No ancient landslides are shown on geologic maps of the region and no indications of landslides were observed during our site investigation.
- **Volcanic hazards.** The site is not located in proximity to any known volcanically active area and the risk of volcanic hazards is considered very low.
- **Tsunamis and seiches.** The site is not located near any large bodies of water, so the threat of tsunami, seiches, or other seismically-induced flooding is unlikely.
- **Flooding.** The project site is located in FEMA Flood Zone X, an area determined to be outside the 0.2% annual chance floodplain (FIRM Panels 06025C1775). The project site is also along the East Highline Canal which has potential to overflow into the channelized parcels along the east canal bank.
- **Expansive soil.** The near surface soils in the project site are sands which are considered non-expansive.

3.8 Liquefaction

Liquefaction occurs when granular soil below the water table is subjected to vibratory motions, such as produced by earthquakes. With strong ground shaking, an increase in pore water pressure develops as the soil tends to reduce in volume. If the increase in pore water pressure is sufficient to reduce the vertical effective stress (suspending the soil particles in water), the soil strength decreases and the soil behaves as a liquid (similar to quicksand). Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations.

Four conditions are generally required for liquefaction to occur:

(1) the soil must be saturated (relatively shallow groundwater);
(2) the soil must be loosely packed (low to medium relative density);
(3) the soil must be relatively cohesionless (not clayey); and
(4) groundshaking of sufficient intensity must occur to function as a trigger mechanism.

All of these conditions exist to some degree at this site.

Methods of Analysis: The computer program CLiq (Version 2.2.0.32, Geologismiki, 2017) was utilized for liquefaction assessment at the project site. The estimated settlements have been adjusted for transition zones between layers and the post liquefaction volumetric strain has been weighed with depth (Robertson, 2014 and Cetin et al., 2009). Computer printouts of the liquefaction analyses are provided in Appendix E.

The liquefaction potential at the project site was evaluated using the 1997 NCEER Liquefaction Workshop and the Idriss and Boulanger (2008) methods. The 1997 NCEER methods utilize CPT cone readings from site exploration and earthquake magnitude/PGA estimates from the seismic hazard analysis. The resistance to liquefaction is plotted on a chart of cyclic shear stress ratio (CSR) versus a corrected tip pressures $Q_{tn,cs}$. The analysis was performed using a PGA_M value of 0.55g was used in the analysis with a 10 foot groundwater depth and a threshold factor of safety (FS) of 1.3.

The fines content of the liquefiable sands and silts increases their liquefaction resistance in that more ground motion cycles are required to fully develop the increased pore pressures. The CPT tip pressures (Qc) were adjusted to an equivalent clean sand pressure ($Q_{tn,cs}$) in accordance with NCEER (1998).

The soils encountered at the points of exploration included saturated sands and silty sands that could liquefy during a Maximum Considered Earthquake. Liquefaction can occur within a three-foot thick sand layer at a depth of 26 feet below ground surface and two isolated silt and sand layers at depths of 15 and 42 feet. The likely triggering mechanism for liquefaction appears to be strong groundshaking associated with the rupture of the Rico and Imperial fault. The analysis is summarized in the table below.

Liquefaction Induced Settlements: ***Based on empirical relationships, total induced settlements are estimated to be about ½ inch should liquefaction occur.*** Differential settlement is estimated at be two-thirds of the total potential settlement in accordance with California Special Publication 117. Accordingly, there is a potential for ⅓ inch of liquefaction induced differential settlement at the project site.

The differential settlement based on seismic settlements is estimated at 1 inch over a distance of 100 feet. Foundations should be designed for a maximum deflection of L/720.

Because of the depth of the liquefiable layer, the 15 foot thick non-liquefiable layer may act as a bridge over the liquefiable layer resulting in a fairly uniform ground surface settlement; therefore, wide area subsidence of the soil overburden would be the expected effect of liquefaction rather than bearing capacity failure of the proposed structures.

Liquefaction Induced Ground Failure: Based on research from Ishihara (1985) and Youd and Garris (1995) small ground fissure or sand boil formation is unlikely because of the thickness of the overlying unliquefiable soil. Sand boils are conical piles of sand derived from the upward flow of groundwater caused by excess porewater pressures created during strong ground shaking. Sand boils are not inherently damaging by themselves, but are an indication that liquefaction occurred at depth (Jones, 2003). Liquefaction induced lateral spreading is not expected to occur at this site due to the planar topography.

According to Youd (2005), if the liquefiable layer lies at a depth greater that about twice the height of a free face, lateral spread is not likely to develop. No slopes or free faces occur at this site except for the shallow retention basin, which depths are substantially above the first liquefiable layer.

Mitigation: Based on an estimate of less than ½ inch of liquefaction induced settlements, no ground improvement or deep foundation mitigation is required at this project site. The differential settlement caused by liquefaction is estimated at approximately ⅓ inch. The designer should utilize foundation designs which mitigate the liquefaction induced settlement.

Section 4
DESIGN CRITERIA

4.1 Site Preparation

Clearing and Grubbing: All surface improvements, debris or vegetation including grass, brush, and weeds on the site at the time of construction should be removed from the construction area. Root balls should be completely excavated. Organic strippings should be stockpiled and not used as engineered fill. All trash, construction debris, concrete slabs, old pavement, landfill, and buried obstructions such as old foundations and utility lines exposed during rough grading should be traced to the limits of the foreign material by the grading contractor and removed under our supervision. Any excavations resulting from site clearing should be sloped to a bowl shape to the lowest depth of disturbance and backfilled under the observation of the geotechnical engineer's representative.

Mass Grading: Prior to placing any fills, the surface 12 inches of native soil shall be scarified uniformly moisture conditioned to within 2% of optimum and compacted to at least 90% of ASTM D1557 maximum density. Onsite native soils used for fill should be placed in lifts no greater than 8 inches in loose thickness and compacted to a minimum of 90% of ASTM D1557 maximum dry density at optimum moisture ±2%.

Structural Pads Preparation: The existing surface soil within the inverter pad areas, battery storage container pads or electrical substation foundations area should be removed to 18 inches below the lowest foundation grade or 36 inches below the original grade (whichever is deeper), extending five (5) feet beyond all exterior wall/column lines (including adjacent concreted areas). Exposed subgrade should be scarified to a depth of 8 inches, uniformly moisture conditioned to 2 to 6% above optimum (silts) or 2% below to 4% above optimum (sands) and recompacted to 87 to 92% (silts) or a minimum of 90% (sands) of the maximum density determined in accordance with ASTM D1557 methods. During this process, the exposed surface will also be observed for any loose areas by wheel-rolling with heavy equipment. The exposed surface should then be tested at the rate of 1 test per 1,000 square foot or at least 2 tests per building pad, to conform to the above compaction requirements.

The native soil is suitable for use as engineered fill provided it is free from concentrations of organic matter or other deleterious material. The fill soil should be uniformly moisture conditioned by discing and watering to the limits specified above, placed in maximum 8-inch lifts (loose), and compacted to the limits specified above. Clay soil, if encountered, should not be incorporated into any engineered building pads.

Imported fill soils, if needed, should meet the USCS classifications of ML (non-plastic), SM, SP-SM, or SW-SM with a maximum rock size of 3 inches and no less than 5% passing the No. 200 sieve. The geotechnical engineer should approve imported fill soil sources before hauling material to the site. Imported fill should be placed in lifts no greater than 8 inches in loose thickness and compacted to a minimum of 90% of ASTM D1557 maximum dry density at optimum moisture ±2%. The geotechnical engineer should approve imported fill soil sources before hauling material to the site.

Subgrade Preparation for Mat Foundations: The native sandy soil within mat foundation areas should be removed to 18 inches below the bottom of the mat foundations to 2 feet beyond the edges of the foundation. Exposed subgrade should be scarified to a depth of 12 inches, uniformly moisture conditioned to ±2% of optimum moisture content, and recompacted to a minimum of 90% of the maximum density determined in accordance with ASTM D1557 methods.

A minimum of 6-inches of Caltrans Class 2 aggregate base compacted to at least 95% of ASTM D1557 maximum density, shall be placed over the compacted subgrade prior to placing mat foundations.

Sidewalk and Concrete Hardscape Areas: In areas other than the building pad which are to receive sidewalks or area concrete slabs, the ground surface should be presaturated to a minimum depth of 24 inches and then scarified to 8 inches, moisture conditioned to a minimum of 2% below to 4% above optimum, and recompacted to a minimum of 90% of ASTM D1557 maximum density just prior to concrete placement.

Utility Trench Backfill: On-site soil free of debris, vegetation, and other deleterious matter is suitable for use as utility trench backfill above pipe zone. Native backfill should only be placed and compacted after encapsulating buried pipes with suitable bedding and pipe envelope material. Backfill soil of utility trenches within paved areas should be placed in layers not more than 8 inches in thickness and mechanically compacted to a minimum of 90% relative compaction (ASTM D1557) for trench backfill (above pipe zone). The top 12 inches in roadway areas shall be compacted to a minimum of 95%.

Observation and Density Testing: All site preparation and fill placement should be continuously observed and tested by a representative of a qualified geotechnical engineering firm. Full-time observation services during the excavation and scarification process is necessary to detect undesirable materials or conditions and soft areas that may be encountered in the construction area. The geotechnical firm that provides observation and testing during construction shall assume the responsibility of "*geotechnical engineer of record*" and, as such, shall perform additional tests and investigation as necessary to satisfy themselves as to the site conditions and the geotechnical parameters for site development.

Auxiliary Structures Foundation Preparation: Auxiliary structures such as free standing or retaining walls should have footings extended to a minimum of 30 inches below grade. The existing soil beneath the structure foundation prepared in the manner described for the building pad except the preparation needed only to extend 24 inches below and beyond the footing.

4.2 Foundations and Settlements

Shallow spread footings and continuous wall footings are suitable to support the battery storage containers provided they are founded on a layer of properly prepared and compacted soil as described in Section 4.1. The foundations may be designed using an allowable soil bearing pressure of 2,000 psf. The allowable soil pressure may be increased by 20% for each foot of embedment depth in excess of 18 inches and by one-third for short term loads induced by winds or seismic events. The maximum allowable soil pressure at increased embedment depths shall not exceed 3,000 psf.

Resistance to horizontal loads will be developed by passive earth pressure on the sides of footings and frictional resistance developed along the bases of footings and concrete slabs. Passive resistance to lateral earth pressure may be calculated using an equivalent fluid pressure of 300 pcf to resist lateral loadings. The top one foot of embedment should not be considered in computing passive resistance unless the adjacent area is confined by a slab or pavement. An allowable friction coefficient of 0.35 may also be used at the base of the footings to resist lateral loading.

All exterior footings should be embedded a minimum of 18 inches below the building support pad or lowest adjacent final grade, whichever is deeper. Minimum embedment depth of interior footings should be at least 12 inches into the building support pad to account for variable environmental conditions.

Interior and exterior embedment depths listed herein are minimum depths and greater depths/widths may be required by the structural engineer/designer and should be sufficient to limit differential movement to L/480 for center lift and L/720 for edge lift to comply with the current standards. Continuous wall footings should have a minimum width of 12 inches. Spread footings should have a minimum dimension of 24 inches and should be structurally tied to perimeter footings or grade beams. Concrete reinforcement and sizing for all footings should be provided by the structural engineer.

As an alternative to shallow spread foundations, flat plate structural mats may be used.

Flat Plate Structural Mats: Structural mats may be designed for a modulus of subgrade reaction (Ks) of 175 pci when placed on compacted native soil and 200 pci when placed on 6 inches of Class 2 aggregate base. The structure support pad shall be moisture conditioned and re-compacted as specified in Section 4.1 of this report. Resistance to horizontal loads will be developed by passive earth pressure on the sides of footings and frictional resistance developed along the bases of footings and concrete slabs. Passive resistance to lateral earth pressure may be calculated using an equivalent fluid pressure of 300 pcf to resist lateral loadings. The top one foot of embedment should not be considered in computing passive resistance unless the adjacent area is confined by a slab or pavement. An allowable friction coefficient of 0.35 may also be used at the base of the footings to resist lateral loading.

Settlements: Foundation movement under the estimated loadings and site conditions are estimated to not exceed 1 inch with differential movement of about two-thirds of total movement for the loading assumptions stated above when the subgrade preparation guidelines given above are followed.

4.3 Drilled Piers and Driven Steel Piles

Drilled Piers: Individual short piers should be adequate to support solar panel frames, inverter frames, and security camera poles. Embedment depth for short piers to resist lateral loads where no lateral constraint at ground surface is provided may be designed using the following formula per 2019 CBC Section 1807.3.2.1:

$$d = A/2\ [1 + (1+4.36h/A)^{½}]$$

where:

$A = 2.34P/S_1b$
b = Pier diameter in feet
d = Embedment depth in feet (but not over 12 feet for purpose of computing lateral pressure)
h = Distance in feet from ground surface to point of application of "P"
P = Applied lateral force in pounds
S_1 = Allowable lateral soil bearing pressure (basic value of 150 psf/ft. Isolated piers such solar panel short piers that are not adversely affected by a 0.5 inch motion at the ground surface due to short-term lateral loads are permitted to be designed using lateral soil bearing pressures equal to two times the provided value (300 psf/ft). Reduced lateral soil bearing pressures should be used for the security camera pole foundation designs to reduce pole sway in windy conditions.

The short pier foundations may be designed using an allowable soil bearing pressure of 2,000 psf for the native sandy soils.

***Installation*:** Excavation for piers should be inspected by the geotechnical consultant. A tremie pipe should be used to pour concrete from the bottom up and to ensure less than five feet of free fall. The structural steel and concrete should be placed immediately after drilling. Prior to placing any structural steel or concrete, loose soil or slough material should be removed from the bottom of the drilled pier excavation.

Driven Steel Piles: The use of driven steel posts requires special provisions for corrosion protection. Steel posts for PV panel mounting frames have been preliminary sized as W8x10 (frame and axle supports).

Vertical Capacity: Vertical capacity for the preliminary W8x10 steel post section is presented in Table 3. End bearing and skin friction parameters have been used to determine the allowable shaft capacity. The allowable capacities include a factor of safety of 2.5. The allowable vertical compression capacities may be increased by 33 percent to accommodate temporary loads from wind or seismic forces. The allowable vertical shaft capacities are based on the supporting capacity of the soil.

Lateral Capacity: The allowable lateral capacity for a W8x10 steel post section at 5, 6 and 8 feet embedment depths are given in Table 3. The allowable lateral capacity is based on a deflection of one-half inch at the top of the steel post section. If greater deflection can be tolerated, lateral load capacity can be increased directly in proportion to a maximum of one inch deflection. Axial and lateral loads were applied at 4 feet above ground surface.

Table 3: Allowable Capacities of Driven Steel Posts

Pile Type:	Driven W8x10		
Pile Length (ft):	**9 ft**	**10 ft**	**12 ft**
Specified Tip Depth (ft):	**5 ft**	**6 ft**	**8 ft**
Height Above Ground (ft):	**4 ft**	**4 ft**	**4 ft**
Allowable Axial Capacity (kips) – FS=2.5:	0.66	0.90	1.35
Allowable Uplift Capacity (kips) – FS=2.5:	0.30	0.40	0.63
Lateral Load – Free Head Condition (kips):	0.65	0.95	1.16
Top Deflection (in) – Free Head Condition	0.50	0.50	0.50
Maximum Moment from Lateral Load, Free Head Condition (ft-kips):	3.7	5.6	7.0
Depth of Maximum Moment (from Top of Post), Free Head (ft):	6.0	6.3	6.7

Recommendations for other post sections can be made available upon request.

Soil Parameters: Interpretive soil parameters of the subsoil for AllPile software are presented in Table 4 below.

Table 4: Soil Strength Parameters for AllPile Program

Layer Type	Depth (ft)	Unit Weight (pcf)	Friction Angle (deg)	Cohesion (ksf)	Lateral Soil Modulus, k (pci) (*)	Strain Factor, E50 or Dr (%)
SP-SM	0 to 2	115	32°	0.0	500	35
SP	2 to 12	115	35º	0.0	110	55
CL-ML	12 to 16	125	---	1.25	315	0.85
SP-SM	16 to 20	115	34º	0.0	50	45

(*) k value for static loading. For cycling loading, use 50% of listed value.

Settlement: Total settlements of less than ¼ inch, and differential movement of about two-thirds of total movement for single piles designed according to the preceding recommendations.

Axial Load Group Effect: Reduction in axial load capacity shall be considered necessary for group effect. The axial load capacity shall be reduced by an efficiency factor, η. Efficiency factor, η should be 0.65 for shafts with spacing center to center equal to 2.5 shaft diameters and increases linearly to 1.0 for shafts with center to center spacing equal to 6.0 shaft diameters or more. The factor of safety of the group is the same as that of individual shaft elements.

4.4 Drilled Pier Foundations

Substation structural components such as the A-frame structures, bus supports, dead-end frames, masts, switch, surge arrester, CVT stands and new steel gen-tie line poles may be supported on cast-in-place drilled piers. Design criteria are provided below for the drilled pier foundations.

***Vertical Capacity*:** Vertical capacity for 24, 36, 60 and 72 inch diameter shafts are presented in Plate F-1 in Appendix F. Capacities for other shaft sizes can be determined in direct proportion to shaft diameters. Point bearing and skin friction parameters have been used to determine the allowable shaft capacity. The allowable capacities include a factor of safety of 2.5. The allowable vertical compression capacities may be increased by 33 percent to accommodate temporary loads that result from wind or seismic forces.

***Lateral Capacity*:** The allowable lateral capacity for 24, 36, 60 and 72 inch diameter shafts are given in the table shown below for electric cone penetrometer sounding CPT-11. The horizontal deflection at the top of the drilled pier for the lateral loads indicated is one-half inch (0.50 inch).

Table 5: Lateral Capacities of Drilled Pier Foundations – CPT-11 Location

Shaft Diameter (in.)	**24**		**36**		**60**		**72**	
Head Condition	Free	Fixed	Free	Fixed	Free	Fixed	Free	Fixed
Allowable Head Deflection (in.)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum Length (ft.)	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Lateral Capacity (kips)	20.4	82	28.8	148	38	239	40.5	272
Maximum Moment (foot-kips)	62.3	-487.5	90.8	-958.3	118.3	-1616.7	125	-1850
@Depth from Pier Head (ft.)	4.5	0	4.5	0	4.5	0	4.5	0
Minimum Length (ft.)	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**
Lateral Capacity (kips)	42.3	98	86	195	138	512	155	698
Maximum Moment (foot-kips)	185	-501.7	450	-1366.7	756.7	-5500	850	-8200
@Depth from Pier Head (ft.)	7.0	0	8.1	0	8.3	0	8.4	0
Minimum Length (ft.)	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**
Lateral Capacity (kips)	42.8	100	46.5	221	228	550	272	735
Maximum Moment (foot-kips)	187.5	512.5	540.8	-1466.7	1608.3	-5333.3	1958.3	-8500
@Depth from Pier Head (ft.)	7.0	0	8.8	0	11.0	0	11.7	0

Settlement: Total static (non-seismic) settlements of less than ¼ inch are anticipated for single piles designed according to the preceding recommendations. If pile spacing is a least 2.5 pile diameters center-to-center, no reduction in axial load capacity is considered necessary for a group effect.

Uplift Capacity: Pier capacity in tension should be taken as 50% of the compression capacity.

Soil Parameters: Interpretive engineering soil parameters of the subsurface soil for Allpile Computer Program are presented in the tables below.

Table 6: Drilled Pier Soil Parameters (CPT-11 Location)

Layer Type	Depth (ft)	Unit Weight (pcf)	Friction Angle (deg)	Cohesion (ksf)	Modulus of Subgrade Reaction (pci)	E50 or Dr
SP-SM	0 to 2	115	32°	0.0	50	35
SP	2 to 24	115	36º	0.0	135	60
SM	24 to 29	115	35º	0.0	70	55
SW	29 to 42	115	38º	0.0	110	70
ML	42 to 47	120	26º	0.50	300	0.85
SP	47 to 50	115	38º	0.0	110	70

***Installation*:** The drilled piers shall be placed in conformance to ACI 336 guidelines. Excavation for piers should be inspected by the geotechnical consultant. The bottom of the excavation for piers should be reasonably free of loose or slough material. A tremie pipe should be used to place concrete from the bottom up and to ensure less than five feet of free fall. Steel reinforcement and concrete shall be placed immediately after drilling.

Due to the presence of granular soils, drilled piers shall be cased to prevent caving or lateral deformation. Groundwater was encountered in Boring B-3, proposed electrical substation area, (Plate B-14) at about 9.0 feet at the time of exploration. Groundwater was encountered between 18 and 20 feet in Boring B-2 and B-1 respectively. Groundwater is likely to be present at the interface between surface sands and underlying clays. The structural steel and concrete should be placed immediately after drilling. Prior to placing any structural steel or concrete, loose soil or slough material should be removed from the bottom of the drilled pier excavation.

4.5 Slabs-On-Grade

Structural Concrete: Structural concrete slabs are those slabs (foundations) that underlie structures or shades. These concrete slab should have a minimum thickness of 5 inches. The concrete slabs should be underlain by a 10-mil polyethylene vapor retarder that works as a capillary break to reduce moisture migration into the slab section. The vapor retarder should be properly lapped and continuously sealed.

The vapor retarder should be overlain by 2 inches of clean sand (Sand Equivalent SE>30). Concrete slabs may be placed without a sand cover directly over a 15-mil vapor retarder (Stego-Wrap or equivalent).

Slab thickness and steel reinforcement are minimums only and should be verified by the structural engineer/designer knowing the actual project loadings. All steel components of the foundation system should be protected from corrosion by maintaining a 3-inch minimum concrete cover of densely consolidated concrete at footings (by use of a vibrator). The construction joint between the foundation and any sidewalks placed adjacent to foundations should be sealed with a polyurethane based non-hardening sealant to prevent moisture migration between the joint. Epoxy coated embedded steel components or permanent waterproofing membranes placed at the exterior footing sidewall may also be used to mitigate the corrosion potential of concrete placed in contact with native soil.

Control joints should be provided in all concrete slabs-on-grade at a maximum spacing (in feet) of 2 to 3 times the slab thickness (in inches) as recommended by American Concrete Institute (ACI) guidelines. All joints should form approximately square patterns to reduce randomly oriented contraction cracks. Contraction joints in the slabs should be tooled at the time of the pour or sawcut (¼ of slab depth) within 6 to 8 hours of concrete placement. Construction (cold) joints in foundations and area flatwork should either be thickened butt-joints with dowels or a thickened keyed-joint designed to resist vertical deflection at the joint. All joints in flatwork should be sealed to prevent moisture, vermin, or foreign material intrusion. Precautions should be taken to prevent curling of slabs in this arid desert region (refer to ACI guidelines).

Non-structural Concrete: All non-structural independent flatwork (sidewalks and housekeeping slabs) shall be a minimum of 4 inches thick and should be placed on a minimum of 2 inches of concrete sand or aggregate base, dowelled to the perimeter foundations where adjacent to the building to prevent separation. The ground surface should be pre-saturated to a minimum of 24 inches and then scarified to 8 inches, moisture conditioned to minimum of 2% over optimum, and recompacted to 90% of ASTM D1557 maximum relative density just prior to concrete placement. All flatwork should be jointed in square patterns and at irregularities in shape at a maximum spacing of 8 feet or the least width of the sidewalk.

4.6 Concrete Mixes and Corrosivity

Selected chemical analyses for corrosivity were conducted on bulk samples of the near surface soil from the project site (Appendix E). The native soils were found to have S0 (low) levels of sulfate ion concentration (40 to 390 ppm). Sulfate ions in high concentrations can attack the cementitious material in concrete, causing weakening of the cement matrix and eventual deterioration by raveling.

The following table provides American Concrete Institute (ACI) recommended cement types, water-cement ratio and minimum compressive strengths for concrete in contact with soils:

Table 7. Concrete Mix Design Criteria due to Soluble Sulfate Exposure

Sulfate Exposure Class	Water-soluble Sulfate (SO_4) in soil, ppm	Cement Type	Maximum Water-Cement Ratio by weight	Minimum Strength f'c (psi)
S0	0-1,000	–	–	–
S1	1,000-2,000	II	0.50	4,000
S2	2,000-20,000	V	0.45	4,500
S3	Over 20,000	V (plus Pozzolon)	0.45	4,500

Note: From ACI 318-14 Table 19.3.1.1 and Table 19.3.2.1

However, in consideration of general corrosive environment in the region, it is recommended a minimum of 6.0 sacks per cubic yard of concrete (4,000 psi) of Type V Portland Cement with a maximum water/cement ratio of 0.50 (by weight) should be used for concrete placed in contact with native soil on this project (sitework including sidewalks, driveways, housekeeping slabs and foundations). Admixtures may be required to allow placement of this low water/cement ratio concrete.

The native soil has low levels of chloride ion concentration (30 to 170 ppm). Chloride ions can cause corrosion of reinforcing steel, anchor bolts and other buried metallic conduits. Resistivity determinations on the soil indicate moderate to very severe potential for metal loss because of electrochemical corrosion processes. Mitigation of the corrosion of steel can be achieved by using steel elements coated with epoxy corrosion inhibitors, asphaltic and epoxy coatings, cathodic protection or by zinc galvanizing.

Foundation designs shall provide a minimum concrete cover of three (3) inches around steel reinforcing or embedded components (anchor bolts, etc.) exposed to native soil or landscape water (to 18 inches above grade). If the 3-inch concrete edge distance cannot be achieved, all embedded steel components (anchor bolts, etc.) shall be epoxy coated for corrosion protection (in accordance with ASTM D3963/A934) or a corrosion inhibitor and a permanent waterproofing membrane shall be placed along the exterior face of the exterior footings. ***Hold-down straps should not be used at foundation edges due to corrosion of metal at its protrusion from the slab edge.*** Additionally, the concrete should be thoroughly vibrated at footings during placement to decrease the permeability of the concrete.

4.7 Excavations

All site excavations should conform to CalOSHA requirements for Type C soil. The contractor is solely responsible for the safety of workers entering trenches. Temporary excavations with depths of 4 feet or less may be no steeper than 1:1 (horizontal:vertical). Sandy soil slopes should be kept moist, but not saturated, to reduce the potential of raveling or sloughing. Excavations deeper than 4 feet will require shoring or slope inclinations in conformance to CAL/OSHA regulations for Type C soil. Surcharge loads of stockpiled soil or construction materials should be set back from the top of the slope a minimum distance equal to the height of the slope.

All permanent slopes should not be steeper than 3:1 to reduce wind and rain erosion. Protected slopes with ground cover may be as steep as 2:1. However, maintenance with motorized equipment may not be possible at this inclination.

4.8 Seismic Design

This site is located in the seismically active southern California area and the site structures are subject to strong ground shaking due to potential fault movements along the Imperial, Rico and Brawley Faults. Engineered design and earthquake-resistant construction are the common solutions to increase safety and development of seismic areas. Designs should comply with the latest edition of the CBC for Site Class D using the seismic coefficients given in Section 3.6 and Table 2 of this report.

4.9 All Weather Access Roadways

Unpaved roads may be used for stabilized roadways. The unpaved roads should consist of 12 inches of native soils compacted to 95% of ASTM D1557 maximum density at a minimum of optimum moisture with a 4 inch layer of Class 2 aggregate base compacted to a minimum of 95% of ASTM D1557 maximum density placed over the compacted subgrade.

Cement stabilization is an alternative for internal road stabilization within this project since the existing subgrade is comprised of fine to medium grained sands. An 80,000 lb. two-axle truck (fire truck) was considered for the subgrade soil stabilization recommendations. Soil–cement stabilization of the subgrade soils will result in a Gravel Factor for the treated depth, typically in the range of 1.2 to 1.5.

A minimum of 8 inches of cement-treated subgrade soil (estimated at 4% by weight) compacted to 95% minimum should yield a minimum Unconfined Compressive Strength of 300 psi. The cement application ratio should be confirmed through proper testing to obtain the minimum Unconfined Compressive Strength of 300 psi. The 80,000 lb. axle load will be adequately supported by the compacted soil–cement.

Section 5
LIMITATIONS AND ADDITIONAL SERVICES

5.1 Limitations

The findings and professional opinions within this report are based on current information regarding the proposed 100MW Viking photo-voltaic solar power generation facility situated on the approximately 600-acre site located at the east end of Nelson Pit Road east of the East Highline Canal approximately 6 miles east to southeast of Holtville, California. The conclusions and professional opinions of this report are invalid if:

- Structural loads change from those stated or the structures are relocated.
- The Additional Services section of this report is not followed.
- This report is used for adjacent or other property.
- Changes of grade or groundwater occur between the issuance of this report and construction other than those anticipated in this report.
- Any other change that materially alters the project from that proposed at the time this report was prepared.

This report was prepared according to the generally accepted *geotechnical engineering standards of practice* that existed in Imperial County at the time the report was prepared. No express or implied warranties are made in connection with our services.

Findings and professional opinions in this report are based on selected points of field exploration, geologic literature, limited laboratory testing, and our understanding of the proposed project. Our analysis of data and professional opinions presented herein are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil conditions can exist between and beyond the exploration points or groundwater elevations may change. The nature and extend of such variations may not become evident until, during or after construction. If variations are detected, we should immediately be notified as these conditions may require additional studies, consultation, and possible design revisions.

Environmental or hazardous materials evaluations were not performed by Landmark for this project. Landmark will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials.

The client has responsibility to see that all parties to the project including designer, contractor, and subcontractor are made aware of this entire report within a reasonable time from its issuance. This report should be considered invalid for periods after two years from the date of report issuance without a review of the validity of the findings and professional opinions by our firm, because of potential changes in the Geotechnical Engineering Standards of Practice. This report is based upon government regulations in effect at the time of preparation of this report. Future changes or modifications to these regulations may require modification of this report. Land or facility use, on and off-site conditions, regulations, design criteria, procedures, or other factors may change over time, which may require additional work. Any party other than the client who wishes to use this report shall notify Landmark of such intended use. Based on the intended use of the report, Landmark may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Landmark from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold Landmark harmless from any claim or liability associated with such unauthorized use or non-compliance.

This report contains information that may be useful in the preparation of contract specifications. However, the report is not worded is such a manner that we recommend its use as a construction specification document without proper modification. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk.

5.2 Plan Review

Landmark Consultants, Inc. should be retained during development of design and construction documents to check that the geotechnical professional opinions are appropriate for the proposed project and that the geotechnical professional opinions are properly interpreted and incorporated into the documents. Landmark should have the opportunity to review the final design plans and specifications for the project prior to the issuance of such for bidding.

Governmental agencies may require review of the plans by the geotechnical engineer of record for compliance to the geotechnical report.

5.3 Additional Services

We recommend that Landmark Consultant be retained to provide the tests and observations services during construction. *The geotechnical engineering firm providing such tests and observations shall become the geotechnical engineer of record and assume responsibility for the project.*

Landmark Consultants, Inc. professional opinions for this site are, to a high degree, dependent upon appropriate quality control of subgrade preparation, fill placement, and foundation construction. Accordingly, the findings and professional opinions in this report are made contingent upon the opportunity for Landmark Consultants to observe grading operations and foundation excavations for the proposed construction.

If parties other than Landmark Consultants, Inc. are engaged to provide observation and testing services during construction, such parties must be notified that they will be required to assume complete responsibility as the geotechnical engineer of record for the geotechnical phase of the project by concurring with the professional opinions in this report and/or by providing alternative professional guidance.

Additional information concerning the scope and cost of these services can be obtained from our office.

TABLES

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Table 1
Summary of Characteristics of Closest Known Active Faults

Fault Name	Approximate Distance (miles)	Approximate Distance (km)	Maximum Moment Magnitude (Mw)	Fault Length (km)	Slip Rate (mm/yr)
Rico *	7.1	11.4			
Imperial	7.9	12.6	7	62 ± 6	20 ± 5
Brawley *	11.4	18.3			
Superstition Hills	18.9	30.2	6.6	23 ± 2	4 ± 2
Algodones *	19.7	31.5			
Cerro Prieto *	22.9	36.6			
Superstition Mountain	24.4	39.0	6.6	24 ± 2	5 ± 3
Unnamed 2*	24.8	39.6			
Unnamed 1*	27.4	43.9			
Borrego (Mexico)*	28.0	44.7			
Cucapah (Mexico)*	28.2	45.1			
Pescadores (Mexico)*	28.6	45.8			
Yuha*	29.1	46.5			
Laguna Salada	29.4	47.0	7	67 ± 7	3.5 ± 1.5
Shell Beds	32.3	51.7			
Yuha Well *	32.6	52.2			
Vista de Anza*	36.0	57.6			
Elmore Ranch	36.1	57.7	6.6	29 ± 3	1 ± 0.5
Painted Gorge Wash*	36.8	58.9			
Ocotillo*	40.2	64.4			
Elsinore - Coyote Mountain	43.7	69.9	6.8	39 ± 4	4 ± 2
San Jacinto - Borrego	43.8	70.1	6.6	29 ± 3	4 ± 2

* Note: Faults not included in CGS database.

Table 2
2019 California Building Code (CBC) and ASCE 7-16 Seismic Parameters

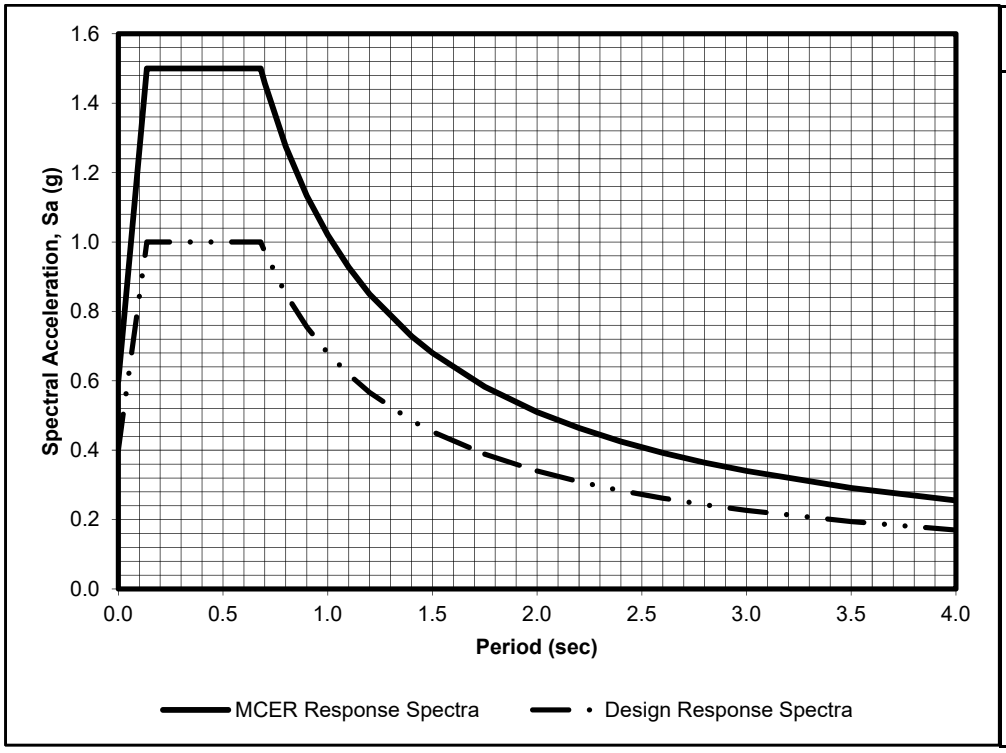
			ASCE 7-16 Reference
Soil Site Class:	**D**		Table 20.3-1
Latitude:	32.8041	N	
Longitude:	-115.2781	W	
Risk Category:	II		
Seismic Design Category:	D		

Maximum Considered Earthquake (MCE) Ground Motion

Mapped MCE_R Short Period Spectral Response	S_s	1.500 g	ASCE Figure 22-1	
Mapped MCE_R 1 second Spectral Response	S_1	0.600 g	ASCE Figure 22-2	
Short Period (0.2 s) Site Coefficient	F_a	1.00	ASCE Table 11.4-1	
Long Period (1.0 s) Site Coefficient	F_v	1.70	ASCE Table 11.4-2	
MCE_R Spectral Response Acceleration Parameter (0.2 s)	S_{MS}	1.500 g	= Fa * S_s	ASCE Equation 11.4-1
MCE_R Spectral Response Acceleration Parameter (1.0 s)	S_{M1}	1.020 g	= Fv * S_1	ASCE Equation 11.4-2

Design Earthquake Ground Motion

Design Spectral Response Acceleration Parameter (0.2 s)	S_{DS}	1.000 g	= 2/3*S_{MS}	ASCE Equation 11.4-3
Design Spectral Response Acceleration Parameter (1.0 s)	S_{D1}	0.680 g	= 2/3*S_{M1}	ASCE Equation 11.4-4
Risk Coefficient at Short Periods (less than 0.2 s)	C_{RS}	0.950		ASCE Figure 22-17
Risk Coefficient at Long Periods (greater than 1.0 s)	C_{R1}	0.924		ASCE Figure 22-18
	T_L	8.00 sec		ASCE Figure 22-12
	T_O	0.14 sec	=0.2*S_{D1}/S_{DS}	
	T_S	0.68 sec	=S_{D1}/S_{DS}	
Peak Ground Acceleration	PGA_M	0.55 g		ASCE Equation 11.8-1



Period T (sec)	Sa (g)	MCE_R Sa (g)
0.00	0.40	0.60
0.14	1.00	1.50
0.68	1.00	1.50
0.70	0.97	1.46
0.80	0.85	1.28
0.90	0.76	1.13
1.00	0.68	1.02
1.10	0.62	0.93
1.20	0.57	0.85
1.20	0.57	0.85
1.40	0.49	0.73
1.50	0.45	0.68
1.75	0.39	0.58
2.00	0.34	0.51
2.20	0.31	0.46
2.40	0.28	0.43
2.60	0.26	0.39
2.80	0.24	0.36
3.00	0.23	0.34
3.50	0.19	0.29
4.00	0.17	0.26

FIGURES

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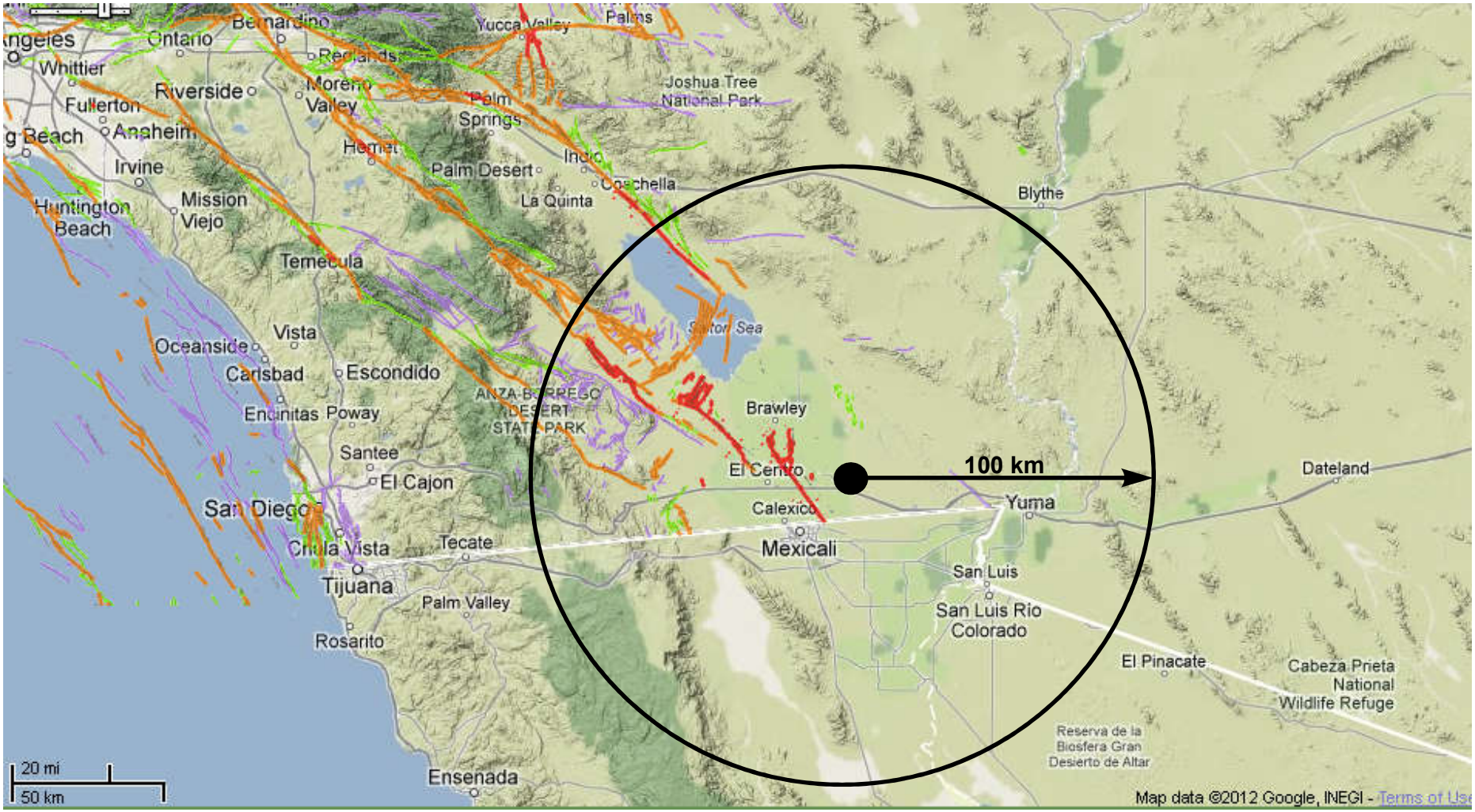
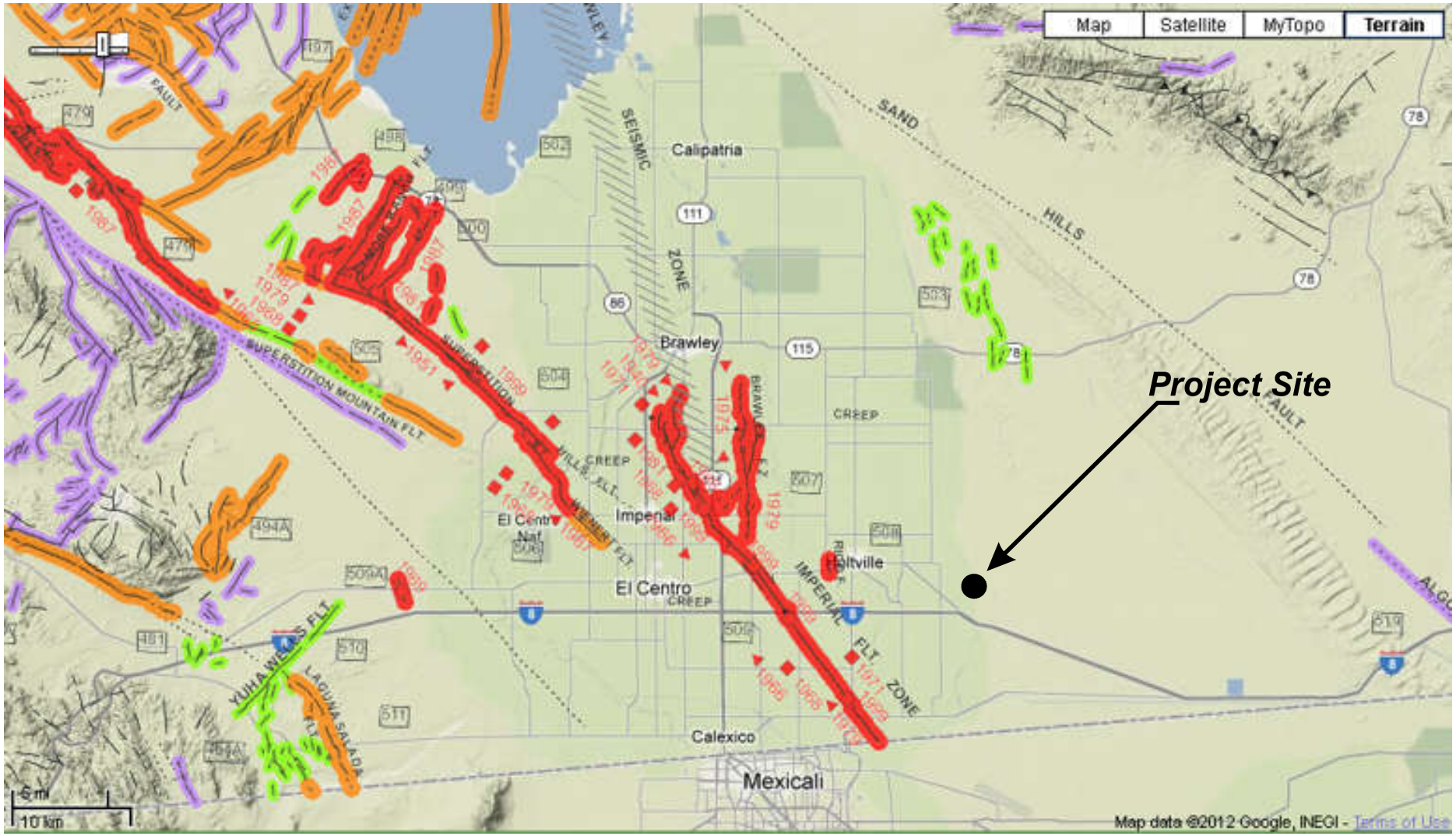


Source: California Geological Survey 2010 Fault Activity Map of California
http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

LANDMARK Geo-Engineers and Geologists **Project No.: LE20189**	**Regional Fault Map**	**Figure 1**



Source: California Geological Survey 2010 Fault Activity Map of California
http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

LANDMARK Geo-Engineers and Geologists **Project No.: LE20189**	**Map of Local Faults**	**Figure 2**

APPENDIX A

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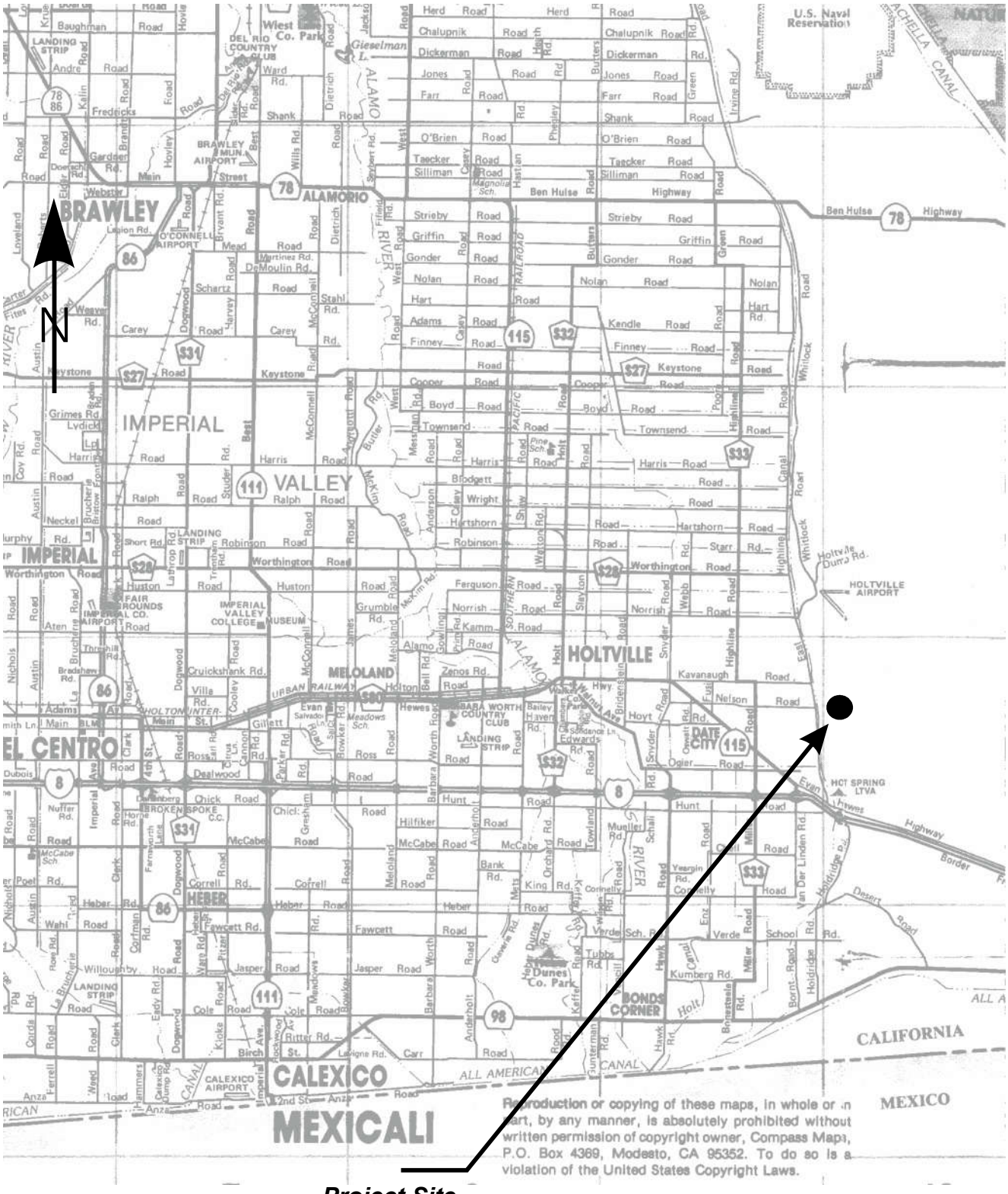

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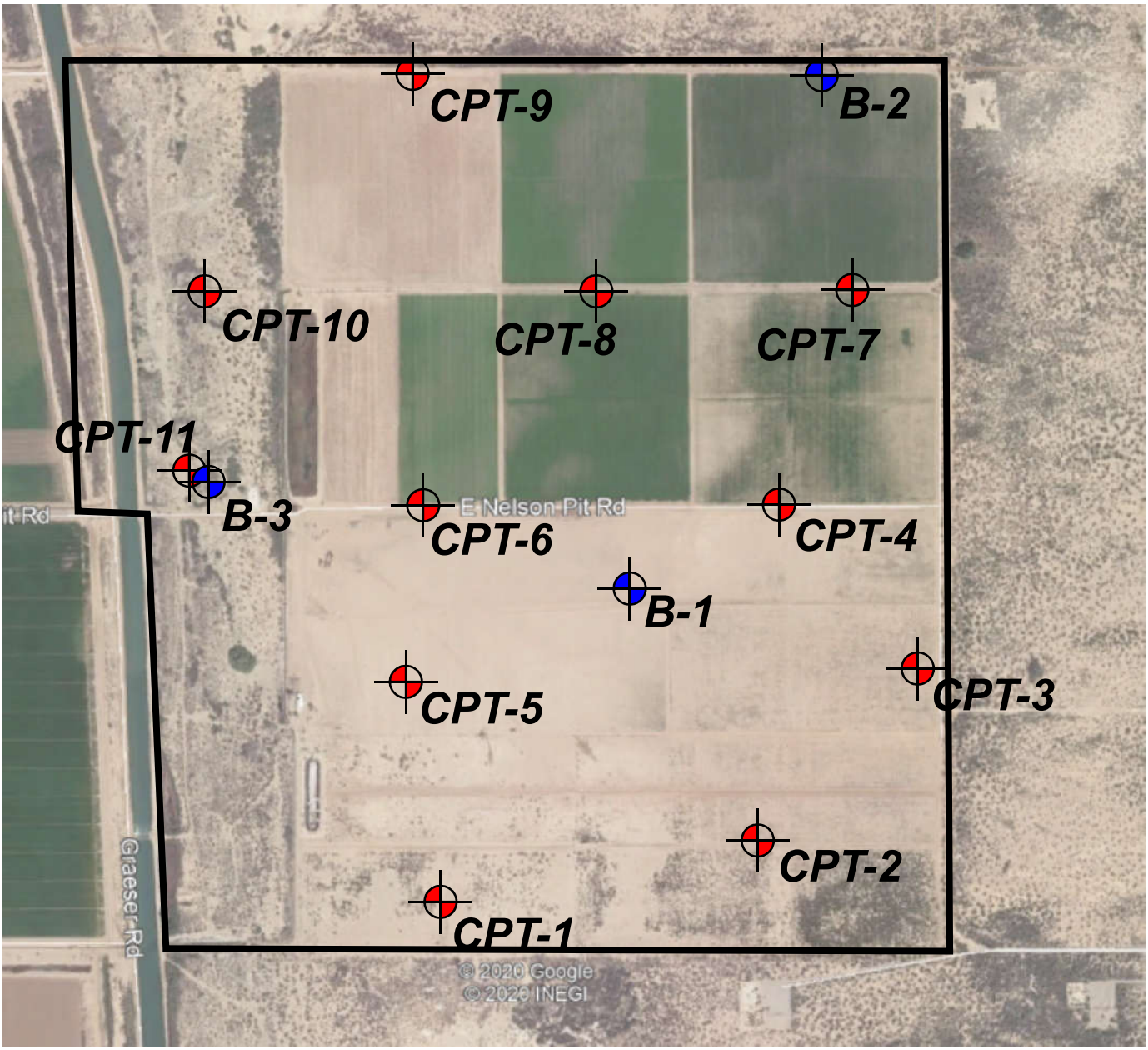
Vicinity Map

Plate A-1



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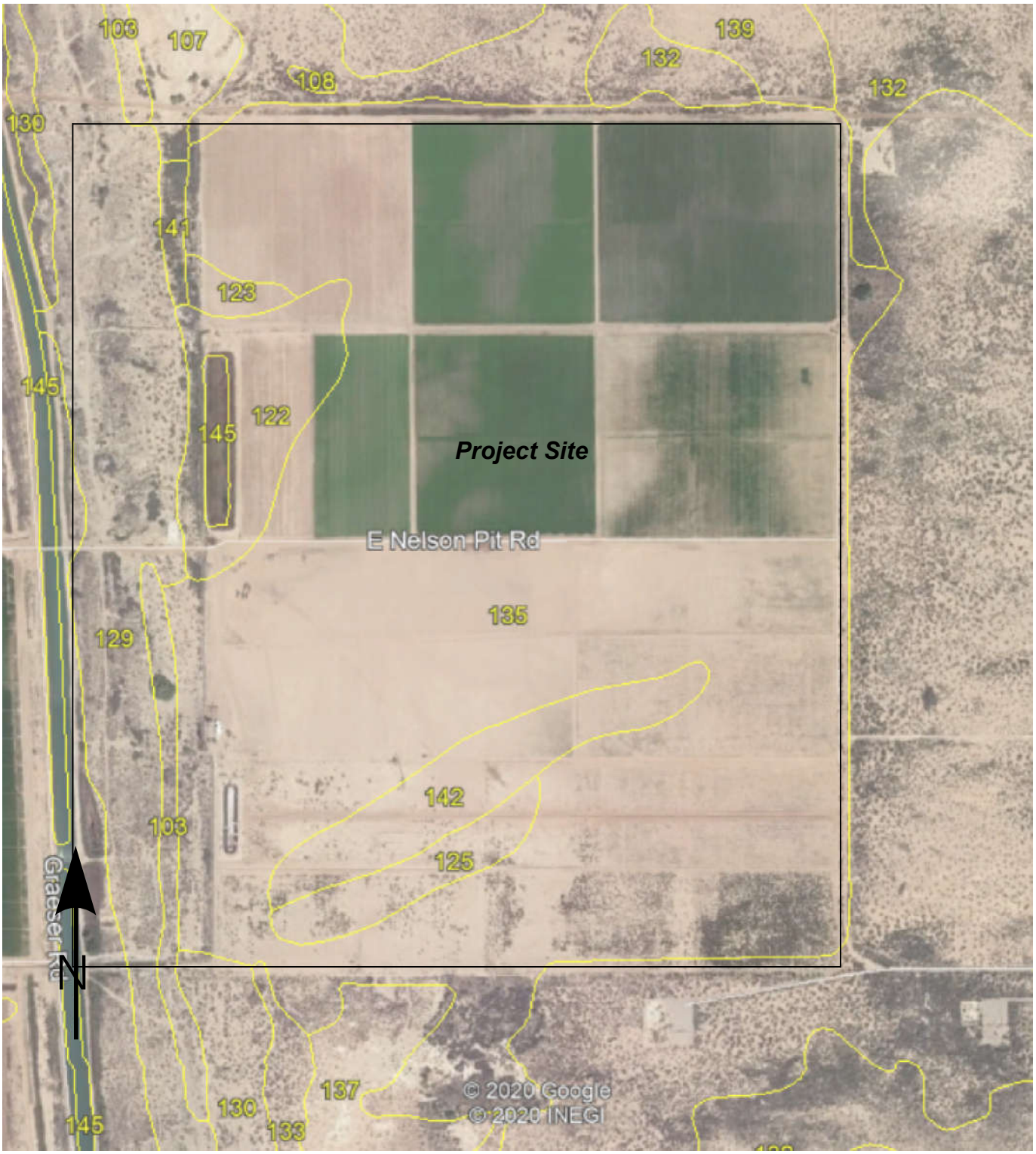
Site and Exploration Map

Plate
A-2



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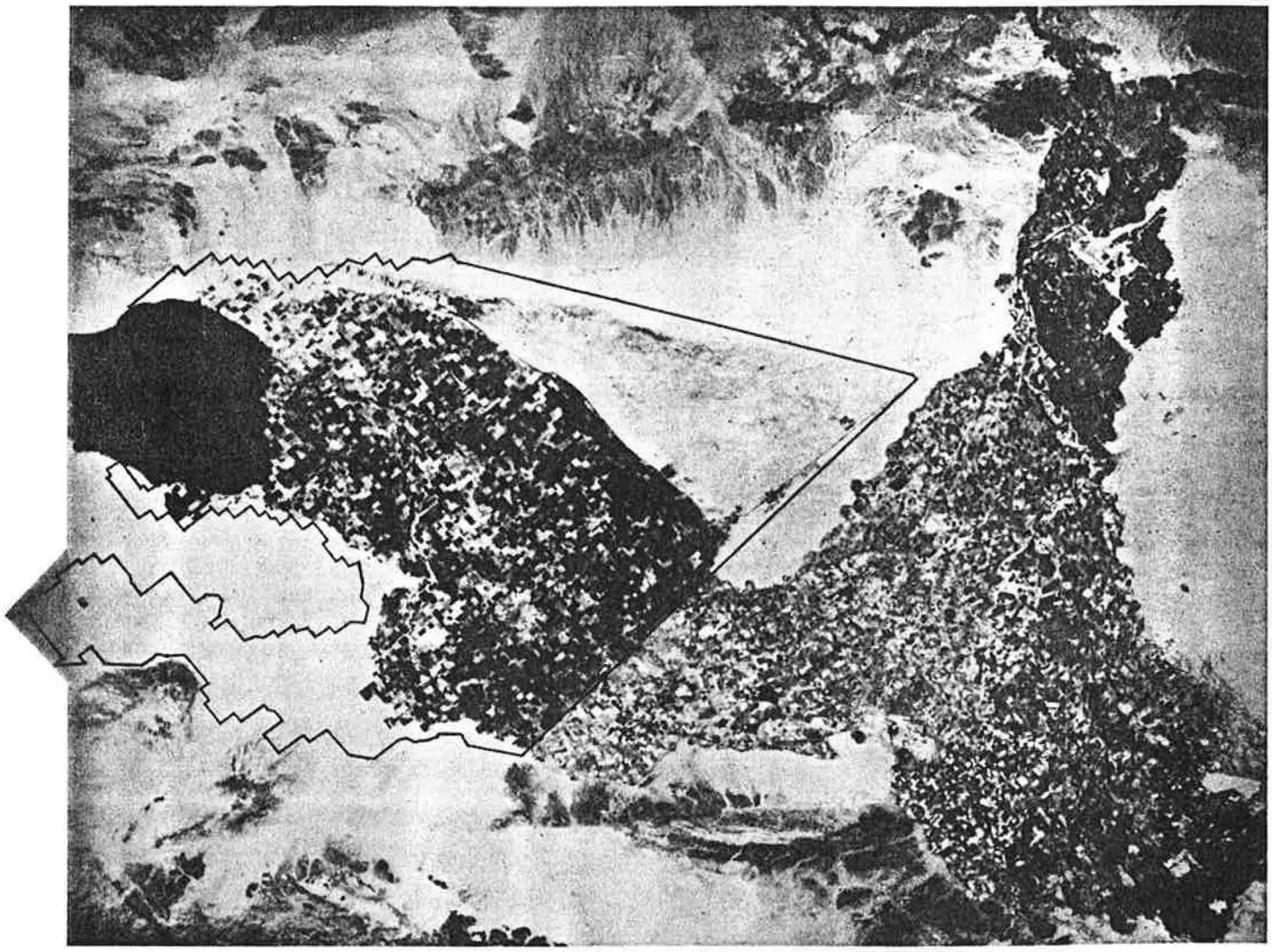
Soil Survey Map

Plate
A-3

Soil Survey of

IMPERIAL COUNTY CALIFORNIA IMPERIAL VALLEY AREA



United States Department of Agriculture Soil Conservation Service
in cooperation with
University of California Agricultural Experiment Station
and
Imperial Irrigation District

TABLE 11.--ENGINEERING INDEX PROPERTIES

[The symbol > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
100---------- Antho	0-13	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	13-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
101*:											
Antho----------	0-8	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	8-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
Superstition------	0-6	Fine sand-------	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
102*. Badland											
103---------- Carsitas	0-10	Gravelly sand---	SP, SP-SM	A-1, A-2	0-5	60-90	50-85	30-55	0-10	---	NP
	10-60	Gravelly sand, gravelly coarse sand, sand.	SP, SP-SM	A-1	0-5	60-90	50-85	25-50	0-10	---	NP
104* Fluvaquents											
105---------- Glenbar	0-13	Clay loam-------	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
106---------- Glenbar	0-13	Clay loam-------	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
107*---------- Glenbar	0-13	Loam----------	ML, CL-ML, CL	A-4	0	100	100	100	70-80	20-30	NP-10
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	75-95	35-45	15-30
108---------- Holtville	0-14	Loam----------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	14-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
109---------- Holtville	0-17	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	17-24	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
110---------- Holtville	0-17	Silty clay------	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	17-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
111*:											
Holtville	0-10	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	10-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
Imperial	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
112	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
113	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay, clay, silty clay loam.	CH	A-7	0	100	100	100	85-95	50-70	25-45
114	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
115*:											
Imperial	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
116*:											
Imperial	0-13	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	13-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
117, 118	0-12	Loam	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Indio	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
119*:											
Indio	0-12	Loam	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Vint	0-10	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	25-35	---	NP
	10-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
120*	0-12	Loam	ML, CL-ML	A-4	0	100	95-100	75-85	55-65	20-30	NP-10
Laveen	12-60	Loam, very fine sandy loam.	ML, CL-ML	A-4	0	95-100	85-95	70-80	55-65	15-25	NP-10

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

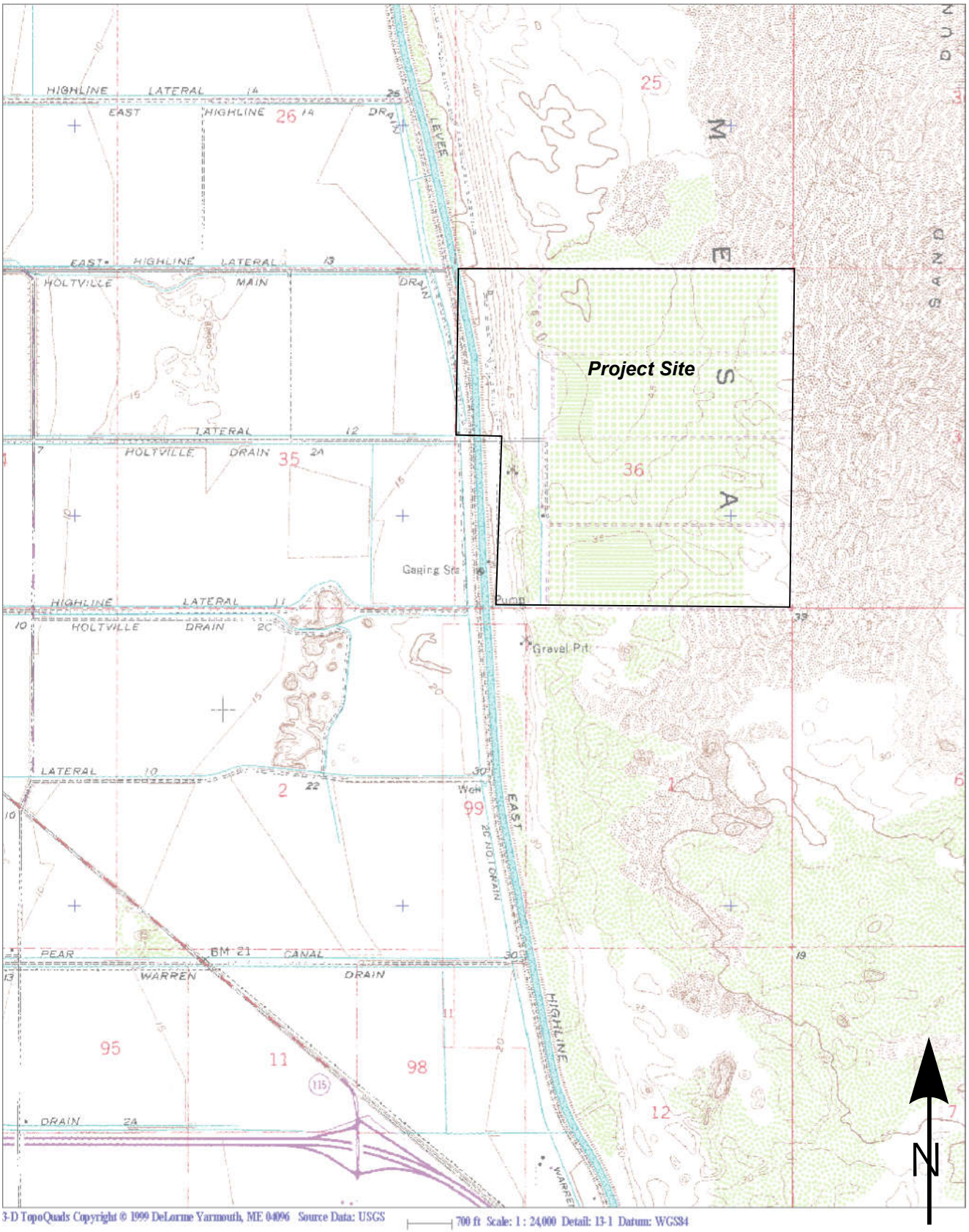
Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
121---------- Meloland	0-12	Fine sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	75-100	5-30	---	NP
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-65	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-40
122---------- Meloland	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
123*:											
Meloland----------	0-12	Loam----------	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-38	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
	38-60	Stratified silt loam to loamy fine sand.	SM, ML	A-4	0	100	100	75-100	35-55	25-35	NP-10
Holtville---------	0-12	Loam----------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	12-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-36	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	36-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
124, 125---------- Niland	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
126---------- Niland	0-23	Fine sand-------	SM, SP-SM	A-2, A-3	0	90-100	90-100	50-65	5-25	---	NP
	23-60	Silty clay------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
127---------- Niland	0-23	Loamy fine sand	SM	A-2	0	90-100	90-100	50-65	15-30	---	NP
	23-60	Silty clay------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
128*:											
Niland----------	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-100	40-65	20-40
Imperial----------	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
129*: Pits											
130, 131---------- Rositas	0-27	Sand----------	SP-SM	A-3, A-1, A-2	0	100	80-100	40-70	5-15	---	NP
	27-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
132, 133, 134, 135-Rositas	0-9	Fine sand-------	SM	A-3, A-2	0	100	80-100	50-80	10-25	---	NP
	9-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
136----------	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
Rositas	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
137----------	0-12	Silt loam-------	ML	A-4	0	100	100	90-100	70-90	20-30	NP-5
Rositas	12-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
138*:											
Rositas----------	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
Superstition------	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
139----------	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
Superstition	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
140*:											
Torriorthents											
Rock outcrop											
141*:											
Torriorthents											
Orthids											
142----------	0-10	Loamy very fine sand.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
Vint	10-60	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
143----------	0-12	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-85	45-55	15-25	NP-5
Vint	12-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
144*:											
Vint----------	0-10	Very fine sandy loam.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
	10-40	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
	40-60	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
Indio----------	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-40	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	40-72	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35

* See description of the map unit for composition and behavior characteristics of the map unit.



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Topographic Map

Plate A-4

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APPENDIX B

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CLIENT: APEX
PROJECT: Viking Solar

CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

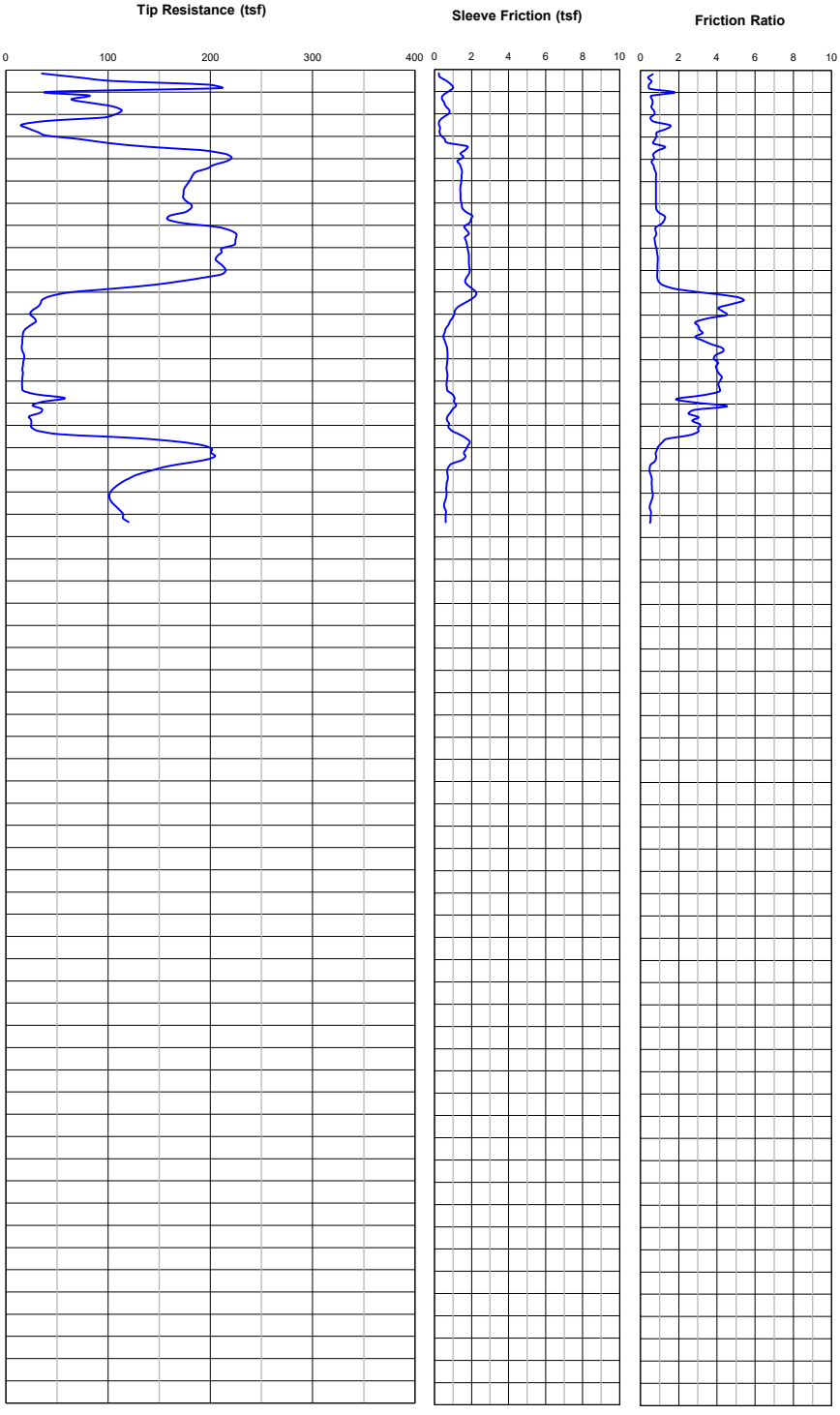
LOCATION: See Site and Boring Location Plan

DATE: 11/24/2020

CONE SOUNDING DATA CPT-1

DEPTH	INTERPRETED SOIL PROFILE From Robertson and Campanella (1989		
	GROUND ELEVATION +/-		
	Sand	SP	very dense
	Sand to Silty Sand	SP/SM	very dense
	Silty Sand to Sandy Silt	SM/ML	dense
	Sand	SP	very dense
5	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
10	Sand to Silty Sand	SP/SM	very dense
	Silty Clay to Clay	CL	very stiff
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Silty Clay to Clay	CL	stiff
	Silty Clay to Clay	" "	stiff
15	Clayey Silt to Silty Clay	ML/CL	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
	Sand to Silty Sand	SP/SM	dense
	Sand	SP	very dense
	Sand	" "	dense
20	Sand	" "	dense
	Sand	" "	dense
25			
30			
35			
40			
45			
50			
55			

END OF SOUNDING AT 20 ft.



Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-1

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/24/2020

CONE SOUNDING: CPT-1

Est. GWT (ft): 8 Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	69.95	0.54	Sand to Silty Sand	SP/SM	very dense	115	13	132.2	15	124	45		
0.30	1.0	150.14	0.90	Sand	SP	very dense	110	23	283.8	10	130	46		
0.45	1.5	75.85	0.60	Sand to Silty Sand	SP/SM	very dense	115	14	143.4	15	103	42		
0.60	2.0	108.74	0.66	Sand	SP	very dense	110	17	205.6	10	108	43		
0.75	2.5	50.50	0.91	Silty Sand to Sandy Silt	SM/ML	dense	115	11	95.5	25	82	39		
0.93	3.0	30.78	1.02	Silty Sand to Sandy Silt	SM/ML	medium dense	115	7	58.2	35	64	37		
1.08	3.5	103.27	0.90	Sand to Silty Sand	SP/SM	very dense	115	19	195.2	15	98	42		
1.23	4.0	208.42	0.75	Sand	SP	very dense	110	32	394.0	5	116	44		
1.38	4.5	205.48	0.66	Sand	SP	very dense	110	32	388.4	5	114	44		
1.53	5.0	182.80	0.80	Sand	SP	very dense	110	28	343.6	5	109	43		
1.68	5.5	175.34	0.80	Sand	SP	very dense	110	27	313.9	5	106	43		
1.83	6.0	177.06	0.81	Sand	SP	very dense	110	27	303.1	5	105	43		
1.98	6.5	172.01	1.02	Sand	SP	very dense	110	26	282.7	10	103	42		
2.13	7.0	179.07	1.04	Sand	SP	very dense	110	28	283.3	10	103	42		
2.28	7.5	223.08	0.78	Sand	SP	very dense	110	34	340.8	5	109	43		
2.45	8.0	219.48	0.79	Sand	SP	very dense	110	34	324.5	5	107	43		
2.60	8.5	207.62	0.89	Sand	SP	very dense	110	32	302.8	5	105	43		
2.75	9.0	212.21	0.88	Sand	SP	very dense	110	33	305.4	5	105	43		
2.90	9.5	191.33	0.91	Sand	SP	very dense	110	29	271.8	5	102	42		
3.05	10.0	103.09	2.24	Silty Sand to Sandy Silt	SM/ML	dense	115	23	144.6	30	83	40		
3.20	10.5	37.96	5.07	Clay	CL/CH	hard	125	30		65			2.20	>10
3.35	11.0	26.86	4.29	Silty Clay to Clay	CL	very stiff	125	15		75			1.55	>10
3.50	11.5	27.16	3.12	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		65			1.57	>10
3.65	12.0	17.67	3.07	Clayey Silt to Silty Clay	ML/CL	very stiff	120	7		80			1.01	>10
3.80	12.5	15.92	3.74	Silty Clay to Clay	CL	stiff	125	9		90			0.90	>10
3.95	13.0	17.20	4.03	Silty Clay to Clay	CL	stiff	125	10		90			0.98	>10
4.13	13.5	16.63	4.00	Silty Clay to Clay	CL	stiff	125	10		90			0.94	>10
4.28	14.0	16.34	4.17	Clay	CL/CH	stiff	125	13		95			0.93	>10
4.43	14.5	16.26	4.10	Silty Clay to Clay	CL	stiff	125	9		95			0.92	>10
4.58	15.0	41.64	2.64	Sandy Silt to Clayey Silt	ML	medium dense	115	12	50.9	55	53	35		
4.73	15.5	31.57	3.28	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		65			1.82	>10
4.88	16.0	24.31	2.97	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		75			1.39	>10
5.03	16.5	70.95	2.29	Silty Sand to Sandy Silt	SM/ML	medium dense	115	16	84.0	40	67	37		
5.18	17.0	187.99	0.97	Sand	SP	very dense	110	29	220.6	10	96	41		
5.33	17.5	199.75	0.79	Sand	SP	very dense	110	31	232.3	10	97	42		
5.48	18.0	155.87	0.50	Sand	SP	dense	110	24	179.8	5	90	41		
5.65	18.5	121.10	0.57	Sand	SP	dense	110	19	138.5	10	82	39		
5.80	19.0	105.12	0.61	Sand	SP	dense	110	16	119.3	15	78	39		
5.95	19.5	102.69	0.56	Sand	SP	dense	110	16	115.6	15	77	39		
6.10	20.0	111.89	0.52	Sand	SP	dense	110	17	124.9	10	79	39		
6.25	20.5	117.20	0.51	Sand	SP	dense	110	18	129.8	10	80	39		

CLIENT: APEX
PROJECT: Viking Solar

CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

LOCATION: See Site and Boring Location Plan

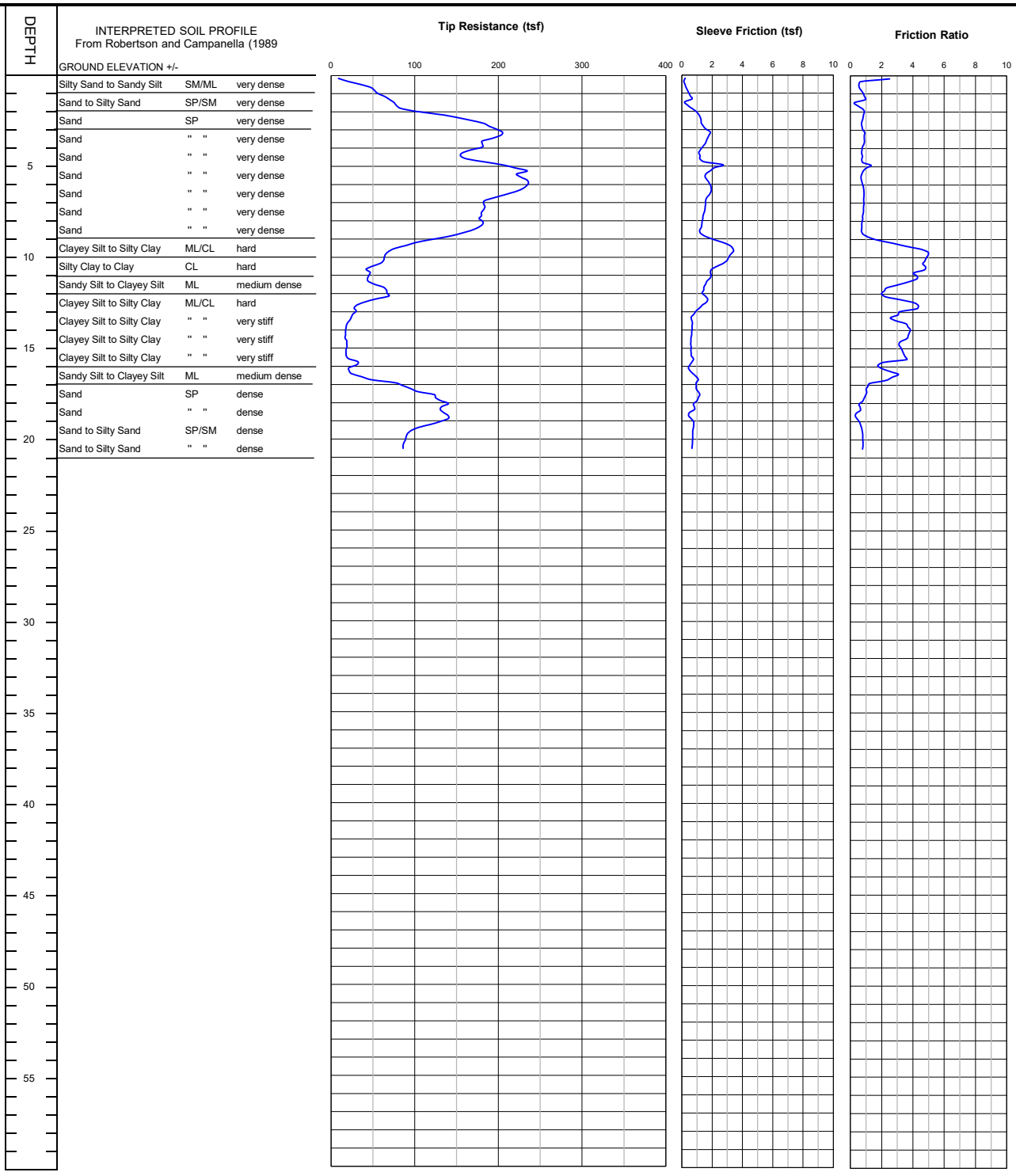
DATE: 11/24/2020

CONE SOUNDING DATA CPT-2

INTERPRETED SOIL PROFILE
From Robertson and Campanella (1989

GROUND ELEVATION +/-

Silty Sand to Sandy Silt	SM/ML	very dense
Sand to Silty Sand	SP/SM	very dense
Sand	SP	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Clayey Silt to Silty Clay	ML/CL	hard
Silty Clay to Clay	CL	hard
Sandy Silt to Clayey Silt	ML	medium dense
Clayey Silt to Silty Clay	ML/CL	hard
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Sand	SP	dense
Sand	" "	dense
Sand to Silty Sand	SP/SM	dense
Sand to Silty Sand	" "	dense



END OF SOUNDING AT 20 ft.

Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-2

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/24/2020

CONE SOUNDING: CPT-2

Est. GWT (ft): 8

Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	21.52	1.23	Sandy Silt to Clayey Silt	ML	dense	115	6	40.7	45	89	40		
0.30	1.0	51.67	0.70	Sand to Silty Sand	SP/SM	very dense	115	9	97.7	20	99	42		
0.45	1.5	69.50	0.70	Sand to Silty Sand	SP/SM	very dense	115	13	131.4	15	100	42		
0.60	2.0	87.38	0.70	Sand to Silty Sand	SP/SM	very dense	115	16	165.2	15	102	42		
0.75	2.5	147.99	0.80	Sand	SP	very dense	110	23	279.8	10	113	44		
0.93	3.0	189.52	0.74	Sand	SP	very dense	110	29	358.3	5	118	45		
1.08	3.5	200.26	0.90	Sand	SP	very dense	110	31	378.6	5	117	44		
1.23	4.0	180.81	0.83	Sand	SP	very dense	110	28	341.8	5	112	44		
1.38	4.5	159.15	0.74	Sand	SP	very dense	110	24	300.9	5	107	43		
1.53	5.0	184.35	0.95	Sand	SP	very dense	110	28	347.3	10	109	43		
1.68	5.5	225.59	0.80	Sand	SP	very dense	110	35	404.7	5	114	44		
1.83	6.0	234.41	0.76	Sand	SP	very dense	110	36	402.1	5	114	44		
1.98	6.5	218.53	0.86	Sand	SP	very dense	110	34	359.8	5	110	43		
2.13	7.0	186.68	0.85	Sand	SP	very dense	110	29	295.9	5	105	43		
2.28	7.5	181.85	0.83	Sand	SP	very dense	110	28	278.2	5	103	42		
2.45	8.0	179.37	0.77	Sand	SP	very dense	110	28	265.5	5	101	42		
2.60	8.5	174.19	0.72	Sand	SP	very dense	110	27	254.4	5	100	42		
2.75	9.0	137.92	1.22	Sand to Silty Sand	SP/SM	very dense	115	25	198.6	15	93	41		
2.90	9.5	88.96	3.53	Sandy Silt to Clayey Silt	ML	dense	115	25	126.3	40	79	39		
3.05	10.0	65.77	4.92	Overconsolidated Soil	??	dense	120	66	92.0	55	70	38		
3.20	10.5	56.76	4.73	Silty Clay to Clay	CL	hard	125	32		55			3.31	>10
3.35	11.0	44.55	4.34	Silty Clay to Clay	CL	hard	125	25		60			2.59	>10
3.50	11.5	46.55	3.66	Clayey Silt to Silty Clay	ML/CL	hard	120	19		55			2.71	>10
3.65	12.0	65.28	2.16	Silty Sand to Sandy Silt	SM/ML	medium dense	115	15	86.2	35	68	38		
3.80	12.5	53.77	3.19	Sandy Silt to Clayey Silt	ML	medium dense	115	15	70.2	50	62	37		
3.95	13.0	29.43	3.91	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		70			1.70	>10
4.13	13.5	24.37	2.83	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		70			1.40	>10
4.28	14.0	18.52	3.69	Silty Clay to Clay	CL	very stiff	125	11		85			1.05	>10
4.43	14.5	17.11	3.69	Silty Clay to Clay	CL	stiff	125	10		90			0.97	>10
4.58	15.0	18.89	3.17	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		80			1.07	>10
4.73	15.5	17.98	3.40	Clayey Silt to Silty Clay	ML/CL	very stiff	120	7		85			1.02	>10
4.88	16.0	26.41	2.36	Sandy Silt to Clayey Silt	ML	loose	115	8	31.7	65	39	33		
5.03	16.5	27.51	2.76	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		70			1.58	>10
5.18	17.0	70.05	1.53	Silty Sand to Sandy Silt	SM/ML	medium dense	115	16	82.3	30	67	37		
5.33	17.5	107.47	1.00	Sand to Silty Sand	SP/SM	dense	115	20	125.1	20	79	39		
5.48	18.0	131.80	0.73	Sand	SP	dense	110	20	152.0	10	85	40		
5.65	18.5	132.37	0.54	Sand	SP	dense	110	20	151.4	10	85	40		
5.80	19.0	136.79	0.45	Sand	SP	dense	110	21	155.2	10	85	40		
5.95	19.5	106.69	0.71	Sand	SP	dense	110	16	120.1	15	78	39		
6.10	20.0	90.19	0.79	Sand to Silty Sand	SP/SM	dense	115	16	100.7	20	73	38		
6.25	20.5	86.49	0.79	Sand to Silty Sand	SP/SM	dense	115	16	95.7	20	71	38		

CLIENT: APEX
PROJECT: Viking Solar

CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

LOCATION: See Site and Boring Location Plan

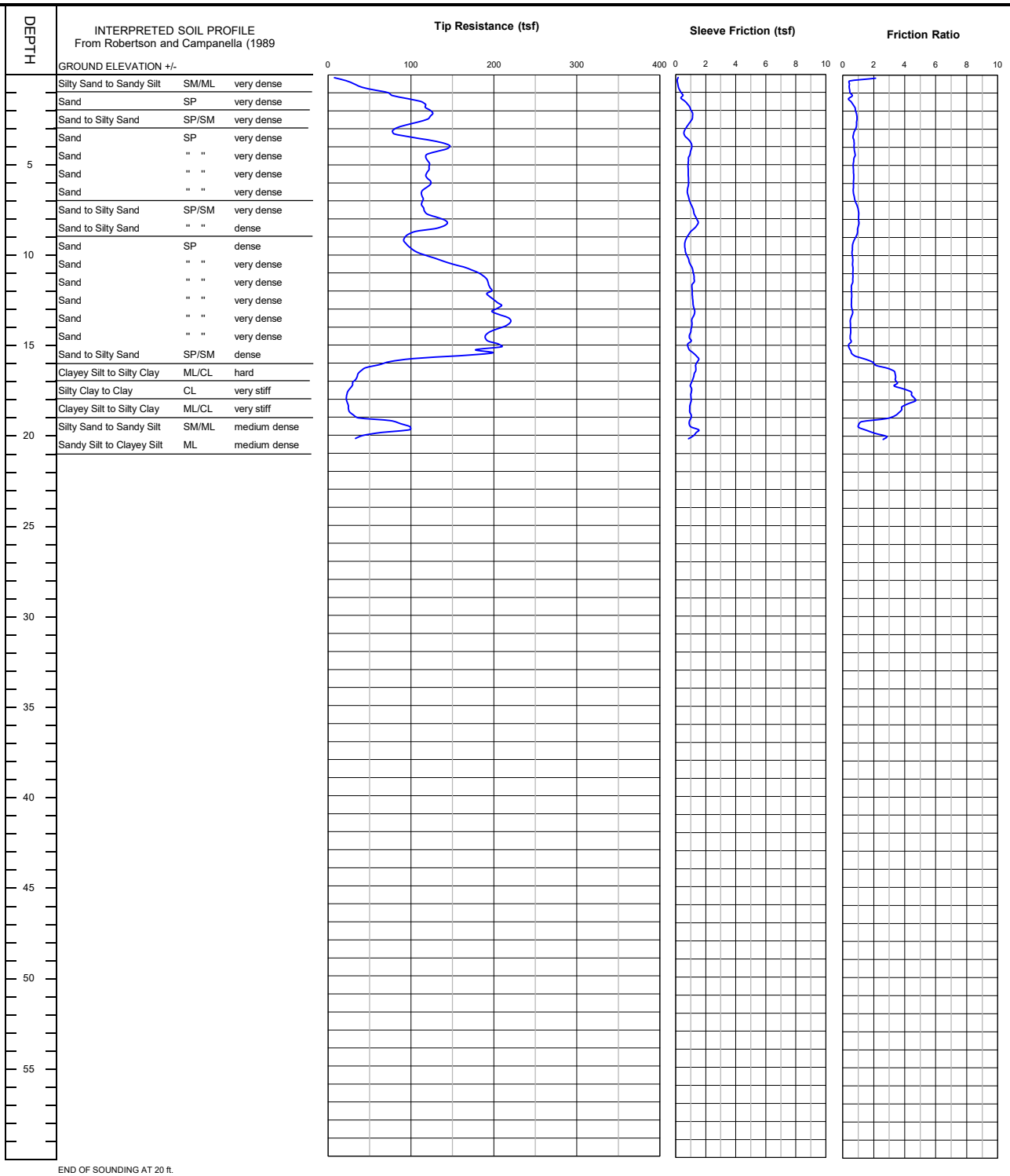
DATE: 11/24/2020

CONE SOUNDING DATA CPT-3

INTERPRETED SOIL PROFILE
From Robertson and Campanella (1989

GROUND ELEVATION +/-

Silty Sand to Sandy Silt	SM/ML	very dense
Sand	SP	very dense
Sand to Silty Sand	SP/SM	very dense
Sand	SP	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand to Silty Sand	SP/SM	very dense
Sand to Silty Sand	" "	dense
Sand	SP	dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand to Silty Sand	SP/SM	dense
Clayey Silt to Silty Clay	ML/CL	hard
Silty Clay to Clay	CL	very stiff
Clayey Silt to Silty Clay	ML/CL	very stiff
Silty Sand to Sandy Silt	SM/ML	medium dense
Sandy Silt to Clayey Silt	ML	medium dense



END OF SOUNDING AT 20 ft.

Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-3

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/24/2020

CONE SOUNDING: CPT-3

Est. GWT (ft): 8

Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	20.14	0.99	Sandy Silt to Clayey Silt	ML	dense	115	6	38.1	45	87	40		
0.30	1.0	54.68	0.44	Sand to Silty Sand	SP/SM	very dense	115	10	103.4	15	100	42		
0.45	1.5	94.77	0.51	Sand	SP	very dense	110	15	179.2	10	109	43		
0.60	2.0	119.28	0.76	Sand	SP	very dense	110	18	225.5	10	111	44		
0.75	2.5	123.16	0.90	Sand to Silty Sand	SP/SM	very dense	115	22	232.8	10	108	43		
0.93	3.0	94.44	0.88	Sand to Silty Sand	SP/SM	very dense	115	17	178.5	15	97	42		
1.08	3.5	85.71	0.69	Sand to Silty Sand	SP/SM	very dense	115	16	162.0	15	92	41		
1.23	4.0	134.82	0.73	Sand	SP	very dense	110	21	254.9	10	103	42		
1.38	4.5	130.45	0.77	Sand	SP	very dense	110	20	246.6	10	101	42		
1.53	5.0	120.07	0.70	Sand	SP	very dense	110	18	225.7	10	97	42		
1.68	5.5	120.21	0.69	Sand	SP	very dense	110	18	215.2	10	95	41		
1.83	6.0	122.24	0.70	Sand	SP	very dense	110	19	209.3	10	94	41		
1.98	6.5	115.18	0.69	Sand	SP	very dense	110	18	189.3	10	91	41		
2.13	7.0	113.80	0.78	Sand to Silty Sand	SP/SM	dense	115	21	179.9	10	90	41		
2.28	7.5	114.73	0.97	Sand to Silty Sand	SP/SM	dense	115	21	174.9	15	89	40		
2.45	8.0	129.08	1.02	Sand to Silty Sand	SP/SM	very dense	115	23	190.1	15	91	41		
2.60	8.5	137.56	1.00	Sand to Silty Sand	SP/SM	very dense	115	25	199.6	10	93	41		
2.75	9.0	98.03	0.89	Sand to Silty Sand	SP/SM	dense	115	18	140.2	15	82	40		
2.90	9.5	93.90	0.66	Sand to Silty Sand	SP/SM	dense	115	17	132.5	10	81	39		
3.05	10.0	108.64	0.61	Sand	SP	dense	110	17	151.3	10	85	40		
3.20	10.5	139.07	0.64	Sand	SP	very dense	110	21	191.3	5	92	41		
3.35	11.0	172.64	0.65	Sand	SP	very dense	110	27	234.7	5	98	42		
3.50	11.5	190.40	0.64	Sand	SP	very dense	110	29	255.9	5	100	42		
3.65	12.0	195.49	0.56	Sand	SP	very dense	110	30	259.8	5	101	42		
3.80	12.5	195.23	0.57	Sand	SP	very dense	110	30	256.6	5	100	42		
3.95	13.0	205.80	0.57	Sand	SP	very dense	110	32	267.6	5	102	42		
4.13	13.5	206.35	0.59	Sand	SP	very dense	110	32	265.5	5	101	42		
4.28	14.0	217.50	0.49	Sand	SP	very dense	110	33	277.0	0	103	42		
4.43	14.5	195.97	0.50	Sand	SP	very dense	110	30	247.1	5	99	42		
4.58	15.0	195.59	0.47	Sand	SP	very dense	110	30	244.1	5	99	42		
4.73	15.5	195.20	0.49	Sand	SP	very dense	110	30	241.3	5	98	42		
4.88	16.0	99.31	1.61	Silty Sand to Sandy Silt	SM/ML	dense	115	22	121.5	25	78	39		
5.03	16.5	40.78	3.20	Clayey Silt to Silty Clay	ML/CL	hard	120	16		60			2.36	>10
5.18	17.0	32.72	3.45	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		70			1.89	>10
5.33	17.5	26.64	3.89	Silty Clay to Clay	CL	very stiff	125	15		80			1.53	>10
5.48	18.0	22.30	4.58	Clay	CL/CH	very stiff	125	18		90			1.27	>10
5.65	18.5	24.20	3.94	Silty Clay to Clay	CL	very stiff	125	14		85			1.38	>10
5.80	19.0	30.91	3.27	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		70			1.78	>10
5.95	19.5	87.06	1.09	Sand to Silty Sand	SP/SM	dense	115	16	98.8	25	72	38		
6.10	20.0	68.49	2.16	Silty Sand to Sandy Silt	SM/ML	medium dense	115	15	77.0	40	65	37		
6.25	20.5	33.00	2.60	Sandy Silt to Clayey Silt	ML	medium dense	115	9	36.8	65	43	34		

CLIENT: APEX
PROJECT: Viking Solar

CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

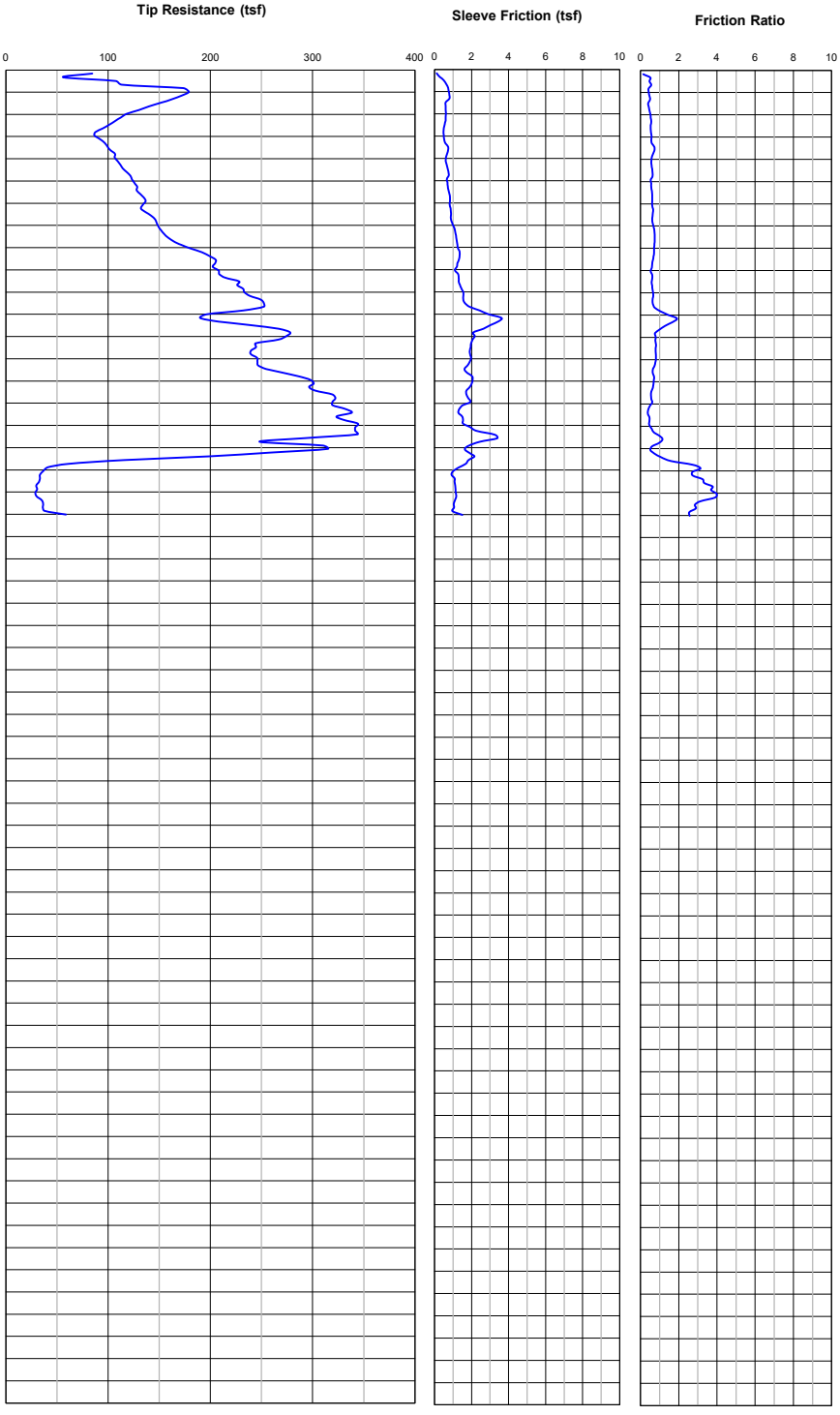
LOCATION: See Site and Boring Location Plan

DATE: 11/24/2020

CONE SOUNDING DATA CPT-4

DEPTH	INTERPRETED SOIL PROFILE From Robertson and Campanella (1989		
	GROUND ELEVATION +/-		
	Sand	SP	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
5	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
10	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
15	Gravelly Sand to Sand	SW	very dense
	Gravelly Sand to Sand	" "	very dense
	Sand	SP	very dense
	Silty Sand to Sandy Silt	SM/ML	dense
	Clayey Silt to Silty Clay	ML/CL	very stiff
20	Sandy Silt to Clayey Silt	ML	medium dense
25			
30			
35			
40			
45			
50			
55			

END OF SOUNDING AT 20 ft.



Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-4

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/24/2020

CONE SOUNDING: CPT-4

Est. GWT (ft): 8 Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	82.59	0.37	Sand to Silty Sand	SP/SM	very dense	115	15	156.1	10	129	46		
0.30	1.0	155.23	0.47	Sand	SP	very dense	110	24	293.4	5	131	46		
0.45	1.5	162.02	0.45	Sand	SP	very dense	110	25	306.3	5	125	46		
0.60	2.0	129.37	0.47	Sand	SP	very dense	110	20	244.5	5	114	44		
0.75	2.5	106.94	0.54	Sand	SP	very dense	110	16	202.2	10	104	43		
0.93	3.0	89.73	0.55	Sand to Silty Sand	SP/SM	very dense	115	16	169.6	10	96	41		
1.08	3.5	96.03	0.62	Sand to Silty Sand	SP/SM	very dense	115	17	181.5	10	96	41		
1.23	4.0	105.12	0.65	Sand	SP	very dense	110	16	198.7	10	96	41		
1.38	4.5	111.87	0.58	Sand	SP	very dense	110	17	211.5	10	96	41		
1.53	5.0	121.05	0.60	Sand	SP	very dense	110	19	228.6	5	97	42		
1.68	5.5	128.32	0.58	Sand	SP	very dense	110	20	230.7	5	97	42		
1.83	6.0	135.11	0.61	Sand	SP	very dense	110	21	232.2	5	97	42		
1.98	6.5	137.06	0.64	Sand	SP	very dense	110	21	226.0	5	97	42		
2.13	7.0	147.57	0.65	Sand	SP	very dense	110	23	234.3	5	98	42		
2.28	7.5	155.11	0.73	Sand	SP	very dense	110	24	237.7	5	98	42		
2.45	8.0	172.08	0.72	Sand	SP	very dense	110	26	255.1	5	100	42		
2.60	8.5	198.62	0.68	Sand	SP	very dense	110	31	290.5	5	104	43		
2.75	9.0	204.99	0.58	Sand	SP	very dense	110	32	295.8	5	105	43		
2.90	9.5	217.05	0.60	Sand	SP	very dense	110	33	309.2	5	106	43		
3.05	10.0	230.40	0.63	Sand	SP	very dense	110	35	324.1	5	107	43		
3.20	10.5	246.78	0.64	Sand	SP	very dense	110	38	342.9	0	109	43		
3.35	11.0	226.95	1.09	Sand	SP	very dense	110	35	311.6	10	106	43		
3.50	11.5	211.99	1.61	Sand to Silty Sand	SP/SM	very dense	115	39	287.5	15	104	43		
3.65	12.0	272.97	0.84	Sand	SP	very dense	110	42	365.8	5	111	44		
3.80	12.5	251.85	0.79	Sand	SP	very dense	110	39	333.7	5	108	43		
3.95	13.0	241.60	0.80	Sand	SP	very dense	110	37	316.6	5	107	43		
4.13	13.5	248.98	0.71	Sand	SP	very dense	110	38	322.8	5	107	43		
4.28	14.0	284.25	0.68	Sand	SP	very dense	110	44	364.7	5	111	43		
4.43	14.5	300.12	0.62	Gravelly Sand to Sand	SW	very dense	115	40	381.0	0	112	44		
4.58	15.0	320.31	0.57	Gravelly Sand to Sand	SW	very dense	115	43	402.1	0	114	44		
4.73	15.5	329.90	0.42	Gravelly Sand to Sand	SW	very dense	115	44	409.7	0	114	44		
4.88	16.0	334.78	0.48	Gravelly Sand to Sand	SW	very dense	115	45	411.4	0	114	44		
5.03	16.5	326.17	0.92	Sand	SP	very dense	110	50	396.8	5	113	44		
5.18	17.0	290.81	0.70	Sand	SP	very dense	110	45	350.6	5	110	43		
5.33	17.5	190.73	1.13	Sand	SP	very dense	110	29	227.8	15	97	42		
5.48	18.0	46.65	2.86	Sandy Silt to Clayey Silt	ML	medium dense	115	13	55.2	55	55	36		
5.65	18.5	33.05	3.10	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		65			1.90	>10
5.80	19.0	29.73	3.82	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		75			1.71	>10
5.95	19.5	33.81	3.29	Clayey Silt to Silty Clay	ML/CL	very stiff	120	14		70			1.95	>10
6.10	20.0	44.27	2.67	Sandy Silt to Clayey Silt	ML	medium dense	115	13	50.3	55	52	35		
6.25	20.5	#DIV/0!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!

CLIENT: APEX
PROJECT: Viking Solar

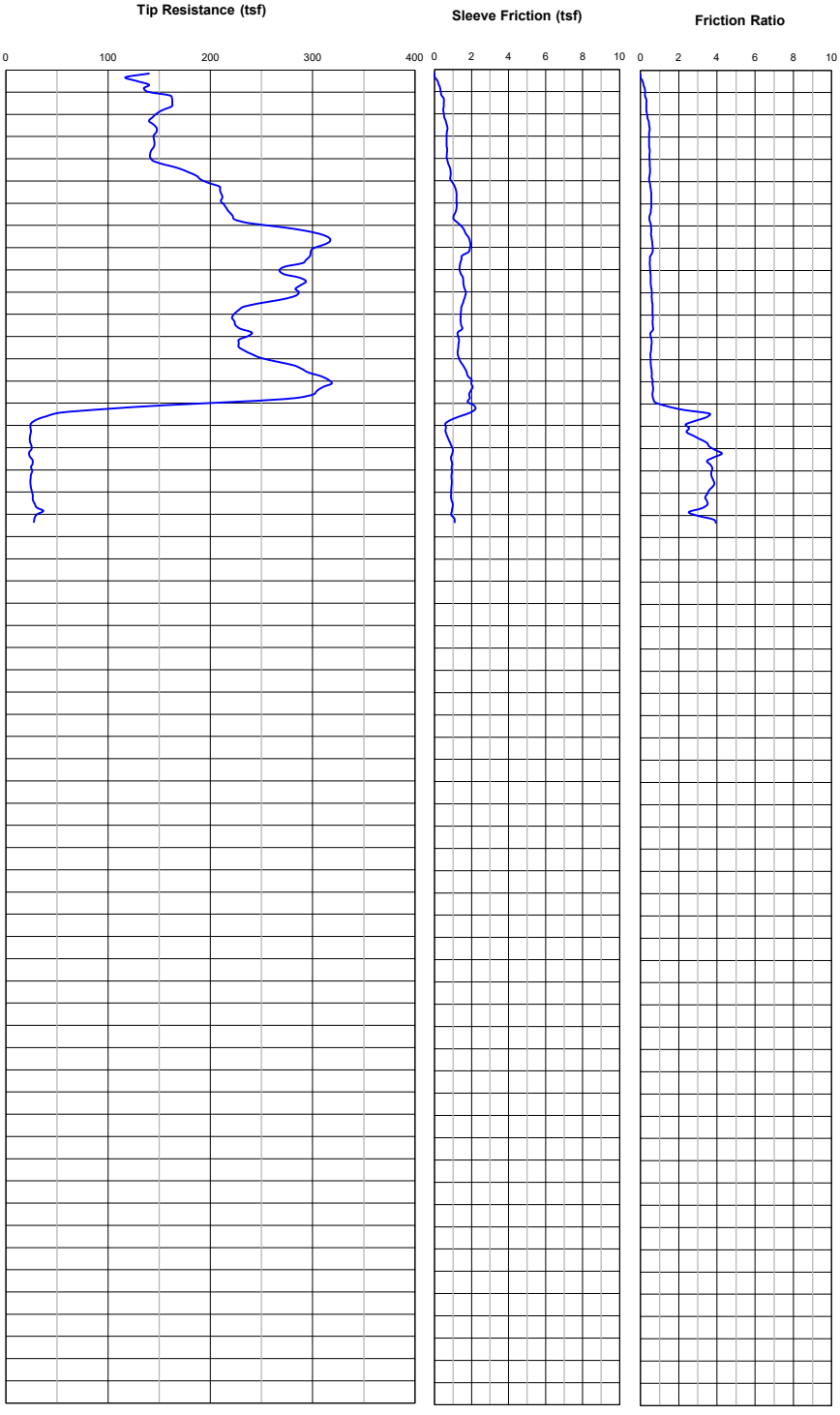
CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

LOCATION: See Site and Boring Location Plan

DATE: 11/25/2020

CONE SOUNDING DATA CPT-5

DEPTH	INTERPRETED SOIL PROFILE From Robertson and Campanella (1989		
	GROUND ELEVATION +/-		
	Sand	SP	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
5	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Gravelly Sand to Sand	SW	very dense
	Gravelly Sand to Sand	" "	very dense
10	Gravelly Sand to Sand	" "	very dense
	Sand	SP	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Gravelly Sand to Sand	SW	very dense
15	Gravelly Sand to Sand	" "	very dense
	Sandy Silt to Clayey Silt	ML	medium dense
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
	Clayey Silt to Silty Clay	" "	very stiff
20	Clayey Silt to Silty Clay	" "	very stiff
25			
30			
35			
40			
45			
50			
55			



END OF SOUNDING AT 20 ft.

Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-5

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/25/2020

CONE SOUNDING: CPT-5

Est. GWT (ft): 8

Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	128.19	0.04	Sand	SP	very dense	110	20	242.3	0	142	48		
0.30	1.0	137.91	0.21	Sand	SP	very dense	110	21	260.7	0	128	46		
0.45	1.5	161.98	0.28	Sand	SP	very dense	110	25	306.2	0	125	46		
0.60	2.0	154.15	0.32	Sand	SP	very dense	110	24	291.4	0	119	45		
0.75	2.5	142.65	0.41	Sand	SP	very dense	110	22	269.7	5	113	44		
0.93	3.0	146.45	0.46	Sand	SP	very dense	110	23	276.8	5	111	44		
1.08	3.5	144.91	0.45	Sand	SP	very dense	110	22	273.9	5	108	43		
1.23	4.0	141.50	0.47	Sand	SP	very dense	110	22	267.5	5	105	43		
1.38	4.5	156.62	0.49	Sand	SP	very dense	110	24	296.1	5	106	43		
1.53	5.0	184.98	0.47	Sand	SP	very dense	110	28	349.7	0	110	43		
1.68	5.5	206.79	0.53	Sand	SP	very dense	110	32	374.1	0	111	44		
1.83	6.0	211.87	0.56	Sand	SP	very dense	110	33	366.3	0	111	44		
1.98	6.5	218.66	0.51	Sand	SP	very dense	110	34	362.6	0	111	43		
2.13	7.0	242.87	0.51	Sand	SP	very dense	110	37	387.5	0	112	44		
2.28	7.5	304.33	0.56	Gravelly Sand to Sand	SW	very dense	115	41	468.2	0	118	45		
2.45	8.0	309.08	0.62	Gravelly Sand to Sand	SW	very dense	115	41	459.2	0	118	44		
2.60	8.5	296.36	0.54	Gravelly Sand to Sand	SW	very dense	115	40	433.7	0	116	44		
2.75	9.0	276.48	0.49	Gravelly Sand to Sand	SW	very dense	115	37	398.7	0	113	44		
2.90	9.5	284.21	0.53	Gravelly Sand to Sand	SW	very dense	115	38	404.1	0	114	44		
3.05	10.0	286.02	0.57	Gravelly Sand to Sand	SW	very dense	115	38	401.1	0	113	44		
3.20	10.5	266.42	0.60	Sand	SP	very dense	110	41	368.8	0	111	44		
3.35	11.0	227.46	0.63	Sand	SP	very dense	110	35	311.1	5	106	43		
3.50	11.5	223.08	0.64	Sand	SP	very dense	110	34	301.6	5	105	43		
3.65	12.0	235.39	0.57	Sand	SP	very dense	110	36	314.7	0	106	43		
3.80	12.5	227.80	0.57	Sand	SP	very dense	110	35	301.1	0	105	43		
3.95	13.0	240.99	0.53	Sand	SP	very dense	110	37	315.1	0	106	43		
4.13	13.5	278.48	0.55	Gravelly Sand to Sand	SW	very dense	115	37	360.1	0	110	43		
4.28	14.0	306.28	0.60	Gravelly Sand to Sand	SW	very dense	115	41	391.5	0	113	44		
4.43	14.5	310.92	0.64	Gravelly Sand to Sand	SW	very dense	115	41	393.0	0	113	44		
4.58	15.0	270.91	0.69	Sand	SP	very dense	110	42	338.9	5	109	43		
4.73	15.5	101.87	2.41	Silty Sand to Sandy Silt	SM/ML	dense	115	23	126.1	35	79	39		
4.88	16.0	29.41	2.81	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		65			1.69	>10
5.03	16.5	23.96	2.74	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		70			1.37	>10
5.18	17.0	24.53	3.66	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		80			1.40	>10
5.33	17.5	24.06	3.85	Silty Clay to Clay	CL	very stiff	125	14		80			1.38	>10
5.48	18.0	25.48	3.70	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		80			1.46	>10
5.65	18.5	24.27	3.78	Silty Clay to Clay	CL	very stiff	125	14		85			1.39	>10
5.80	19.0	24.94	3.62	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		80			1.42	>10
5.95	19.5	26.92	3.45	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		80			1.54	>10
6.10	20.0	32.37	2.90	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		70			1.86	>10
6.25	20.5	27.73	3.88	Silty Clay to Clay	CL	very stiff	125	16		80			1.59	>10

CLIENT: APEX
PROJECT: Viking Solar

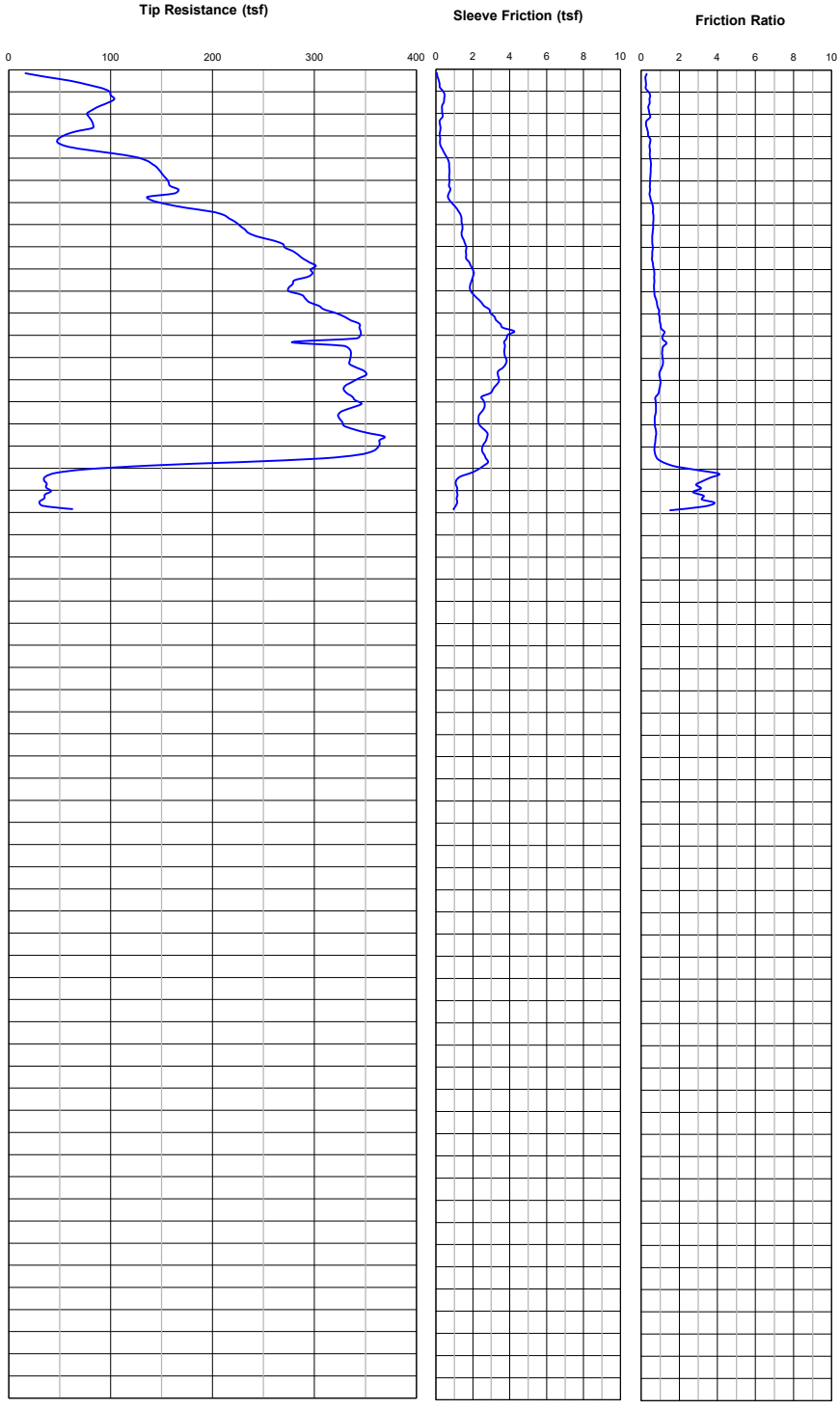
CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

LOCATION: See Site and Boring Location Plan

DATE: 11/24/2020

CONE SOUNDING DATA CPT-6

DEPTH	INTERPRETED SOIL PROFILE From Robertson and Campanella (1989		
	GROUND ELEVATION +/-		
	Sand to Silty Sand	SP/SM	very dense
	Sand	SP	very dense
	Sand to Silty Sand	SP/SM	very dense
	Sand to Silty Sand	" "	dense
5	Sand	SP	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Gravelly Sand to Sand	SW	very dense
10	Gravelly Sand to Sand	" "	very dense
	Sand	SP	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
15	Sand	" "	very dense
	Gravelly Sand to Sand	SW	very dense
	Gravelly Sand to Sand	" "	very dense
	Sand to Silty Sand	SP/SM	very dense
	Clayey Silt to Silty Clay	ML/CL	hard
20	Sandy Silt to Clayey Silt	ML	medium dense



END OF SOUNDING AT 20 ft.

Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-6

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/24/2020

CONE SOUNDING: CPT-6

Est. GWT (ft): 8

Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	37.78	0.25	Sand to Silty Sand	SP/SM	very dense	115	7	71.4	15	106	43		
0.30	1.0	88.50	0.29	Sand	SP	very dense	110	14	167.3	5	115	44		
0.45	1.5	100.65	0.45	Sand	SP	very dense	110	15	190.3	5	111	44		
0.60	2.0	82.89	0.40	Sand to Silty Sand	SP/SM	very dense	115	15	156.7	10	100	42		
0.75	2.5	80.89	0.33	Sand	SP	very dense	110	12	152.9	5	96	41		
0.93	3.0	67.52	0.34	Sand to Silty Sand	SP/SM	dense	115	12	127.6	10	88	40		
1.08	3.5	50.96	0.46	Sand to Silty Sand	SP/SM	dense	115	9	96.3	15	77	39		
1.23	4.0	99.91	0.45	Sand	SP	very dense	110	15	188.9	5	95	41		
1.38	4.5	140.72	0.50	Sand	SP	very dense	110	22	266.0	5	103	42		
1.53	5.0	151.58	0.48	Sand	SP	very dense	110	23	285.6	5	103	42		
1.68	5.5	161.19	0.45	Sand	SP	very dense	110	25	289.1	5	104	43		
1.83	6.0	143.85	0.53	Sand	SP	very dense	110	22	246.7	5	99	42		
1.98	6.5	194.38	0.63	Sand	SP	very dense	110	30	320.0	5	107	43		
2.13	7.0	222.32	0.63	Sand	SP	very dense	110	34	352.4	5	110	43		
2.28	7.5	237.35	0.59	Sand	SP	very dense	110	37	363.2	0	111	43		
2.45	8.0	266.58	0.59	Sand	SP	very dense	110	41	394.7	0	113	44		
2.60	8.5	284.16	0.57	Gravelly Sand to Sand	SW	very dense	115	38	414.7	0	114	44		
2.75	9.0	297.39	0.63	Gravelly Sand to Sand	SW	very dense	115	40	427.7	0	115	44		
2.90	9.5	290.63	0.69	Sand	SP	very dense	110	45	412.4	0	114	44		
3.05	10.0	275.98	0.68	Sand	SP	very dense	110	42	386.7	0	112	44		
3.20	10.5	291.20	0.77	Sand	SP	very dense	110	45	403.1	5	114	44		
3.35	11.0	311.47	0.90	Sand	SP	very dense	110	48	426.0	5	115	44		
3.50	11.5	336.47	0.98	Sand	SP	very dense	110	52	454.9	5	117	44		
3.65	12.0	344.86	1.14	Sand	SP	very dense	110	53	461.0	5	118	44		
3.80	12.5	315.81	1.20	Sand	SP	very dense	110	49	417.5	5	115	44		
3.95	13.0	335.28	1.11	Sand	SP	very dense	110	52	438.4	5	116	44		
4.13	13.5	336.83	1.11	Sand	SP	very dense	110	52	435.8	5	116	44		
4.28	14.0	347.46	0.97	Sand	SP	very dense	110	53	444.9	5	117	44		
4.43	14.5	331.83	0.97	Sand	SP	very dense	110	51	420.5	5	115	44		
4.58	15.0	336.18	0.79	Sand	SP	very dense	110	52	421.8	5	115	44		
4.73	15.5	336.67	0.77	Sand	SP	very dense	110	52	418.3	5	115	44		
4.88	16.0	325.90	0.72	Gravelly Sand to Sand	SW	very dense	115	43	400.8	5	113	44		
5.03	16.5	353.03	0.77	Sand	SP	very dense	110	54	429.9	5	116	44		
5.18	17.0	363.27	0.72	Gravelly Sand to Sand	SW	very dense	115	48	438.1	0	116	44		
5.33	17.5	335.95	0.78	Sand	SP	very dense	110	52	401.3	5	114	44		
5.48	18.0	147.29	2.03	Silty Sand to Sandy Silt	SM/ML	dense	115	33	174.3	25	89	40		
5.65	18.5	38.82	3.64	Clayey Silt to Silty Clay	ML/CL	hard	120	16		65			2.24	>10
5.80	19.0	38.49	2.91	Sandy Silt to Clayey Silt	ML	medium dense	115	11	44.6	60	49	35		
5.95	19.5	33.48	3.44	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		70			1.93	>10
6.10	20.0	47.65	2.39	Sandy Silt to Clayey Silt	ML	medium dense	115	14	54.2	50	54	36		
6.25	20.5	#DIV/0!	#DIV/0!	#REF!	#REF!	#REF!	#REF!	#DIV/0!	#REF!	#DIV/0!	#REF!	#REF!	#REF!	#REF!

CLIENT: APEX
PROJECT: Viking Solar

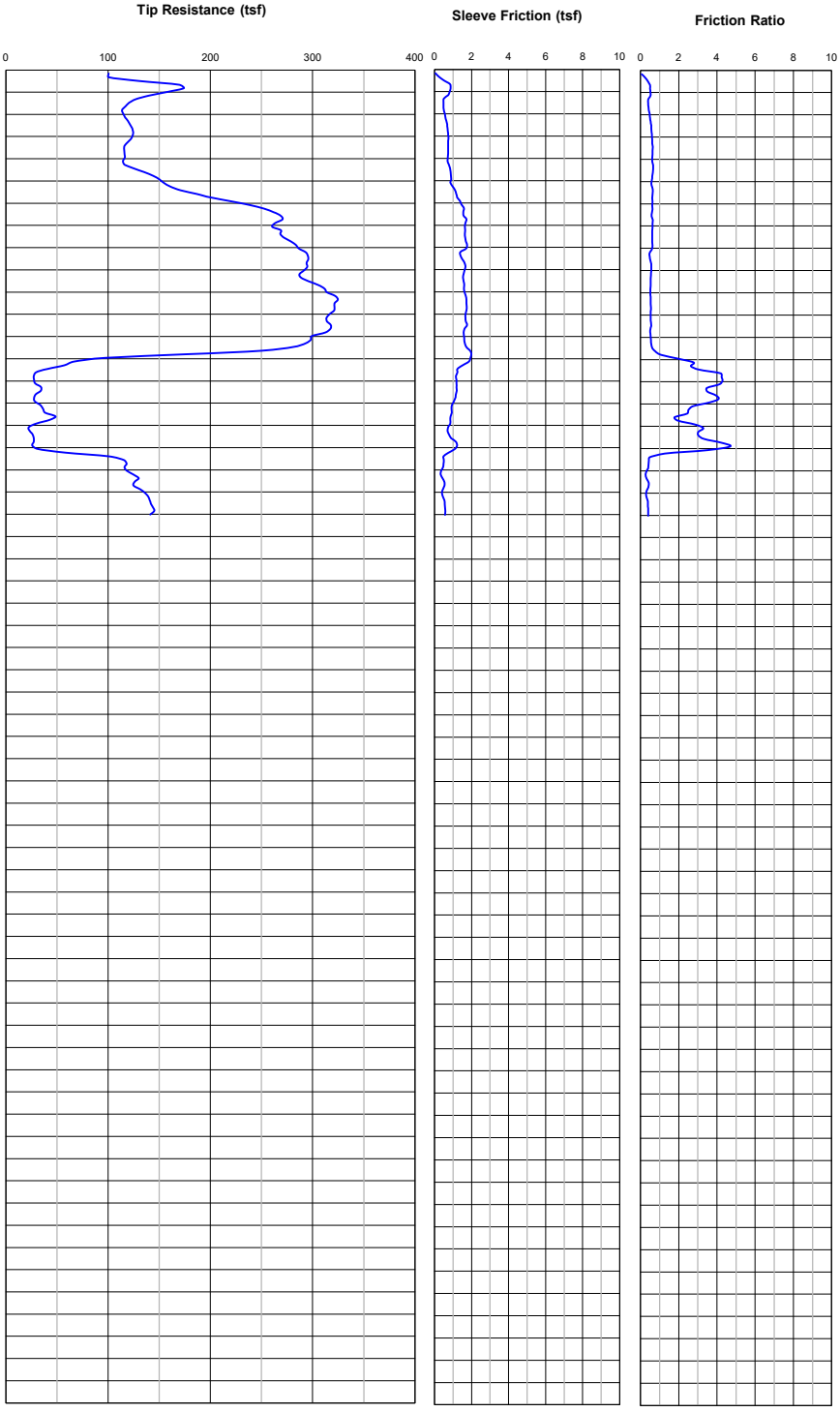
CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

LOCATION: See Site and Boring Location Plan

DATE: 11/25/2020

CONE SOUNDING DATA CPT-7

DEPTH	INTERPRETED SOIL PROFILE From Robertson and Campanella (1989		
	GROUND ELEVATION +/-		
	Sand	SP	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
5	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
10	Gravelly Sand to Sand	SW	very dense
	Gravelly Sand to Sand	" "	very dense
	Gravelly Sand to Sand	" "	very dense
	Gravelly Sand to Sand	" "	very dense
	Sand	SP	very dense
	Clayey Silt to Silty Clay	ML/CL	hard
15	Clayey Silt to Silty Clay	" "	very stiff
	Sandy Silt to Clayey Silt	ML	medium dense
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Sand	SP	dense
	Sand	" "	dense
20	Sand	" "	dense



END OF SOUNDING AT 20 ft.

Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-7

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/25/2020

CONE SOUNDING: CPT-7

Est. GWT (ft): 8

Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	110.42	0.23	Sand	SP	very dense	110	17	208.7	0	138	47		
0.30	1.0	167.21	0.50	Sand	SP	very dense	110	26	316.1	5	134	47		
0.45	1.5	129.27	0.44	Sand	SP	very dense	110	20	244.4	5	119	45		
0.60	2.0	115.08	0.44	Sand	SP	very dense	110	18	217.5	5	110	43		
0.75	2.5	119.15	0.53	Sand	SP	very dense	110	18	225.2	5	108	43		
0.93	3.0	123.98	0.58	Sand	SP	very dense	110	19	234.4	5	106	43		
1.08	3.5	118.72	0.62	Sand	SP	very dense	110	18	224.4	10	102	42		
1.23	4.0	116.00	0.62	Sand	SP	very dense	110	18	219.3	10	99	42		
1.38	4.5	118.55	0.64	Sand	SP	very dense	110	18	224.1	10	98	42		
1.53	5.0	143.03	0.62	Sand	SP	very dense	110	22	270.4	5	102	42		
1.68	5.5	168.30	0.61	Sand	SP	very dense	110	26	304.5	5	105	43		
1.83	6.0	219.12	0.62	Sand	SP	very dense	110	34	378.8	5	112	44		
1.98	6.5	260.91	0.60	Sand	SP	very dense	110	40	432.6	0	116	44		
2.13	7.0	264.77	0.63	Sand	SP	very dense	110	41	422.5	0	115	44		
2.28	7.5	269.75	0.61	Sand	SP	very dense	110	42	415.3	0	115	44		
2.45	8.0	282.87	0.61	Gravelly Sand to Sand	SW	very dense	115	38	420.9	0	115	44		
2.60	8.5	294.67	0.49	Gravelly Sand to Sand	SW	very dense	115	39	431.9	0	116	44		
2.75	9.0	293.37	0.56	Gravelly Sand to Sand	SW	very dense	115	39	423.7	0	115	44		
2.90	9.5	290.59	0.54	Gravelly Sand to Sand	SW	very dense	115	39	413.7	0	114	44		
3.05	10.0	310.39	0.52	Gravelly Sand to Sand	SW	very dense	115	41	435.8	0	116	44		
3.20	10.5	322.56	0.53	Gravelly Sand to Sand	SW	very dense	115	43	446.8	0	117	44		
3.35	11.0	319.52	0.53	Gravelly Sand to Sand	SW	very dense	115	43	436.8	0	116	44		
3.50	11.5	315.12	0.54	Gravelly Sand to Sand	SW	very dense	115	42	425.3	0	115	44		
3.65	12.0	309.58	0.52	Gravelly Sand to Sand	SW	very dense	115	41	412.6	0	114	44		
3.80	12.5	290.73	0.57	Gravelly Sand to Sand	SW	very dense	115	39	382.8	0	112	44		
3.95	13.0	175.49	1.29	Sand to Silty Sand	SP/SM	very dense	115	32	228.3	15	97	42		
4.13	13.5	54.86	2.82	Sandy Silt to Clayey Silt	ML	medium dense	115	16	70.5	45	62	37		
4.28	14.0	28.02	4.24	Silty Clay to Clay	CL	very stiff	125	16		75			1.61	>10
4.43	14.5	32.37	3.71	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		70			1.87	>10
4.58	15.0	28.37	3.88	Clayey Silt to Silty Clay	ML/CL	very stiff	120	11		75			1.63	>10
4.73	15.5	36.20	2.57	Sandy Silt to Clayey Silt	ML	medium dense	115	10	44.4	55	48	35		
4.88	16.0	35.98	2.46	Sandy Silt to Clayey Silt	ML	medium dense	115	10	43.6	55	48	35		
5.03	16.5	25.52	3.13	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		75			1.46	>10
5.18	17.0	27.95	4.14	Silty Clay to Clay	CL	very stiff	125	16		80			1.60	>10
5.33	17.5	91.28	0.73	Sand to Silty Sand	SP/SM	dense	115	17	107.2	15	75	38		
5.48	18.0	117.48	0.37	Sand	SP	dense	110	18	136.7	5	82	39		
5.65	18.5	126.93	0.34	Sand	SP	dense	110	20	146.5	5	84	40		
5.80	19.0	130.58	0.35	Sand	SP	dense	110	20	149.4	5	84	40		
5.95	19.5	140.47	0.36	Sand	SP	dense	110	22	159.4	5	86	40		
6.10	20.0	143.36	0.40	Sand	SP	dense	110	22	161.4	5	87	40		

CLIENT: APEX
PROJECT: Viking Solar

CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

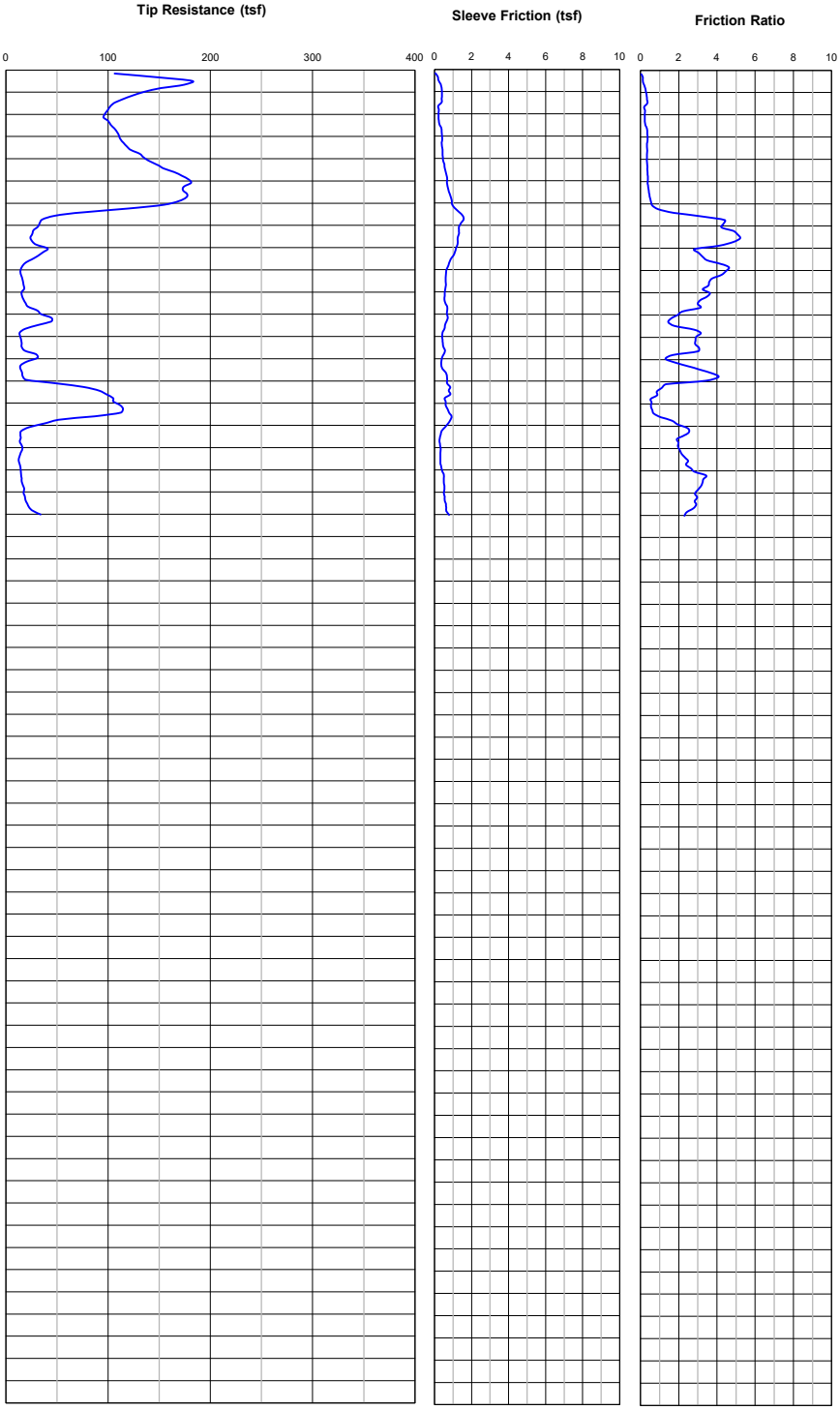
LOCATION: See Site and Boring Location Plan

DATE: 11/25/2020

CONE SOUNDING DATA CPT-8

DEPTH	INTERPRETED SOIL PROFILE From Robertson and Campanella (1989		
	GROUND ELEVATION +/-		
	Sand	SP	very dense
	Sand	" "	very dense
	Sand	" "	very dense
	Sand	" "	very dense
5	Sand	" "	very dense
	Sand	" "	very dense
	Sandy Silt to Clayey Silt	ML	dense
	Silty Clay to Clay	CL	very stiff
	Silty Clay to Clay	" "	very stiff
10	Silty Clay to Clay	" "	stiff
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Sandy Silt to Clayey Silt	ML	medium dense
	Clayey Silt to Silty Clay	ML/CL	very stiff
	Clayey Silt to Silty Clay	" "	stiff
15	Sand to Silty Sand	SP/SM	dense
	Sand to Silty Sand	" "	dense
	Clayey Silt to Silty Clay	ML/CL	stiff
	Clayey Silt to Silty Clay	" "	stiff
	Clayey Silt to Silty Clay	" "	stiff
20	Clayey Silt to Silty Clay	" "	very stiff

END OF SOUNDING AT 20 ft.



Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-8

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/25/2020

CONE SOUNDING: CPT-8

Est. GWT (ft): 8 Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	145.53	0.09	Sand	SP	very dense	110	22	275.1	-5	146	48		
0.30	1.0	153.79	0.24	Sand	SP	very dense	110	24	290.7	0	131	46		
0.45	1.5	114.82	0.34	Sand	SP	very dense	110	18	217.1	5	115	44		
0.60	2.0	99.53	0.22	Sand	SP	very dense	110	15	188.1	0	106	43		
0.75	2.5	99.29	0.24	Sand	SP	very dense	110	15	187.7	5	102	42		
0.93	3.0	108.43	0.35	Sand	SP	very dense	110	17	205.0	5	102	42		
1.08	3.5	115.16	0.35	Sand	SP	very dense	110	18	217.7	5	101	42		
1.23	4.0	129.35	0.34	Sand	SP	very dense	110	20	244.5	0	103	42		
1.38	4.5	147.56	0.35	Sand	SP	very dense	110	23	278.9	0	105	43		
1.53	5.0	171.74	0.37	Sand	SP	very dense	110	26	324.7	0	107	43		
1.68	5.5	176.33	0.42	Sand	SP	very dense	110	27	319.0	0	107	43		
1.83	6.0	166.51	0.56	Sand	SP	very dense	110	26	287.9	5	104	43		
1.98	6.5	81.27	1.94	Silty Sand to Sandy Silt	SM/ML	dense	115	18	134.6	30	81	39		
2.13	7.0	33.35	4.33	Silty Clay to Clay	CL	very stiff	125	19		65			1.94	>10
2.28	7.5	25.64	5.05	Clay	CL/CH	very stiff	125	21		80			1.48	>10
2.45	8.0	32.28	3.93	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		65			1.87	>10
2.60	8.5	30.83	3.25	Clayey Silt to Silty Clay	ML/CL	very stiff	120	12		60			1.79	>10
2.75	9.0	16.23	4.43	Clay	CL/CH	stiff	125	13		90			0.93	>10
2.90	9.5	15.73	3.86	Silty Clay to Clay	CL	stiff	125	9		85			0.90	>10
3.05	10.0	16.84	3.48	Silty Clay to Clay	CL	stiff	125	10		80			0.96	>10
3.20	10.5	17.40	3.19	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		80			0.99	>10
3.35	11.0	29.00	2.43	Sandy Silt to Clayey Silt	ML	medium dense	115	8	38.9	55	45	34		
3.50	11.5	40.18	1.61	Silty Sand to Sandy Silt	SM/ML	medium dense	115	9	53.2	40	54	36		
3.65	12.0	15.62	2.95	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		80			0.89	>10
3.80	12.5	15.28	2.93	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		85			0.87	>10
3.95	13.0	26.26	1.99	Sandy Silt to Clayey Silt	ML	medium dense	115	8	33.5	55	40	34		
4.13	13.5	16.44	2.45	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		80			0.93	>10
4.28	14.0	17.34	3.75	Silty Clay to Clay	CL	stiff	125	10		90			0.98	>10
4.43	14.5	72.60	1.10	Sand to Silty Sand	SP/SM	medium dense	115	13	89.3	25	69	38		
4.58	15.0	102.79	0.66	Sand to Silty Sand	SP/SM	dense	115	19	125.2	15	79	39		
4.73	15.5	112.90	0.61	Sand	SP	dense	110	17	136.2	10	82	39		
4.88	16.0	49.73	1.78	Silty Sand to Sandy Silt	SM/ML	medium dense	115	11	59.4	40	57	36		
5.03	16.5	14.62	2.25	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		85			0.82	>10
5.18	17.0	15.11	2.00	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		80			0.85	>10
5.33	17.5	13.52	2.31	Clayey Silt to Silty Clay	ML/CL	stiff	120	5		90			0.75	>10
5.48	18.0	14.11	2.61	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		95			0.79	>10
5.65	18.5	15.20	3.32	Silty Clay to Clay	CL	stiff	125	9		100			0.85	>10
5.80	19.0	17.34	2.99	Clayey Silt to Silty Clay	ML/CL	stiff	120	7		90			0.98	>10
5.95	19.5	19.47	2.91	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		85			1.10	>10
6.10	20.0	27.74	2.49	Sandy Silt to Clayey Silt	ML	loose	115	8	30.6	70	38	33		

CLIENT: APEX
PROJECT: Viking Solar

CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

LOCATION: See Site and Boring Location Plan

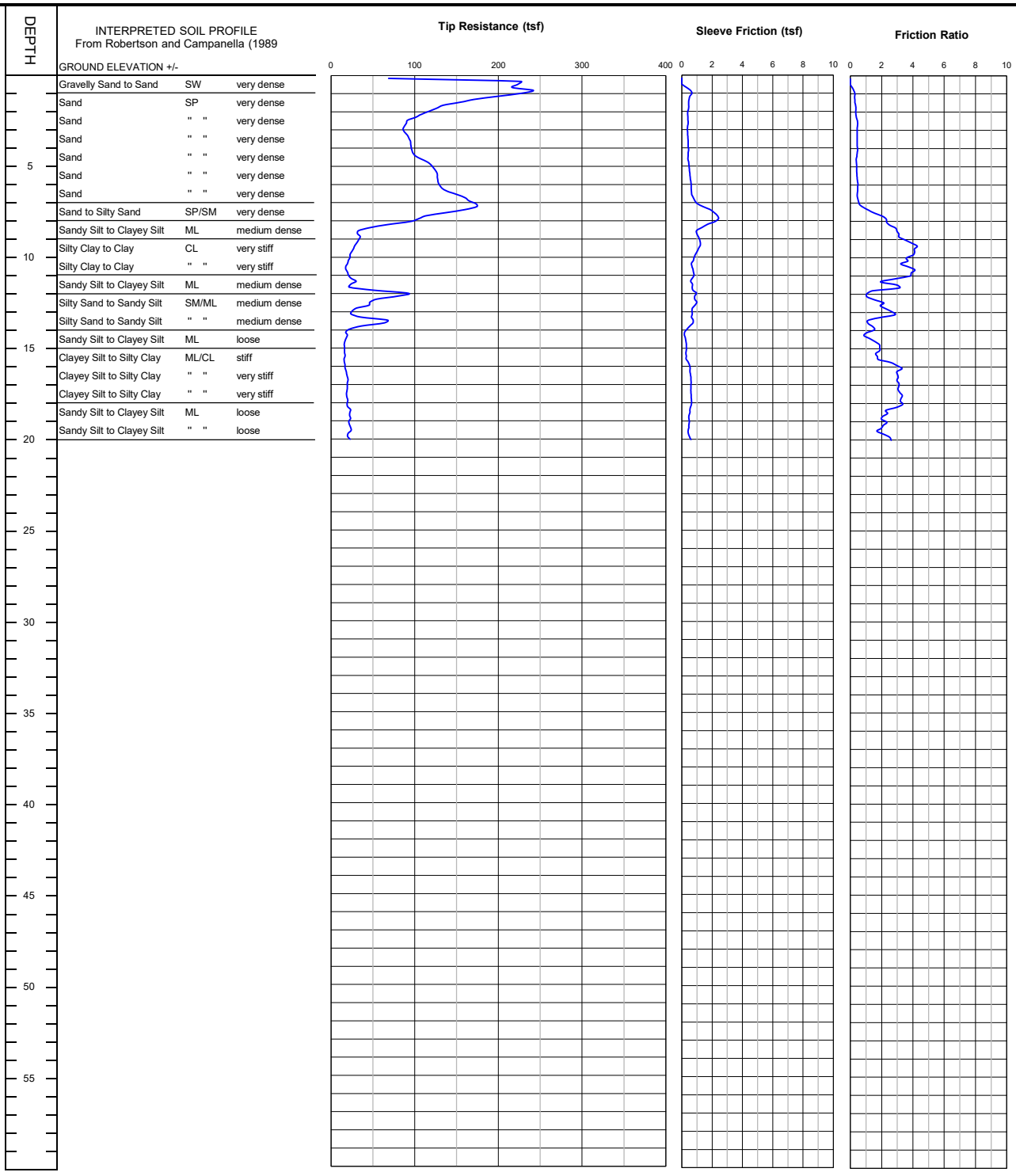
DATE: 11/25/2020

CONE SOUNDING DATA CPT-9

INTERPRETED SOIL PROFILE
From Robertson and Campanella (1989

GROUND ELEVATION +/-

Gravelly Sand to Sand	SW	very dense
Sand	SP	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand to Silty Sand	SP/SM	very dense
Sandy Silt to Clayey Silt	ML	medium dense
Silty Clay to Clay	CL	very stiff
Silty Clay to Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	medium dense
Silty Sand to Sandy Silt	SM/ML	medium dense
Silty Sand to Sandy Silt	" "	medium dense
Sandy Silt to Clayey Silt	ML	loose
Clayey Silt to Silty Clay	ML/CL	stiff
Clayey Silt to Silty Clay	" "	very stiff
Clayey Silt to Silty Clay	" "	very stiff
Sandy Silt to Clayey Silt	ML	loose
Sandy Silt to Clayey Silt	" "	loose



END OF SOUNDING AT 20 ft.

Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-9

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/25/2020

CONE SOUNDING: CPT-9

Est. GWT (ft): 8

Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	172.88	0.00	Sand	SP	very dense	110	27	326.8	#NUM!	151	49		
0.30	1.0	228.48	0.21	Gravelly Sand to Sand	SW	very dense	115	30	431.9	-5	143	48		
0.45	1.5	174.59	0.28	Sand	SP	very dense	110	27	330.0	0	127	46		
0.60	2.0	125.63	0.35	Sand	SP	very dense	110	19	237.5	5	113	44		
0.75	2.5	100.20	0.39	Sand	SP	very dense	110	15	189.4	5	102	42		
0.93	3.0	87.89	0.44	Sand	SP	very dense	110	14	166.1	10	96	41		
1.08	3.5	90.65	0.43	Sand	SP	very dense	110	14	171.4	10	94	41		
1.23	4.0	95.16	0.44	Sand	SP	very dense	110	15	179.9	5	93	41		
1.38	4.5	98.46	0.43	Sand	SP	very dense	110	15	186.1	5	93	41		
1.53	5.0	114.15	0.38	Sand	SP	very dense	110	18	215.8	5	95	41		
1.68	5.5	125.38	0.41	Sand	SP	very dense	110	19	226.4	5	97	42		
1.83	6.0	128.65	0.46	Sand	SP	very dense	110	20	222.0	5	96	41		
1.98	6.5	141.83	0.45	Sand	SP	very dense	110	22	234.8	5	98	42		
2.13	7.0	166.09	0.52	Sand	SP	very dense	110	26	264.6	5	101	42		
2.28	7.5	156.95	1.17	Sand to Silty Sand	SP/SM	very dense	115	29	241.1	10	98	42		
2.45	8.0	104.34	2.22	Silty Sand to Sandy Silt	SM/ML	dense	115	23	154.8	25	85	40		
2.60	8.5	48.74	2.80	Sandy Silt to Clayey Silt	ML	medium dense	115	14	71.2	45	62	37		
2.75	9.0	33.19	3.24	Clayey Silt to Silty Clay	ML/CL	very stiff	120	13		60			1.93	>10
2.90	9.5	28.83	4.09	Silty Clay to Clay	CL	very stiff	125	16		70			1.67	>10
3.05	10.0	23.35	3.90	Silty Clay to Clay	CL	very stiff	125	13		75			1.34	>10
3.20	10.5	19.43	3.54	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		75			1.11	>10
3.35	11.0	19.42	3.95	Silty Clay to Clay	CL	very stiff	125	11		80			1.11	>10
3.50	11.5	25.87	2.58	Clayey Silt to Silty Clay	ML/CL	very stiff	120	10		60			1.49	>10
3.65	12.0	55.20	1.87	Silty Sand to Sandy Silt	SM/ML	medium dense	115	12	72.6	35	63	37		
3.80	12.5	60.36	1.58	Silty Sand to Sandy Silt	SM/ML	medium dense	115	13	78.5	30	65	37		
3.95	13.0	33.71	2.28	Sandy Silt to Clayey Silt	ML	medium dense	115	10	43.3	55	48	35		
4.13	13.5	42.46	1.91	Sandy Silt to Clayey Silt	ML	medium dense	115	12	54.0	45	54	36		
4.28	14.0	40.82	1.38	Silty Sand to Sandy Silt	SM/ML	medium dense	115	9	51.3	40	53	35		
4.43	14.5	18.44	1.06	Sandy Silt to Clayey Silt	ML	loose	115	5	22.9	55	29	32		
4.58	15.0	16.17	1.77	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		75			0.91	>10
4.73	15.5	16.43	1.74	Sandy Silt to Clayey Silt	ML	loose	115	5	20.0	70	25	31		
4.88	16.0	16.18	2.66	Clayey Silt to Silty Clay	ML/CL	stiff	120	6		85			0.91	>10
5.03	16.5	18.73	3.01	Clayey Silt to Silty Clay	ML/CL	very stiff	120	7		85			1.06	>10
5.18	17.0	19.75	3.06	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		85			1.12	>10
5.33	17.5	18.89	3.17	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		85			1.07	>10
5.48	18.0	19.42	3.26	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		85			1.10	>10
5.65	18.5	21.86	2.54	Clayey Silt to Silty Clay	ML/CL	very stiff	120	9		75			1.24	>10
5.80	19.0	22.20	2.13	Sandy Silt to Clayey Silt	ML	loose	115	6	25.1	70	32	32		
5.95	19.5	23.06	1.92	Sandy Silt to Clayey Silt	ML	loose	115	7	25.9	70	33	33		
6.10	20.0	20.94	2.41	Clayey Silt to Silty Clay	ML/CL	very stiff	120	8		80			1.19	>10

CLIENT: APEX
PROJECT: Viking Solar

CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

LOCATION: See Site and Boring Location Plan

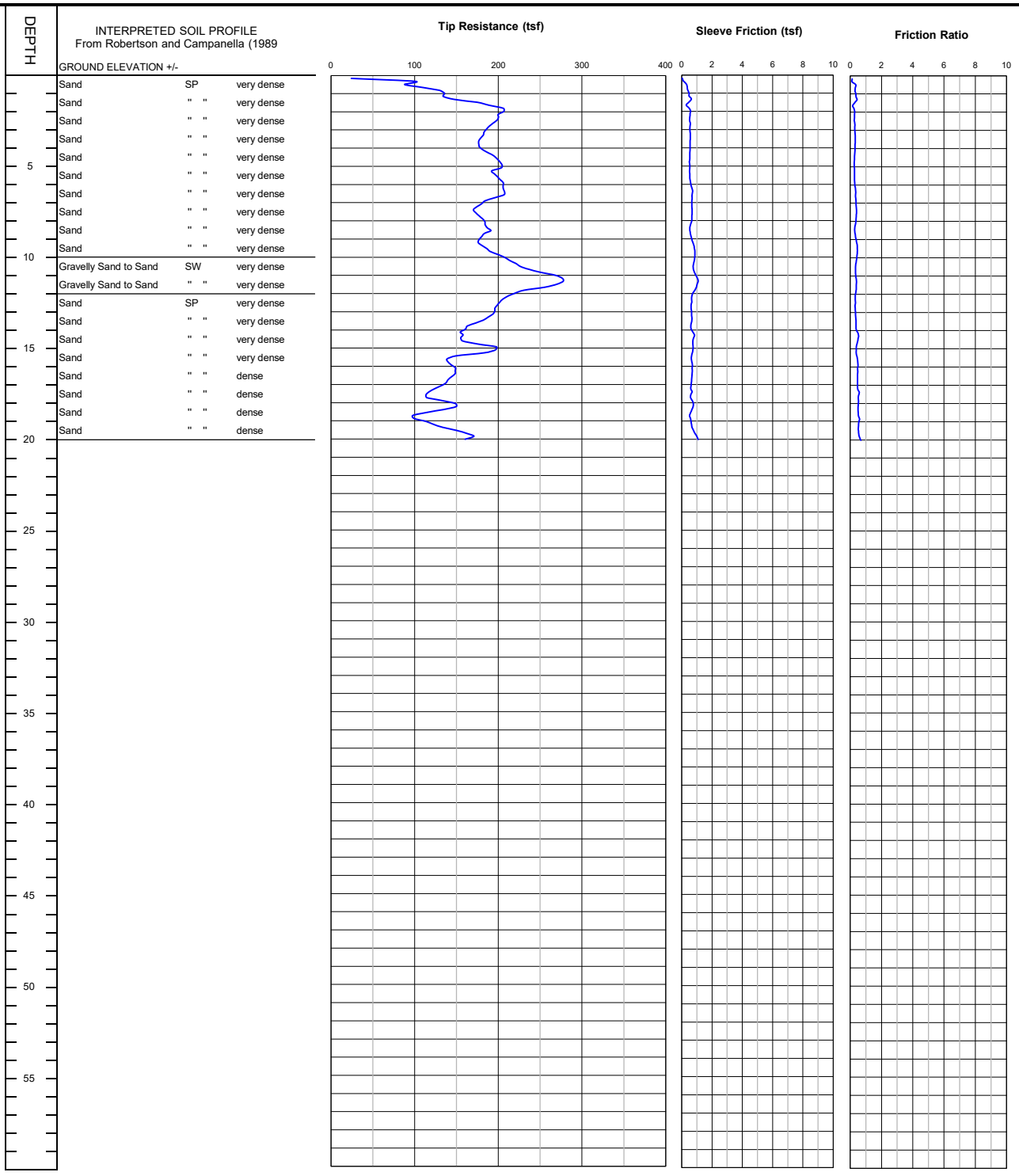
DATE: 11/25/2020

CONE SOUNDING DATA CPT-10

INTERPRETED SOIL PROFILE
From Robertson and Campanella (1989

GROUND ELEVATION +/-

Sand	SP	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Gravelly Sand to Sand	SW	very dense
Gravelly Sand to Sand	" "	very dense
Sand	SP	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	very dense
Sand	" "	dense
Sand	" "	dense
Sand	" "	dense
Sand	" "	dense



END OF SOUNDING AT 20 ft.

Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-10

LANDMARK CONSULTANTS, INC.
CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/25/2020

CONE SOUNDING: CPT-10
Est. GWT (ft): 8
Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	71.27	0.19	Sand to Silty Sand	SP/SM	very dense	115	13	134.7	5	124	45		
0.30	1.0	125.01	0.33	Sand	SP	very dense	110	19	236.3	5	125	45		
0.45	1.5	152.05	0.36	Sand	SP	very dense	110	23	287.4	0	123	45		
0.60	2.0	200.51	0.22	Sand	SP	very dense	110	31	379.0	-5	127	46		
0.75	2.5	199.43	0.27	Sand	SP	very dense	110	31	377.0	0	123	45		
0.93	3.0	189.51	0.29	Sand	SP	very dense	110	29	358.2	0	118	45		
1.08	3.5	181.15	0.31	Sand	SP	very dense	110	28	342.4	0	115	44		
1.23	4.0	176.91	0.31	Sand	SP	very dense	110	27	334.4	0	112	44		
1.38	4.5	188.47	0.28	Sand	SP	very dense	110	29	356.3	0	112	44		
1.53	5.0	201.72	0.26	Sand	SP	very dense	110	31	381.3	0	112	44		
1.68	5.5	197.54	0.27	Sand	SP	very dense	110	30	356.6	0	110	43		
1.83	6.0	204.67	0.29	Sand	SP	very dense	110	31	353.1	0	110	43		
1.98	6.5	206.78	0.34	Sand	SP	very dense	110	32	342.3	0	109	43		
2.13	7.0	186.51	0.36	Sand	SP	very dense	110	29	297.1	0	105	43		
2.28	7.5	172.54	0.39	Sand	SP	very dense	110	27	265.2	0	101	42		
2.45	8.0	180.50	0.37	Sand	SP	very dense	110	28	268.4	0	102	42		
2.60	8.5	187.23	0.30	Sand	SP	very dense	110	29	274.6	0	102	42		
2.75	9.0	180.14	0.34	Sand	SP	very dense	110	28	260.7	0	101	42		
2.90	9.5	180.69	0.44	Sand	SP	very dense	110	28	258.1	0	100	42		
3.05	10.0	199.07	0.43	Sand	SP	very dense	110	31	280.8	0	103	42		
3.20	10.5	220.02	0.36	Sand	SP	very dense	110	34	306.5	0	106	43		
3.35	11.0	251.58	0.34	Gravelly Sand to Sand	SW	very dense	115	34	346.1	0	109	43		
3.50	11.5	274.63	0.38	Gravelly Sand to Sand	SW	very dense	115	37	372.9	0	111	44		
3.65	12.0	235.14	0.36	Sand	SP	very dense	110	36	315.4	0	106	43		
3.80	12.5	206.17	0.32	Sand	SP	very dense	110	32	273.5	0	102	42		
3.95	13.0	196.77	0.32	Sand	SP	very dense	110	30	258.2	0	100	42		
4.13	13.5	187.76	0.35	Sand	SP	very dense	110	29	243.7	0	99	42		
4.28	14.0	165.70	0.37	Sand	SP	very dense	110	25	212.8	0	95	41		
4.43	14.5	155.82	0.50	Sand	SP	very dense	110	24	198.1	5	93	41		
4.58	15.0	176.62	0.42	Sand	SP	very dense	110	27	222.3	5	96	41		
4.73	15.5	176.21	0.39	Sand	SP	very dense	110	27	219.6	5	96	41		
4.88	16.0	142.60	0.47	Sand	SP	dense	110	22	176.0	5	89	40		
5.03	16.5	146.92	0.46	Sand	SP	dense	110	23	179.6	5	90	41		
5.18	17.0	136.42	0.47	Sand	SP	dense	110	21	165.2	5	87	40		
5.33	17.5	118.49	0.53	Sand	SP	dense	110	18	142.2	10	83	40		
5.48	18.0	131.81	0.52	Sand	SP	dense	110	20	156.8	10	86	40		
5.65	18.5	132.82	0.50	Sand	SP	dense	110	20	156.6	10	86	40		
5.80	19.0	103.65	0.55	Sand	SP	dense	110	16	121.2	10	78	39		
5.95	19.5	135.30	0.52	Sand	SP	dense	110	21	156.8	10	86	40		
6.10	20.0	164.49	0.60	Sand	SP	very dense	110	25	189.0	10	91	41		

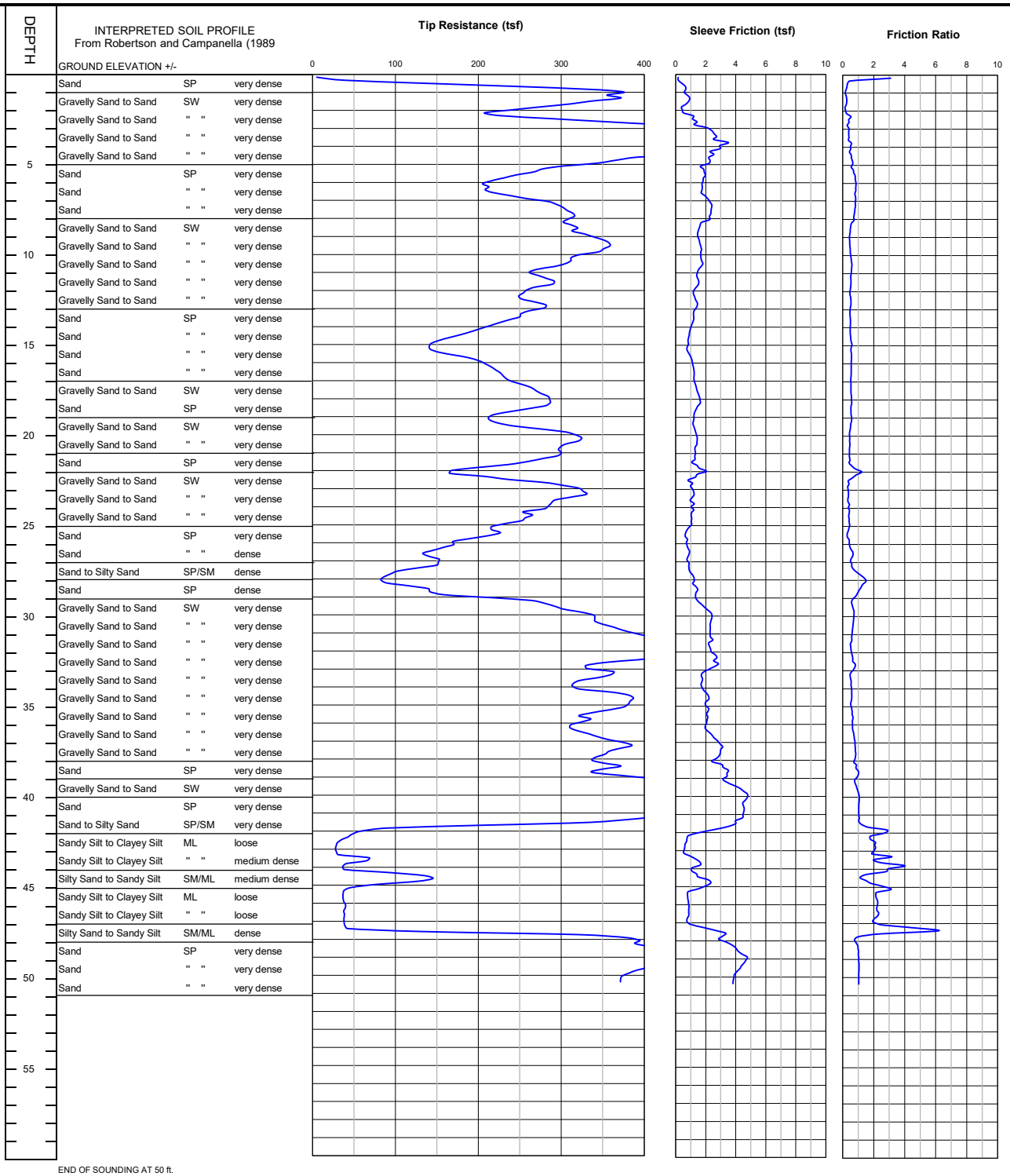
CLIENT: APEX
PROJECT: Viking Solar

CONE PENETROMETER: Middle Earth Geotesting Truck Mounted Electric Cone with 23 ton reaction weight

LOCATION: See Site and Boring Location Plan

DATE: 11/25/2020

CONE SOUNDING DATA CPT-11



Project No.		PLATE
LE20189	LANDMARK Geo-Engineers and Geologists	B-11

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/25/2020

CONE SOUNDING: CPT-11

Est. GWT (ft): 8

Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
0.15	0.5	59.14	1.28	Silty Sand to Sandy Silt	SM/ML	very dense	115	13	111.8	25	119	45		
0.30	1.0	315.65	0.21	Gravelly Sand to Sand	SW	very dense	115	42	596.7	-5	152	49		
0.45	1.5	354.30	0.24	Gravelly Sand to Sand	SW	very dense	115	47	669.8	-5	148	49		
0.60	2.0	275.88	0.18	Gravelly Sand to Sand	SW	very dense	115	37	521.5	-5	136	47		
0.75	2.5	240.68	0.39	Gravelly Sand to Sand	SW	very dense	115	32	455.0	0	128	46		
0.93	3.0	433.29	0.36	Gravelly Sand to Sand	SW	very dense	115	58	819.1	-5	142	48		
1.08	3.5	652.47	0.39	Gravelly Sand to Sand	SW	very dense	115	87	1233.4	-5	152	49		
1.23	4.0	629.21	0.48	Gravelly Sand to Sand	SW	very dense	115	84	1189.4	-5	149	49		
1.38	4.5	527.03	0.50	Gravelly Sand to Sand	SW	very dense	115	70	996.3	-5	142	48		
1.53	5.0	367.84	0.61	Gravelly Sand to Sand	SW	very dense	115	49	684.3	0	129	46		
1.68	5.5	273.38	0.68	Sand	SP	very dense	110	42	484.2	0	119	45		
1.83	6.0	217.37	0.83	Sand	SP	very dense	110	33	368.6	5	111	44		
1.98	6.5	212.69	0.82	Sand	SP	very dense	110	33	346.4	5	109	43		
2.13	7.0	260.19	0.82	Sand	SP	very dense	110	40	408.3	5	114	44		
2.28	7.5	300.98	0.79	Sand	SP	very dense	110	46	456.3	5	117	44		
2.45	8.0	312.69	0.73	Sand	SP	very dense	110	48	458.9	0	117	44		
2.60	8.5	311.73	0.52	Gravelly Sand to Sand	SW	very dense	115	42	451.1	0	117	44		
2.75	9.0	326.71	0.45	Gravelly Sand to Sand	SW	very dense	115	44	466.1	0	118	45		
2.90	9.5	355.75	0.45	Gravelly Sand to Sand	SW	very dense	115	47	500.5	0	120	45		
3.05	10.0	339.66	0.50	Gravelly Sand to Sand	SW	very dense	115	45	471.4	0	118	45		
3.20	10.5	309.57	0.56	Gravelly Sand to Sand	SW	very dense	115	41	424.0	0	115	44		
3.35	11.0	274.33	0.56	Sand	SP	very dense	110	42	371.1	0	111	44		
3.50	11.5	281.94	0.52	Gravelly Sand to Sand	SW	very dense	115	38	376.9	0	112	44		
3.65	12.0	271.72	0.49	Gravelly Sand to Sand	SW	very dense	115	36	358.8	0	110	43		
3.80	12.5	251.64	0.50	Sand	SP	very dense	110	39	328.5	0	108	43		
3.95	13.0	276.67	0.51	Gravelly Sand to Sand	SW	very dense	115	37	357.2	0	110	43		
4.13	13.5	254.05	0.47	Sand	SP	very dense	110	39	324.4	0	107	43		
4.28	14.0	225.70	0.49	Sand	SP	very dense	110	35	285.3	0	103	42		
4.43	14.5	191.32	0.49	Sand	SP	very dense	110	29	239.4	5	98	42		
4.58	15.0	153.63	0.55	Sand	SP	very dense	110	24	190.4	5	91	41		
4.73	15.5	145.15	0.54	Sand	SP	dense	110	22	178.2	5	90	41		
4.88	16.0	193.31	0.55	Sand	SP	very dense	110	30	235.1	5	98	42		
5.03	16.5	221.21	0.55	Sand	SP	very dense	110	34	266.5	5	101	42		
5.18	17.0	235.17	0.52	Sand	SP	very dense	110	36	280.8	5	103	42		
5.33	17.5	262.50	0.53	Gravelly Sand to Sand	SW	very dense	115	35	310.5	0	106	43		
5.48	18.0	282.20	0.56	Gravelly Sand to Sand	SW	very dense	115	38	330.6	0	108	43		
5.65	18.5	277.00	0.54	Gravelly Sand to Sand	SW	very dense	115	37	321.5	0	107	43		
5.80	19.0	224.23	0.55	Sand	SP	very dense	110	34	257.9	5	100	42		
5.95	19.5	227.48	0.52	Sand	SP	very dense	110	35	259.5	5	101	42		
6.10	20.0	300.15	0.45	Gravelly Sand to Sand	SW	very dense	115	40	339.5	0	109	43		
6.25	20.5	316.97	0.45	Gravelly Sand to Sand	SW	very dense	115	42	355.4	0	110	43		
6.40	21.0	298.67	0.43	Gravelly Sand to Sand	SW	very dense	115	40	332.0	0	108	43		
6.55	21.5	277.41	0.43	Gravelly Sand to Sand	SW	very dense	115	37	305.7	0	105	43		
6.70	22.0	200.30	0.87	Sand	SP	very dense	110	31	219.0	10	96	41		
6.85	22.5	202.93	0.62	Sand	SP	very dense	110	31	220.2	5	96	41		
7.00	23.0	300.17	0.36	Gravelly Sand to Sand	SW	very dense	115	40	323.2	0	107	43		
7.18	23.5	323.13	0.36	Gravelly Sand to Sand	SW	very dense	115	43	345.2	0	109	43		
7.33	24.0	288.20	0.37	Gravelly Sand to Sand	SW	very dense	115	38	305.5	0	105	43		
7.48	24.5	266.25	0.41	Gravelly Sand to Sand	SW	very dense	115	36	280.0	0	103	42		
7.63	25.0	247.06	0.43	Gravelly Sand to Sand	SW	very dense	115	33	257.9	5	100	42		
7.78	25.5	219.49	0.34	Sand	SP	very dense	110	34	227.4	5	97	42		
7.93	26.0	191.17	0.38	Sand	SP	very dense	110	29	196.8	5	92	41		
8.08	26.5	151.91	0.56	Sand	SP	dense	110	23	155.3	10	85	40		
8.23	27.0	148.28	0.55	Sand	SP	dense	110	23	150.6	10	85	40		
8.38	27.5	126.00	0.74	Sand	SP	dense	110	19	127.2	15	80	39		
8.53	28.0	87.59	1.37	Sand to Silty Sand	SP/SM	medium dense	115	16	87.8	30	69	38		
8.68	28.5	114.62	1.17	Sand to Silty Sand	SP/SM	dense	115	21	114.1	25	76	39		
8.85	29.0	170.62	0.81	Sand	SP	dense	110	26	168.8	15	88	40		
9.00	29.5	279.41	0.62	Sand	SP	very dense	110	43	274.7	5	102	42		
9.15	30.0	322.78	0.72	Gravelly Sand to Sand	SW	very dense	115	43	315.3	5	106	43		
9.30	30.5	343.52	0.68	Gravelly Sand to Sand	SW	very dense	115	46	333.4	5	108	43		
9.45	31.0	374.96	0.61	Gravelly Sand to Sand	SW	very dense	115	50	361.5	5	110	43		
9.60	31.5	422.76	0.55	Gravelly Sand to Sand	SW	very dense	115	56	405.0	0	114	44		
9.75	32.0	429.99	0.54	Gravelly Sand to Sand	SW	very dense	115	57	409.3	0	114	44		
9.90	32.5	415.25	0.63	Gravelly Sand to Sand	SW	very dense	115	55	392.8	5	113	44		
10.05	33.0	337.37	0.75	Gravelly Sand to Sand	SW	very dense	115	45	317.2	5	107	43		
10.20	33.5	356.58	0.49	Gravelly Sand to Sand	SW	very dense	115	48	333.2	5	108	43		
10.38	34.0	316.91	0.55	Gravelly Sand to Sand	SW	very dense	115	42	294.3	5	104	43		
10.53	34.5	355.21	0.57	Gravelly Sand to Sand	SW	very dense	115	47	327.9	5	108	43		
10.68	35.0	383.78	0.54	Gravelly Sand to Sand	SW	very dense	115	51	352.2	5	110	43		
10.83	35.5	356.15	0.60	Gravelly Sand to Sand	SW	very dense	115	47	325.0	5	107	43		
10.98	36.0	327.27	0.64	Gravelly Sand to Sand	SW	very dense	115	44	296.9	5	105	43		
11.13	36.5	318.39	0.67	Gravelly Sand to Sand	SW	very dense	115	42	287.2	5	104	43		
11.28	37.0	357.71	0.77	Gravelly Sand to Sand	SW	very dense	115	48	320.9	10	107	43		
11.43	37.5	371.11	0.82	Gravelly Sand to Sand	SW	very dense	115	49	331.1	10	108	43		
11.58	38.0	343.67	0.78	Sand	SP	very dense	110	53	305.0	10	105	43		
11.73	38.5	357.56	0.91	Sand	SP	very dense	110	55	315.7	10	106	43		

LANDMARK CONSULTANTS, INC.

CONE PENETROMETER INTERPRETATION (based on Robertson & Campanella, 1989, refer to Key to CPT logs)

Project: Viking Solar **Project No:** LE20189 **Date:** 11/25/2020

CONE SOUNDING: CPT-11

Est. GWT (ft): 8

Phi Correlation: **0** 0-Schm(78),1-R&C(83),2-PHT(74)

Base Depth (m)	Base Depth (ft)	Avg Tip Qc, tsf	Avg Friction Ratio, %	Soil Classification	USCS	Density or Consistency	Est. Density (pcf)	SPT N(60)	Norm. Qc1n	Est. % Fines	Rel. Dens. Dr (%)	**Nk:** Phi (deg.)	**17** Su (tsf)	OCR
11.88	39.0	367.40	0.91	Sand	SP	very dense	110	57	322.8	10	107	43		
12.05	39.5	442.32	0.86	Gravelly Sand to Sand	SW	very dense	115	59	386.7	5	112	44		
12.20	40.0	456.03	1.03	Sand	SP	very dense	110	70	396.7	10	113	44		
12.35	40.5	435.48	1.04	Sand	SP	very dense	110	67	377.0	10	112	44		
12.50	41.0	439.00	1.03	Sand	SP	very dense	110	68	378.3	10	112	44		
12.65	41.5	379.14	1.10	Sand	SP	very dense	110	58	325.2	10	107	43		
12.80	42.0	119.66	2.40	Silty Sand to Sandy Silt	SM/ML	dense	115	27	102.1	45	73	38		
12.95	42.5	41.55	1.89	Sandy Silt to Clayey Silt	ML	medium dense	115	12	35.3	70	42	34		
13.10	43.0	28.68	2.06	Sandy Silt to Clayey Silt	ML	loose	115	8	24.2	85	31	32		
13.25	43.5	42.75	2.35	Sandy Silt to Clayey Silt	ML	medium dense	115	12	35.9	75	42	34		
13.40	44.0	47.47	3.14	Sandy Silt to Clayey Silt	ML	medium dense	115	14	39.7	80	45	34		
13.58	44.5	88.48	1.81	Silty Sand to Sandy Silt	SM/ML	medium dense	115	20	73.7	45	63	37		
13.73	45.0	116.18	1.98	Silty Sand to Sandy Silt	SM/ML	dense	115	26	96.3	40	71	38		
13.88	45.5	40.93	2.48	Sandy Silt to Clayey Silt	ML	medium dense	115	12	33.8	75	40	34		
14.03	46.0	37.21	2.22	Sandy Silt to Clayey Silt	ML	loose	115	11	30.5	80	37	33		
14.18	46.5	38.98	2.24	Sandy Silt to Clayey Silt	ML	loose	115	11	31.9	75	39	33		
14.33	47.0	38.10	2.20	Sandy Silt to Clayey Silt	ML	loose	115	11	31.0	80	38	33		
14.48	47.5	72.14	4.40	Clayey Silt to Silty Clay	ML/CL	hard	120	29		75			4.16	>10
14.63	48.0	364.67	0.86	Sand	SP	very dense	110	56	293.8	10	104	43		
14.78	48.5	400.29	0.99	Sand	SP	very dense	110	62	321.2	10	107	43		
14.93	49.0	452.25	1.02	Sand	SP	very dense	110	70	361.5	10	110	43		
15.10	49.5	420.12	1.05	Sand	SP	very dense	110	65	334.4	10	108	43		
15.25	50.0	382.20	1.03	Sand	SP	very dense	110	59	303.1	15	105	43		

LOG OF BORING NO. B-1

SHEET 1 OF 1

DEPTH	FIELD: SAMPLE	FIELD: USCS CLASS.	FIELD: BLOW COUNT	FIELD: POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	LABORATORY: DRY DENSITY (pcf)	LABORATORY: MOISTURE CONTENT (% dry wt.)	LABORATORY: OTHER TESTS
					SAND (SP): Tan, dry, medium and fine grain sands with very few coarse sands.			Passing #200 = 3.3%
5			16		SAND (SP): Tan, dry, medium dense, medium and fine grain sands.			
10			22		SAND (SP): Tan, moist, medium and fine grain sands.			
15			13		SAND (SP): Tan, dry, medium dense, medium grain sands.			
				4.5	SILTY CLAY (CL): Brown, moist, hard.			
20			14	3.0	SILTY CLAY (CL): Brown, very moist, very stiff.			
					SILTY SAND/SAND (SM-SP): Brown, saturated, fine grain.			
					Groundwater measured at 20 feet at time of drilling. This is not considered the stabilized groundwater depth as groundwater may rise to a level higher than that measured in borehole.			
25								
30								

DATE DRILLED: 11/23/20 TOTAL DEPTH: 20 Feet DEPTH TO WATER: 20'

LOGGED BY: P. LaBrucherie TYPE OF BIT: Hollow Stem Auger DIAMETER: 8 in.

SURFACE ELEVATION: Approximately 39' HAMMER WT.: 140 lbs. DROP: 30 in.

PROJECT No. LE20189

LANDMARK Geo-Engineers and Geologists

PLATE B-12

LOG OF BORING NO. B-2

SHEET 1 OF 1

DEPTH	FIELD: SAMPLE	FIELD: USCS CLASS.	FIELD: BLOW COUNT	FIELD: POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	LABORATORY: DRY DENSITY (pcf)	LABORATORY: MOISTURE CONTENT (% dry wt.)	LABORATORY: OTHER TESTS
					SILTY SAND/SAND (SP-SM): Light brown, little moisture, fine and very fine grain sands.			Passing #200 = 9.9%
5			19		SILTY SAND/SAND (SP-SM): Light brown, little moisture, fine and very fine grain sands.			
10			15		SAND (SP): Gray, dry to moist, medium and fine grain sands.			Passing #200 = 4.8%
15			25		SAND (SP): Gray, wet, medium and fine grain sands.			
20			18		SAND (SP): Gray, saturated, medium and fine grain sands.			
				2.5	SILTY CLAY (CL): Brown, saturated, very stiff.			
25					Groundwater measured at 18 feet at time of drilling. This is not considered the stabilized groundwater depth as groundwater may rise to a level higher than that measured in borehole.			
30								

DATE DRILLED: 11/23/20 TOTAL DEPTH: 20 Feet DEPTH TO WATER: 18'

LOGGED BY: P. LaBrucherie TYPE OF BIT: Hollow Stem Auger DIAMETER: 8 in.

SURFACE ELEVATION: Approximately 37' HAMMER WT.: 140 lbs. DROP: 30 in.

PROJECT No. LE20189

LANDMARK Geo-Engineers and Geologists

PLATE B-13

LOG OF BORING NO. B-3

SHEET 1 OF 1

DEPTH	FIELD: SAMPLE	FIELD: USCS CLASS.	FIELD: BLOW COUNT	FIELD: POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	LABORATORY: DRY DENSITY (pcf)	LABORATORY: MOISTURE CONTENT (% dry wt.)	LABORATORY: OTHER TESTS
					GRAVELLY SAND (SW): Grays and tans, dry, coarse and fine grain gravels.			
5			15		SAND (SP): Tan, moist, medium dense, medium and fine grain sands.			
10			22		SAND (SP): Tan, moist, medium dense, medium and fine grain sands.			Passing #200 = 3.1%
15			35		SAND (SP): Tan, saturated, dense, medium grain sands.			
					Groundwater measured at 9 feet at time of drilling. This is not considered the stabilized groundwater depth as groundwater may rise to a level higher than that measured in borehole.			
20								
25								
30								

DATE DRILLED: 11/23/20 TOTAL DEPTH: 15 Feet DEPTH TO WATER: 9'

LOGGED BY: P. LaBrucherie TYPE OF BIT: Hollow Stem Auger DIAMETER: 8 in.

SURFACE ELEVATION: Approximately 28' HAMMER WT.: 140 lbs. DROP: 30 in.

PROJECT No. LE20189

LANDMARK Geo-Engineers and Geologists

PLATE B-14

APPENDIX C

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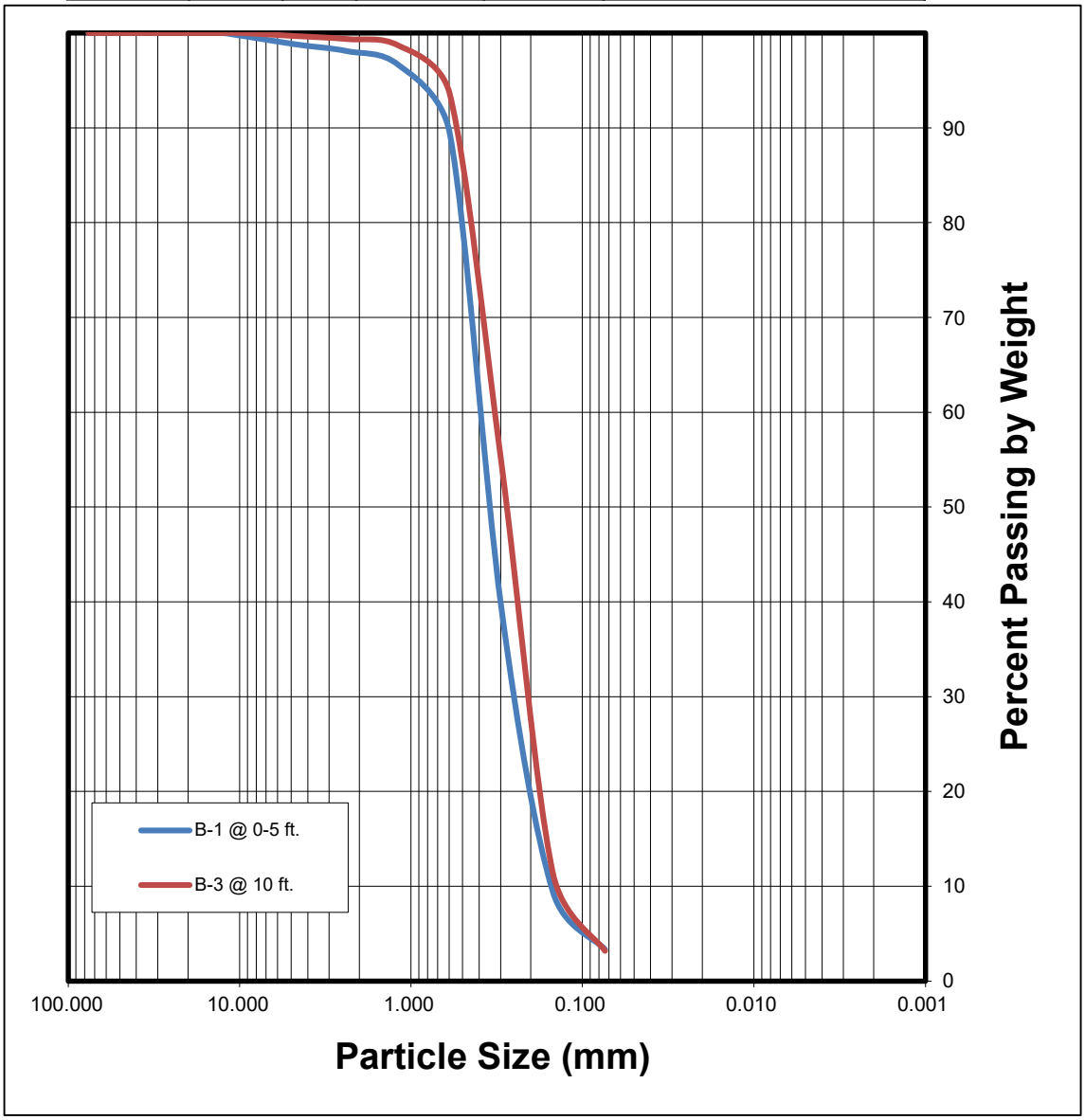
SIEVE ANALYSIS					HYDROMETER ANALYSIS
Gravel		Sand			Silt and Clay Fraction
Coarse	Fine	Coarse	Medium	Fine	



LANDMARK
Geo-Engineers and Geologists

Project No.: LE20189

Grain Size Analysis

Plate C-1

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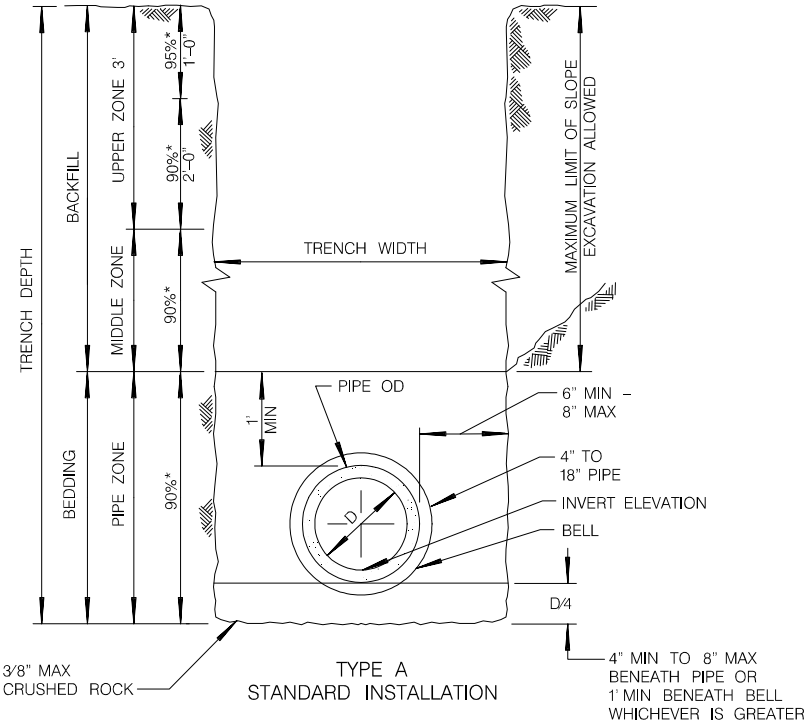
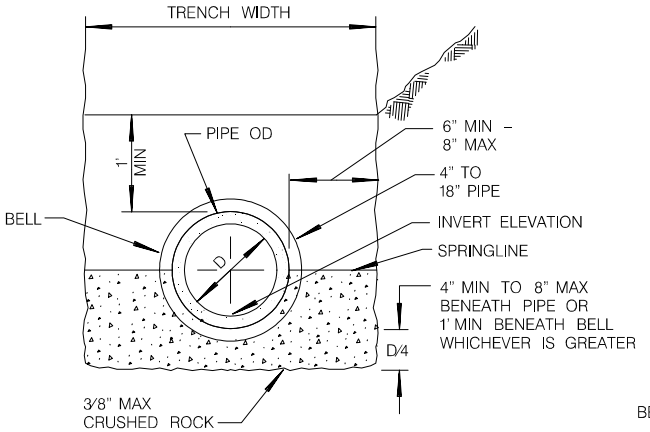
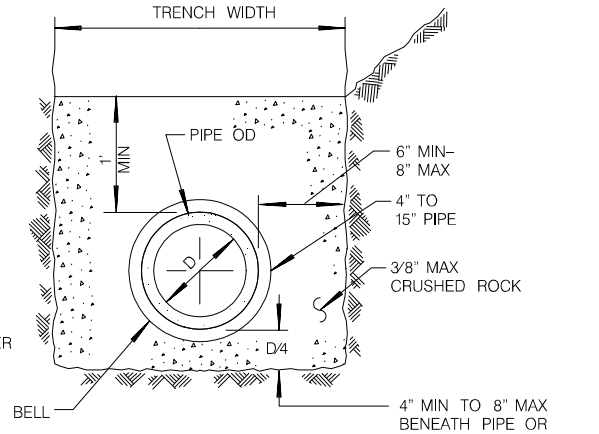
APPENDIX D



TYPE A
STANDARD INSTALLATION



TYPE B
ROCK TO SPRINGLINE



TYPE C
ROCK ENVELOPE

NOTES

1. FOR TRENCH RESURFACING IN IMPROVED STREETS, SEE STANDARD DRAWINGS SDG–107 AND SDG–108.
2. (*) INDICATES MINIMUM RELATIVE COMPACTION.
3. MINIMUM DEPTH OF COVER FROM THE TOP OF PIPE TO FINISH GRADE FOR PVC SDR 35 SEWER MAIN SHALL BE 5'. FOR SHALLOWER DEPTH, SPECIAL DESIGN IS REQUIRED. SEE SDS–101.
4. SEE TYPE A INSTALLATION FOR DETAILS NOT SHOWN FOR TYPES B AND C.
5. FOR PIPE SIZE ENCASEMENT LARGER THAN 15", MAXIMUM SIDE WALL CLEARANCE SHALL BE 12" OR AS SHOWN ON THE PLANS.
6. 6" METAL TAPE SHALL BE INSTALLED ABOVE PIPE 4" BELOW TRENCH CAP AND 12" BELOW FINISH GRADE IN UNIMPROVED STREETS.
7. 1' SAND CUSHION OR A 6" MINIMUM SAND CUSHION WITH 1" NEOPRENE PAD SHALL BE PLACED FOR CROSSINGS UTILITIES WHEN VERTICAL CLEARANCE IS 1' OR LESS. THE NEOPRENE PAD SHALL BE PLACED ON THE MOST FRAGILE UTILITY.

From: City of San Diego Standard Drawing SDS-110 (2016)

LANDMARK Geo-Engineers and Geologists **Project No.: LE20189**	**Pipe Bedding and Trench Backfill Recommendations**	**Plate D-1**

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APPENDIX E

VIKING SOLAR
SITE CORROSIVITY ASSESSMENT REPORT

Presented To:

Landmark Consultants

Prepared by:

R F Yeager
ENGINEERING

DECEMBER 9, 2020

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INTRODUCTION

RFYeager Engineering has completed an electrical and thermal resistivity assessment for the Viking Solar Project (Project) located near Holtville, California. The electrical resistivity assessment was conducted in the field. The thermal resistivity assessment was conducted at RFYeager Engineering's office on soil samples prepared by Landmark Consultants (Landmark). A chemical analysis of three (3) soil samples provided by Landmark was also conducted. The objective of this study is to determine the thermal and electrical resistivity, as well as to determine the corrosivity of the soil at the Project site.

The location and numbering of the assessment sites is shown in Figure 1 at the end of this report. Figure 1 is based upon the site map provided by Landmark.

SCOPE

The electrical resistivity of the soil was determined by using the Wenner 4 pin method in accordance with ASTM G57 standards. Six readings were obtained and recorded for each assessment site based upon pin spacings of 40, 20, 15, 10, 5, and 2.5 feet. Testing was conducted in both the north/south and east/west direction at each site (i.e. 12 readings per test site). Readings were recorded at three sites within the Project boundaries. All resistivity readings were recorded utilizing a Soil Resistance Meter (Megger Model DET4T2).

The soil corrosivity was evaluated based on the results of the field soil electrical resistivity assessment and the chemical analyses of the three soil samples. The soil samples were obtained by Landmark from depths ranging between zero and six feet. The samples were analyzed for pH, soluble salts (chlorides and sulfates) as well as resistivity (in the as-received and saturated condition).

The thermal resistivity was determined using a Decagon KD2 Pro Portable Thermal Properties Analyzer (KD2 Pro) outfitted with the 100 mm long, 2.4 mm diameter TR-1 sensor. The KD2 Pro works in accordance with ASTM D5334-08 using a transient heat method. Soil samples from three locations were tested. The samples, as prepared by Landmark per ASTM D1557, were tested in a 2.50 inch diameter by 6.75 inch deep holder.

CONCLUSIONS

The following are significant conclusions resulting from this assessment:

1. The results of the field electrical resistivity assessment are provided in Table 1 below. Resistivity readings between each assessment location were varied. The readings from Sites No. 1 and No. 2 (located in previously tilled soil at the south central and northeast region of the Project site, respectively) were relatively low, ranging between 996 ohm-cm and 28,246 ohm-cm. The readings Test No. 3 (located near the western edge of the site in native undisturbed soil) were much higher, ranging from 6,599 ohm-cm to 90,005 ohm-cm. It is noted that the dry, loose soil conditions at all locations made it challenging to obtain accurate field data. Large amounts of water had to be poured at each pin location in order to achieve adequate electrical contact with the earth.

Table 1 – Viking Solar Site
Electrical Resistivity Data
Prepared by: RFYeager Engineering
Test Date: 10.19.2020

Test No.	Assessment Site ID	Soil Resistivity (Ohm-cm)					
		Ave. Soil Depth (feet)					
		40	20	15	10	5	2.5
1	Site 1 (N/S orientation)	996	1302	3160	9575	9575	18671
2	Site 1 (E/W orientation)	2221	1838	3447	6128	7660	13884
3	Site 2 (N/S orientation)	2528	2375	4022	17235	19150	28246
4	Site 2 (E/W orientation)	3294	3370	4912	11490	17235	15799
5	Site 3 (N/S orientation)	6511	17695	20108	32747	47205	65876
6	Site 3 (E/W orientation)	8426	26044	32172	67025	65110	90005

1 - See Figure 1 for soil assessment location relative to project site

2. The chemical analysis results were also varied (see Table 2 on the following page). Samples B-1 and B-2 (located in the south central and northeast regions of the Project site, respectively) had relatively low saturated soil resistivities (970 ohm-cm and 1,600 ohm-cm, respectively). The saturated resistivity of the B-3 soil sample, from the western side of the Project site, was much higher at 6,200 ohm-cm.

3. Soil sample B-3 had the lowest soluble salt concentrations. However, none of the three samples exhibited high concentrations of chlorides (i.e. greater than 300 ppm) or sulfates (i.e. greater than 1,000 ppm). The pH readings for all soil samples are indicative of slightly alkaline soil conditions.

Table 2 – Viking Solar Site Chemical Analysis Data Prepared by: RFYeager Engineering				
Sample ID[1] (Depth)	**Min. Soil Box Resistivity - CalTest 643 (ohm-cm)**	**Chloride Concentration - CalTest 422 (ppm)**	**Sulfate Concentration - CalTest 417 (ppm)**	**pH CalTest 643**
B-1 (5 ft.)	970	170	390	8.0
B-2 (0-3 ft.)	1,600	50	250	8.7
B-3 (5-6 ft.)	6,200	30	40	9.2

1 - See Figure 1 for soil sample location.

4. It is noted that the saturated soil box resistivities measured on the three soil samples are lower than the Wenner 4-pin resistivities recorded in the field. This is likely due to the relatively dry soil conditions at the project site during the field assessment. The dryer the soil, the lesser the impact soluble soil salts have on resistivity. The saturated (minimum) soil box measurements represent the lowest, most corrosive conditions whereby the soils become fully saturated and have the lowest resistivity.

5. The results of the field electrical resistivity assessment and soil sample analysis at the Project site indicate varying levels of soil corrosivity. The soil in the western side of the project site in the vicinity of the electrical resistivity assessment Site 3 is less corrosive to buried metallic structures compared to the soil in the south central and northeast regions of the project site (assessment Sites 1 and 2). However, for all locations, the soil is considered aggressive enough to initiate and support the corrosion of buried metallic utilities. Accordingly, supplemental corrosion control measures are recommended in order to prevent premature failures. These measures include the application of exterior coatings on buried utilities, as well as cathodic protection in the more corrosive areas.

6. The soil thermal resistivity is provided in Table 3 on the following page. The corresponding Time vs. Temperature graphs for each soil sample is provided in Appendix A.

Table 3 – Viking Solar **Thermal Resistivity Data** Prepared by: RFYeager Engineering	
Sample ID[1]	**Thermal Resistivity[2] ($m\ ^0CW^{-1}$)**
B-1	3.77
B-2	3.86
B-3	2.89

1 - See Figure 1 for sample location relative to project site
2 – ASTM D5334-08.

DISCUSSION

Electrical Resistivity Assessment

Soil electrical resistivity (inverse of conductivity) measures the ability of an electrolyte (soil) to support electrical current flow. The most common method of measuring soil electrical resistivity is the Wenner 4-Pin Method which uses four pins (electrodes) that are driven into the earth, equally spaced apart in a straight line. The Wenner 4-pin Method provides an average resistivity of a hemisphere (essentially) of soil whose diameter is approximately equal to the pin spacing. For example, the electrical resistivity value obtained with the pins spaced at 5 feet apart is the average resistivity of a hemisphere of soil from the surface to a depth of 2.5 feet. By taking readings at different pin spacings (or depths), average soil electrical resistivity conditions can be obtained within areas at, above, and below trench zones.

Corrosion versus Resistivity

Corrosion is an electrochemical process, whereby the reaction rate is largely dependent upon the electrical conductivity of the surrounding electrolyte. Accordingly, the lower the electrical resistivity, then the greater the current flow and the greater the corrosion rate assuming all other factors are equal.

One common relationship between corrosivity and soil electrical resistivity used by corrosion engineers is provided on the following page.

Corrosivity	Electrical Resistivity
Very Corrosive	0-1000 ohm-cm
Corrosive	1001-2000 ohm-cm
Fairly Corrosive	2001-5000 ohm-cm
Moderately Corrosive	5001-12000 ohm-cm
Slightly Corrosive	12001-30000 ohm-cm
Relatively Non-Corrosive	Greater than 30001 ohm-cm

Thermal Resistivity Assessment

Thermal resistivity was measured on soil samples from three locations at the Project site. The samples were obtained by Landmark from a depth range of zero to five feet. For each sample, the thermal resistivity was measured two times with the average provided in Table 3. The assessment was conducted in general accordance with the standard method ASTM D5334-08 which calculates thermal resistivity by monitoring the dissipation of heat from a line heat source. The assessment consists of inserting a thermal sensor into the soil with a known current and voltage applied. The corresponding temperature rise in the soil over a period of time is recorded. The thermal resistivity is obtained from an analysis of the time series temperature data during the heating and cooling cycle of the sensor.

For purposes of this report, the thermal resistivity values are provided as "data only" in order to assist others in the project design.

Thank you for this opportunity to provide these corrosion engineering services. Please contact me if you have any questions.

Randy J. Geving, PE
Registered Professional Engineer – Corrosion No.1060
RGeving@RFYeager.com, 760.715.2358

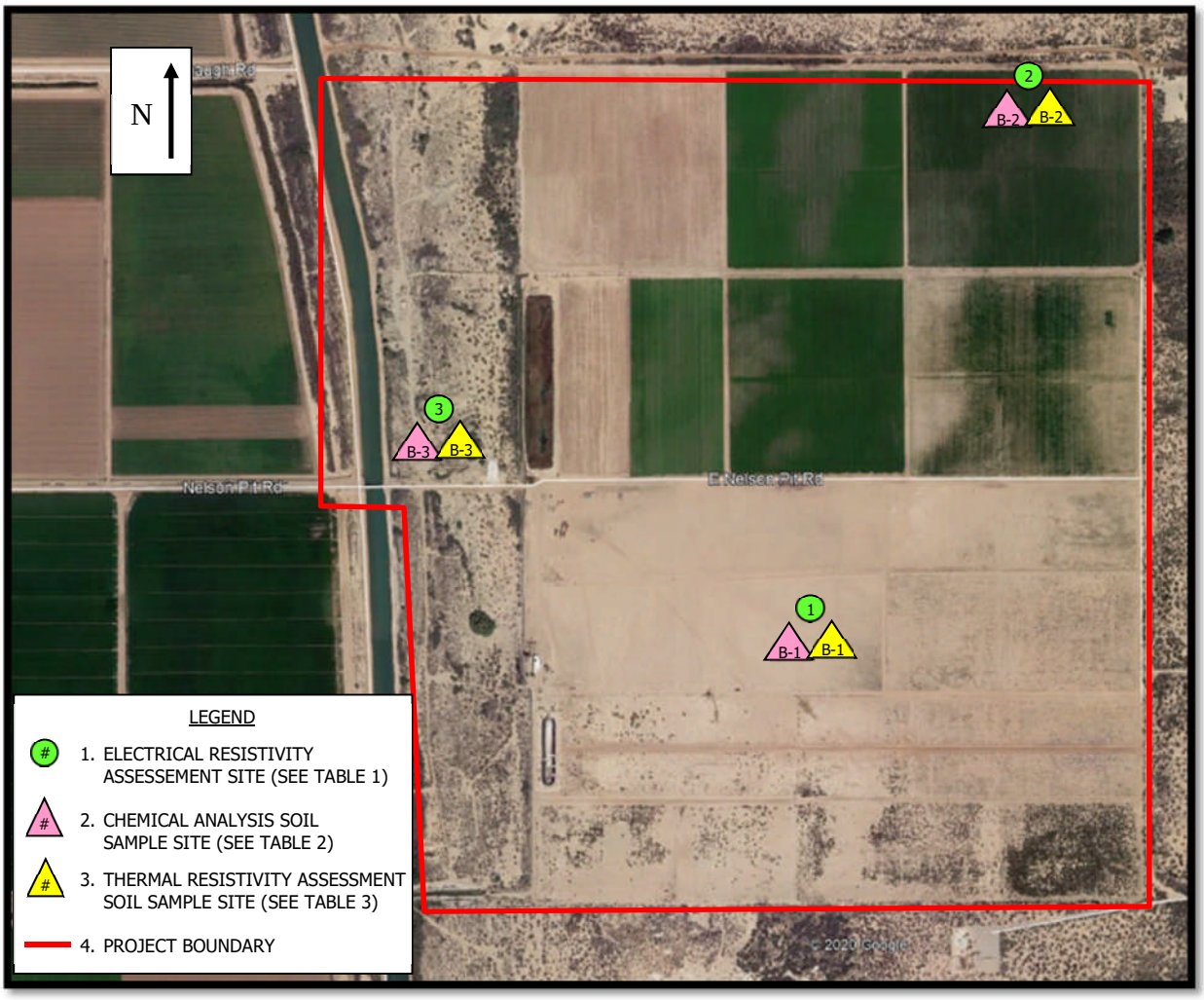

Figure 1 – Viking Solar Project Site Assessment Locations

APPENDIX A

THERMAL RESISTIVITY

TEMPERATURE VS. TIME GRAPHS

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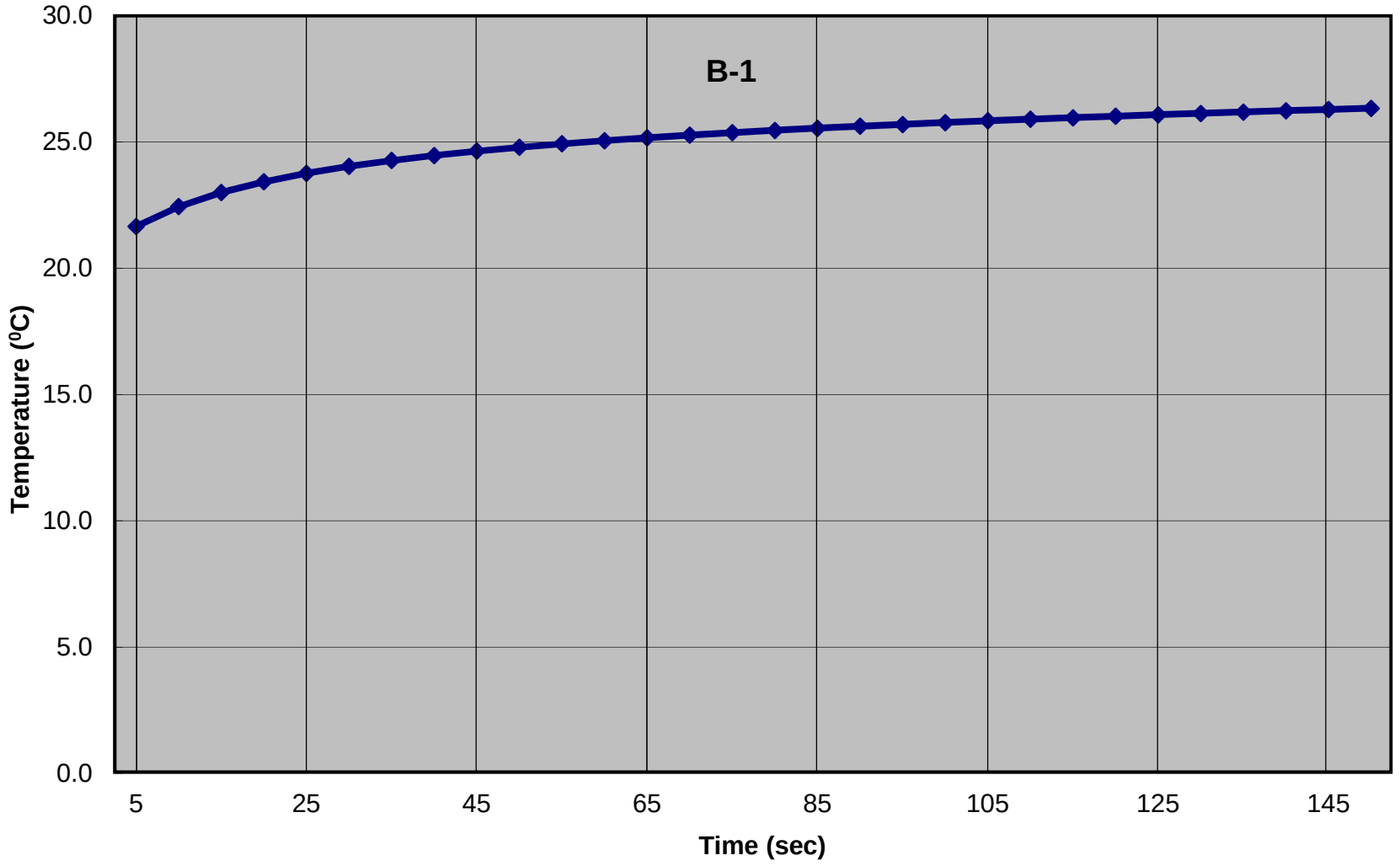
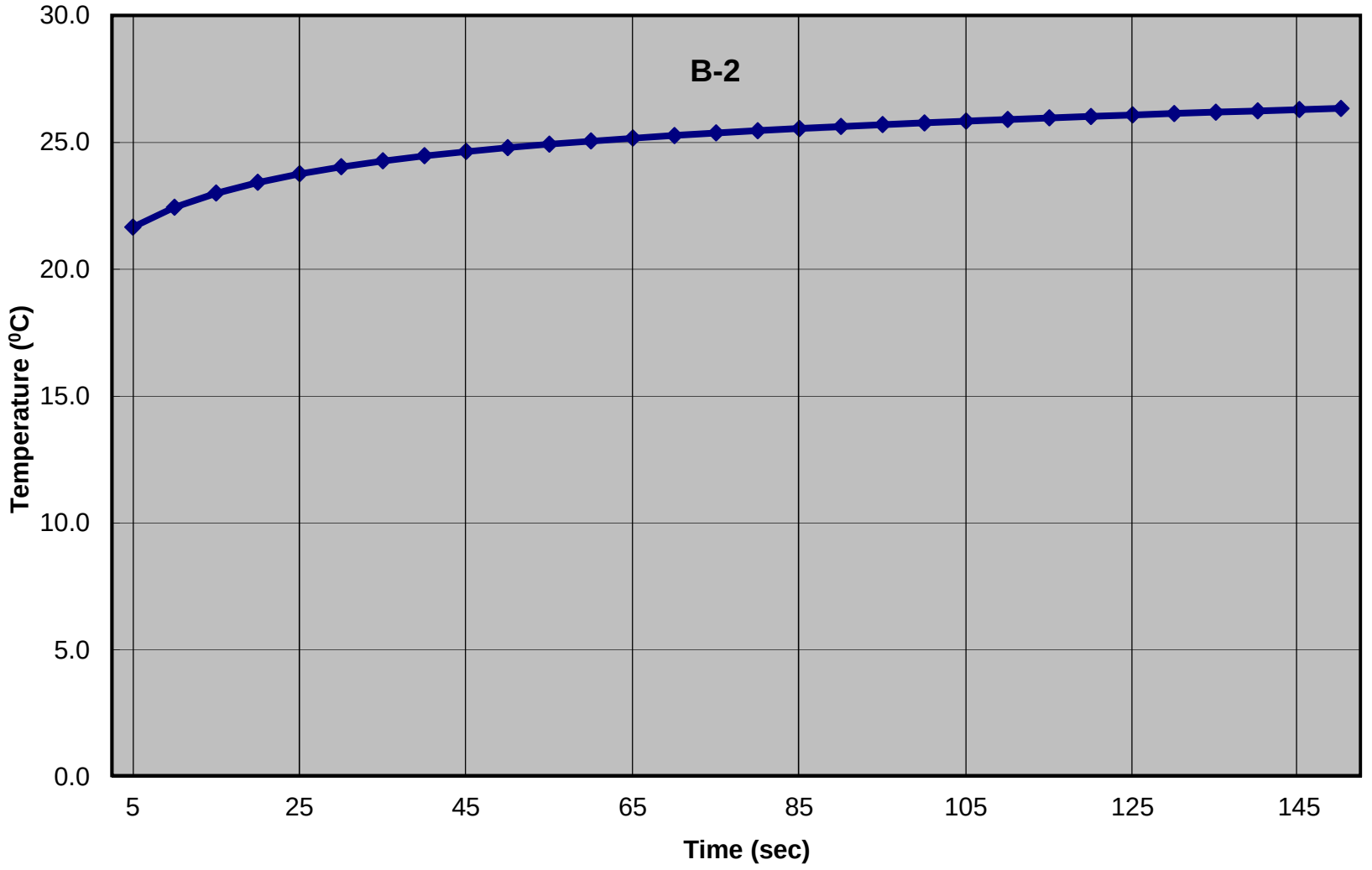
Viking Solar
Thermal Resistivity Temperature vs. Time Graph
Test Date: November 30, 2020



RFYeager Engineering

Viking Solar
Thermal Resistivity Temperature vs. Time Graph
Test Date: November 30, 2020



RFYeager Engineering

Viking Solar
Thermal Resistivity Temperature vs. Time Graph
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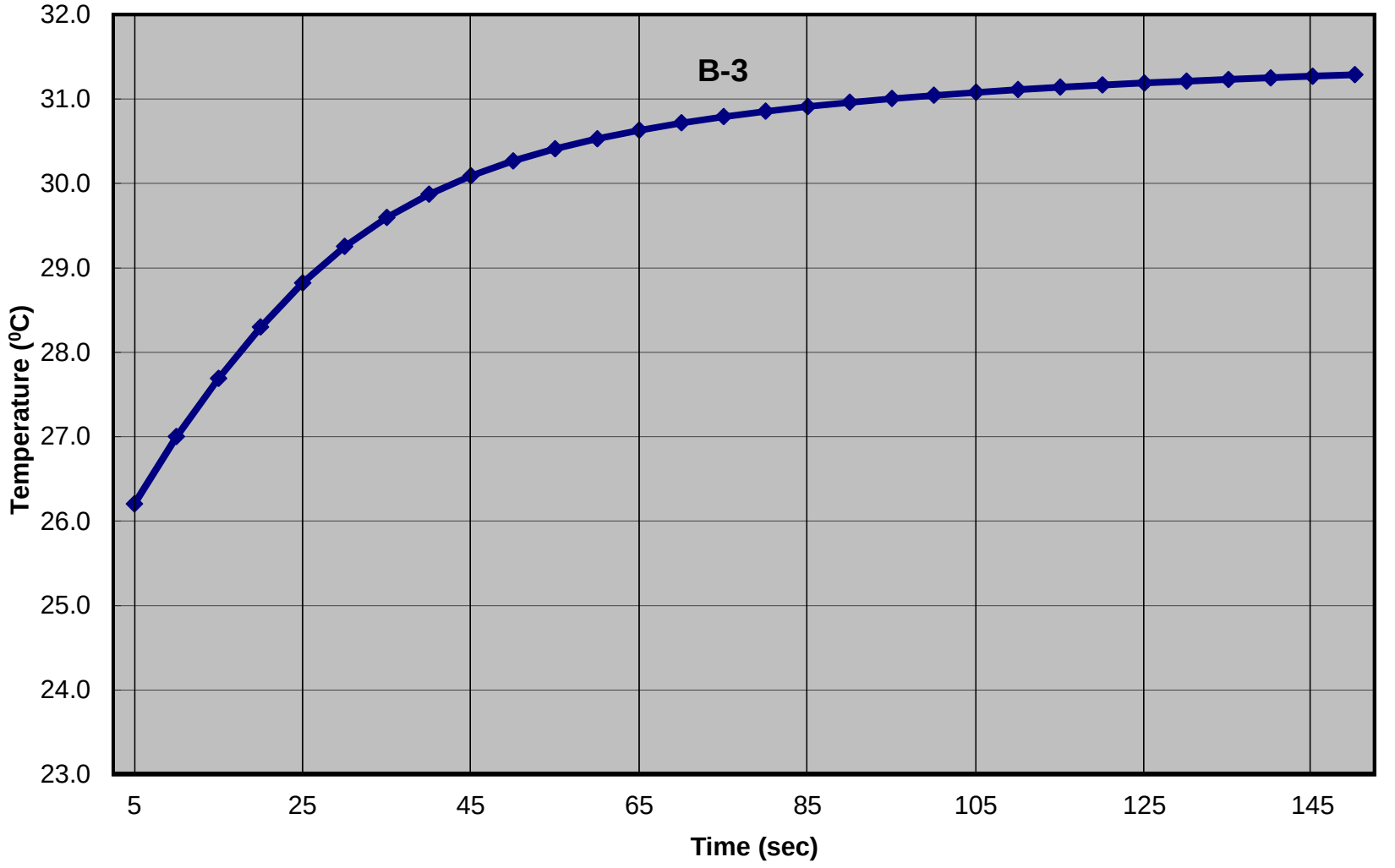


RFYeager Engineering

Landmark Consultants, Inc.
780 N. 4th Street
El Centro, CA 92243

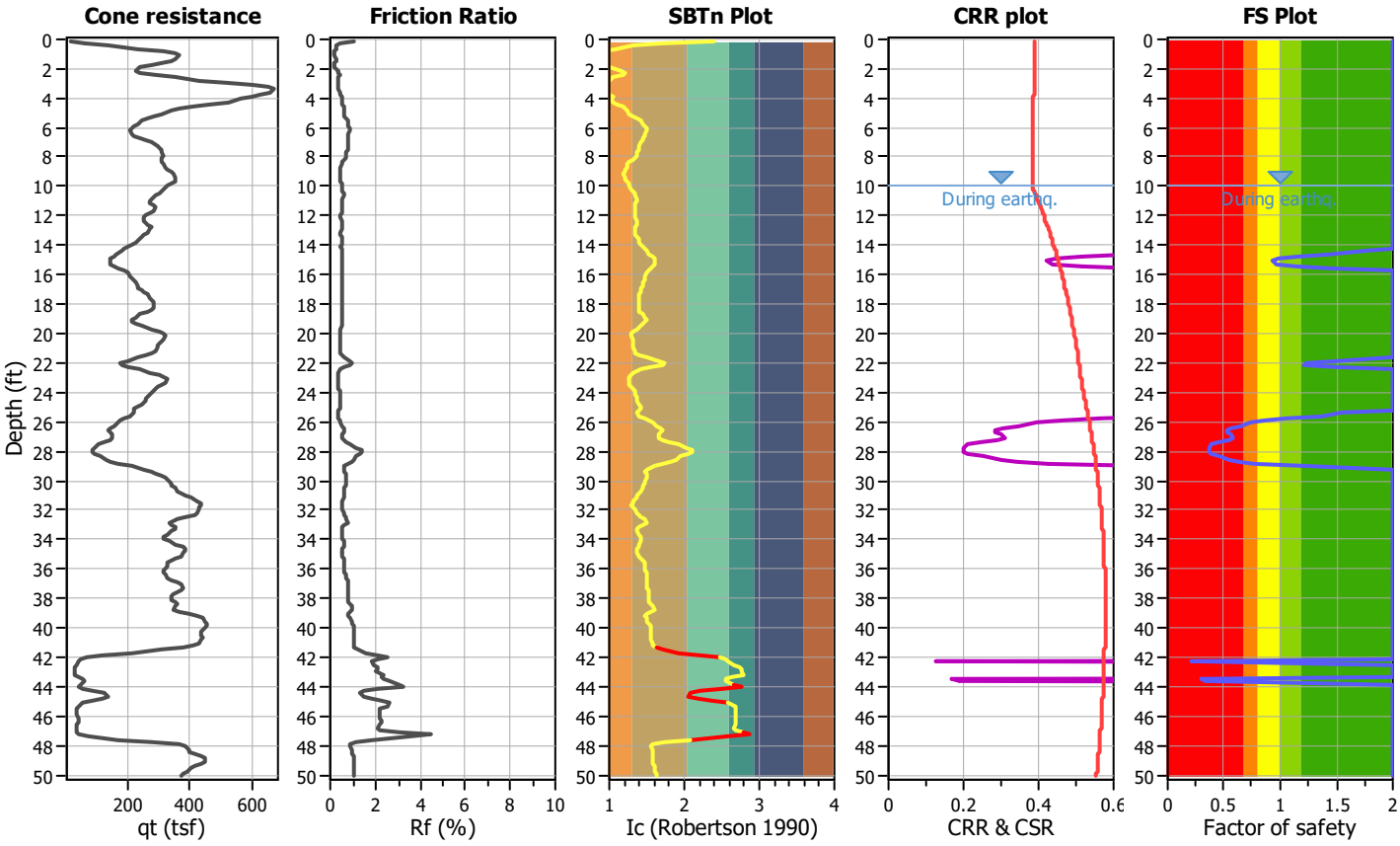
LIQUEFACTION ANALYSIS REPORT

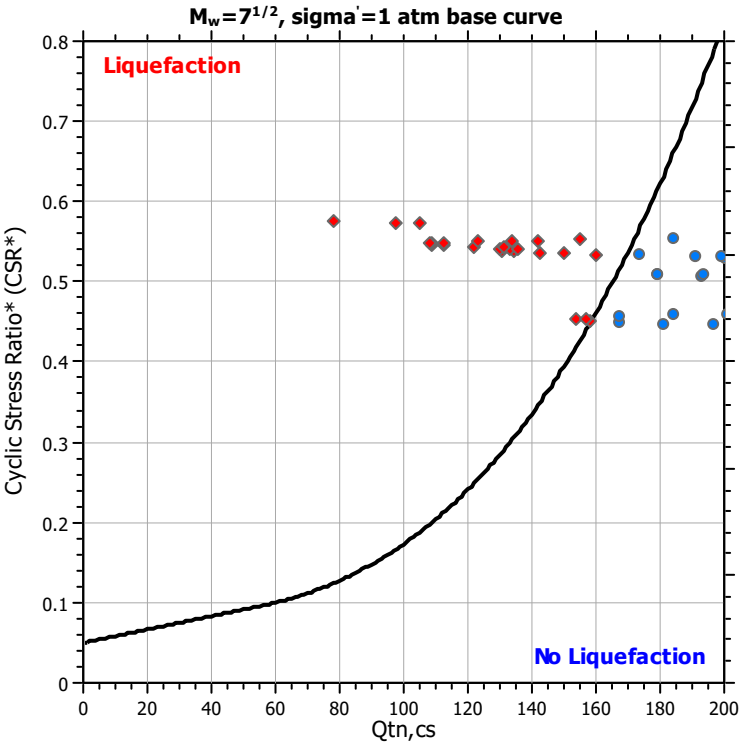
Project title : Vikings Solar Project **Location : Holtville, CA**

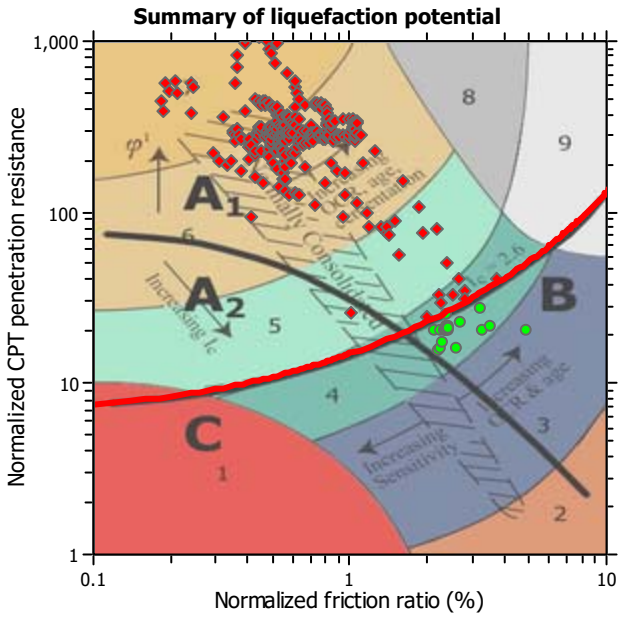
CPT file : CPT-11

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.00	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.55	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

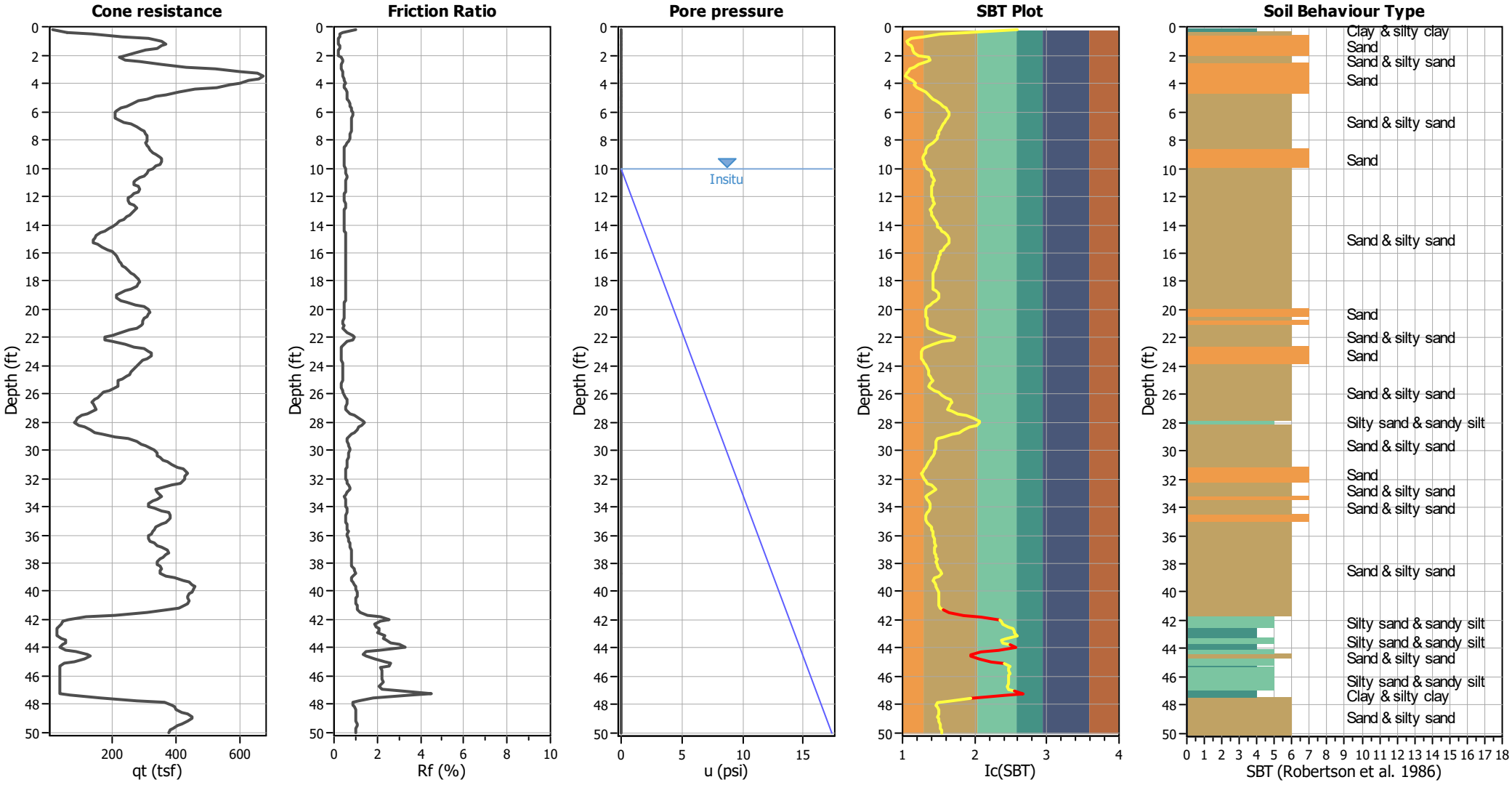






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



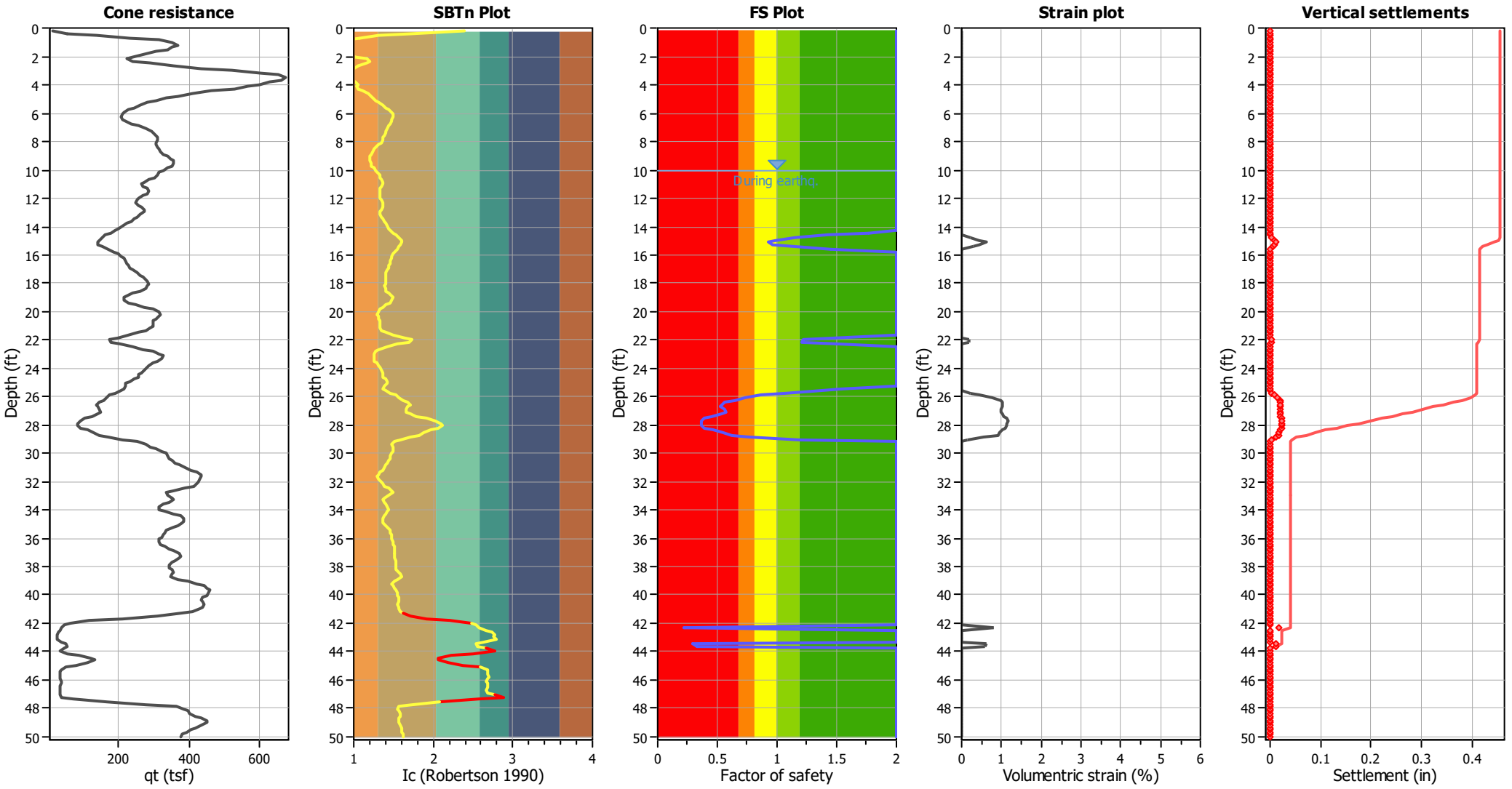
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.00	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.55	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

APPENDIX F

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:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
10.01	397.58	2.00	0.00	0.83	0.00	10.17	382.35	2.00	0.00	0.83	0.00
10.33	373.63	2.00	0.00	0.82	0.00	10.50	363.72	2.00	0.00	0.82	0.00
10.66	345.69	2.00	0.00	0.82	0.00	10.83	326.92	2.00	0.00	0.82	0.00
10.99	317.97	2.00	0.00	0.81	0.00	11.15	321.45	2.00	0.00	0.81	0.00
11.32	332.03	2.00	0.00	0.81	0.00	11.48	337.63	2.00	0.00	0.81	0.00
11.65	330.62	2.00	0.00	0.80	0.00	11.81	316.26	2.00	0.00	0.80	0.00
11.98	301.31	2.00	0.00	0.80	0.00	12.14	292.79	2.00	0.00	0.79	0.00
12.30	289.57	2.00	0.00	0.79	0.00	12.47	294.16	2.00	0.00	0.79	0.00
12.63	305.65	2.00	0.00	0.79	0.00	12.80	314.97	2.00	0.00	0.78	0.00
12.96	310.93	2.00	0.00	0.78	0.00	13.12	298.33	2.00	0.00	0.78	0.00
13.29	286.06	2.00	0.00	0.77	0.00	13.45	276.33	2.00	0.00	0.77	0.00
13.62	265.67	2.00	0.00	0.77	0.00	13.78	251.41	2.00	0.00	0.77	0.00
13.94	237.39	2.00	0.00	0.76	0.00	14.11	224.26	2.00	0.00	0.76	0.00
14.27	210.86	2.00	0.00	0.76	0.00	14.44	196.57	1.77	0.00	0.76	0.00
14.60	181.43	1.42	0.00	0.75	0.00	14.76	167.51	1.15	0.21	0.75	0.00
14.93	158.02	0.99	0.43	0.75	0.01	15.09	153.81	0.92	0.62	0.74	0.01
15.26	156.75	0.96	0.43	0.74	0.01	15.42	167.67	1.14	0.29	0.74	0.01
15.58	184.42	1.45	0.00	0.74	0.00	15.75	201.49	2.00	0.00	0.73	0.00
15.91	214.03	2.00	0.00	0.73	0.00	16.08	222.65	2.00	0.00	0.73	0.00
16.24	228.75	2.00	0.00	0.72	0.00	16.40	234.27	2.00	0.00	0.72	0.00
16.57	238.47	2.00	0.00	0.72	0.00	16.73	242.38	2.00	0.00	0.72	0.00
16.90	246.82	2.00	0.00	0.71	0.00	17.06	254.44	2.00	0.00	0.71	0.00
17.22	264.11	2.00	0.00	0.71	0.00	17.39	273.11	2.00	0.00	0.71	0.00
17.55	280.06	2.00	0.00	0.70	0.00	17.72	286.24	2.00	0.00	0.70	0.00
17.88	291.00	2.00	0.00	0.70	0.00	18.04	293.67	2.00	0.00	0.69	0.00
18.21	291.83	2.00	0.00	0.69	0.00	18.37	283.03	2.00	0.00	0.69	0.00
18.54	266.45	2.00	0.00	0.69	0.00	18.70	244.76	2.00	0.00	0.68	0.00
18.86	226.90	2.00	0.00	0.68	0.00	19.03	217.32	2.00	0.00	0.68	0.00
19.19	218.19	2.00	0.00	0.67	0.00	19.36	228.27	2.00	0.00	0.67	0.00
19.52	248.90	2.00	0.00	0.67	0.00	19.69	275.29	2.00	0.00	0.67	0.00
19.85	299.05	2.00	0.00	0.66	0.00	20.01	313.89	2.00	0.00	0.66	0.00
20.18	318.03	2.00	0.00	0.66	0.00	20.34	313.23	2.00	0.00	0.66	0.00
20.51	303.97	2.00	0.00	0.65	0.00	20.67	295.26	2.00	0.00	0.65	0.00
20.83	292.66	2.00	0.00	0.65	0.00	21.00	290.68	2.00	0.00	0.64	0.00
21.16	283.60	2.00	0.00	0.64	0.00	21.33	269.56	2.00	0.00	0.64	0.00
21.49	249.36	2.00	0.00	0.64	0.00	21.65	222.93	2.00	0.00	0.63	0.00
21.82	193.30	1.48	0.00	0.63	0.00	21.98	179.65	1.22	0.17	0.63	0.00
22.15	179.23	1.21	0.17	0.62	0.00	22.31	193.74	1.48	0.00	0.62	0.00
22.47	229.32	2.00	0.00	0.62	0.00	22.64	258.46	2.00	0.00	0.62	0.00
22.80	285.08	2.00	0.00	0.61	0.00	22.97	299.52	2.00	0.00	0.61	0.00
23.13	308.23	2.00	0.00	0.61	0.00	23.29	304.69	2.00	0.00	0.61	0.00
23.46	293.20	2.00	0.00	0.60	0.00	23.62	279.11	2.00	0.00	0.60	0.00
23.79	269.62	2.00	0.00	0.60	0.00	23.95	265.05	2.00	0.00	0.59	0.00
24.11	253.77	2.00	0.00	0.59	0.00	24.28	247.18	2.00	0.00	0.59	0.00
24.44	239.42	2.00	0.00	0.59	0.00	24.61	238.43	2.00	0.00	0.58	0.00
24.77	227.65	2.00	0.00	0.58	0.00	24.93	214.60	2.00	0.00	0.58	0.00
25.10	202.86	2.00	0.00	0.57	0.00	25.26	200.71	2.00	0.00	0.57	0.00
25.43	199.52	1.54	0.00	0.57	0.00	25.59	191.41	1.38	0.00	0.57	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
25.75	173.48	1.06	0.22	0.56	0.00	25.92	160.02	0.86	0.44	0.56	0.01
26.08	149.88	0.73	0.77	0.56	0.02	26.25	142.36	0.65	0.97	0.56	0.02
26.41	134.21	0.57	1.01	0.55	0.02	26.57	130.41	0.53	1.03	0.55	0.02
26.74	130.14	0.53	1.03	0.55	0.02	26.90	133.32	0.56	1.00	0.54	0.02
27.07	135.45	0.57	0.99	0.54	0.02	27.23	131.35	0.54	1.01	0.54	0.02
27.40	121.72	0.46	1.07	0.54	0.02	27.56	112.41	0.39	1.13	0.53	0.02
27.72	108.61	0.36	1.16	0.53	0.02	27.89	108.69	0.36	1.15	0.53	0.02
28.05	108.16	0.36	1.15	0.52	0.02	28.22	112.60	0.39	1.11	0.52	0.02
28.38	123.04	0.46	1.02	0.52	0.02	28.54	133.66	0.55	0.95	0.52	0.02
28.71	141.62	0.62	0.90	0.51	0.02	28.87	155.03	0.77	0.55	0.51	0.01
29.04	184.17	1.19	0.13	0.51	0.00	29.20	219.50	2.00	0.00	0.51	0.00
29.36	242.60	2.00	0.00	0.50	0.00	29.53	253.46	2.00	0.00	0.50	0.00
29.69	265.84	2.00	0.00	0.50	0.00	29.86	278.61	2.00	0.00	0.49	0.00
30.02	288.59	2.00	0.00	0.49	0.00	30.18	292.36	2.00	0.00	0.49	0.00
30.35	294.62	2.00	0.00	0.49	0.00	30.51	300.50	2.00	0.00	0.48	0.00
30.68	309.31	2.00	0.00	0.48	0.00	30.84	319.60	2.00	0.00	0.48	0.00
31.00	330.32	2.00	0.00	0.47	0.00	31.17	344.23	2.00	0.00	0.47	0.00
31.33	358.18	2.00	0.00	0.47	0.00	31.50	367.45	2.00	0.00	0.47	0.00
31.66	368.44	2.00	0.00	0.46	0.00	31.82	361.97	2.00	0.00	0.46	0.00
31.99	359.31	2.00	0.00	0.46	0.00	32.15	355.69	2.00	0.00	0.46	0.00
32.32	347.23	2.00	0.00	0.45	0.00	32.48	324.00	2.00	0.00	0.45	0.00
32.64	297.62	2.00	0.00	0.45	0.00	32.81	279.99	2.00	0.00	0.44	0.00
32.97	282.62	2.00	0.00	0.44	0.00	33.14	290.70	2.00	0.00	0.44	0.00
33.30	294.22	2.00	0.00	0.44	0.00	33.46	282.47	2.00	0.00	0.43	0.00
33.63	269.24	2.00	0.00	0.43	0.00	33.79	259.73	2.00	0.00	0.43	0.00
33.96	259.22	2.00	0.00	0.42	0.00	34.12	271.50	2.00	0.00	0.42	0.00
34.28	289.60	2.00	0.00	0.42	0.00	34.45	306.60	2.00	0.00	0.42	0.00
34.61	311.97	2.00	0.00	0.41	0.00	34.78	311.17	2.00	0.00	0.41	0.00
34.94	307.24	2.00	0.00	0.41	0.00	35.10	299.44	2.00	0.00	0.41	0.00
35.27	286.93	2.00	0.00	0.40	0.00	35.43	271.86	2.00	0.00	0.40	0.00
35.60	265.67	2.00	0.00	0.40	0.00	35.76	261.99	2.00	0.00	0.39	0.00
35.93	258.96	2.00	0.00	0.39	0.00	36.09	251.69	2.00	0.00	0.39	0.00
36.25	249.55	2.00	0.00	0.39	0.00	36.42	254.64	2.00	0.00	0.38	0.00
36.58	262.80	2.00	0.00	0.38	0.00	36.75	272.11	2.00	0.00	0.38	0.00
36.91	282.69	2.00	0.00	0.37	0.00	37.07	293.37	2.00	0.00	0.37	0.00
37.24	296.63	2.00	0.00	0.37	0.00	37.40	291.64	2.00	0.00	0.37	0.00
37.57	282.49	2.00	0.00	0.36	0.00	37.73	274.33	2.00	0.00	0.36	0.00
37.89	268.39	2.00	0.00	0.36	0.00	38.06	267.40	2.00	0.00	0.35	0.00
38.22	274.91	2.00	0.00	0.35	0.00	38.39	277.73	2.00	0.00	0.35	0.00
38.55	273.37	2.00	0.00	0.35	0.00	38.71	270.87	2.00	0.00	0.34	0.00
38.88	283.80	2.00	0.00	0.34	0.00	39.04	306.80	2.00	0.00	0.34	0.00
39.21	325.70	2.00	0.00	0.34	0.00	39.37	340.12	2.00	0.00	0.33	0.00
39.53	347.41	2.00	0.00	0.33	0.00	39.70	351.48	2.00	0.00	0.33	0.00
39.86	348.69	2.00	0.00	0.32	0.00	40.03	343.37	2.00	0.00	0.32	0.00
40.19	334.95	2.00	0.00	0.32	0.00	40.35	330.99	2.00	0.00	0.32	0.00
40.52	331.52	2.00	0.00	0.31	0.00	40.68	334.01	2.00	0.00	0.31	0.00
40.85	331.80	2.00	0.00	0.31	0.00	41.01	324.61	2.00	0.00	0.30	0.00
41.17	309.72	2.00	0.00	0.30	0.00	41.34	284.70	2.00	0.00	0.30	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
41.50	240.80	2.00	0.00	0.30	0.00	41.67	182.06	2.00	0.00	0.29	0.00
41.83	134.59	2.00	0.00	0.29	0.00	41.99	108.92	2.00	0.00	0.29	0.00
42.16	89.18	2.00	0.00	0.29	0.00	42.32	78.43	0.22	0.81	0.28	0.02
42.49	75.53	2.00	0.00	0.28	0.00	42.65	73.72	2.00	0.00	0.28	0.00
42.81	71.11	2.00	0.00	0.27	0.00	42.98	69.85	2.00	0.00	0.27	0.00
43.14	76.03	2.00	0.00	0.27	0.00	43.31	85.87	2.00	0.00	0.27	0.00
43.47	97.76	0.29	0.63	0.26	0.01	43.64	104.87	0.33	0.59	0.26	0.01
43.80	103.13	2.00	0.00	0.26	0.00	43.96	97.98	2.00	0.00	0.25	0.00
44.13	92.22	2.00	0.00	0.25	0.00	44.29	97.28	2.00	0.00	0.25	0.00
44.46	115.04	2.00	0.00	0.25	0.00	44.62	124.84	2.00	0.00	0.24	0.00
44.78	123.15	2.00	0.00	0.24	0.00	44.95	114.30	2.00	0.00	0.24	0.00
45.11	101.19	2.00	0.00	0.24	0.00	45.28	88.14	2.00	0.00	0.23	0.00
45.44	79.05	2.00	0.00	0.23	0.00	45.60	78.98	2.00	0.00	0.23	0.00
45.77	79.79	2.00	0.00	0.22	0.00	45.93	80.72	2.00	0.00	0.22	0.00
46.10	81.04	2.00	0.00	0.22	0.00	46.26	81.29	2.00	0.00	0.22	0.00
46.42	81.05	2.00	0.00	0.21	0.00	46.59	79.65	2.00	0.00	0.21	0.00
46.75	77.69	2.00	0.00	0.21	0.00	46.92	79.38	2.00	0.00	0.20	0.00
47.08	92.66	2.00	0.00	0.20	0.00	47.24	112.99	2.00	0.00	0.20	0.00
47.41	131.27	2.00	0.00	0.20	0.00	47.57	150.18	2.00	0.00	0.19	0.00
47.74	205.20	2.00	0.00	0.19	0.00	47.90	258.58	2.00	0.00	0.19	0.00
48.06	274.26	2.00	0.00	0.19	0.00	48.23	279.86	2.00	0.00	0.18	0.00
48.39	282.68	2.00	0.00	0.18	0.00	48.56	294.75	2.00	0.00	0.18	0.00
48.72	307.21	2.00	0.00	0.17	0.00	48.88	318.09	2.00	0.00	0.17	0.00
49.05	316.02	2.00	0.00	0.17	0.00	49.21	305.95	2.00	0.00	0.17	0.00
49.38	293.90	2.00	0.00	0.16	0.00	49.54	283.26	2.00	0.00	0.16	0.00
49.70	274.36	2.00	0.00	0.16	0.00	49.87	265.90	2.00	0.00	0.15	0.00
50.03	261.21	2.00	0.00	0.15	0.00						

Total estimated settlement: 0.46

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

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APPENDIX G

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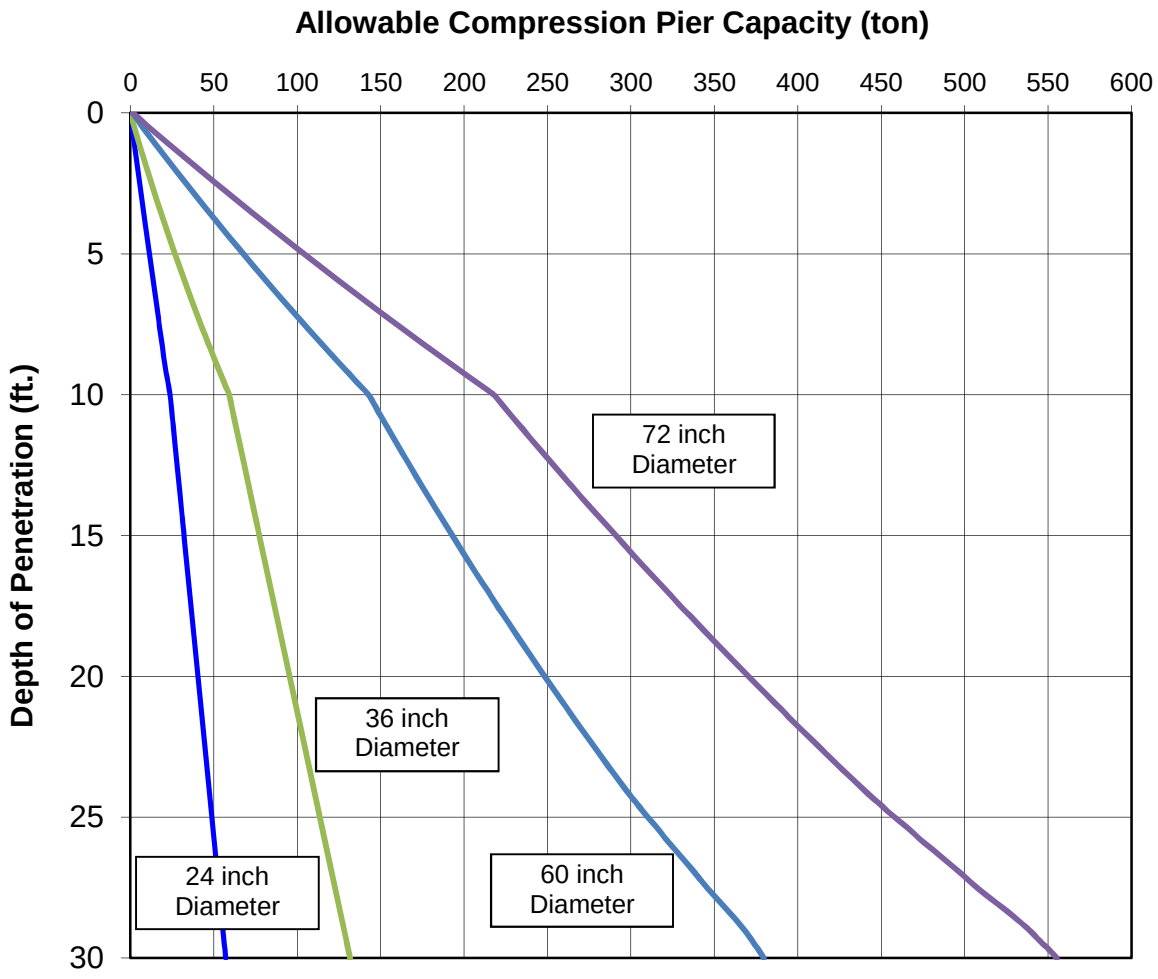

Notes:

1. Compression load capacity are based on skin friction and end-bearing capacity. The structural capacity of the piers should be checked.

2. The indicated capacities are for sustained (dead plus live) vertical compression load, and include a factor of safety of at least 2.5

3. For temporary wind or seismic load, the above values may be increased by one-third.

4. Capacities of other pier sizes are in direct proportion to the pile diameter.

5. Pier capacity in tension should be taken as 50% of the compression capacity.

LANDMARK
Geo-Engineers and Geologists

Project No.: LE20189

Drlled Piers Compression Capacity Chart
CPT-11 Sounding
Viking Solar Project
Holtville, California

Plate
G-1

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APPENDIX H

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Phase I Environmental Site Assessment

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Phase I ESA Report

Proposed Vikings Solar Project
Nelson Pit Road and East Highline Canal
Holtville, California

Prepared for:

Apex Energy Solutions, LLC
750 W. Main Street
El Centro, CA 92243

Prepared by:

GS Lyon Consultants, Inc.
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(760) 337-1100

January 2021
(Revised August 18, 2021)

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GSL Lyon

Engineering And
Information Technology

January 18, 2021
(Revised October 12, 2021)

Ms. Jamie Nagel
Apex Energy Solutions, LLC
750 W. Main Street
El Centro, CA 92243

Phase I Environmental Site Assessment Report
Vikings Solar Project (APNs 050-070-018, -019, -021)
Nelson Pit Road and East Highline Canal
Holtville, California
GSL Report No. GS2120

Dear Ms. Nagel:

We have performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM E1527-13 of the property located on Nelson Pit Road east of the East Highline Canal east of Holtville, California. Any exceptions to, or deletions from, this practice are described in Section 1.4 of this report.

This assessment has revealed the following recognized environmental conditions (REC's) in connection with the property:

- There is a potential of buried asbestos concrete (transite) pipe existing onsite for irrigation water distribution piping. The pipe material is only considered "friable" when disturbed.
- Old tires, household debris and concrete debris piles are found in the western portion of the subject site.
- Concrete saddles for a large above ground storage tank (AST) were noted south of the existing residence on the subject site. The tank had been removed.
- A 55-gallon drum containing what appeared to be waste oil was noted in the area of the concrete saddles. The drum was on a wooden pallet and had leaked onto the soil.
- A large above ground steel storage tank placed on concrete saddles with no secondary spill containment structure showed some evidence of leakage of hydrocarbons.
- There is a potential for asbestos and/or lead containing materials existing at the farm residence due to the age of the structures.

This assessment has revealed the following "de minimis" environmental conditions (REC's) in connection with the property:

- Pesticide residues (low concentrations) typical to agricultural crop applications are present in the near surface soils.
- Pole-mounted sealed electrical transformers owned and maintained by the Imperial Irrigation District (IID) exist on this subject property. All IID transformers containing PCB's have been replaced. ***If the transformers begin to leak, the IID should be notified and the transformers replaced.***
- A small spill of pelleted fertilizer was observed in the equipment storage area.

We declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR §312 and we have the specific qualifications based on education, training and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Attached is our report which describes the procedures used and results of the assessment. If you have any questions or require additional information, please do not hesitate to contact the undersigned at (760) 337-1100. We appreciate the opportunity to provide our professional review for this subject property.

Respectfully Submitted,
GS Lyon Consultants, Inc.

Steven K. Williams, PG, CEG
Consulting Geologist

Peter E. LaBrucherie, PE
Consulting Engineer

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Appendix A: Site Photographs
Appendix B: Vicinity, Site, and Soils Maps
Appendix C: Historical Aerial Photographs
Appendix D: Historical Topographic Maps
Appendix E: EDR Sanborn Fire Insurance Maps
Appendix F: EDR Environmental Records Search Report
Appendix G: Other Environmental Records Search Results
Appendix H: EDR Street Directories
Appendix I: User Questionnaire and EDR Environmental Lien and AUL Search
Appendix J: Resumes of Environmental Professionals

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1.0 INTRODUCTION

1.1 Purpose

GS Lyon Consultants, Inc. was retained by Apex Energy Solutions, LLC to conduct a Phase I Environmental Site Assessment (ESA) for the Property (herein referred to as the subject property or subject property in this Phase I ESA Report) as a prerequisite to property transaction (purchase, sale, refinance, etc.). The subject property is located on Nelson Pit Road east of the East Highline Canal east of Holtville, California. See Plate 1 in Appendix B for a Vicinity Map of the subject property.

The purpose of this Phase I Environmental Site Assessment (ESA) is to identify, to the extent feasible, recognized environmental conditions (RECs) associated with past and present activities on the subject property or in the immediate subject property vicinity in general conformance to ASTM Standard E1527-13 "*Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*" that may affect future uses of the subject property.

This report is intended to satisfy the Phase I ESA portion of "*all appropriate inquiry*" into the previous ownership and uses of the subject property as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) at Title 42 of the United States Code (U.S.C.) §9601(35)(B) and in accordance with 40 Code of Federal Regulations (CFR) Part 312, Standards and Practices for All Appropriate Inquiries; Final Rule (AAI Rule).

1.2 Scope of Services

The scope of work for this ESA is in general accordance with the requirements of ASTM Standard E1527-13. This assessment included:

- Reconnaissance of the subject property and adjacent properties
- Review user-provided information
- Interviews with persons with significant knowledge of the subject property
- Review of a regulatory database report provided by a third-party vendor
- Review readily-available historical sources (including but not limited to: aerial photographs, fire insurance maps, property tax files, recorded land title records, and topographical maps)
- Prepare report of findings

1.3 Limitations

No Phase I ESA can completely eliminate uncertainty regarding the potential for RECs in connection with a property. Conformance of this assessment with ASTM Standard E1527-13 is intended to reduce, but not eliminate uncertainty regarding the potential for RECs in connection with the Subject Property. While GS Lyon has made reasonable effort to discover and interpret available historical and current information on the property within the time available, the possibility of undiscovered contamination remains. Our assessment of the subject property and surrounding areas was conducted in accordance with ASTM guidelines and the *generally accepted environmental engineering standard of practice* which existed in Imperial County, California at the time that the report was prepared. No warranty, express or implied, is made.

GS Lyon Consultants, Inc. derived the data in this report primarily from visual inspections, examination of public records and information in the public domain, informal interviews with individuals, and readily available information about the subject property. The passage of time, manifestation of latent conditions or occurrence of future events may require further exploration of the subject property, analysis of the data, and reevaluation of the findings, observations, and conclusions expressed in this report.

The findings, observations, and conclusions expressed by GS Lyon Consultants in this report are not, and should not be considered, an opinion concerning the compliance of any past or present owner or operator of the subject property with any federal, state or local law or regulation.

This report should not be relied upon after **180 days** from the date of issuance, unless additional services are performed as defined in ASTM E1527-13 - Section 4.7.

1.4 Deviations or Data Gaps

ASTM Standard E1527-13 requires any significant data gaps, deviations, and deletions from the ASTM Standard to be identified and addressed in the Phase I ESA. A significant data gap would be one that affected the ability to identify a REC on the subject property or adjacent properties.

Through the course of this assessment, *data failures* or *data gaps* may have been encountered. These failures or gaps, if any, are discussed below. The following provides the opinion of the Environmental Professional as to the significance of the data gaps in terms of defining *recognized environmental conditions* at the subject property. Data failures may or may not be significant data gaps, and the discussion also provides information pertaining to whether the data failures resulted in significant data gaps.

1.4.1 Data Failures

Data failure is a failure to achieve the historical (property use) research objectives specified in the ASTM Standard Practice even after reviewing the eight standard historical sources that are reasonably ascertainable and likely to be useful. Data failure is one type of data gap. No *data failures w*ere encountered during this investigation.

1.4.2 Data Gaps

A *data gap* is a lack of or inability to obtain information required by the ASTM Standard Practice, despite good faith efforts by the Environmental Professional (EP) to gather such information. This could include any component of the Practice, e.g., standard environmental records, interviews, or a complete reconnaissance. A data gap by itself is not inherently significant, but if other information and/or the EP's experience raises reasonable concerns about the gap, it may be judged to be significant.

Due to the location of the subject property, Sanborn Fire Insurance maps were not available for the subject property. Because there is no historical data or physical indications that the property has ever been developed or occupied by a business that would have produced hazardous materials, the lack of Sanborn Fire Insurance maps is not considered a significant data gap.

Aerial photographs and other historical records were not available at 5 year intervals as required under the ASTM E1527-13 standard. This resulted in a data gap for years that records were not available regarding the area of the subject property. However, based upon other historical information reviewed, the subject property has been vacant desert land until the late 1940s when the subject site was developed for agricultural use. Therefore, this data gap is not considered to be significant.

Interviews with past owners, operators and occupants were not reasonably ascertainable and thus constitute a data gap. Based on information obtained from other historical sources (as discussed in Section 3.0), this data gap is not expected to alter the findings of this assessment.

1.5 Significant Assumptions

In preparing this report, GS Lyon Consultants, Inc. has relied upon and presumed accurate certain information (or the absence thereof) about the subject property and adjacent properties by governmental officials and agencies, the Client, and others identified herein. Except as otherwise stated in the report, GS Lyon Consultants has not attempted to verify the accuracy or completeness of any such information.

1.6 User Reliance

This report has been prepared on behalf of and for the exclusive use of Apex Energy Solutions, LLC for the particular subject property identified in this report, and is subject to and issued in connection with the referenced Agreement and the provisions thereof. This report should not be relied upon by any party other than the client, its legal counsel, and financial institution without the express permission of GS Lyon Consultants, Inc. Any reliance on this report by other parties shall be at such party's sole risk. Any future consultation or provision of services to third parties related to the subject property requires written authorization from Apex Energy Solutions, LLC or their representatives. Any such services may be provided at GS Lyon Consultants sole discretion and under terms and conditions acceptable to GS Lyon Consultants, including potential additional compensation.

2.0 SITE DESCRIPTION

2.1 Site Location and Legal Description

The subject property is located on Nelson Pit Road east of the East Highline Canal (APNs 050-070-018, -019, -021) approximately 5.5 miles east of Holtville, California. The subject property location is depicted on Plate 1, Site Map.

2.2 Current Property Use and Description

The subject property is comprised of 3 parcels consisting of approximately 480 acres of agricultural use land (east parcel) and 125 acres of undeveloped desert land (two western parcels). The 480 acre agricultural use land is separated by East Nelson Pit Road, the north portion is currently in agricultural production while the southern portion is fallowed. The two western parcels are undeveloped desert land they abut and cross the IID's East Highline Canal.

2.3 Adjoining Property Use

The subject property is located within a mixed agricultural, desert, and geothermal resource area east of Holtville, California. Adjacent properties consist of agricultural use lands west of the East Highline Canal and vacant desert land to the north. Vacant desert land and geothermal wells and power plants are located to the east and south.

2.4 Physical Site Characteristics

Topography: Topographic maps (USGS 7.5 minute Holtville East, CA Quadrangle) indicate that the subject property elevation is approximately 35 to 50 feet above mean sea level (MSL) or Elevation 1035 to 1050 (local datum). The Imperial Irrigation District, which supplies power and raw (irrigation) water to the area, established local datum by equating mean sea level to El. 1000.00 feet.

Geologic Setting: The subject site is located in the East Mesa portion of the Salton Trough physiographic province. The Salton Trough is a geologic structural depression resulting from large scale regional faulting. The trough is bounded on the northeast by the San Andreas Fault and Chocolate Mountains and the southwest by the Peninsular Range and faults of the San Jacinto Fault Zone. The Salton Trough represents the northward extension of the Gulf of California, containing both marine and non-marine sediments since the Miocene Epoch. Tectonic activity that formed the trough continues at a high rate as evidenced by deformed young sedimentary deposits and high levels of seismicity. Figure 1 shows the location of the site in relation to regional faults and physiographic features.

The East Mesa lies east of the Imperial Valley, which is underlain by lacustrine deposits consisting of interbedded lenticular and tabular silt, sand, and clay, and west of the Algodones Sand Dunes. The East Mesa is underlain by deep sand deposits derived from eolian deposition along the eastern margin of the Imperial Valley.

The Late Pleistocene to Holocene lake deposits of the Imperial Valley are probably less than 100 feet thick and derived from periodic flooding of the Colorado River which intermittently formed Lake Cahuilla. Older deposits consist of Miocene to Pleistocene non-marine and marine sediments deposited during intrusions of the Gulf of California. Basement rock consisting of Mesozoic granite and Paleozoic metamorphic rocks are estimated to exist at depths between 15,000 - 20,000 feet

The project site lies within the East Mesa desert plain which is underlain by sandy soils which are generally non-expansive.

Soil Conditions: The U. S. Soil Conservation Service compiled a map of surface soil conditions and published a soil survey report including maps in 1980. The soil survey maps indicate that surficial deposits at the subject property and surrounding area consist predominantly of silty clay and silty clay loams of the Imperial soil group (see Appendix B). These loams are formed in sediment and alluvium of mixed origin (Colorado River overflows and fresh-water lake-bed sediments). Based on Unified Soil Classification System presented in the Soils Survey Report, the permeability of these soils is expected to be low to very low.

Groundwater Conditions: The groundwater in the vicinity of the subject property is brackish and is encountered at a depth of 8 to 20 feet below the ground surface. Depth to groundwater may fluctuate due to localized geologic conditions, seepage from the unlined East Highline Canal, precipitation, irrigation, drainage and construction practices in the region. Based on the regional topography, groundwater flow is assumed to be generally towards the east within the subject property area. Flow directions may also vary locally in the vicinity of the subject property.

3.0 USER PROVIDED INFORMATION

In order to qualify for one of the *Landowner Liability Protections (LLPs)* offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the *Brownfields Amendments*), the *User* must provide the following information (if available) to the *environmental professional*. Failure to provide this information could result in a determination that *all appropriate inquiry* is not complete. The user was asked to provide information or knowledge of the following:

- Environmental cleanup liens that are filed or recorded against the subject property.
- Activity and land use limitations that are in place on the subject property or that have been filed or recorded in a registry.
- Specialized knowledge or experience of the person seeking to qualify for the LLPs.
- Relationship of the purchase price to the fair market value of the *property* if it were not contaminated.
- Commonly known or *reasonably ascertainable* information about the *property*.
- The degree of obviousness of the presence or likely presence of contamination at the *property*, and the ability to detect the contamination by appropriate investigation.
- The reason for preparation of this Phase I ESA.

A user questionnaire was provided to the user to aid in gathering information that may be pertinent to the evaluation of the subject property for environmental conditions. The environmental user questionnaire was not returned by the client prior to issuance of the environmental report.

3.1 Title Records

GS Lyon reviewed preliminary title reports as part of this assessment and did not find past ownership or easements that would indicate environmentally hazardous uses on the parcels.

3.2 Environmental Liens or Activity and Use Limitations

An environmental lien is a charge, security, or encumbrance upon the title to a property to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of hazardous substances or petroleum products upon the property. GS Lyon Consultants contracted Environmental Data Resources, Inc. (EDR) of Shelton, Connecticut to conduct a search of environmental liens for the subject property. According to the EDR environmental lien report, there are no environmental liens associated with the subject property. The EDR environmental lien report is included in Appendix I.

3.3 Specialized Knowledge

GS Lyon does not have personal knowledge of the subject property.

3.4 Commonly Known or Reasonable Ascertainable Information

No information was provided by the Client regarding any commonly known or reasonably ascertainable information within the local community that is material to RECs in connection with the subject property.

3.5 Valuation Reduction for Environmental Issues

The client indicated that the purchase price of this property reasonably reflects the fair market value of the property with no discounts for environmental issues.

3.6 Owner, Property Manager, and Occupant Information

The current owner of the subject property is the County of Imperial, RL&R Strahm, and ARB, Inc.

3.7 Previous Reports and Other Provided Documentation

No previous reports or other pertinent documentation was provided to GS Lyon for review during the course of this assessment.

4.0 RECORDS REVIEW

A review of historic aerial photographs (Appendix C), historic topographic maps (Appendix D), historic Sanborn Fire Insurance maps (Appendix E), governmental regulatory databases (Appendix F), other regulatory and agency databases (Appendix G), and historic telephone and city directories (Appendix H) was performed to evaluate potentially adverse environmental conditions resulting from previous ownership and uses of the subject property. The details of the review are presented in Sections 4.1 through 4.5 of this report.

4.1 Regulatory Database Review

4.1.1 Standard Environmental Record Sources

GS Lyon Consultants contracted Environmental Data Resources, Inc. (EDR) of Shelton, Connecticut which queries and maintains comprehensive environmental databases and historical information, including proprietary databases, aerial photography, topographic maps, Sanborn Maps, and city directories to generate a compilation of Federal, State and Tribal regulatory lists containing information regarding hazardous materials occurrences on or within the prescribed radii of ASTM E1527-13. The search of each database was conducted using the approximate minimum search distances from the subject property defined by the ASTM E1527-13 Standard. The purpose of the records review is to obtain and review *reasonably ascertainable* records that will help identify *recognized environmental conditions* or *historical recognized environmental conditions* in connection with the subject property.

EDR‘s Phase I ESA search package was ordered and performed on January 5, 2021. The search package included: Radius Map with Geocheck, aerial photographs, historic topographic maps, Sanborn maps, building permits, city directory, and property tax information.

The results of EDR’s search were used to evaluate if the subject property and/or properties within prescribed search distances are listed as having a past or present record of actual or potential environmental impact. Inclusion of a property in a government database list does not necessarily indicate that the property has an environmental problem.

The following is a brief synopsis of sites identified in the EDR Radius Map with Geocheck report. The government record search report is included in its entirety in Appendix F.

Federal NPL List

The Environmental Protection Agency's (EPA) National Priorities List (NPL) of uncontrolled or abandoned hazardous waste sites was reviewed for risk sites within a 1 mile radius of the subject property. The NPL identifies sites for priority cleanup and long-term care of properties under the Superfund Program that are contaminated with hazardous substances.

The database search did not identify any NPL sites within 1 mile of the subject property.

Federal CERCLIS List

The EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) listings were reviewed to determine if risks sites within ½ mile are listed for investigation. The CERCLIS database identifies hazardous waste sites that are on or proposed to be included in the NPL and sites that require investigation and possible remedial action to mitigate potential negative impacts on human health or the environment.

The CERCLIS database search did not identify any risk sites within 0.5 mile of the subject property.

Federal CERCLIS – No Further Remedial Action Planned

The EPA's CERCLIS – No Further Remedial Action Planned (NFRAP) database was reviewed to determine if risks sites within ½ mile are listed. CERCLIS NFRAP site are risk sites that have been removed from and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at the subject property has been completed and the EPA has determined that no further steps will be taken to list this subject property on the NPL, unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time.

This designation is for sites where no contamination was found, contamination was quickly removed without the need for the subject property to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration.

The CERCLIS – NFRAP database search did not identify any risk sites within ½mile of the subject property.

Federal RCRA List

The Federal Resource Conservation Recovery Act (RCRA) Notifiers List was reviewed to determine if RCRA treatment, storage or disposal sites (TSD) are located within 1 mile of the subject property. The RCRA Correction Action Sites List (CORRACTS) is maintained for risk sites which are undergoing "a corrective action". A corrective action order is issued when there has been a release of hazardous waste constituents into the environment from a RCRA facility.

The RCRA and RCRA CORRACTS database searches did not identify any RCRA TSD or RCRA CORRACTS risk sites within ½ mile of the subject property.

The RCRA regulated hazardous waste generator notifiers list was reviewed to determine if RCRA generator facilities are located on or adjoining the subject property. No RCRA generator facilities within ¼ mile of the subject property were identified in the database.

Federal ERNS List

The Federal Emergency Response Notification System (ERNS) List was reviewed to determine if reported release of oil and/or hazardous substances occurred on the subject property.

The ERNS database searches did not identify any reported releases for the subject property.

State and Tribal NPL List

The Environmental Protection Agency's (EPA) National Priorities List (NPL) of uncontrolled or abandoned hazardous waste sites was reviewed for risk sites within a 1 mile radius of the subject property. The NPL identifies sites for priority cleanup and long-term care of properties under the Superfund Program that are contaminated with hazardous substances.

The database search did not identify any NPL sites within 1 mile of the subject property.

State and Tribal equivalent CERCLIS

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifies sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites.

EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites. The EnviroStor database search did not identify any risk sites within 1 mile of the subject property.

State and Tribal Leaking Underground Storage Tank Sites

The California State Water Resources Control Board (SWRCB) maintains a list of information concerning reported leaking underground storage tanks (LUST). The LUST inventory list was reviewed to determine if any LUSTs are located within ½ mile the subject property.

The SWRCB LUST database did not identify any risk sites within ½ mile of the subject property.

State and Tribal Underground and Aboveground Storage Tank Sites

The California State Water Resource Control Board (SWRCB) underground storage tank (UST) and above ground storage tank (AST) inventory list was reviewed to determine if any UAST's are located on or adjacent to the subject property.

The SWRCB UST and AST databases did not identify any risk sites within ¼ mile of the subject property.

Solid Waste Disposal/Landfill Facilities

The Solid Waste Disposal/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data comes from the Integrated Waste Management Board's Solid Waste Information System (SWIS) database.

A review of the SWF/LF list database did not identify any risk sites within ½ mile of the subject property.

Unmapped (Orphan) Sites

Not all sites or facilities identified in the database records can be accurately located in relation to the Subject Property due to incomplete information being supplied to the regulatory agencies and are referred to as "orphan sites" by EDR.

One orphan listing was reported. The orphan site listed is from the Clandestine Drug Lab (CDL) database and is located at Neslon Pit Road and E. Highline Canal (Trailer) which is near the subject property. No definitive location or additional records for this risk were found in the California CDL database.

4.1.2 Additional Environmental Record Sources

California Department of Toxic Substances Control (DTSC) Records – Envirostor Database: EnviroStor is an online search and Geographic Information System tool for identifying sites that have known contamination or sites for which there may be reasons to investigate further. Public Access to EnviroStor is accessible via the DTSC Web Page located at: http://www.envirostor.dtsc.ca.gov/public/. The EnviroStor database includes the following site types: Federal Superfund sites (National Priority List); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. The information includes site name, site type, status, address, any restricted use (recorded deed restrictions), past use(s) that caused contamination, potential contaminants of concern, potential environmental media affected, site history, planned and completed activities. The EnviroStor database also contains current and historical information relating to Permitted and Corrective Action facilities. The EnviroStor database includes current and historical information on the following permit-related documents: facility permits; permit renewal applications; permit modifications to an existing permit; closure of hazardous waste management units (HWMUs) or entire facilities; facility corrective action (investigation and/or cleanup); and/or post-closure permits or other required post-closure activities.

The EnviroStor database was queried on January 5, 2021. A map showing the results of the query is provided in Appendix G. No reported cases were found on the subject property. No risk sites were located within ½ mile of the subject property.

California State Water Resources Control Board Records – GeoTracker Database: GeoTracker is a geographic information system (GIS) maintained by the California State Water Resources Control Board (SWRCB) that provides online access to environmental data at http://www.geotracker.swrcb.ca.gov\. GeoTracker tracks regulatory data about underground fuel tanks, fuel pipelines, and public drinking water supplies. Site information from the Spills, Leaks, Investigations, and Cleanups (SLIC) Program is also included in GeoTracker. The GeoTracker database was queried for environmental data pertaining to the Subject property on January 5, 2021. A map showing the results of the query is provided in Appendix G. No reported cases were found on the subject property. No risk sites were located within ½ mile of the subject property.

CalEPA Records Search: CalEPA Regulated Site Portal is a website that combines data about environmentally regulated sites and facilities in California into a single, searchable database and interactive map. The portal was created to provide a more holistic view of regulated activities statewide. By combining data from a variety of state and federal databases, the portal provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials. The portal combines information from the following databases: Cal/OSHA, California Environmental Reporting System (CERS), California Integrated Water Quality System (CIWQS), US EPA's Air Emission Inventory System (EIS), Envirostor, Geotracker, Stormwater Multiple Application and Report Tracking System (SMARTS), Solid Waste Information System (SWIS), and Toxics Release Inventory (TRI).

The CalEPA database was queried for environmental data pertaining to the Site on January 5, 2021. No risk sites were noted on or adjacent to the subject property.

CUPA Records Search: The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of six environmental and emergency response programs. Cal/EPA and other state agencies set the standards for their programs while local governments implement the standards—these local implementing agencies are called Certified Unified Program Agencies (CUPA).

The DTSC Imperial CUPA office was contacted (Veronica Lopez) by email on January 5, 2021. CUPA records were searched for environmental issues related to the subject property located at 2910 and 3000 E. Nelson Pit Road. No records were found associated with the subject property.

4.2 Historical Use Records

ASTM E1527-13 requires the environmental professional to identify all obvious uses of the property from the present back to the property's first developed use or 1940, whichever is earliest. This information is collected to identify the likelihood that past uses have led to RECs in connection with the property. This task is accomplished by reviewing standard historical sources to the extent that they are necessary, reasonably ascertainable, and likely to be useful. These standard records include aerial photographs, fire insurance maps, property tax files, land title records, topographic maps, city directories, telephone directories, building department records, and zoning/land use records.

The general type of historical use (i.e., commercial, retail, residential, industrial, undeveloped, office) should be identified at 5-year intervals, unless the specific use of the property appears to be unchanged over a period longer than 5 years. The historical research is complete when the use is defined or when data failure occurs. Data failure occurs when all of the standard historical sources have been reviewed, yet the property use cannot be identified back to its first developed use or to 1940. Data failure is not uncommon in trying to identify the use of the property at 5-year intervals back to first use or 1940, whichever is earlier.

GS Lyon reviewed the following historical records to identify obvious uses of the subject property from the present back to the property's first developed use, or to 1940, whichever is earlier. The results of this research and data failure, if encountered, are presented in the following sections.

4.2.1 Title Records

GS Lyon reviewed preliminary title reports as part of this assessment and did not find past ownership or easements that would indicate environmentally hazardous uses on the parcels.

4.2.2 Sanborn Fire Insurance Maps

Sanborn Fire Insurance Maps are large scale maps depicting the commercial, industrial, and residential sections of various cities across the United States. Since the primary use of the fire insurance maps was to assess the buildings that were being insured, the existence and location of fuel storage tanks, flammable or other potentially toxic substances, and the nature of businesses are often shown on these maps.

Due to the rural undeveloped nature of the subject property and vicinity for the years the Sanborn Fire Insurance Maps were available for this subject property, no maps are available for the subject property. An "Unmapped Property" letter for the Sanborn Fire Insurance Maps is included in Appendix E.

4.2.3 Aerial Photographs

Aerial photographs obtained from Environmental Data Resources (EDR) dating back to 1937, the Imperial Irrigation District (IID) archives dating back to 1949, and Google Earth aerial photographs dating back to 1996 were reviewed for historical development of the subject property. Reproductions of the historical aerial photographs reviewed are included in Appendix C.

The 1937 aerial photograph shows the subject property as being vacant desert land. The ancient shoreline of Lake Cahuilla is visible along the west side of the subject site. The East Highline Canal (EHL) is also present on the western margin of the subject site.

The 1949 aerial photograph shows the subject site undergoing land leveling for the agricultural field. The East Highline Canal appears to have been widened since the 1937 aerial photograph.

The 1953 shows a majority of the subject site has been converted into agricultural production. The western portion of the subject site remains undeveloped except for a small structure located north of Nelson Pit Road adjacent to the EHL Canal.

The 1976 aerial photograph shows the subject site as being predominantly an agricultural field. A raw water pond and a rural residence and farm shop have been constructed on the west side of the agricultural fields.

The 1985, 1996, 2002 and 2006 aerial photographs are similar to the 1976 aerial photograph. The agricultural crop appears to have changed from a ground crop to citrus orchards.

The 2009 aerial photograph shows the subject site as being similar to the 2006 aerial photograph except that the orchards have been removed from the agricultural areas. A raw water pond has been constructed south of the rural residence.

The 2012 and 2016 aerial photographs are similar to the 2009 aerial photograph except that the northern half of the agricultural area has been converted back to ground crops while the southern half is fallow.

4.2.4 Street Directories

GS Lyon Consultants contracted Environmental Data Resources, Inc. (EDR) of Shelton, Connecticut to conduct a search of historic city directories for the subject property (Appendix H). City directories are used for locating individuals and businesses in a particular urban or suburban area. City directories are generally divided into three sections: a business index, a list of resident names and addresses, the name and type of businesses (if unclear from the name). While city directory coverage is comprehensive for major cities, it may be spotty for rural and small towns.

EDR Digital Archives and Haynes Criss-Cross Directories: The EDR Digital Archives and Haynes Criss-Cross City Directories for the years 1992, 1995, 2000, 2005, 2010, and 2017 were reviewed. No listings for the subject property were found.

Polk City Directories: The Polk City Directories for the years 1963 and 1984 were reviewed. No listings for the subject site was found.

4.2.5 Historic Topographic Maps

Historic topographic maps (1907, 1940, 1945, 1947, 1957, 1979, and 2012), USGS 30 Min. Holtville, 15 Min. Alamorio and 7.5 Min. Holtville East, CA Quadrangles, showed the subject property as being vacant from 1907 to 1947 (Appendix D).

The 1957 and 1979 topographic maps show a structure at the location of the rural residence and also a structure in the northwest corner of the subject property. A "mine" is also shown on the south side of Nelson Pit Road where soil was surface mined.

The 2012 topographic map does not show any development on the subject property.

4.2.6 Historical Telephone Directories

Telephone Directories: Telephone directories for the Imperial County, which included the City of Holtville businesses published in 1941, 1955, 1965, and 1974 were reviewed. No service stations, chemical manufacturers, petroleum manufacturers, distributors, or automotive repair facilities were noted at or in the immediate vicinity of the subject property.

4.3 Historical Use Summary

4.3.1 Summary of the Historical Use of Property

Based on a review of the historical information, the subject property was first developed in the late 1940s for agricultural use. Prior to development of the agricultural fields, the subject site was vacant desert land. The western portion of the subject site may have been used for surface mining of soil along the ancient Lake Cahuilla shoreline.

4.3.2 Summary of the Historical Use of Adjacent Properties

Historically, the properties located immediately adjacent to the subject property have been comprised of agricultural fields to the west and vacant desert lands to the east. Development of the geothermal resource to the east began in the 1970s and 1980s.

5.0 SITE RECONNAISSANCE

5.1 Methodology and Limiting Conditions

A site reconnaissance was performed by Mr. Pete LaBrucherie, a consulting engineer to GS Lyon Consultants, on November 13, 2020. A second site reconnaissance was conducted by Mr. LaBrucherie on August 17, 2021 as part of this update. The site visit consisted of a walking the perimeter of the subject property and randomly crossing the subject property. The reconnaissance included visual observations of surficial conditions at the subject property and observation of adjoining properties to the extent that they were visible from public areas. Mr. LaBrucherie was unaccompanied during the site reconnaissance.

The site reconnaissance was limited to visual and/or physical observation of the exterior and interior of the subject property and its improvements, the current uses of the property and adjoining properties, and the current condition of the property. The site visit evaluated the subject property and adjoining properties for potential hazardous materials/waste and petroleum product use, storage, disposal, or accidental release, including the following: presence of tank and drum storage; mechanical or electrical equipment likely to contain liquids; evidence of soil or pavement staining or stressed vegetation; ponds, pits, lagoons, or sumps; suspicious odors; fill and depressions; or any other condition indicative of potential contamination. The site visit did not evaluate the presence of asbestos-containing materials, radon, lead-based paint, mold, indoor air quality, or structural defects, or other non-scope items.

A site reconnaissance can be limited by weather conditions, bodies of water, adjacent buildings, or other obstacles. The weather was warm and sunny and no access limitations were placed on the site visit that the farm residence and shop structure interior were not accessed during the site visit. There was no one was onsite during the visit to provide access.

5.2 General Site Setting

The subject property is comprised of 3 parcels consisting of approximately 480 acres of agricultural use land (east parcel) and 125 acres of undeveloped desert land (two western parcels). The 480 acre agricultural use land is separated by East Nelson Pit Road. The north portion is currently in agricultural production while the southern portion is fallowed. The two western parcels are undeveloped desert land the abut and cross the IID's East Highline Canal.

The subject property eastern parcel is currently in crop production in the northern half while the southern half is fallowed. This parcel has two raw water irrigation reservoirs with pump systems located along the western boundary of the parcel.

Power lines with pole mounted transformers are located within the site for the residence and irrigation pump locations. There is a farm residence and shop located along the western boundary of this parcel just south of East Nelson Pit Road. Outside of the shop there are some empty above ground tanks and a 55-gallon drum of used oil. The inside of the shop and residence were not open for access during the visit. There are multiple pole mounted transformers adjacent to concrete standpipes scattered around the property. The standpipes have electrical water pumps. The water pumps near the reservoirs are still in operation. The southern fallowed portion has underground transit gravity flow pipelines used to distribute water around the field

The subject property's west parcels are undeveloped desert land with scattered large desert vegetation, concrete debris piles, and scattered household trash piles on the south end. The parcels abut and cross the East Highline Canal. The side against the canal is elevated above the canal waterline with a depressed area in the middle of the parcels that parallels the canal.

Photographs of the subject property taken on November 13, 2020 during our site reconnaissance are included in Appendix A.

5.3 Adjacent Properties

The subject property is located within a mixed agricultural, desert, and geothermal resource area east of Holtville, California. Adjacent properties consist of agricultural use lands west of the East Highline Canal and vacant desert land to the north. Vacant desert land and geothermal wells and power plants are located to the east and south. Along the outside of the southern boundary of the property there is a large pile used tires.

5.4 Exterior and Interior Observations

The following conditions were specifically assessed for their potential to indicate RECs and may include conditions inside or outside structures on the subject property.

5.4.1 Hazardous Substances and Petroleum Products

GS Lyon did not observe operations that use, treat, store, dispose of, or generate hazardous materials or petroleum products on the subject property other than farm equipment that is stored onsite and a 55-gallon drum of used oil outside of the farm shop area.

5.4.2 Storage Tanks

Underground Storage Tanks (USTs) – No obvious visual evidence indicating the current presence of USTs (i.e. vent pipes, fill ports, etc.) was noted.

Aboveground Storage Tanks (ASTs) – There was visual evidence indicating the historical presence of ASTs (i.e. secondary containments, concrete saddles, etc.) was observed to the east of the existing farm shop structure. There are 3 empty tanks located within the containment area and further to the east is a large (>5,000 gallon) empty metal tank.

5.4.3 Odors

No obvious strong, pungent, or noxious odors were noted during the site reconnaissance.

5.4.4 Pools of Liquid

Pools of liquid were not observed during the site reconnaissance.

5.4.5 Drums and Containers

GS Lyon did observe drums and storage containers on the subject property. A 55-gallon used oil drum is located east of the farm shop structure. Multiple 5-gallon buckets were observed within the shop structure.

5.4.6 Unidentified Substance Containers

GS Lyon did not observe open or damaged containers containing unidentified substances at the subject property other than unidentified 5-gallon buckets within the shop structure.

5.4.7 Suspect Polychlorinated Biphenyl (PCB) Containing Equipment

No potential PCB containing equipment such as electrical transformers, capacitors, and hydraulic equipment were observed during the site reconnaissance on the subject property or immediate vicinity.

Pole-mounted sealed electrical transformers owned and maintained by the Imperial Irrigation District (IID) are located on multiple power poles within the subject property. In recent years, the IID has replaced all transformers that contained PCB's. No leaks were noted during our site visit.

5.5 Interior Observations

The subject property currently has two structures, a farm residence and a shop structure. Access to the structures was not provided; therefore, no interior observations were made during our site reconnaissance.

5.6 Exterior Observations

5.6.1 Pits, Ponds, and Lagoons

No pits, ponds, or lagoons were noted on the subject property other than the two raw water irrigation reservoirs.

5.6.2 Stained Soils or Pavement

No evidence of significantly stained soil or pavement was noted on the subject property.

5.6.3 Stressed Vegetation

No evidence of stressed vegetation attributed to potential contamination was noted on the subject property.

5.6.4 Solid Waste

No dumpsters or solid waste containers exist on the subject property. There were debris piles scattered throughout the two western parcels.

5.6.5 Wastewater

Wastewater generated at the subject property is limited to sinks, toilets, etc. and is disposed of via the farm residence septic system.

5.6.6 Wells

No evidence of wells (dry wells, drinking water, observation wells, groundwater monitoring wells, irrigation wells, injection wells or abandoned wells) was noted on the subject property.

5.6.7 Septic Systems

The farm residence is likely connected to a septic system, non was identified during site visit.

5.7 Non-Scope Issues

ASTM guidelines identify non-scope issues, which are beyond the scope of a Phase I ESA as defined by ASTM. These issues may affect environmental risk at the subject property and may warrant discussion and/or assessment. Some of these non-scope issues include; asbestos-containing building materials, radon, lead-based paint, and wetlands which are discussed below.

5.7.1 Asbestos-Containing Building Materials

There is a potential for asbestos containing materials (ACM) existing at the subject property due to the age of the buildings. Asbestos may also exist in the old transit waterlines and concrete standpipes.

5.7.2 Lead-Based Paint

There is a potential for lead based paint residues existing at the subject property due to the age of the buildings.

5.7.3 Radon

The subject property is located in Zone 3 as shown on the EPA Map of Radon Zones indicating a predicted average indoor radon screening level of less than 2 pCi/L; therefore, no further action is required. Radon gas is not believed to be a potential hazard at the subject property.

5.7.4 Wetlands

No wetlands are located within one (1) mile of the subject property.

5.7.5 Agricultural Use

Based on our review of environmental records, historical documents, and subject property conditions, the property has been in agricultural use and/or vacant since the late 1940's. Residues of currently available pesticides and currently banned pesticides such as DDT/DDE may be present in near surface soils in limited concentrations. The concentrations of these pesticides found on other Imperial Valley agricultural sites are typically less than 25% of the current regulatory threshold limits and, at those levels, are not considered a significant environmental hazard. The presence and concentration of near surface pesticides at this subject property can be accurately characterized only by site-specific sampling and testing.

6.0 INTERVIEWS

GS Lyon interviewed various individuals familiar with the subject property, as identified to us, and/or government officials in order to evaluate historical uses and identify potential RECs existing on the subject property. The individuals interviewed were asked to provide responses in good faith and to the best of their knowledge. The following sections identify the individuals interviewed and summarize the information each provided; however, additional information provided by these individuals may be presented in other sections of this report.

6.1 Interview with Owner

Mr. Roy Strahm, one of the property owners, was interviewed by GS Lyon personnel on July 19, 2021. Mr. Strahm indicated that he had no information pertaining to any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, or from the subject property; any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the subject property; or any notices from a governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products. He also indicated the farm residence is being rented out and the shop in rear of property has not been used for commercial farm equipment since his family purchased the property. Mr. Strahm was also unaware of the substance that was held in the large steel tanks that sat on concrete collars as they were either removed or empty since he has owned the property. He also indicated the two smaller above ground tanks have been empty since his family purchased the property and that they may have been fuel tanks previous owners leased from a local commercial fuel supplier.

6.2 Interview with the Site Manager

The subject property is vacant, undeveloped land and active and fallow agricultural land. No site manager was available for an interview.

6.3 Interview with Occupants

The subject property is vacant, undeveloped land and active and fallow agricultural land; therefore, there are no occupants.

6.4 Interview with Local Government Officials

The DTSC Imperial CUPA office was contacted (Veronica Lopez) by email on January 5, 2021. CUPA records were searched for environmental issues related to the subject property located at 2910 and 3000 E. Nelson Pit Road. No records were found associated with the subject property.

7.0 EVALUATION

7.1 Summary of Findings

The approximately 605-acre property on Nelson Pit Road east of the East Highline Canal approximately 5.5 miles east of Holtville, California. The eastern portion (APN 050-070-018) of the subject property was first developed about 1949 for agricultural use. The western portion (APNs 050-070-019 and -021) of the subject site has remained vacant desert land.

7.2 Conclusions

GS Lyon has performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM E1527-13 of the property located on Nelson Pit Road east of the East Highline Canal approximately 5.5 miles east of Holtville, California. Any exceptions to, or deviations from, this practice are described in Section 1.4 of this Phase I ESA report.

7.2.1 Recognized Environmental Conditions

A *recognized environmental condition (REC)* refers to the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term REC includes hazardous substances and petroleum products even under conditions that might be in compliance with laws. The term is not intended to include "de minimis" conditions as defined in Section 7.2.3 of this report.

This assessment has revealed the following RECs for the study site:

1. There is the potential for buried asbestos concrete (transite) pipe existing onsite for irrigation water piping. The pipe material is only considered “friable” when disturbed.
2. Old tires, household debris and concrete debris piles are found in the western portion of the subject site.
3. Concrete saddles for a large above ground storage tank (AST) were noted south of the existing residence on the subject site. The tank had been removed.
4. A 55-gallon drum containing what appeared to be waste oil was noted in the area of the concrete saddles. The drum was on a wooden pallet and had leaked onto the soil.

5. A large above ground steel storage tank placed on concrete saddles with no secondary spill containment structure showed some evidence of leakage of hydrocarbons.
6. There is a potential for asbestos and/or lead containing materials existing at the farm residence due to the age of the structures.

7.2.2 Historical Recognized Environmental Conditions

A *historical recognized environmental condition (HREC)* refers to a past *release* of any *hazardous substances* or *petroleum products* that has occurred in connection with the *property* and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the *property* to any required controls (for example, *property* use restrictions, *activity and use limitations*, *institutional controls*, or *engineering controls*).

This Phase I ESA has revealed no evidence of *historical recognized environmental conditions* in connection with the subject property.

7.2.3 Environmental Concerns and De Minimis Conditions

A *de minimis condition* is a condition that generally does not present a threat to human health or the *environment* and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis conditions* are not *recognized environmental conditions* nor *controlled recognized environmental conditions*.

This Phase I ESA has revealed the following *de minimis* conditions or environmental concerns in connection with the subject property:

1. Pole-mounted sealed electrical transformers owned and maintained by the Imperial Irrigation District (IID) exist on this subject property. All IID transformers containing PCB's have been replaced. ***If the transformers begin to leak, the IID should be notified and the transformers replaced.***
2. Pesticide residues (low concentrations) typical to agricultural crop applications may be present in the near surface soils.
3. A small spill of pelleted fertilizer was observed in the equipment storage area.

7.3 Recommendations

Based on the scope of work performed for this assessment, it is our professional opinion that no RECs have been identified in connection with the subject property that would warrant further environmental study (Phase II) at this time. The following RECs should be addressed during site demolition and prior to construction activities occurring on the subject site.

- Asbestos concrete (transite) pipe. The piping material is not required to be removed, but if disturbed, requires proper handling with respiratory protection and if removed should be properly disposed by a qualified ACM abatement contractor.
- Old tires, household debris and concrete debris piles. This debris should be cleaned up and properly disposed.
- 55-gallon drum containing suspected waste oil. The oil drum and any affected soil should be cleaned up and properly disposed.
- Large above ground steel storage tank. The tank and any hydrocarbon affected soil below the tank should be removed and properly disposed.
- Asbestos and/or lead containing materials. If demolition or remodeling of the residence is planned, the structure should be evaluated for asbestos and lead based paint.

8.0 REFERENCES

40 CFR 312, Standards and Practices for All Appropriate Inquiries; Final Rule, November 2005 (AAI Rule).

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Department of Toxic Substances Control. 2021. EnviroStor Database Website, http://www.envirostor.dtsc.ca.gov/public/ .

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Environmental Data Resources, Inc., *EDR Historical Topographic Map Report*. Inquiry number 6320675, dated January 6, 2021

Environmental Data Resources, Inc., *The EDR Aerial Photo Decade Package*. Inquiry number 6320675, dated January 6, 2021

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State Water Resources Control Board. 2021. GeoTracker Database Website, http://geotracker.swrcb.ca.gov/

United States Department of Agriculture, Natural Resources Conservation Service, Web Soil Survey, accessed via the Internet, January 2021

United States Environmental Protection Agency, EPA Map of Radon Zones (Document EPA-402-R-93-071), accessed via the Internet, January 2021

United States Geological Survey Topographic Map 1997, 7.5 minute series

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APPENDIX A

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Photo 1: Looking north along the west boundary of the subject property east parcel from E. Nelson Pit Road (Photo Location 1, Plate A-2).

Photo 2: Looking northeast across the subject property east parcel from the west end E. Nelson Pit Road (Photo Location 1, Plate A-2).

Photo 3: Looking south along the west boundary of the subject property east parcel from E. Nelson Pit Road (Photo Location 1, Plate A-2).

Photo 4: Looking southeast across the subject property east parcel from the west end of E. Nelson Pit Road (Photo Location 1, Plate A-2).

Photo 5: Looking southwest across the subject property east parcel from the east end E. Nelson Pit Road (Photo Location 2, Plate A-2).

Photo 6: Looking north across the subject property east parcel from the east end E. Nelson Pit Road (Photo Location 2, Plate A-2).

Photo 7: Looking west across the subject property east parcel from the east end of the field road at the north quarter of the site (Photo Location 3, Plate A-2).

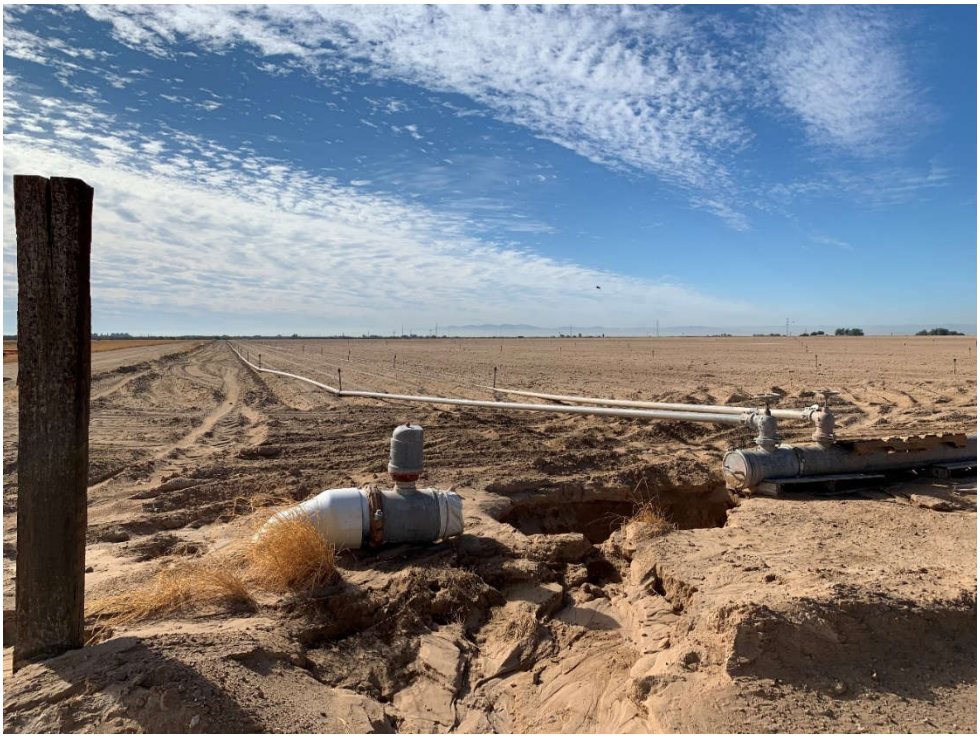

Photo 8: Looking southwest across the subject property east parcel from photo location #4 (Photo Location 4, Plate A-2).

Photo9: Looking west to northwest across the subject property east parcel from photo location #5 (Photo Location 5, Plate A-2).

Photo 10: Looking south at the irrigation reservoir within the north side of subject property east parcel from photo location #6 (Photo Location 6, Plate A-2).

Photo 11: Looking southwest at the concrete stacked within the north side of subject property east parcel from photo location #6 (Photo Location 6, Plate A-2).

Photo 12: Looking west at the irrigation reservoir's pump system and pole mounted transformers within the north side of subject property east parcel from photo location #6 (Photo Location 6, Plate A-2).

Photo 13: Looking west to southwest across the north side of subject property east parcel from the northeast corner of the site (Photo Location 7, Plate A-2).

Photo 14: Looking south to southwest across the northwest parcel from the northern boundary of the subject property (Photo Location 8, Plate A-2).

Photo 15: Looking east at concrete debris pile at the northwest parcel of the subject property (Photo Location 9, Plate A-2).

Photo 16: Looking southwest at concrete slab within northwest parcel of the subject property (Photo Location 10, Plate A-2).

Photo 17: Looking east at concrete debris within northwest parcel of the subject property (Photo Location 10, Plate A-2).

Photo 18: Looking east at water pipe within northwest parcel of the subject property (Photo Location 11, Plate A-2).

Photo 19: Looking south across the southwest parcel of the subject property (Photo Location 12, Plate A-2).

Photo 20: Looking east along the southern boundary of the southwest parcel of the subject property (Photo Location 13, Plate A-2).

Photo 21: Looking at glass debris within the southwest parcel of the subject property (Photo Location 14, Plate A-2).

Photo 22: Looking at concrete debris within the southwest parcel of the subject property (Photo Location 15, Plate A-2).

Photo 23: Looking at debris within the southwest parcel of the subject property (Photo Location 15, Plate A-2).

Photo 24: Looking southeast at the irrigation ditch and the reservoir at the southwest end of the eastern parcel of the subject property (Photo Location 15, Plate A-2).

Photo 25: Looking south at the residence within the eastern parcel of the subject property (Photo Location 16, Plate A-2).

Photo 26: Looking west at the shop on the south side of the residence within the eastern parcel of the subject property (Photo Location 17, Plate A-2).

Photo 27: Looking southeast at empty above ground tanks on the east side of the shop building within the eastern parcel of the subject property (Photo Location 17, Plate A-2).

Photo 28: Looking east at a 50-gallon drum of used oil and empty chemical tank on the east side of the shop building within the eastern parcel of the subject property (Photo Location 17, Plate A-2).

Photo 29: Looking south at cistern and pump south of shop within the eastern parcel of the subject property (Photo Location 17, Plate A-2).

Photo 30: Looking south at cistern with pump and concrete debris south of shop within the eastern parcel of the subject property (Photo Location 18, Plate A-2).

Photo 31: Looking east across the south portion of the eastern parcel of the subject property (Photo Location 19, Plate A-2).

Photo 32: Looking southwest at piles of used tires south of the southern boundary of the eastern parcel of the subject property (Photo Location 20, Plate A-2).

Photo 33: Looking east along the southern boundary of the eastern parcel of the subject property (Photo Location 21, Plate A-2).

Photo 34: Looking north across the eastern parcel of the subject property (Photo Location 21, Plate A-2).

Photo 35: Looking northwest across the eastern parcel of the subject property (Photo Location 21, Plate A-2).

Photo 36: Looking at concrete transite water pipe remains within the eastern parcel of the subject property (Photo Location 22, Plate A-2).

Photo 37: Looking at underground concrete transite water pipe within the eastern parcel of the subject property (Photo Location 22, Plate A-2).

Photo 38: Looking west at large empty above ground tank and pole mounted transformers within the eastern parcel of the subject property (Photo Location 23, Plate A-2).

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APPENDIX B

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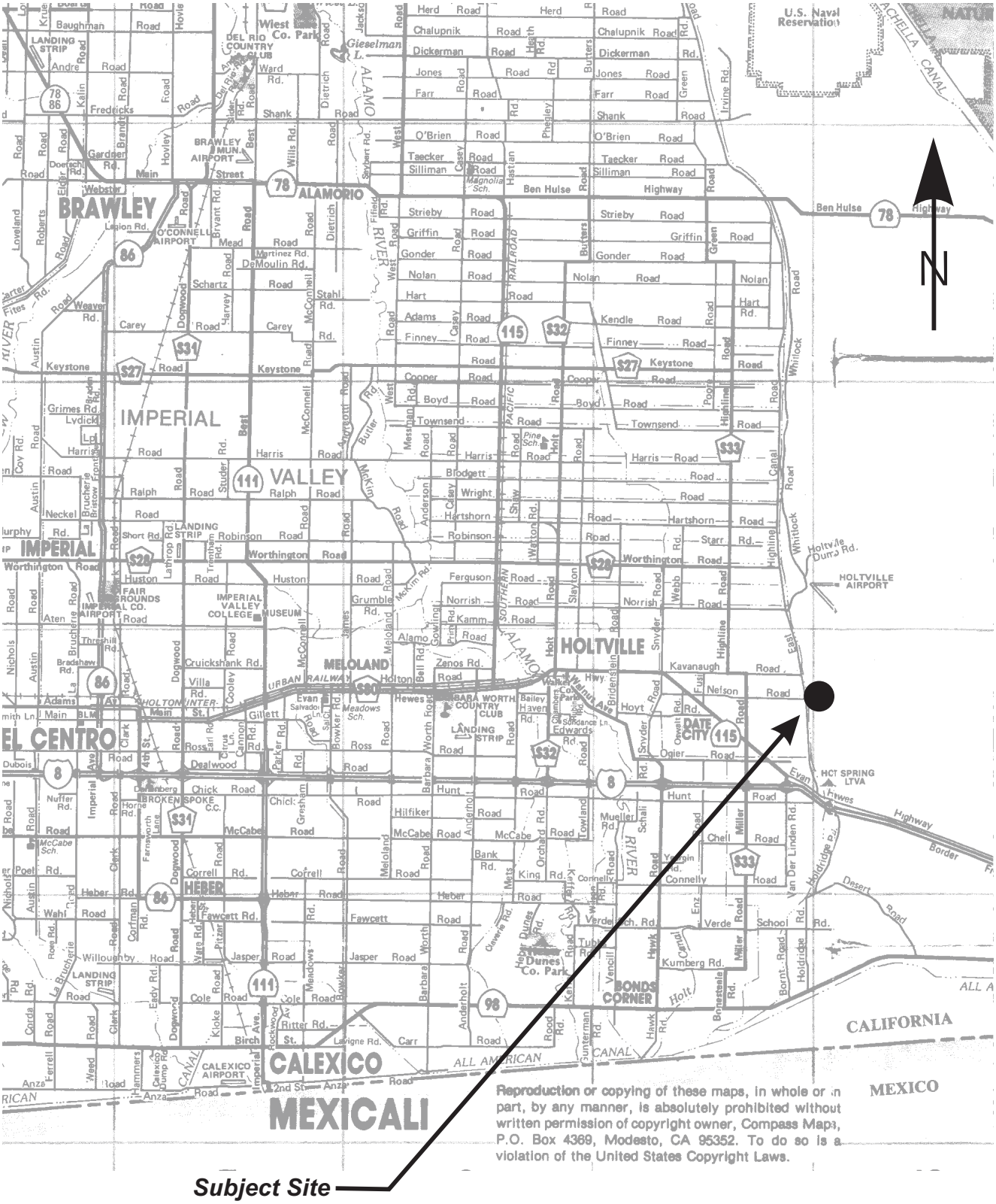
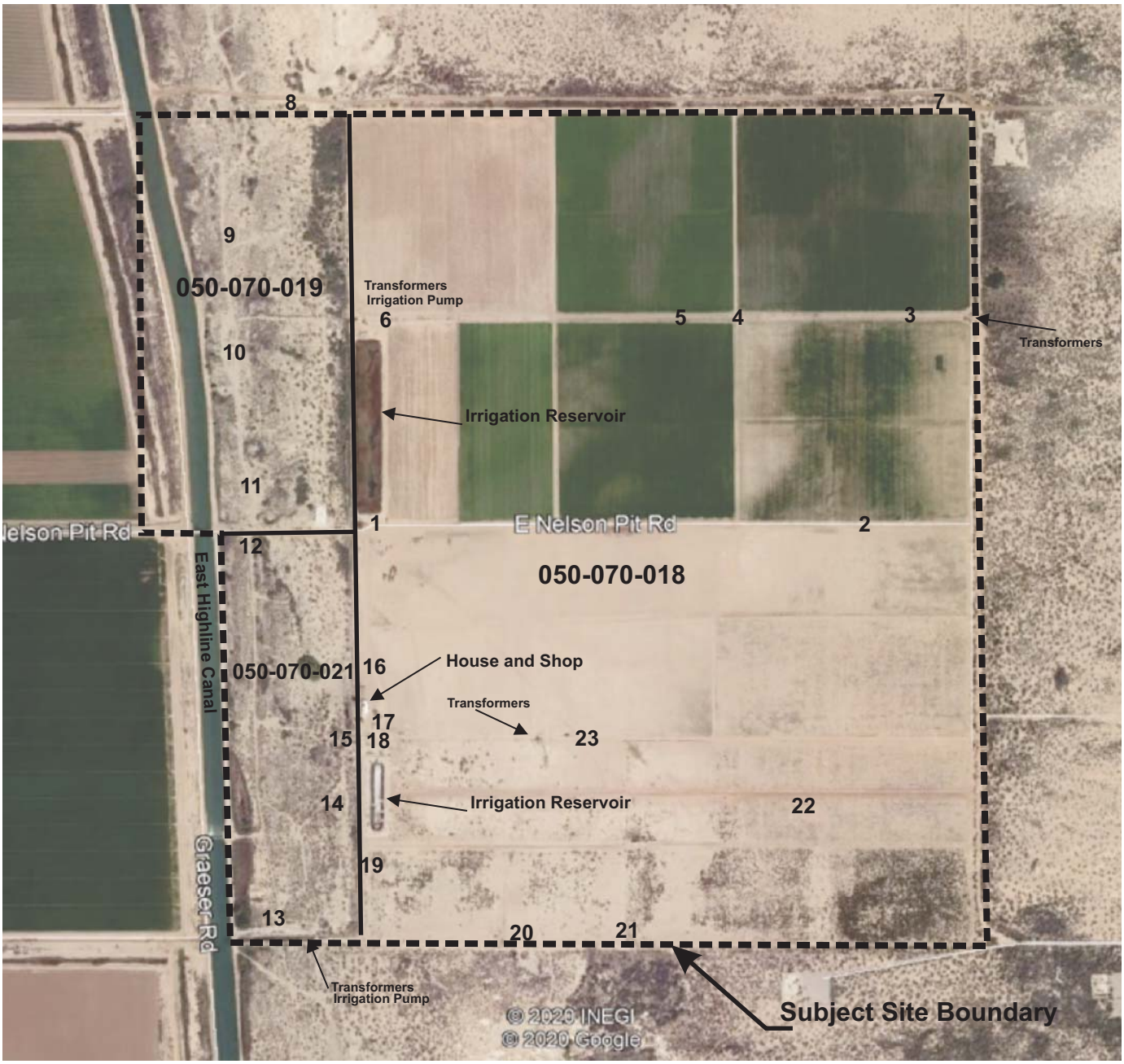


GS Lyon

Project No.: GS2026

Vicinity Map

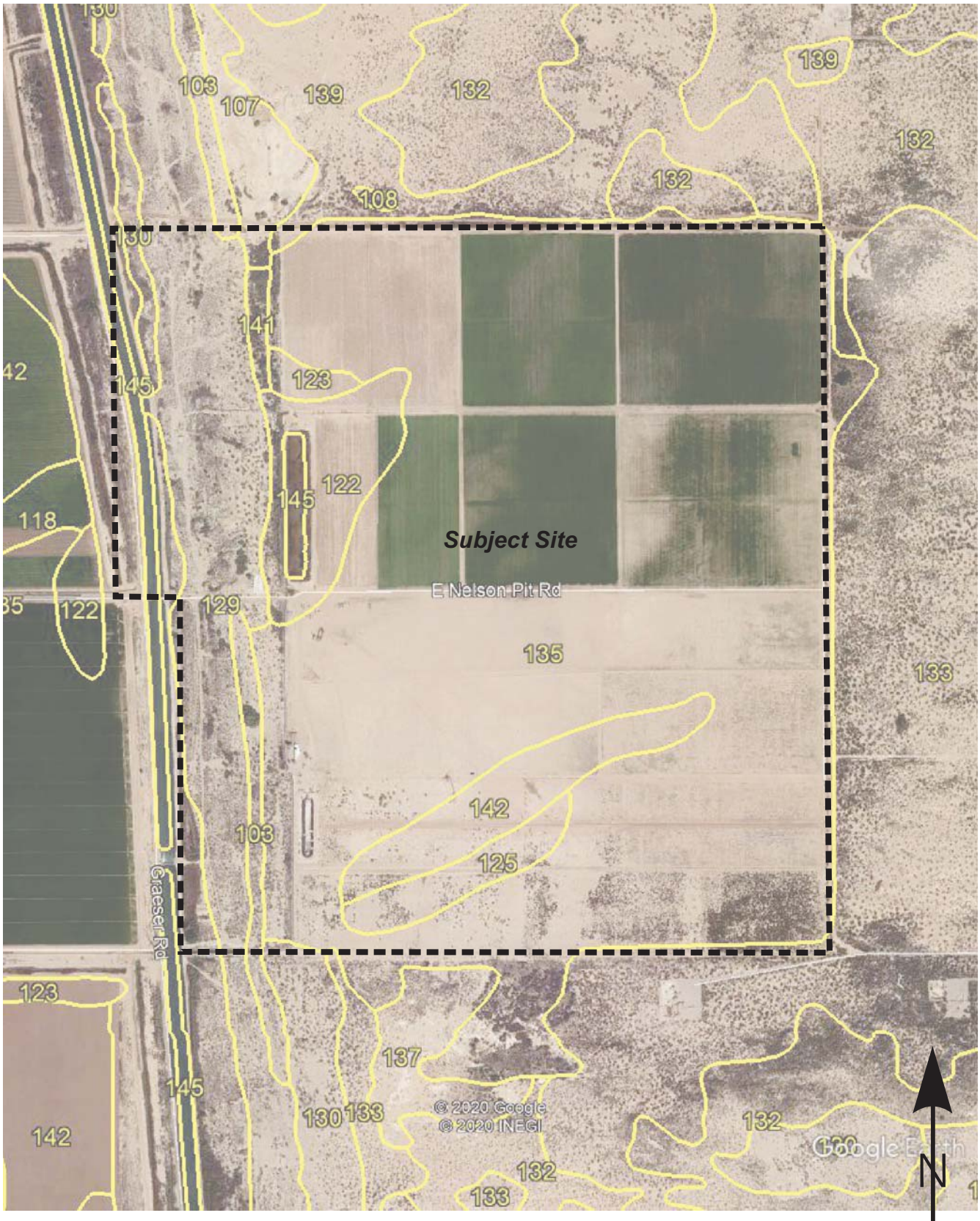
Plate 1



- Photo Location (See Photos Page)

N

GS Lyon Project No.: GS2026	Site Map	Plate 2



GS Lyon Project No.: GS2026	Soil Survey Map	Plate 3

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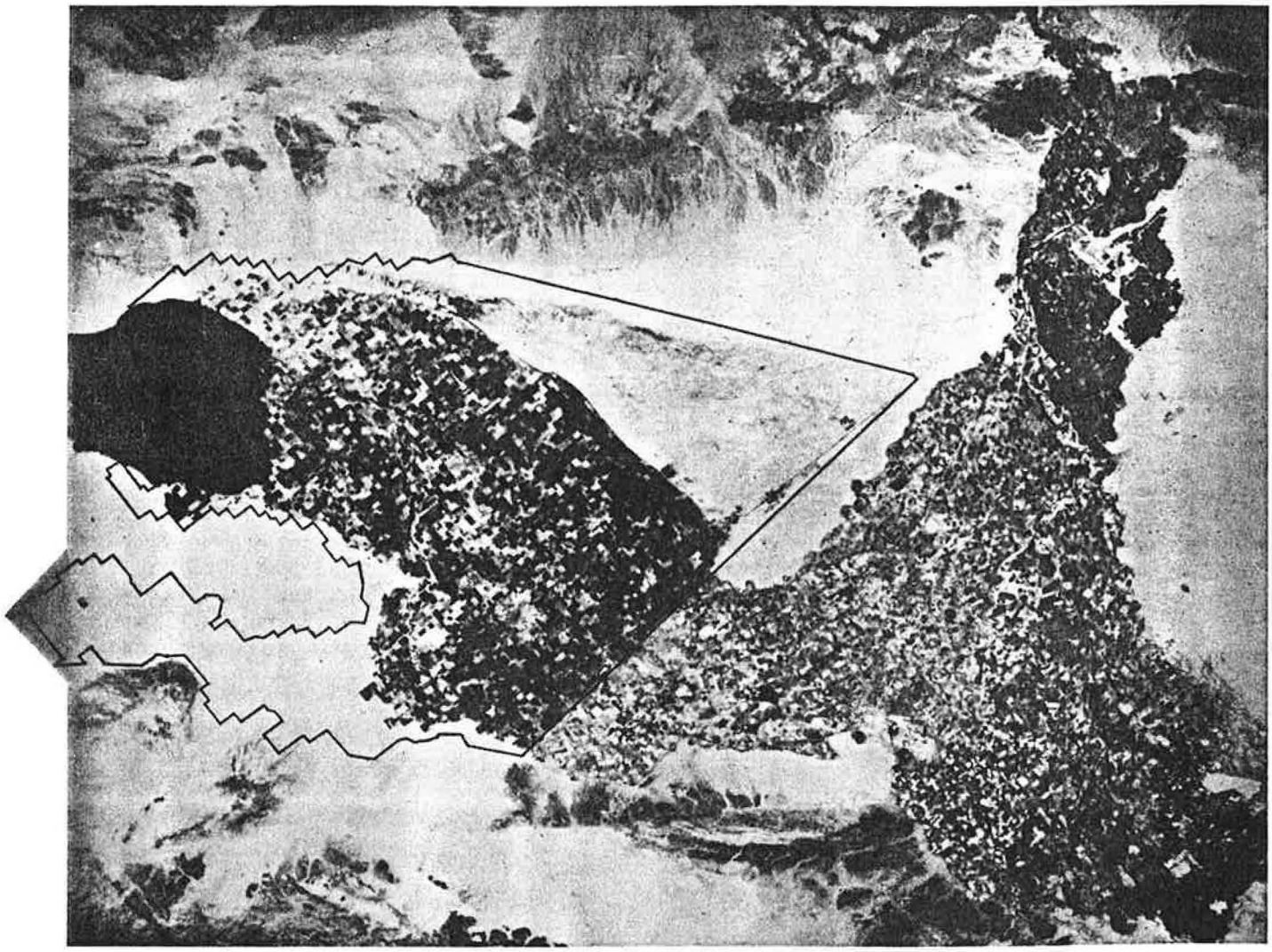
Soil Survey of

IMPERIAL COUNTY CALIFORNIA IMPERIAL VALLEY AREA



United States Department of Agriculture Soil Conservation Service
in cooperation with
University of California Agricultural Experiment Station
and
Imperial Irrigation District

TABLE 11.--ENGINEERING INDEX PROPERTIES

[The symbol > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
100---------- Antho	0-13	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	13-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
101*:											
Antho----------	0-8	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	8-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
Superstition------	0-6	Fine sand-------	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
102*. Badland											
103---------- Carsitas	0-10	Gravelly sand---	SP, SP-SM	A-1, A-2	0-5	60-90	50-85	30-55	0-10	---	NP
	10-60	Gravelly sand, gravelly coarse sand, sand.	SP, SP-SM	A-1	0-5	60-90	50-85	25-50	0-10	---	NP
104* Fluvaquents											
105---------- Glenbar	0-13	Clay loam-------	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
106---------- Glenbar	0-13	Clay loam-------	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
107*---------- Glenbar	0-13	Loam----------	ML, CL-ML, CL	A-4	0	100	100	100	70-80	20-30	NP-10
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	75-95	35-45	15-30
108---------- Holtville	0-14	Loam----------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	14-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
109---------- Holtville	0-17	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	17-24	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
110---------- Holtville	0-17	Silty clay------	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	17-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
111*:											
Holtville	0-10	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	10-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
Imperial	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
112	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
113	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay, clay, silty clay loam.	CH	A-7	0	100	100	100	85-95	50-70	25-45
114	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
115*:											
Imperial	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
116*:											
Imperial	0-13	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	13-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
117, 118	0-12	Loam	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Indio	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
119*:											
Indio	0-12	Loam	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Vint	0-10	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	25-35	---	NP
	10-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
120*	0-12	Loam	ML, CL-ML	A-4	0	100	95-100	75-85	55-65	20-30	NP-10
Laveen	12-60	Loam, very fine sandy loam.	ML, CL-ML	A-4	0	95-100	85-95	70-80	55-65	15-25	NP-10

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

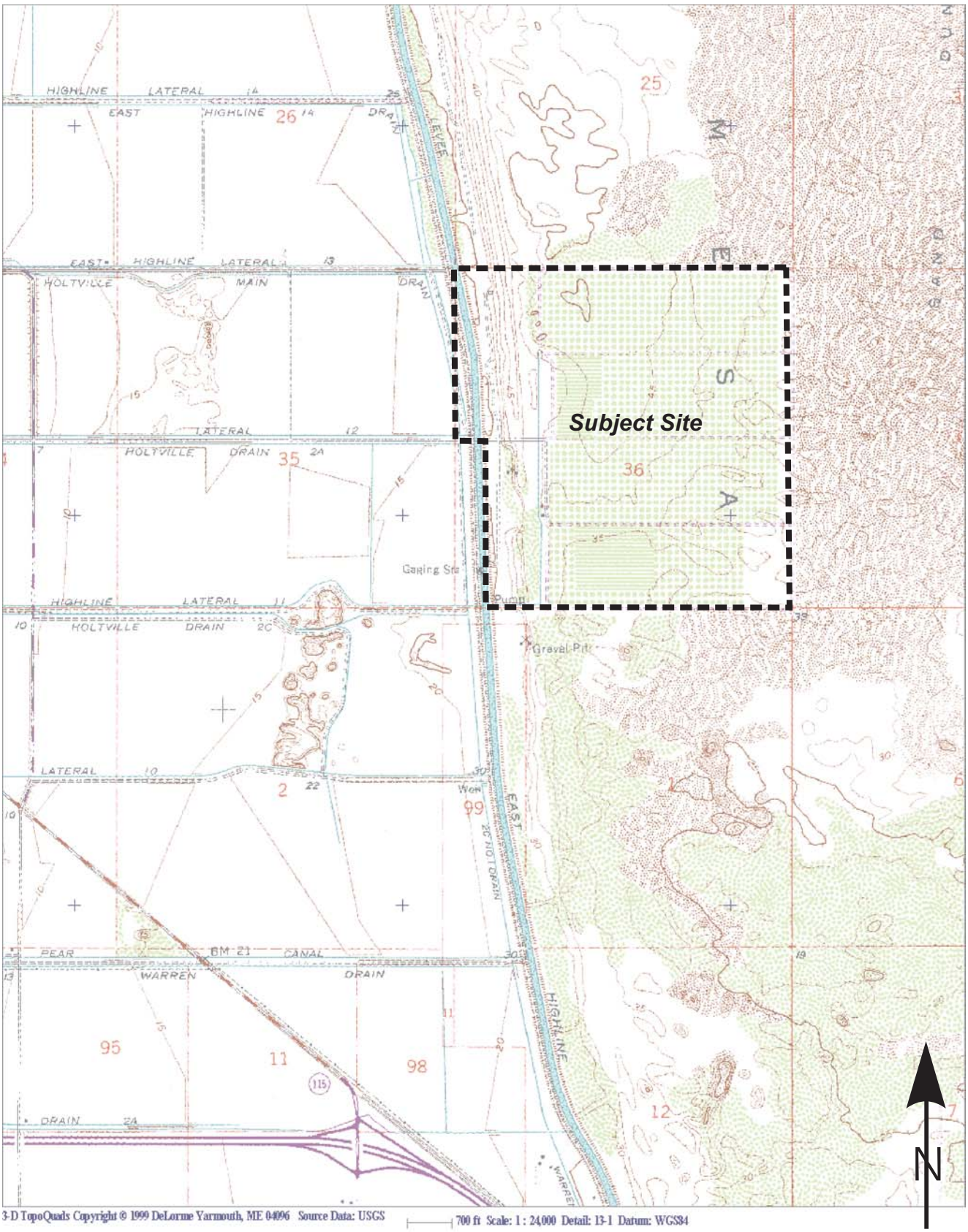
Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
121---------- Meloland	0-12	Fine sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	75-100	5-30	---	NP
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-65	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-40
122---------- Meloland	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
123*:											
Meloland----------	0-12	Loam----------	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-38	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
	38-60	Stratified silt loam to loamy fine sand.	SM, ML	A-4	0	100	100	75-100	35-55	25-35	NP-10
Holtville---------	0-12	Loam----------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	12-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-36	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	36-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
124, 125---------- Niland	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
126---------- Niland	0-23	Fine sand-------	SM, SP-SM	A-2, A-3	0	90-100	90-100	50-65	5-25	---	NP
	23-60	Silty clay------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
127---------- Niland	0-23	Loamy fine sand	SM	A-2	0	90-100	90-100	50-65	15-30	---	NP
	23-60	Silty clay------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
128*:											
Niland----------	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-100	40-65	20-40
Imperial----------	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
129*: Pits											
130, 131---------- Rositas	0-27	Sand----------	SP-SM	A-3, A-1, A-2	0	100	80-100	40-70	5-15	---	NP
	27-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
132, 133, 134, 135-Rositas	0-9	Fine sand-------	SM	A-3, A-2	0	100	80-100	50-80	10-25	---	NP
	9-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
136----------	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
Rositas	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
137----------	0-12	Silt loam-------	ML	A-4	0	100	100	90-100	70-90	20-30	NP-5
Rositas	12-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
138*:											
Rositas----------	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
Superstition------	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
139----------	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
Superstition	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
140*:											
Torriorthents											
Rock outcrop											
141*:											
Torriorthents											
Orthids											
142----------	0-10	Loamy very fine sand.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
Vint	10-60	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
143----------	0-12	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-85	45-55	15-25	NP-5
Vint	12-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
144*:											
Vint----------	0-10	Very fine sandy loam.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
	10-40	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
	40-60	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
Indio----------	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-40	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	40-72	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35

* See description of the map unit for composition and behavior characteristics of the map unit.



GS Lyon Project No.: GS2026	Topographic Map	Plate 4

APPENDIX C

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Vikings Solar

Nelson Pit Road At East Highline Canal

Winterhaven, CA 92283

Inquiry Number: 6320675.11

January 06, 2021

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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EDR Aerial Photo Decade Package

01/06/21

Site Name:

Vikings Solar
Nelson Pit Road At East Highli
Winterhaven, CA 92283
EDR Inquiry # 6320675.11

Client Name:

GS Lyon Consultants
780 N. Fourth Street
El Centro, CA 92243
Contact: Steven Williams

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Search Results:

Year	*Scale*	*Details*	*Source*
2016	1"=750'	Flight Year: 2016	USDA/NAIP
2012	1"=750'	Flight Year: 2012	USDA/NAIP
2009	1"=750'	Flight Year: 2009	USDA/NAIP
2006	1"=750'	Flight Year: 2006	USDA/NAIP
2002	1"=750'	Acquisition Date: January 01, 2002	USGS/DOQQ
1996	1"=750'	Acquisition Date: June 16, 1996	USGS/DOQQ
1985	1"=750'	Flight Date: July 24, 1985	USDA
1976	1"=750'	Flight Date: January 01, 1976	USGS
1953	1"=750'	Flight Date: April 07, 1953	USDA
1949	1"=750'	Flight Date: February 17, 1949	USDA
1937	1"=750'	Flight Date: November 22, 1937	USDA

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INQUIRY #: 6320675.11

YEAR: 1937

= 750'

N

EDR

INQUIRY #: 6320675.11

YEAR: 1949

= 750'

N

EDR

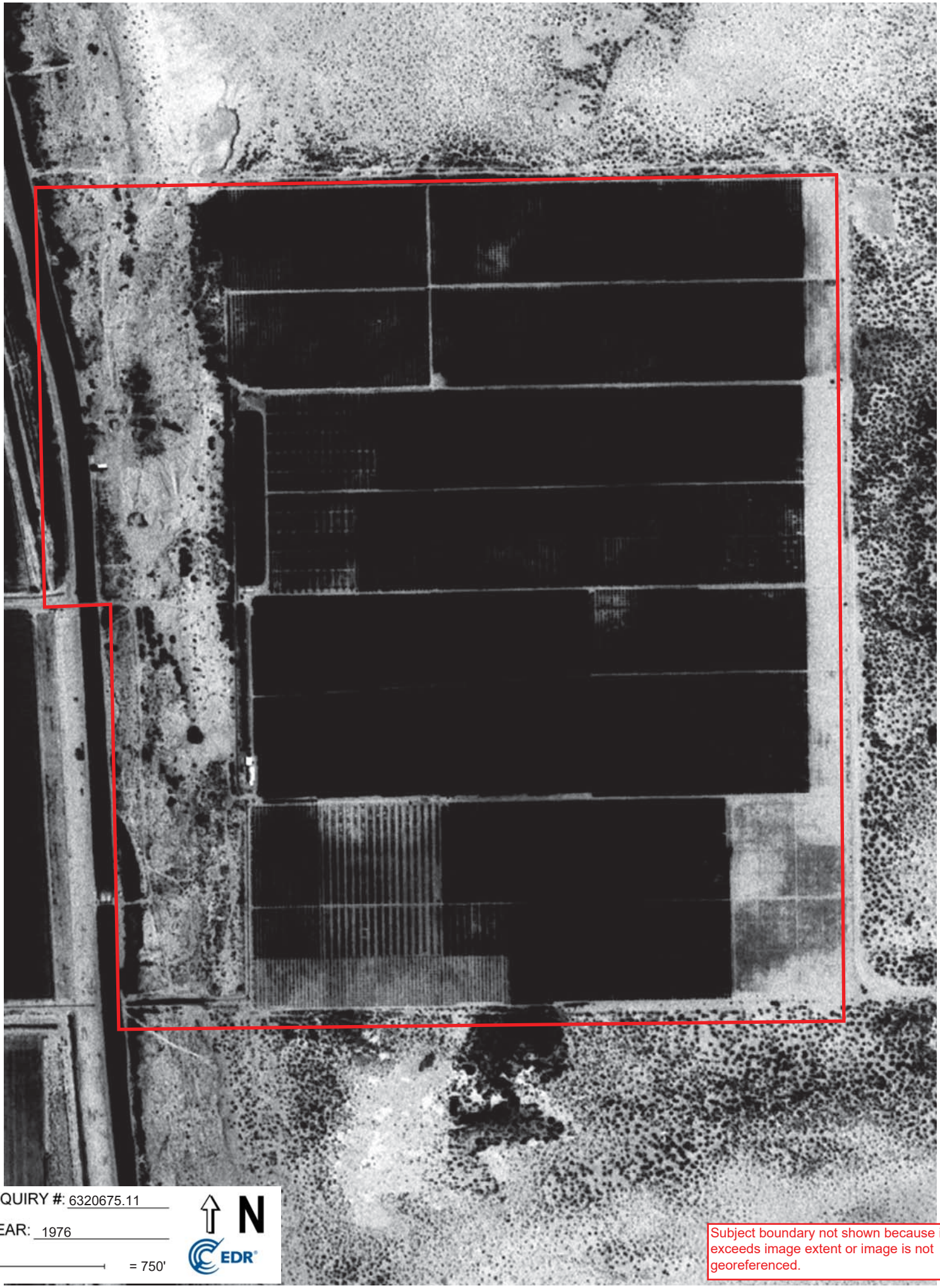
INQUIRY #: 6320675.11

YEAR: 1953

= 750'

N

EDR



INQUIRY #: 6320675.11

YEAR: 1976

= 750'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.

INQUIRY #: 6320675.11

YEAR: 1985

= 750'

N

EDR

INQUIRY #: 6320675.11

YEAR: 1996

= 750'

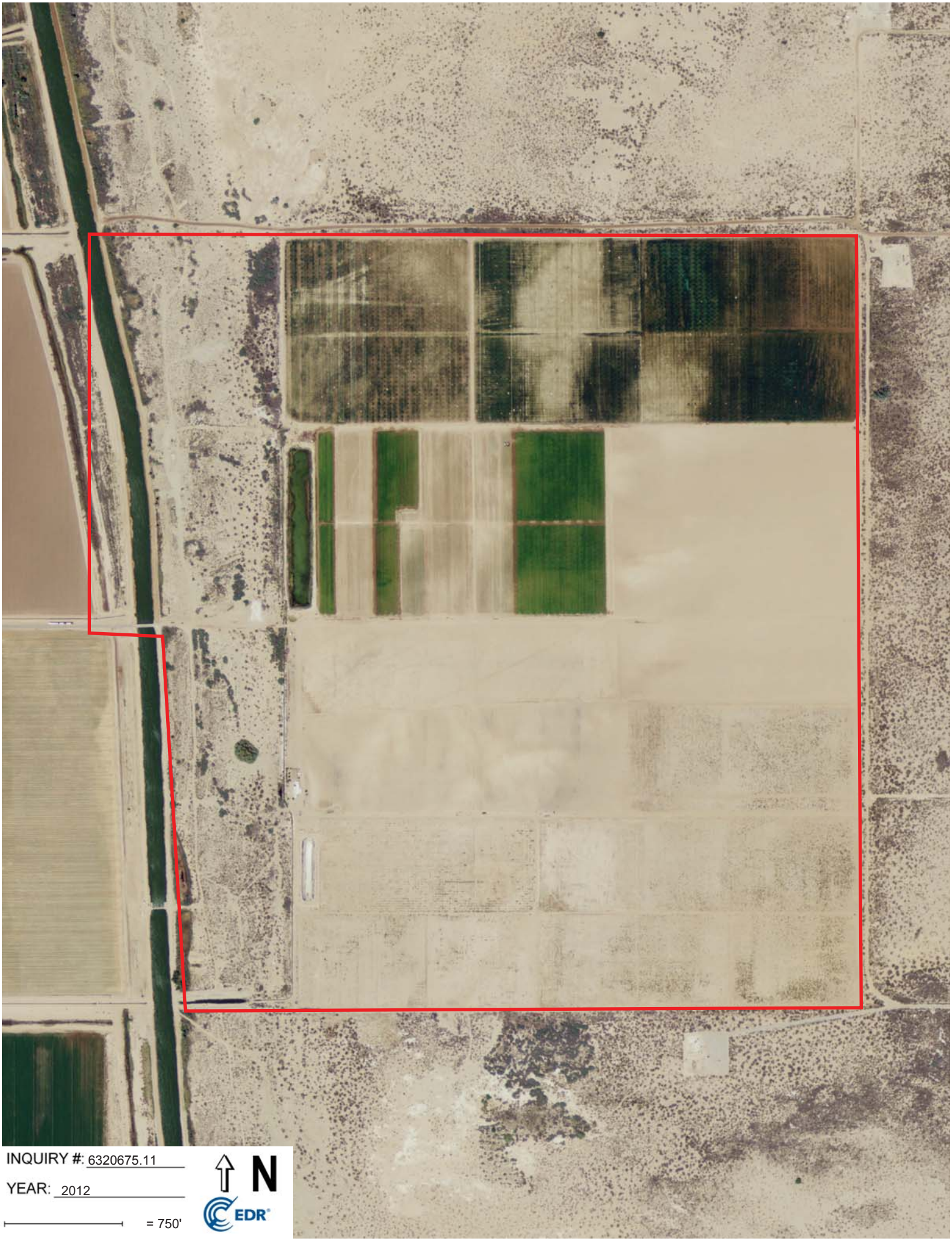
N

EDR

INQUIRY #: 6320675.11
YEAR: 2002
= 750'
N
EDR

INQUIRY #: 6320675.11
YEAR: 2006
= 750'
N
EDR

INQUIRY #: 6320675.11
YEAR: 2009
= 750'
N
EDR


INQUIRY #: 6320675.11
YEAR: 2012
= 750'
N
EDR

INQUIRY #: 6320675.11
YEAR: 2016
= 750'
N
EDR

APPENDIX D

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Vikings Solar

Nelson Pit Road At East Highline Canal

Winterhaven, CA 92283

Inquiry Number: 6320675.4

January 05, 2021

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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EDR Historical Topo Map Report

01/05/21

Site Name:	Client Name:
Vikings Solar	GS Lyon Consultants
Nelson Pit Road At East Highli	780 N. Fourth Street
Winterhaven, CA 92283	El Centro, CA 92243
EDR Inquiry # 6320675.4	Contact: Steven Williams

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Search Results:		*Coordinates:*	
P.O.#	GS2026	**Latitude:**	32.8033 32° 48' 12" North
Project:	Vikings Solar Site	**Longitude:**	-115.27 -115° 16' 12" West
		UTM Zone:	Zone 11 North
		UTM X Meters:	661977.28
		UTM Y Meters:	3630806.16
		Elevation:	44.00' above sea level

Maps Provided:

2012
1979
1955, 1957
1954, 1957
1947
1945
1940
1907

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Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets

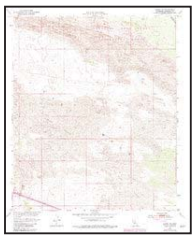
Holtville East

7.5-minute, 24000

Glamis SW

7.5-minute, 24000

1979 Source Sheets



Glamis SW

7.5-minute, 24000
Aerial Photo Revised 1976

Holtville East

7.5-minute, 24000
Aerial Photo Revised 1976

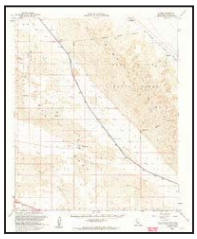
GLAMIS SW

7.5-minute, 24000

HOLTVILLE EAST

7.5-minute, 24000

1955, 1957 Source Sheets



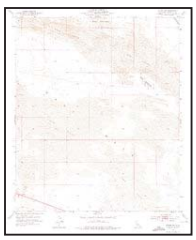
Glamis

15-minute, 62500
Aerial Photo Revised 1948

Holtville

15-minute, 62500
Aerial Photo Revised 1953

1954, 1957 Source Sheets



Glamis SW

7.5-minute, 24000

Holtville East

7.5-minute, 24000
Aerial Photo Revised 1953

Topo Sheet Key

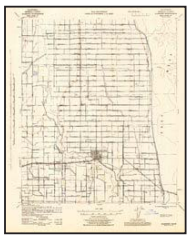
This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1947 Source Sheets

ALAMORIO

15-minute, 50000

1945 Source Sheets



Alamorio

15-minute, 62500
Aerial Photo Revised 1940

1940 Source Sheets

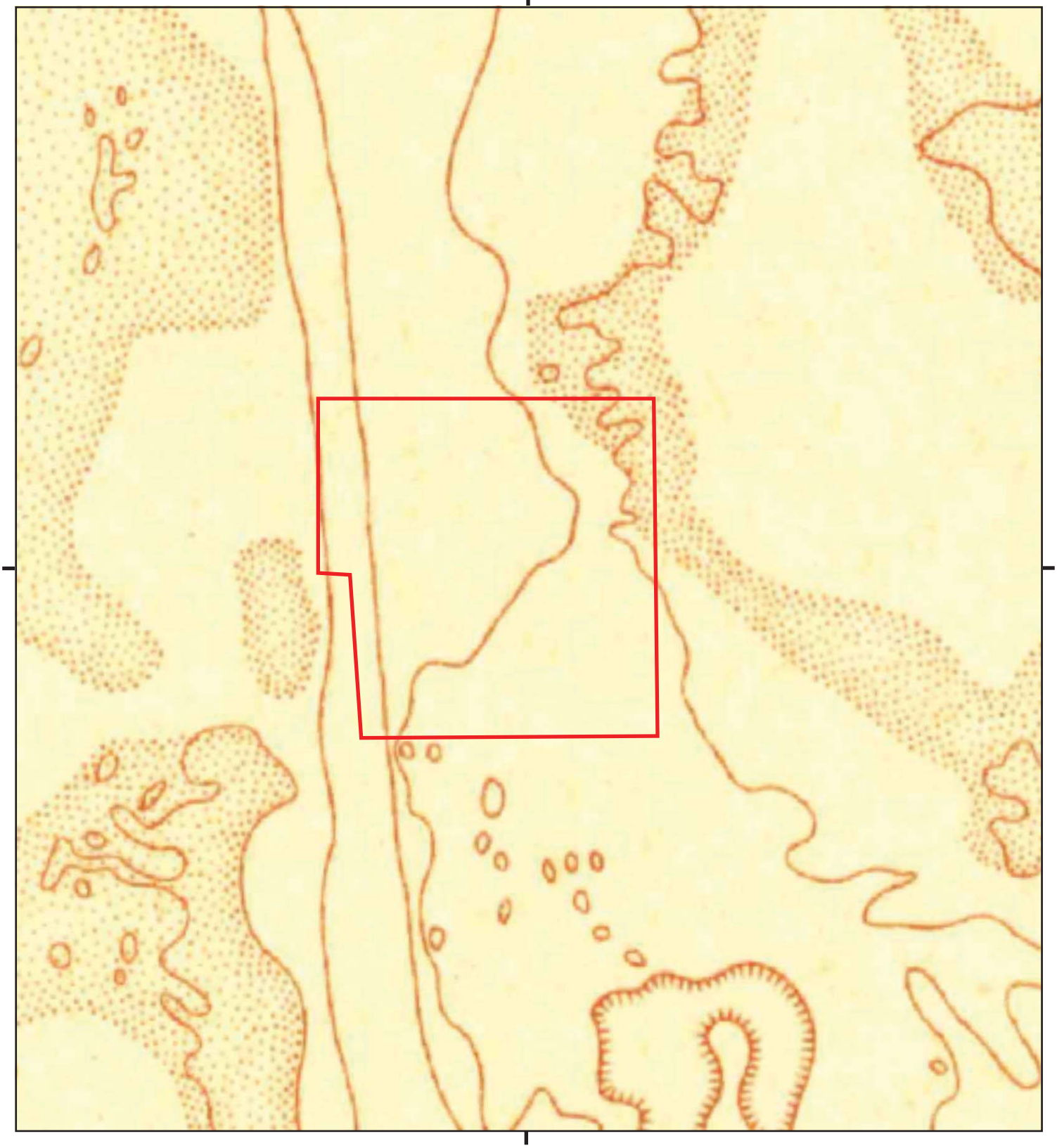
Alamorio

15-minute, 62500
Aerial Photo Revised 1940

1907 Source Sheets

Holtville

30-minute, 125000



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

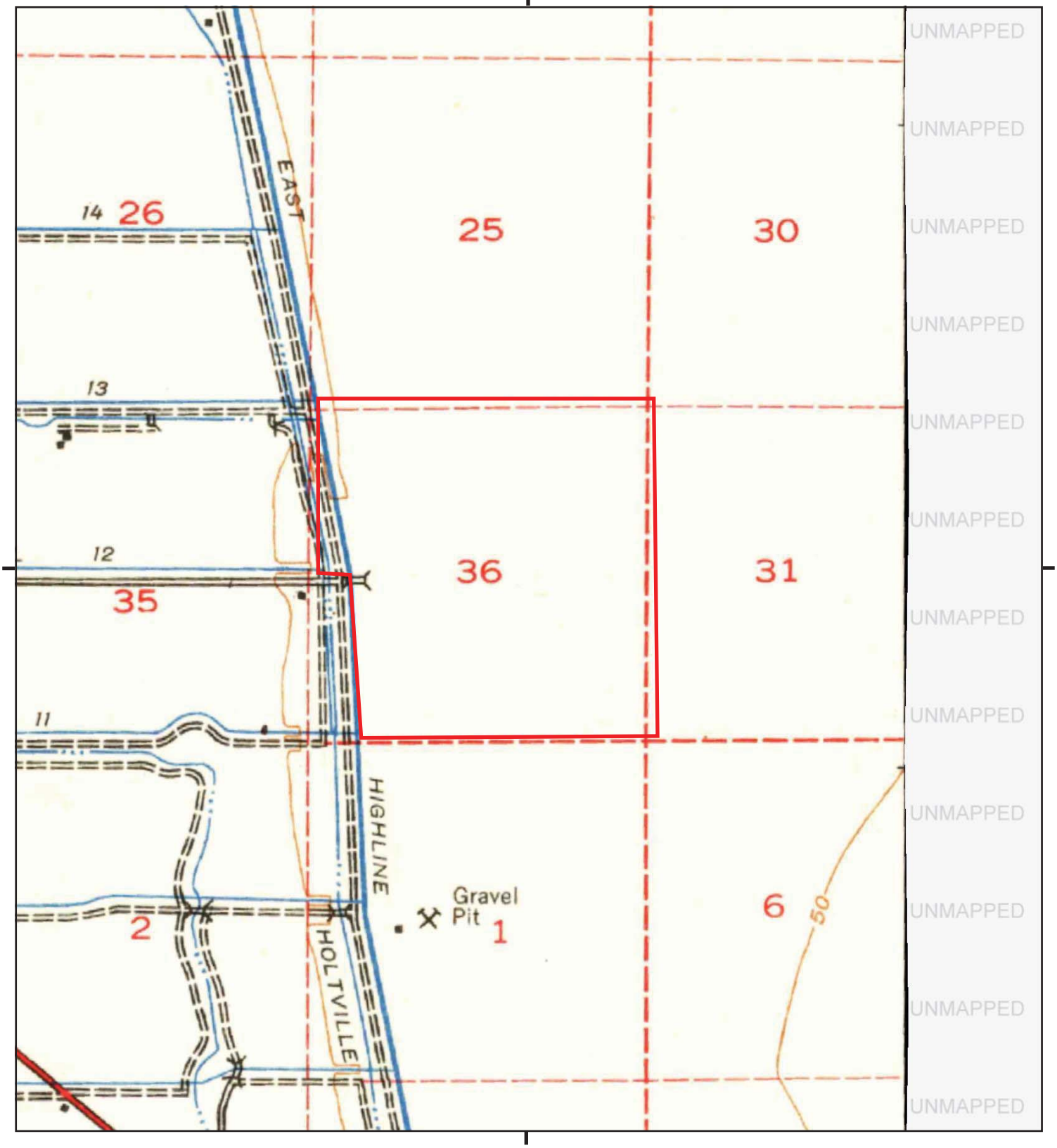
TP, Holtville, 1907, 30-minute

SITE NAME: Vikings Solar
ADDRESS: Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283
CLIENT: GS Lyon Consultants

N

Historical Topo Map

1940



This report includes information from the following map sheet(s).

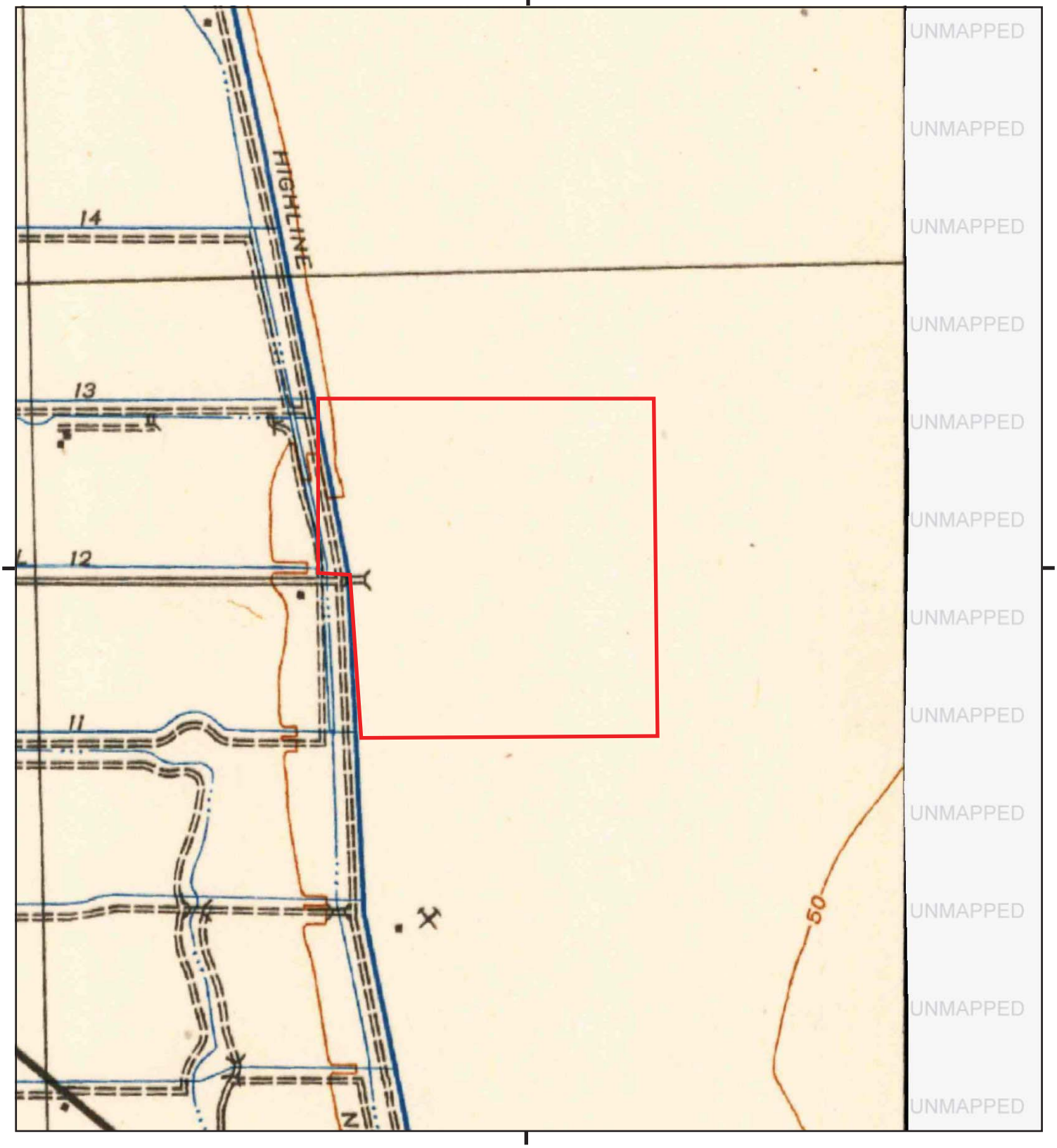
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Alamorio, 1940, 15-minute

SITE NAME: Vikings Solar
ADDRESS: Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283
CLIENT: GS Lyon Consultants

N



This report includes information from the following map sheet(s).

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NW N NE
W E
SW S SE

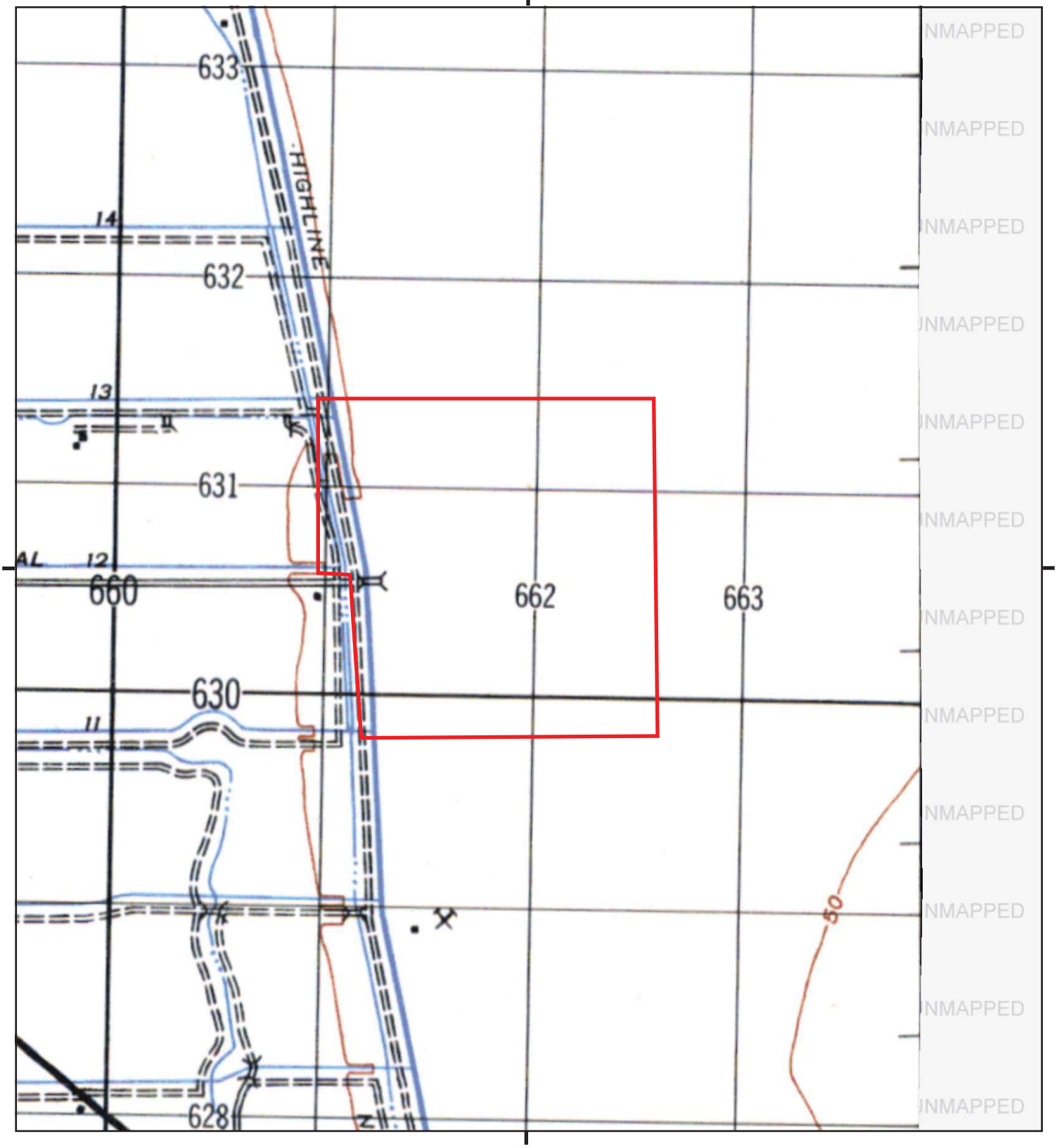
TP, Alamorio, 1945, 15-minute

SITE NAME: Vikings Solar
ADDRESS: Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283
CLIENT: GS Lyon Consultants

N

Historical Topo Map

1947



This report includes information from the following map sheet(s).

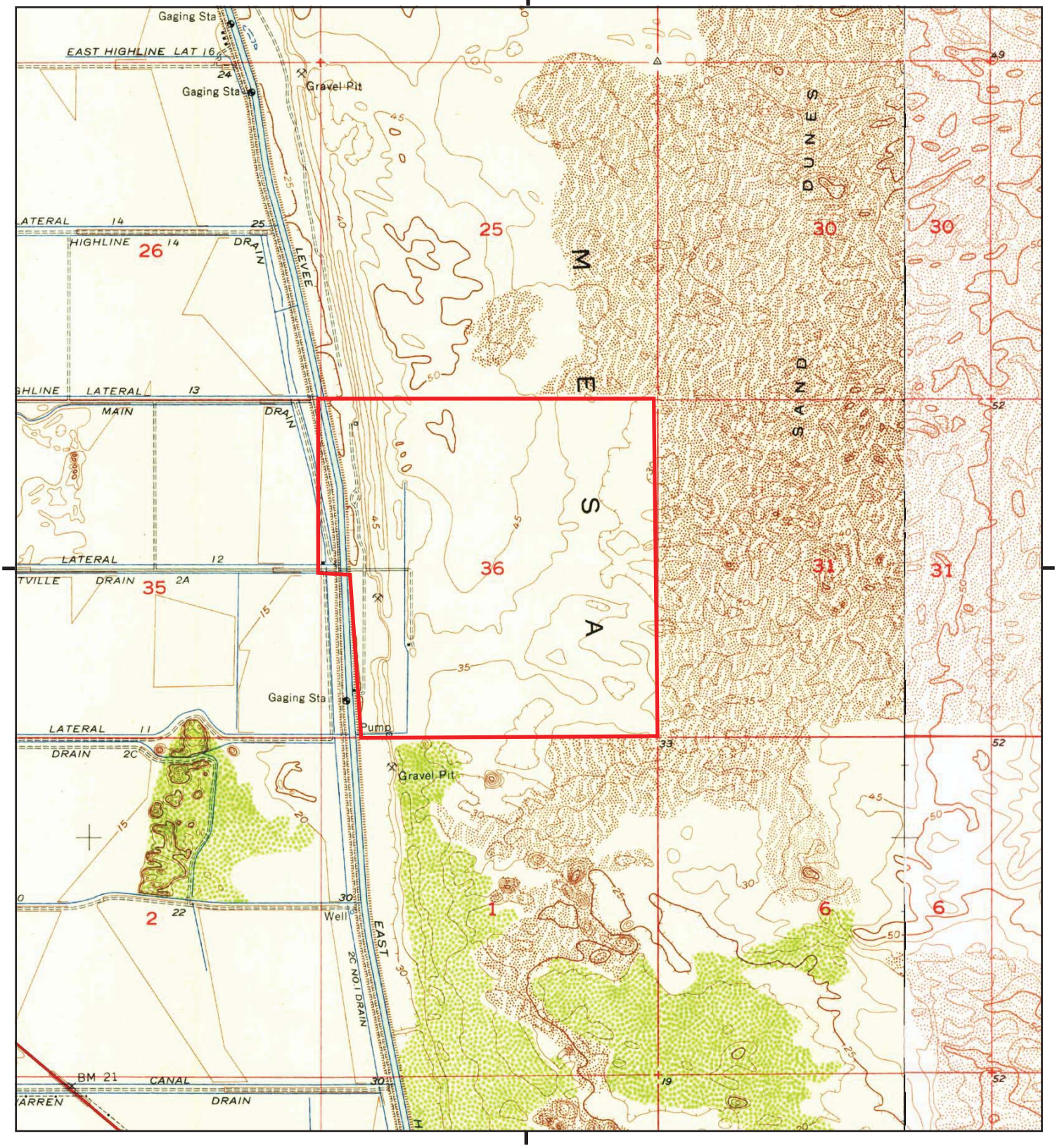
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, ALAMORIO, 1947, 15-minute

SITE NAME: Vikings Solar
ADDRESS: Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283
CLIENT: GS Lyon Consultants

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

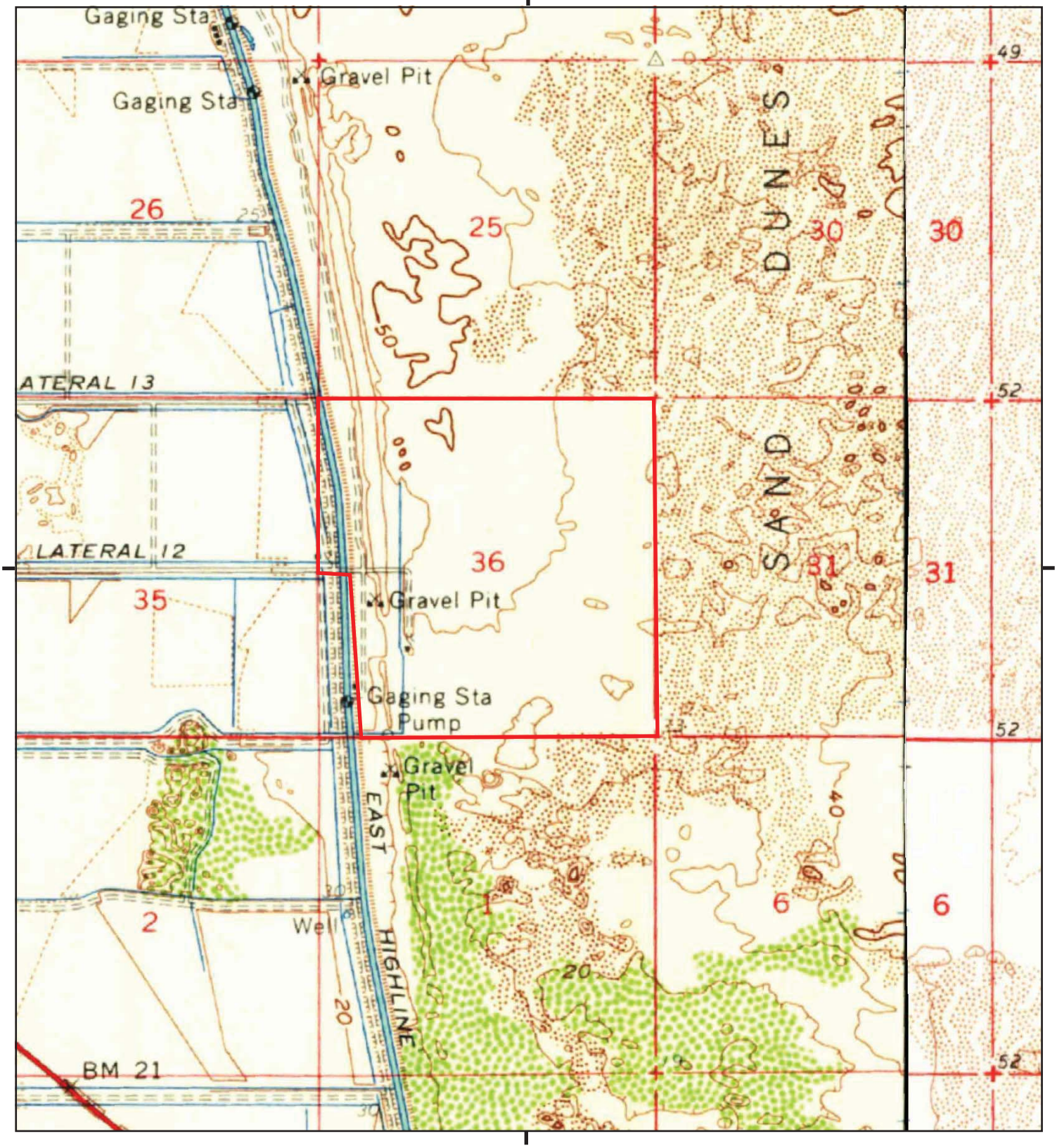
TP, Holtville East, 1957, 7.5-minute
E, Glamis SW, 1954, 7.5-minute

SITE NAME: Vikings Solar
ADDRESS: Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283
CLIENT: GS Lyon Consultants

N

Historical Topo Map

1955, 1957



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Holtville, 1957, 15-minute
NE, Glamis, 1955, 15-minute

SITE NAME: Vikings Solar
ADDRESS: Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283
CLIENT: GS Lyon Consultants

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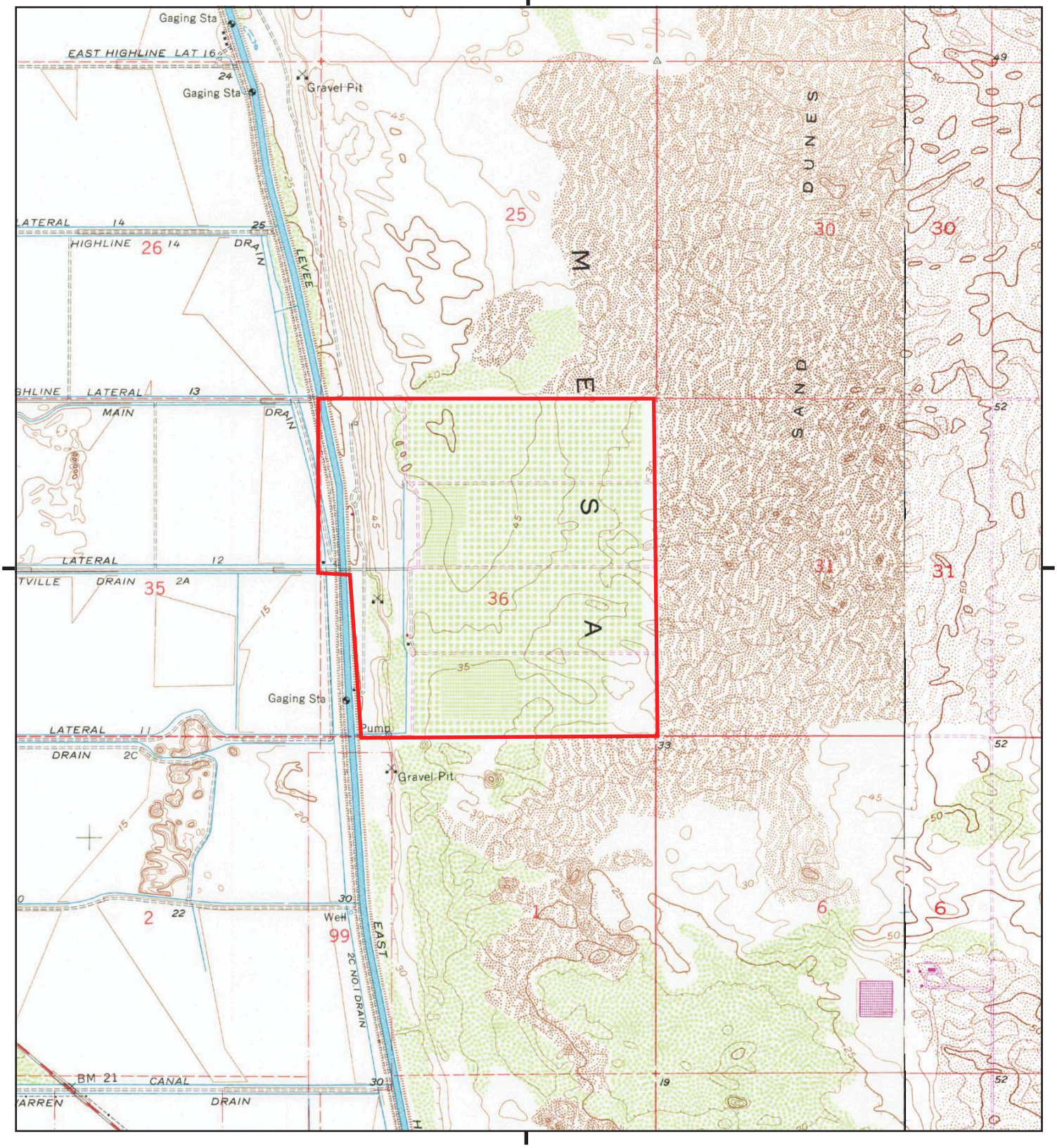


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

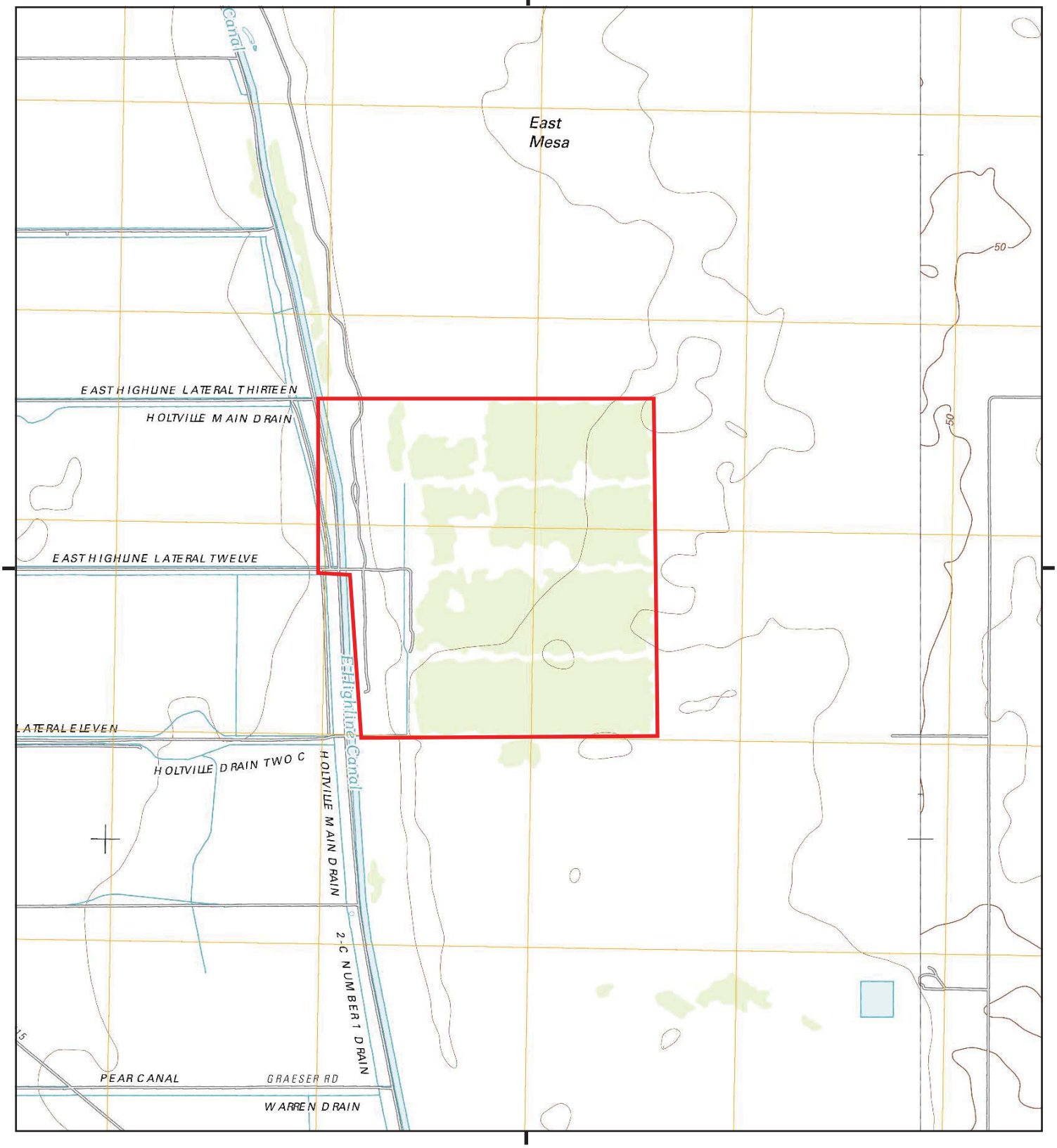
TP, Holtville East, 1979, 7.5-minute
E, Glamis SW, 1979, 7.5-minute
E, GLAMIS SW, 1979, 7.5-minute
TP, HOLTVILLE EAST, 1979, 7.5-minute

SITE NAME: Vikings Solar
ADDRESS: Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283
CLIENT: GS Lyon Consultants

N

Historical Topo Map

2012



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0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Holtville East, 2012, 7.5-minute
E, Glamis SW, 2012, 7.5-minute

SITE NAME: Vikings Solar
ADDRESS: Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283
CLIENT: GS Lyon Consultants

N

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APPENDIX E

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Vikings Solar

Nelson Pit Road At East Highline Canal

Winterhaven, CA 92283

Inquiry Number: 6320675.3

January 05, 2021

Certified Sanborn® Map Report

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Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Certified Sanborn® Map Report

01/05/21

Site Name:

Vikings Solar
Nelson Pit Road At East Highlir
Winterhaven, CA 92283
EDR Inquiry # 6320675.3

Client Name:

GS Lyon Consultants
780 N. Fourth Street
El Centro, CA 92243
Contact: Steven Williams

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The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 9884-4591-9BEB

PO # GS2026

Project Vikings Solar Site

UNMAPPED PROPERTY

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Sanborn® Library search results

Certification #: 9884-4591-9BEB

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- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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APPENDIX F

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Vikings Solar
Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283

Inquiry Number: 6320675.2s
January 05, 2021

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Detail Map	3
Map Findings Summary	4
Map Findings	9
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Physical Setting Source Summary	A-2
Physical Setting SSURGO Soil Map	A-5
Physical Setting Source Map	A-8
Physical Setting Source Map Findings	A-10
Physical Setting Source Records Searched	PSGR-1

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with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

NELSON PIT ROAD AT EAST HIGHLINE CANAL
WINTERHAVEN, CA 92283

COORDINATES

Latitude (North):	32.8033000 - 32° 48' 11.88''
Longitude (West):	115.2700000 - 115° 16' 12.00''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	661980.8
UTM Y (Meters):	3630615.8
Elevation:	44 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5622978 HOLTVILLE EAST, CA
Version Date:	2012
East Map:	5622970 GLAMIS SW, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140606, 20140805
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
NELSON PIT ROAD AT EAST HIGHLINE CANAL
WINTERHAVEN, CA 92283

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	J.B. NELSON-SOUTH PL		MINES MRDS	Higher	1 ft.
2	J B NELSON SOUTH		MINES MRDS	Lower	1 ft.
3	HIGHLINE PIT		MINES MRDS	Lower	1 ft.

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROLS..... Institutional Controls Sites List

Federal ERNS list

ERNS..... Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE..... State Response Sites

State- and tribal - equivalent CERCLIS

ENVIROSTOR..... EnviroStor Database

State and tribal landfill and/or solid waste disposal site lists

SWF/LF..... Solid Waste Information System

State and tribal leaking storage tank lists

LUST..... Geotracker's Leaking Underground Fuel Tank Report
INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land
CPS-SLIC..... Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing
UST..... Active UST Facilities
AST..... Aboveground Petroleum Storage Tank Facilities
INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP..... Voluntary Cleanup Priority Listing
VCP..... Voluntary Cleanup Program Properties

State and tribal Brownfields sites

BROWNFIELDS..... Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT..... Waste Management Unit Database
SWRCY..... Recycler Database
HAULERS..... Registered Waste Tire Haulers Listing
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
ODI..... Open Dump Inventory

DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS ---------- Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---------- Delisted National Clandestine Laboratory Register
HIST Cal-Sites ---------- Historical Calsites Database
SCH ---------- School Property Evaluation Program
CDL ---------- Clandestine Drug Labs
Toxic Pits ---------- Toxic Pits Cleanup Act Sites
CERS HAZ WASTE ---------- CERS HAZ WASTE
US CDL ---------- National Clandestine Laboratory Register
PFAS ---------- PFAS Contamination Site Location Listing

Local Lists of Registered Storage Tanks

SWEEPS UST ---------- SWEEPS UST Listing
HIST UST ---------- Hazardous Substance Storage Container Database
CERS TANKS ---------- California Environmental Reporting System (CERS) Tanks
CA FID UST ---------- Facility Inventory Database

Local Land Records

LIENS ---------- Environmental Liens Listing
LIENS 2 ---------- CERCLA Lien Information
DEED ---------- Deed Restriction Listing

Records of Emergency Release Reports

HMIRS ---------- Hazardous Materials Information Reporting System
CHMIRS ---------- California Hazardous Material Incident Report System
LDS ---------- Land Disposal Sites Listing
MCS ---------- Military Cleanup Sites Listing
SPILLS 90 ---------- SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR ---------- RCRA - Non Generators / No Longer Regulated
FUDS ---------- Formerly Used Defense Sites
DOD ---------- Department of Defense Sites
SCRD DRYCLEANERS ---------- State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ---------- Financial Assurance Information
EPA WATCH LIST ---------- EPA WATCH LIST
2020 COR ACTION ---------- 2020 Corrective Action Program List
TSCA ---------- Toxic Substances Control Act
TRIS ---------- Toxic Chemical Release Inventory System
SSTS ---------- Section 7 Tracking Systems
ROD ---------- Records Of Decision
RMP ---------- Risk Management Plans
RAATS ---------- RCRA Administrative Action Tracking System
PRP ---------- Potentially Responsible Parties
PADS ---------- PCB Activity Database System
ICIS ---------- Integrated Compliance Information System
FTTS ---------- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

MLTS Material Licensing Tracking System
COAL ASH DOE Steam-Electric Plant Operation Data
COAL ASH EPA Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER PCB Transformer Registration Database
RADINFO Radiation Information Database
HIST FTTS FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS Incident and Accident Data
CONSENT Superfund (CERCLA) Consent Decrees
INDIAN RESERV Indian Reservations
FUSRAP Formerly Utilized Sites Remedial Action Program
UMTRA Uranium Mill Tailings Sites
LEAD SMELTERS Lead Smelter Sites
US AIRS Aerometric Information Retrieval System Facility Subsystem
US MINES Mines Master Index File
ABANDONED MINES Abandoned Mines
FINDS Facility Index System/Facility Registry System
UXO Unexploded Ordnance Sites
DOCKET HWC Hazardous Waste Compliance Docket Listing
ECHO Enforcement & Compliance History Information
FUELS PROGRAM EPA Fuels Program Registered Listing
CA BOND EXP. PLAN Bond Expenditure Plan
Cortese "Cortese" Hazardous Waste & Substances Sites List
CUPA Listings CUPA Resources List
DRYCLEANERS Cleaner Facilities
EMI Emissions Inventory Data
ENF Enforcement Action Listing
Financial Assurance Financial Assurance Information Listing
HAZNET Facility and Manifest Data
ICE ICE
HIST CORTESE Hazardous Waste & Substance Site List
HWP EnviroStor Permitted Facilities Listing
HWT Registered Hazardous Waste Transporter Database
MINES Mines Site Location Listing
MWMP Medical Waste Management Program Listing
NPDES NPDES Permits Listing
PEST LIC Pesticide Regulation Licenses Listing
PROC Certified Processors Database
Notify 65 Proposition 65 Records
UIC UIC Listing
UIC GEO UIC GEO (GEOTRACKER)
WASTEWATER PITS Oil Wastewater Pits Listing
WDS Waste Discharge System
WIP Well Investigation Program Case List
MILITARY PRIV SITES MILITARY PRIV SITES (GEOTRACKER)
PROJECT PROJECT (GEOTRACKER)
WDR Waste Discharge Requirements Listing
CIWQS California Integrated Water Quality System
CERS CERS
NON-CASE INFO NON-CASE INFO (GEOTRACKER)
OTHER OIL GAS OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS PROD WATER PONDS (GEOTRACKER)
SAMPLING POINT SAMPLING POINT (GEOTRACKER)
WELL STIM PROJ Well Stimulation Project (GEOTRACKER)
HWTS Hazardous Waste Tracking System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP EDR Proprietary Manufactured Gas Plants

EXECUTIVE SUMMARY

EDR Hist Auto---------- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner---------- EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF---------- Recovered Government Archive Solid Waste Facilities List
RGA LUST---------- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

MINES MRDS: Mineral Resources Data System

A review of the MINES MRDS list, as provided by EDR, and dated 04/06/2018 has revealed that there are 3 MINES MRDS sites within approximately 0.001 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
J.B. NELSON-SOUTH PL		0 - 1/8 (0.000 mi.)	1	9

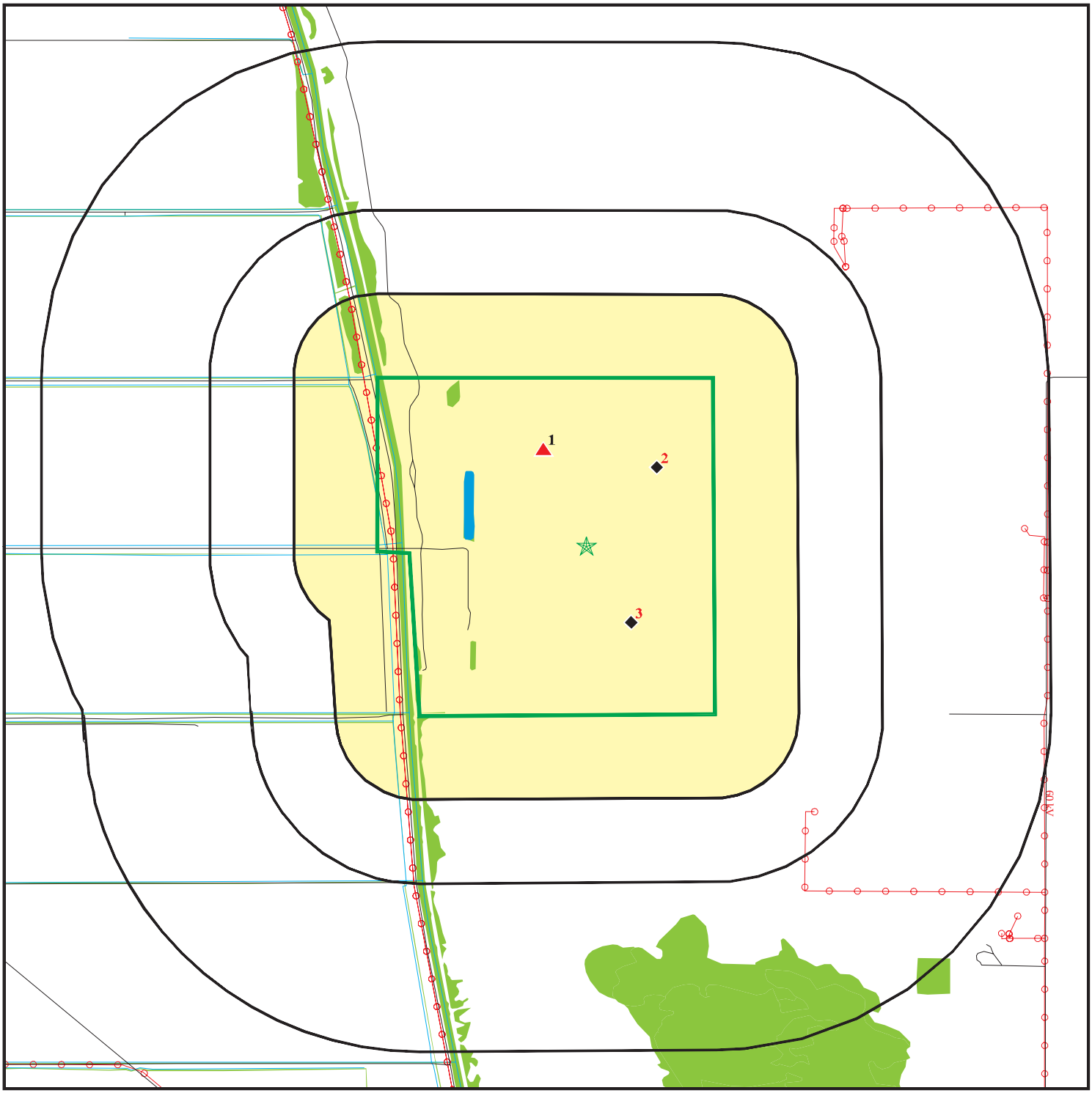
Lower Elevation	Address	Direction / Distance	Map ID	Page
J B NELSON SOUTH		0 - 1/8 (0.000 mi.)	2	10
HIGHLINE PIT		0 - 1/8 (0.000 mi.)	3	11

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 1 records.

Site Name	Database(s)
	CDL

OVERVIEW MAP - 6320675.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites

0 1/4 1/2 1 Miles

- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Vikings Solar	CLIENT:	GS Lyon Consultants
ADDRESS:	Nelson Pit Road At East Highline Canal Winterhaven CA 92283	CONTACT:	Steven Williams
		INQUIRY #:	6320675.2s
LAT/LONG:	32.8033 / 115.27	DATE:	January 05, 2021 2:37 pm

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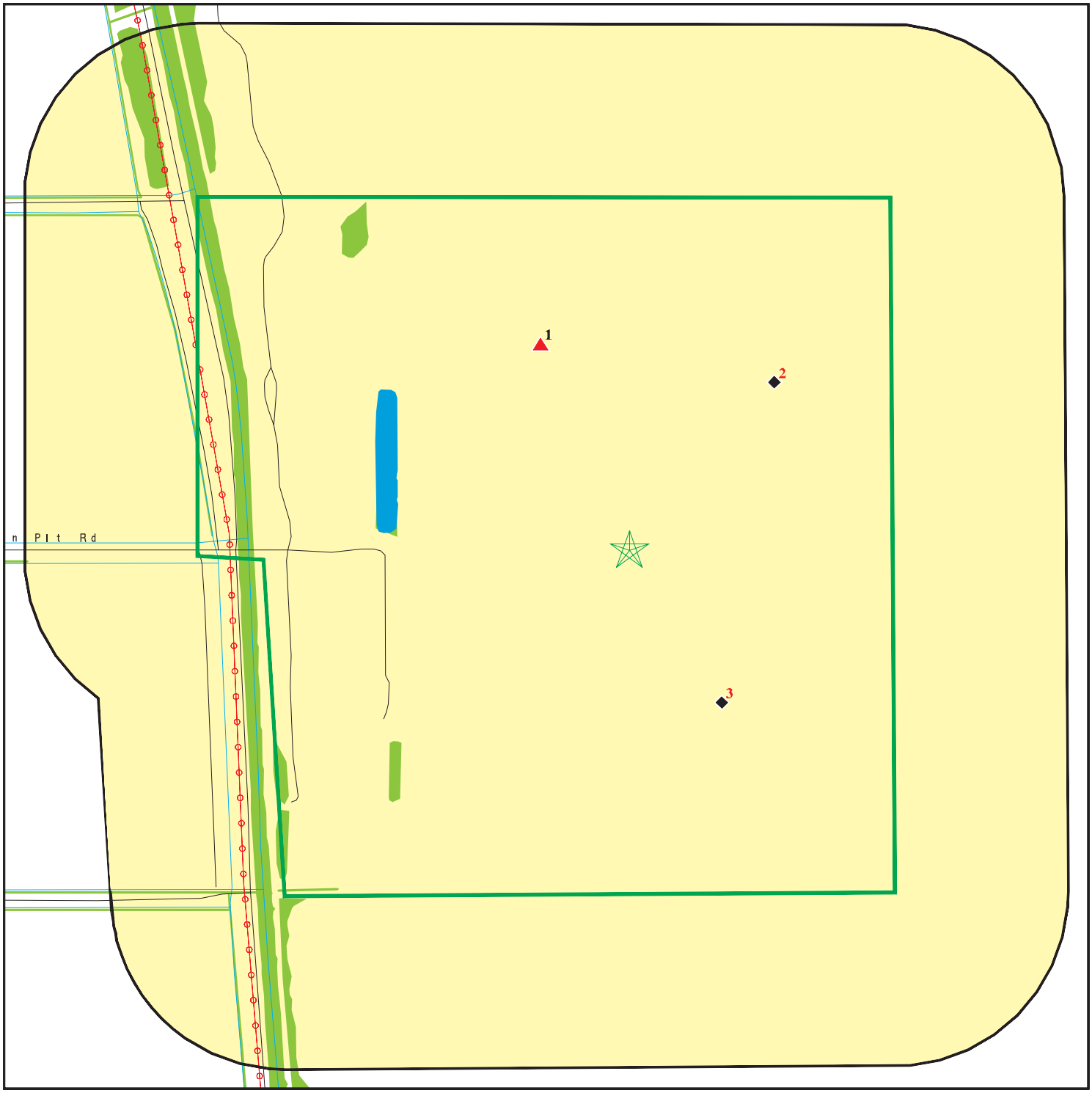
DETAIL MAP - 6320675.2S



Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
Sensitive Receptors
National Priority List Sites
Dept. Defense Sites

0 1/8 1/4 1/2 Miles

Indian Reservations BIA
Power transmission lines
Special Flood Hazard Area (1%)
0.2% Annual Chance Flood Hazard
National Wetland Inventory
State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Vikings Solar	CLIENT:	GS Lyon Consultants
ADDRESS:	Nelson Pit Road At East Highline Canal Winterhaven CA 92283	CONTACT:	Steven Williams
LAT/LONG:	32.8033 / 115.27	INQUIRY #:	6320675.2s
		DATE:	January 05, 2021 2:37 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
CERS HAZ WASTE	0.250		0	0	NR	NR	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
PFAS	0.500		0	0	0	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	0	NR	NR	NR	0
CERS TANKS	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HAZNET	0.001		0	NR	NR	NR	NR	0
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	0	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
PEST LIC	0.001		0	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WDR	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
CERS	0.001		0	NR	NR	NR	NR	0
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
MINES MRDS	0.001		3	NR	NR	NR	NR	3
HWTS	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	3	0	0	0	0	3

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1 **J.B. NELSON-SOUTH PLANT** **MINES MRDS** **1025560644**
N/A

< 1/8
1 ft. **WINTERHAVEN, CA 92283**

Relative:
Higher

Actual:
49 ft.

MINES MRDS:

Name:	J.B. NELSON-SOUTH PLANT
Address:	Not reported
Deposit identification Number:	10064338
City,State,Zip:	WINTERHAVEN, CALIFORNIA 92283
URL:	https://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10064338
MRDS Identification Number:	TC38680
MAS/MILS Identification Number:	Not reported
Region:	NA
Country:	United States
Primary Commodities:	Sand and Gravel, Construction
Secondary Commodities:	Not reported
Tertiary Commodities:	Not reported
Operation Type:	Unknown
Deposit Type:	Sedimentary
Production Size:	Y - Yes, production has occurred
Development Status:	Producer
Ore Minerals or Materials:	Gravel
Gangue Minerals or Materials:	Not reported
Other Minerals or Materials:	Not reported
Ore Body Form:	BED
Workings Type:	Surface
Mineral Deposit Model:	Not reported
Alteration Processes:	Not reported
Concentration Processes:	Not reported
Previous Names:	Not reported
Ore Controls:	Not reported
Reporter:	Unkefer, Jason
Host Rock Unit Name:	Not reported
Host Rock Type:	Not reported
Associated Rock Unit Name:	Not reported
Associated Rock Type Code:	Not reported
Structural Characteristics:	Not reported
Tectonic Setting:	Not reported
References:	Not reported
First Production Year:	Not reported
Began Before/After FPY:	Not reported
Last Production Year:	Not reported
Ended Before/After LPY:	Not reported
Year Discovered:	Not reported
Found Before/After YD:	Not reported
Production History:	Not reported
Discovery Information:	Not reported
Latitude:	32.80757
Longitude:	-115.2722

2 **J B NELSON SOUTH** **MINES MRDS** **1025622809**
N/A

< 1/8
1 ft. **WINTERHAVEN, CA 92283**

Relative:
Lower

Actual:
38 ft.

MINES MRDS:

Name:	J B NELSON SOUTH
Address:	Not reported
Deposit identification Number:	10139544
City,State,Zip:	WINTERHAVEN, CALIFORNIA 92283
URL:	https://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10139544
MRDS Identification Number:	TC38680
MAS/MILS Identification Number:	0060250112
Region:	NA
Country:	United States
Primary Commodities:	Sand and Gravel, Construction
Secondary Commodities:	Not reported
Tertiary Commodities:	Not reported
Operation Type:	Placer
Deposit Type:	Not reported
Production Size:	Not reported
Development Status:	Past Producer
Ore Minerals or Materials:	Not reported
Gangue Minerals or Materials:	Not reported
Other Minerals or Materials:	Not reported
Ore Body Form:	Not reported
Workings Type:	Not reported
Mineral Deposit Model:	Not reported
Alteration Processes:	Not reported
Concentration Processes:	Not reported
Previous Names:	J B Nelson
Ore Controls:	Not reported
Reporter:	Western Field Operations Center (WFOC)
Host Rock Unit Name:	Not reported
Host Rock Type:	Not reported
Associated Rock Unit Name:	Not reported
Associated Rock Type Code:	Not reported
Structural Characteristics:	Not reported
Tectonic Setting:	Not reported
References:	Not reported
First Production Year:	Not reported
Began Before/After FPY:	Not reported
Last Production Year:	Not reported
Ended Before/After LPY:	Not reported
Year Discovered:	Not reported
Found Before/After YD:	Not reported
Production History:	Not reported
Discovery Information:	Not reported
Latitude:	32.80677
Longitude:	-115.26641

3 **HIGHLINE PIT** **MINES MRDS** **1025712268**
N/A

< 1/8 **WINTERHAVEN, CA 92283**
1 ft.

Relative:
Lower

Actual:
36 ft.

MINES MRDS:

Name:	HIGHLINE PIT
Address:	Not reported
Deposit identification Number:	10236473
City,State,Zip:	WINTERHAVEN, CALIFORNIA 92283
URL:	https://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10236473
MRDS Identification Number:	Not reported
MAS/MILS Identification Number:	0060250312
Region:	NA
Country:	United States
Primary Commodities:	Sand and Gravel, Construction
Secondary Commodities:	Not reported
Tertiary Commodities:	Not reported
Operation Type:	Surface
Deposit Type:	Not reported
Production Size:	Not reported
Development Status:	Producer
Ore Minerals or Materials:	Not reported
Gangue Minerals or Materials:	Not reported
Other Minerals or Materials:	Not reported
Ore Body Form:	Not reported
Workings Type:	Not reported
Mineral Deposit Model:	Not reported
Alteration Processes:	Not reported
Concentration Processes:	Not reported
Previous Names:	Not reported
Ore Controls:	Not reported
Reporter:	Western Field Operations Center (WFOC)
Host Rock Unit Name:	Not reported
Host Rock Type:	Not reported
Associated Rock Unit Name:	Not reported
Associated Rock Type Code:	Not reported
Structural Characteristics:	Not reported
Tectonic Setting:	Not reported
References:	Not reported
First Production Year:	Not reported
Began Before/After FPY:	Not reported
Last Production Year:	Not reported
Ended Before/After LPY:	Not reported
Year Discovered:	Not reported
Found Before/After YD:	Not reported
Production History:	Not reported
Discovery Information:	Not reported
Latitude:	32.80007
Longitude:	-115.26771

Count: 1 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
HOLTVILLE	S107539544		NELSON PIT RD AND E HIGHLINE C		CDL

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: N/A
Last EDR Contact: 12/02/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: N/A
Last EDR Contact: 12/02/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: N/A
Last EDR Contact: 12/02/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 12/23/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/02/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/02/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/06/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/11/2020
Number of Days to Update: 82

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/05/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/18/2020
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/05/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/18/2020
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/05/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/15/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 7

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 07/27/2020
Date Data Arrived at EDR: 07/27/2020
Date Made Active in Reports: 10/08/2020
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/26/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 07/27/2020
Date Data Arrived at EDR: 07/27/2020
Date Made Active in Reports: 10/08/2020
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/26/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/11/2020
Date Data Arrived at EDR: 05/12/2020
Date Made Active in Reports: 07/27/2020
Number of Days to Update: 76

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 11/10/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/29/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/26/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 78
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/15/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 07/21/2020
Date Data Arrived at EDR: 09/03/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 83

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 09/03/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/03/2020
Number of Days to Update: 86

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

UST: Active UST Facilities

Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Semi-Annually

MILITARY UST SITES: Military UST Sites (GEOTRACKER)

Military ust sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities

A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 12/09/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/03/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/29/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 85

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/26/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 78

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 07/27/2020
Date Data Arrived at EDR: 07/27/2020
Date Made Active in Reports: 10/08/2020
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/26/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 09/21/2020
Date Data Arrived at EDR: 09/22/2020
Date Made Active in Reports: 12/11/2020
Number of Days to Update: 80

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 09/14/2020
Date Data Arrived at EDR: 09/15/2020
Date Made Active in Reports: 12/10/2020
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/11/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 05/28/2020
Date Data Arrived at EDR: 05/29/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 75

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 11/05/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 10/30/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 03/18/2020
Date Data Arrived at EDR: 03/19/2020
Date Made Active in Reports: 06/09/2020
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 07/27/2020
Date Data Arrived at EDR: 07/27/2020
Date Made Active in Reports: 10/08/2020
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/26/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2019
Date Data Arrived at EDR: 05/28/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 07/20/2020
Date Data Arrived at EDR: 07/21/2020
Date Made Active in Reports: 10/07/2020
Number of Days to Update: 78

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 03/18/2020
Date Data Arrived at EDR: 03/19/2020
Date Made Active in Reports: 06/09/2020
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Quarterly

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/01/2020
Number of Days to Update: 84

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 05/20/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/06/2020
Number of Days to Update: 78

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing
Aboveground storage tank sites

Date of Government Version: 08/03/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/22/2020
Number of Days to Update: 78

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

CA FID UST: Facility Inventory Database
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CERS TANKS: California Environmental Reporting System (CERS) Tanks
List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 07/20/2020
Date Data Arrived at EDR: 07/21/2020
Date Made Active in Reports: 10/07/2020
Number of Days to Update: 78

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Quarterly

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 08/26/2020
Date Data Arrived at EDR: 08/28/2020
Date Made Active in Reports: 11/17/2020
Number of Days to Update: 81

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 12/02/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 08/31/2020
Date Data Arrived at EDR: 08/31/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 81
Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 09/20/2020
Date Data Arrived at EDR: 09/22/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 83
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 06/30/2020
Date Data Arrived at EDR: 07/21/2020
Date Made Active in Reports: 10/07/2020
Number of Days to Update: 78
Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 08/05/2020
Date Data Arrived at EDR: 08/13/2020
Date Made Active in Reports: 10/21/2020
Number of Days to Update: 69

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 11/17/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/08/2020
Next Scheduled EDR Contact: 01/18/2021
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 11/09/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/21/2020
Date Data Arrived at EDR: 09/22/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/02/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 11/06/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/17/2020
Date Made Active in Reports: 09/10/2020
Number of Days to Update: 85

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/18/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 08/14/2020
Date Made Active in Reports: 11/04/2020
Number of Days to Update: 82

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 11/17/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 10/19/2020
Date Data Arrived at EDR: 10/19/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/02/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 07/24/2020
Date Data Arrived at EDR: 08/03/2020
Date Made Active in Reports: 10/21/2020
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 10/14/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 04/27/2020
Date Data Arrived at EDR: 05/06/2020
Date Made Active in Reports: 06/09/2020
Number of Days to Update: 34

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 12/02/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 10/09/2019
Date Data Arrived at EDR: 10/11/2019
Date Made Active in Reports: 12/20/2019
Number of Days to Update: 70

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/02/2020
Next Scheduled EDR Contact: 01/18/2021
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/05/2020
Date Data Arrived at EDR: 08/10/2020
Date Made Active in Reports: 10/08/2020
Number of Days to Update: 59

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 10/12/2020
Next Scheduled EDR Contact: 01/31/2021
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 01/15/2020
Number of Days to Update: 42
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 11/30/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/06/2021
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 09/24/2020
Next Scheduled EDR Contact: 01/11/2021
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 10/27/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 10/08/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 88

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/22/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 151

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 12/23/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/06/2020
Next Scheduled EDR Contact: 01/18/2021
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 11/06/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 11/20/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 12/02/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/04/2020
Date Data Arrived at EDR: 08/25/2020
Date Made Active in Reports: 11/18/2020
Number of Days to Update: 85

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 09/10/2020
Date Data Arrived at EDR: 09/15/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 66

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 11/24/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/06/2020
Date Data Arrived at EDR: 05/27/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 78

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/25/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/25/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/16/2020
Date Data Arrived at EDR: 09/17/2020
Date Made Active in Reports: 12/10/2020
Number of Days to Update: 84

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 12/10/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 09/04/2020
Date Data Arrived at EDR: 09/15/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 66

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 07/02/2020
Date Made Active in Reports: 09/17/2020
Number of Days to Update: 77

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 10/08/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 10/03/2020
Date Data Arrived at EDR: 10/06/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 90

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 10/06/2020
Next Scheduled EDR Contact: 01/18/2021
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 11/17/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/17/2020
Date Data Arrived at EDR: 08/17/2020
Date Made Active in Reports: 10/21/2020
Number of Days to Update: 65

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 11/13/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 06/22/2020
Date Data Arrived at EDR: 06/22/2020
Date Made Active in Reports: 09/04/2020
Number of Days to Update: 74

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 11/13/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Varies

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 08/19/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 09/04/2020
Number of Days to Update: 14

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 08/25/2020
Date Data Arrived at EDR: 08/26/2020
Date Made Active in Reports: 11/13/2020
Number of Days to Update: 79

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/06/2020
Date Data Arrived at EDR: 08/28/2020
Date Made Active in Reports: 11/17/2020
Number of Days to Update: 81

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Annually

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 06/16/2020
Date Made Active in Reports: 08/28/2020
Number of Days to Update: 73

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/18/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Varies

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 07/20/2020
Date Data Arrived at EDR: 07/21/2020
Date Made Active in Reports: 10/07/2020
Number of Days to Update: 78

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 10/13/2020
Date Data Arrived at EDR: 10/14/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 82

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 08/05/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 79

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 11/04/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 04/15/2020
Date Made Active in Reports: 07/02/2020
Number of Days to Update: 78

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 10/05/2020
Next Scheduled EDR Contact: 01/18/2021
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 08/17/2020
Date Data Arrived at EDR: 08/17/2020
Date Made Active in Reports: 11/05/2020
Number of Days to Update: 80

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 11/13/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 08/17/2020
Date Data Arrived at EDR: 08/17/2020
Date Made Active in Reports: 11/05/2020
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/13/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 10/05/2020
Date Data Arrived at EDR: 10/06/2020
Date Made Active in Reports: 12/23/2020
Number of Days to Update: 78

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 10/06/2020
Next Scheduled EDR Contact: 01/18/2021
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 08/31/2020
Date Data Arrived at EDR: 08/31/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 81
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/10/2020
Date Made Active in Reports: 10/29/2020
Number of Days to Update: 80
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/09/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 08/31/2020
Date Data Arrived at EDR: 08/31/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 81
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/01/2020
Number of Days to Update: 84
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 12/10/2020
Number of Days to Update: 1
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/07/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: No Update Planned

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/01/2020
Number of Days to Update: 84
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 11/19/2019
Date Data Arrived at EDR: 01/07/2020
Date Made Active in Reports: 03/09/2020
Number of Days to Update: 62
Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 10/09/2020
Next Scheduled EDR Contact: 01/18/2021
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9
Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 11/13/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing

In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/01/2020
Number of Days to Update: 84
Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 08/31/2020
Date Data Arrived at EDR: 08/31/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 81
Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 07/20/2020
Date Data Arrived at EDR: 07/21/2020
Date Made Active in Reports: 10/07/2020
Number of Days to Update: 78
Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

PCS: Permit Compliance System
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55
Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

PCS INACTIVE: Listing of Inactive PCS Permits
An inactive permit is a facility that has shut down or is no longer discharging.

Date of Government Version: 11/05/2014
Date Data Arrived at EDR: 01/06/2015
Date Made Active in Reports: 05/06/2015
Number of Days to Update: 120
Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29
Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 11/25/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

HWTS: Hazardous Waste Tracking System

DTSC maintains the Hazardous Waste Tracking System that stores ID number information since the early 1980s and manifest data since 1993. The system collects both manifest copies from the generator and destination facility.

Date of Government Version: 10/13/2020
Date Data Arrived at EDR: 10/14/2020
Date Made Active in Reports: 11/03/2020
Number of Days to Update: 20

Source: Department of Toxic Substances Control
Telephone: 916-324-2444
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 10/06/2020
Date Made Active in Reports: 12/23/2020
Number of Days to Update: 78

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 05/18/2020
Date Data Arrived at EDR: 05/19/2020
Date Made Active in Reports: 06/01/2020
Number of Days to Update: 13

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 12/15/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 12/24/2020
Number of Days to Update: 8

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/06/2020
Date Data Arrived at EDR: 04/23/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 78

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 07/16/2020
Date Data Arrived at EDR: 07/22/2020
Date Made Active in Reports: 10/08/2020
Number of Days to Update: 78

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 06/08/2020
Date Data Arrived at EDR: 08/13/2020
Date Made Active in Reports: 10/22/2020
Number of Days to Update: 70

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/13/2020
Date Data Arrived at EDR: 08/13/2020
Date Made Active in Reports: 10/22/2020
Number of Days to Update: 70

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 10/06/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 77

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 12/22/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/13/2020
Date Data Arrived at EDR: 08/17/2020
Date Made Active in Reports: 11/05/2020
Number of Days to Update: 80

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 07/14/2020
Date Data Arrived at EDR: 07/16/2020
Date Made Active in Reports: 09/29/2020
Number of Days to Update: 75

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

KERN COUNTY:

CUPA KERN: CUPA Facility List
A listing of sites included in the Kern County Hazardous Material Business Plan.

Date of Government Version: 07/28/2020
Date Data Arrived at EDR: 07/30/2020
Date Made Active in Reports: 10/13/2020
Number of Days to Update: 75

Source: Kern County Public Health
Telephone: 661-321-3000
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 07/28/2020
Date Data Arrived at EDR: 07/30/2020
Date Made Active in Reports: 10/14/2020
Number of Days to Update: 76

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/11/2020
Date Data Arrived at EDR: 05/12/2020
Date Made Active in Reports: 07/27/2020
Number of Days to Update: 76

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 08/13/2020
Date Data Arrived at EDR: 08/13/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 71

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 10/07/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/31/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 80

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 12/09/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 07/06/2020
Date Data Arrived at EDR: 07/10/2020
Date Made Active in Reports: 09/28/2020
Number of Days to Update: 80

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 10/09/2020
Date Made Active in Reports: 12/29/2020
Number of Days to Update: 81

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 10/09/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 08/17/2020
Date Made Active in Reports: 11/05/2020
Number of Days to Update: 80

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 10/07/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/18/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills
This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 04/30/2012
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 42
Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 10/12/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory
A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/18/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory
A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/18/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 07/20/2020
Date Data Arrived at EDR: 10/09/2020
Date Made Active in Reports: 12/29/2020
Number of Days to Update: 81
Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 10/09/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21
Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 10/07/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 09/11/2020
Date Data Arrived at EDR: 10/07/2020
Date Made Active in Reports: 12/23/2020
Number of Days to Update: 77

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 10/05/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 72

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 12/21/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 07/28/2020
Date Data Arrived at EDR: 07/30/2020
Date Made Active in Reports: 07/31/2020
Number of Days to Update: 1

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 08/20/2020
Date Data Arrived at EDR: 08/24/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 77

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 11/15/2020
Next Scheduled EDR Contact: 03/08/3021
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 07/13/2020
Date Data Arrived at EDR: 07/15/2020
Date Made Active in Reports: 07/31/2020
Number of Days to Update: 16

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 12/21/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 09/05/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 10/31/2019
Number of Days to Update: 52

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 07/29/2020
Date Data Arrived at EDR: 07/30/2020
Date Made Active in Reports: 10/13/2020
Number of Days to Update: 75

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 06/10/2020
Date Data Arrived at EDR: 08/03/2020
Date Made Active in Reports: 10/19/2020
Number of Days to Update: 77

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/02/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 07/02/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 79

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/02/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 07/01/2020
Date Data Arrived at EDR: 08/03/2020
Date Made Active in Reports: 10/19/2020
Number of Days to Update: 77

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/03/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 11/24/2020
Date Data Arrived at EDR: 11/24/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 1

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/06/2020
Date Data Arrived at EDR: 10/07/2020
Date Made Active in Reports: 11/03/2020
Number of Days to Update: 27

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/09/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 10/06/2020
Date Data Arrived at EDR: 10/07/2020
Date Made Active in Reports: 11/03/2020
Number of Days to Update: 27
Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/09/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 02/18/2020
Date Data Arrived at EDR: 03/31/2020
Date Made Active in Reports: 06/15/2020
Number of Days to Update: 76
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 02/24/2020
Date Data Arrived at EDR: 03/31/2020
Date Made Active in Reports: 06/17/2020
Number of Days to Update: 78
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 08/04/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/22/2020
Number of Days to Update: 78
Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 08/04/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 82
Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 08/31/2020
Date Data Arrived at EDR: 08/31/2020
Date Made Active in Reports: 11/23/2020
Number of Days to Update: 84

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 04/18/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 56

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing

A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/14/2020
Date Data Arrived at EDR: 07/16/2020
Date Made Active in Reports: 09/29/2020
Number of Days to Update: 75

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

CUPA SAN FRANCISCO CO: CUPA Facility Listing

Cupa facilities

Date of Government Version: 08/03/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/22/2020
Number of Days to Update: 78

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

LUST SAN FRANCISCO: Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 08/03/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 82

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 12/09/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 07/27/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 75

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 02/20/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 64

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/11/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 08/20/2020
Date Data Arrived at EDR: 08/20/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 81

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 07/30/2020
Date Data Arrived at EDR: 07/31/2020
Date Made Active in Reports: 10/16/2020
Number of Days to Update: 77

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/03/2019
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 08/25/2020
Date Data Arrived at EDR: 08/26/2020
Date Made Active in Reports: 09/16/2020
Number of Days to Update: 21

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/03/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 12/15/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 12/23/2020
Number of Days to Update: 7

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 09/18/2020
Date Data Arrived at EDR: 09/22/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 83

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 10/06/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 77

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 10/02/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 08/25/2020
Date Data Arrived at EDR: 08/26/2020
Date Made Active in Reports: 11/17/2020
Number of Days to Update: 83

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 08/11/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 75

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 07/14/2020
Date Data Arrived at EDR: 07/16/2020
Date Made Active in Reports: 09/29/2020
Number of Days to Update: 75

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 08/06/2020
Date Data Arrived at EDR: 08/06/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 81

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 07/10/2020
Date Data Arrived at EDR: 07/22/2020
Date Made Active in Reports: 10/08/2020
Number of Days to Update: 78
Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/21/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 11/05/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 07/10/2020
Date Data Arrived at EDR: 07/22/2020
Date Made Active in Reports: 10/07/2020
Number of Days to Update: 77
Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 08/26/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/01/2020
Number of Days to Update: 84
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 12/21/2020
Date Data Arrived at EDR: 12/23/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 12
Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 12/20/2020
Next Scheduled EDR Contact: 04/11/2021
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 08/06/2020
Date Data Arrived at EDR: 08/07/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 80

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 11/03/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 10/20/2020
Date Made Active in Reports: 11/02/2020
Number of Days to Update: 13

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/09/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 10/09/2020
Next Scheduled EDR Contact: 01/18/2021
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 04/29/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 72

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 10/30/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/07/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 10/02/2019
Date Made Active in Reports: 12/10/2019
Number of Days to Update: 69

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/03/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

VIKINGS SOLAR
NELSON PIT ROAD AT EAST HIGHLINE CANAL
WINTERHAVEN, CA 92283

TARGET PROPERTY COORDINATES

Latitude (North):	32.8033 - 32° 48' 11.88''
Longitude (West):	115.27 - 115° 16' 12.00''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	661980.8
UTM Y (Meters):	3630615.8
Elevation:	44 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5622978 HOLTVILLE EAST, CA
Version Date:	2012
East Map:	5622970 GLAMIS SW, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

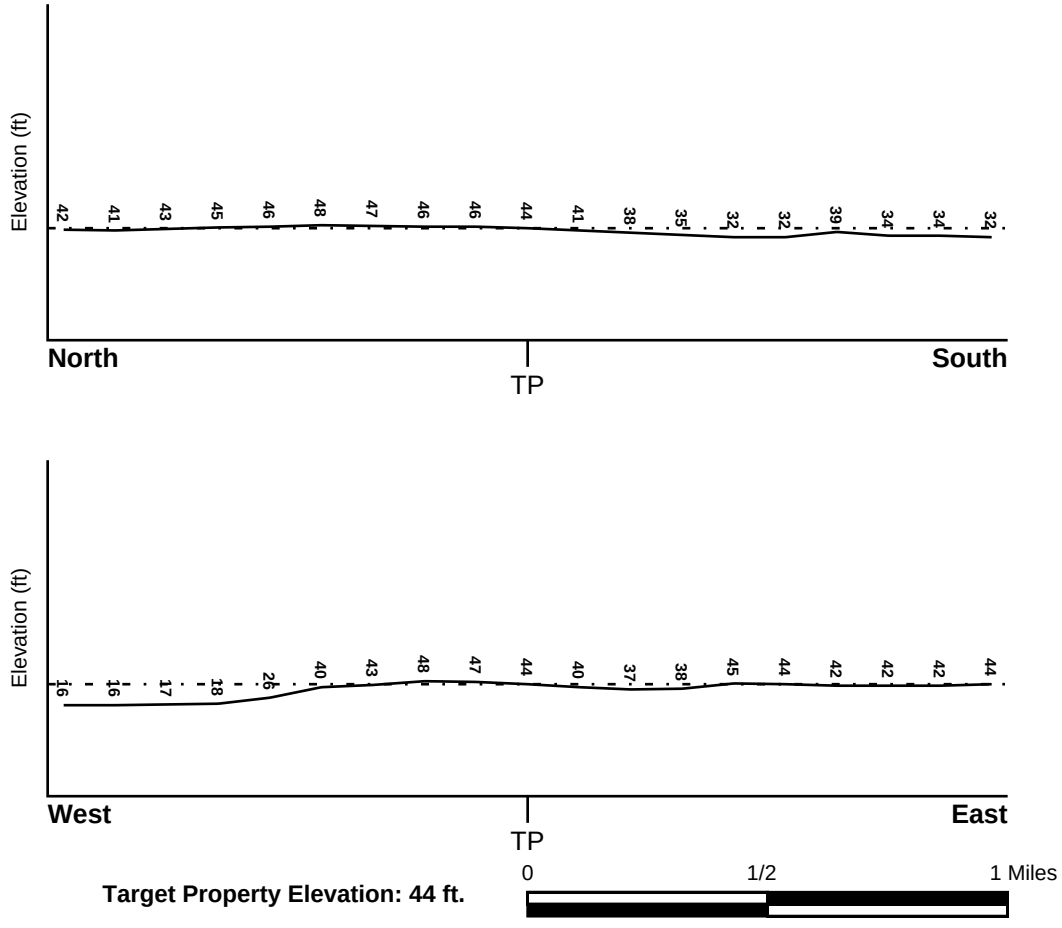
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 44 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06025C1775C	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
Not Reported	

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
HOLTVILLE EAST	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

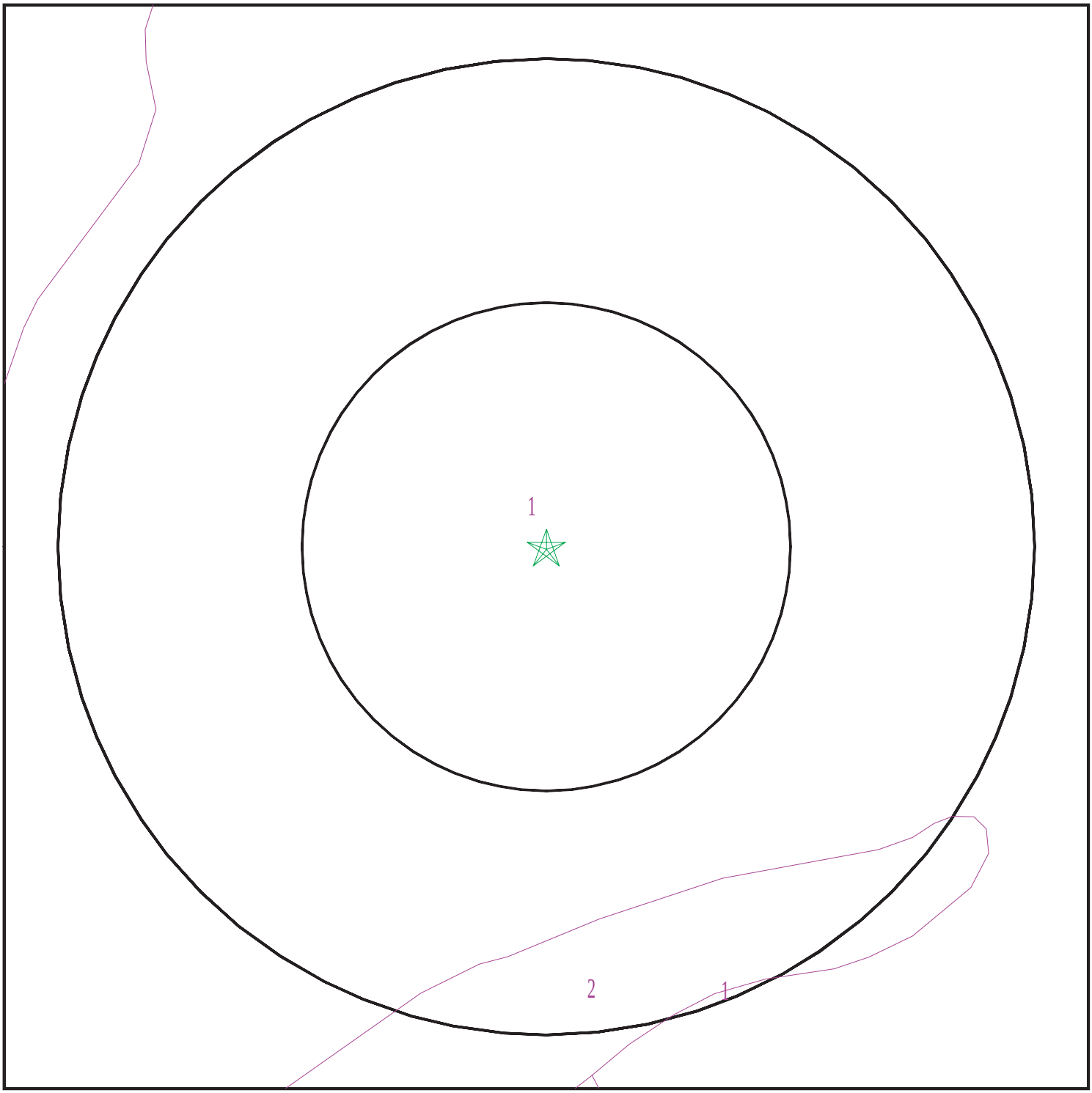
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 6320675.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Vikings Solar	CLIENT:	GS Lyon Consultants
ADDRESS:	Nelson Pit Road At East Highline Canal Winterhaven CA 92283	CONTACT:	Steven Williams
		INQUIRY #:	6320675.2s
LAT/LONG:	32.8033 / 115.27	DATE:	January 05, 2021 2:38 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Rositas

Soil Surface Texture: fine sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 122 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 8.4 Min: 7.9
2	9 inches	59 inches	sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 8.4 Min: 7.9

Soil Map ID: 2

Soil Component Name: Vint

Soil Surface Texture: loamy very fine sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 122 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	loamy very fine sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 8.4 Min: 7.9
2	9 inches	59 inches	loamy fine sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 8.4 Min: 7.9

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS40000126896	1/4 - 1/2 Mile West
3	USGS40000129848	1/2 - 1 Mile SSW
4	USGS40000129844	1/2 - 1 Mile South
A6	USGS40000129866	1/2 - 1 Mile NE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A7	USGS40000129867	1/2 - 1 Mile NE
8	USGS40000129854	1/2 - 1 Mile SE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

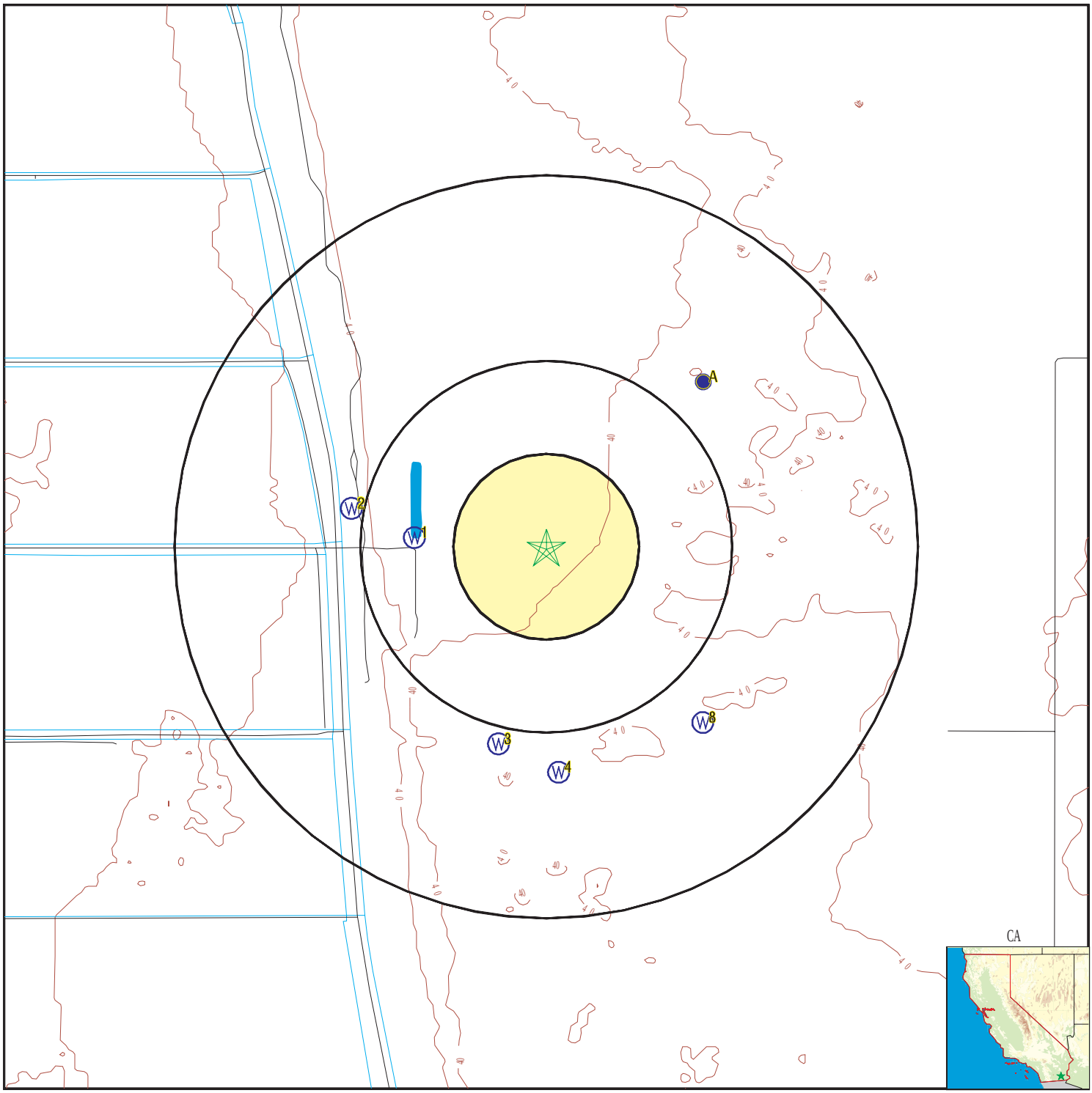
No PWS System Found

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
2	CADWR0000034572	1/2 - 1 Mile West
A5	CAUSGSN00009783	1/2 - 1 Mile NE

PHYSICAL SETTING SOURCE MAP - 6320675.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	Vikings Solar	CLIENT:	GS Lyon Consultants
ADDRESS:	Nelson Pit Road At East Highline Canal Winterhaven CA 92283	CONTACT:	Steven Williams
		INQUIRY #:	6320675.2s
LAT/LONG:	32.8033 / 115.27	DATE:	January 05, 2021 2:38 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
West
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000126896**

Organization ID:	USGS-AZ	Organization Name:	USGS Arizona Water Science Center
Monitor Location:	015S016E36E001S	Type:	Well
Description:	Not Reported	HUC:	18100200
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Not Reported
Aquifer Type:	Not Reported	Construction Date:	196107
Well Depth:	430	Well Depth Units:	ft
Well Hole Depth:	430	Well Hole Depth Units:	ft

2
West
1/2 - 1 Mile
Lower

CA WELLS **CADWR0000034572**

Well ID:	15S16E36E001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	15S16E36E001S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=15S16E36E001S&store_num=		
GeoTracker Data:	Not Reported		

3
SSW
1/2 - 1 Mile
Lower

FED USGS **USGS40000129848**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	016S016E01C001S	Type:	Well
Description:	Not Reported	HUC:	18100200
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Basin and Range basin-fill aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

4
South
1/2 - 1 Mile
Lower

FED USGS **USGS40000129844**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	016S016E01B001S	Type:	Well
Description:	Not Reported	HUC:	18100200
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported

Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Basin and Range basin-fill aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

A5
NE
1/2 - 1 Mile
Lower

CA WELLS **CAUSGSN00009783**

Well ID:	USGS-324835115154302	Well Type:	UNK
Source:	United States Geological Survey		
Other Name:	USGS-324835115154302	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=USGSNEW&samp_date=&global_id=&assigned_name=USGS-324835115154302&store_num=		
GeoTracker Data:	Not Reported		

A6
NE
1/2 - 1 Mile
Lower

FED USGS **USGS40000129866**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	015S017E31D001S	Type:	Well
Description:	Not Reported	HUC:	18100200
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Basin and Range basin-fill aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

A7
NE
1/2 - 1 Mile
Lower

FED USGS **USGS40000129867**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	015S017E31D002S	Type:	Well
Description:	Not Reported	HUC:	18100200
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Basin and Range basin-fill aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

8
SE
1/2 - 1 Mile
Lower | **FED USGS** | **USGS40000129854**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	015S017E31N001S	Type:	Well
Description:	Not Reported	HUC:	18100200
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Basin and Range basin-fill aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for IMPERIAL County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for IMPERIAL COUNTY, CA

Number of sites tested: 2

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	1.450 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

OTHER STATE DATABASE INFORMATION

Groundwater Ambient Monitoring & Assessment Program
State Water Resources Control Board
Telephone: 916-341-5577
The GAMA Program is Californias comprehensive groundwater quality monitoring program. GAMA collects data by testing the untreated, raw water in different types of wells for naturally-occurring and man-made chemicals. The GAMA data includes Domestic, Monitoring and Municipal well types from the following sources, Department of Water Resources, Department of Heath Services, EDF, Agricultural Lands, Lawrence Livermore National Laboratory, Department of Pesticide Regulation, United States Geological Survey, Groundwater Ambient Monitoring and Assessment Program and Local Groundwater Projects.

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations
Source: Dept of Conservation, Geologic Energy Management Division
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

PHYSICAL SETTING SOURCE RECORDS SEARCHED

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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APPENDIX G

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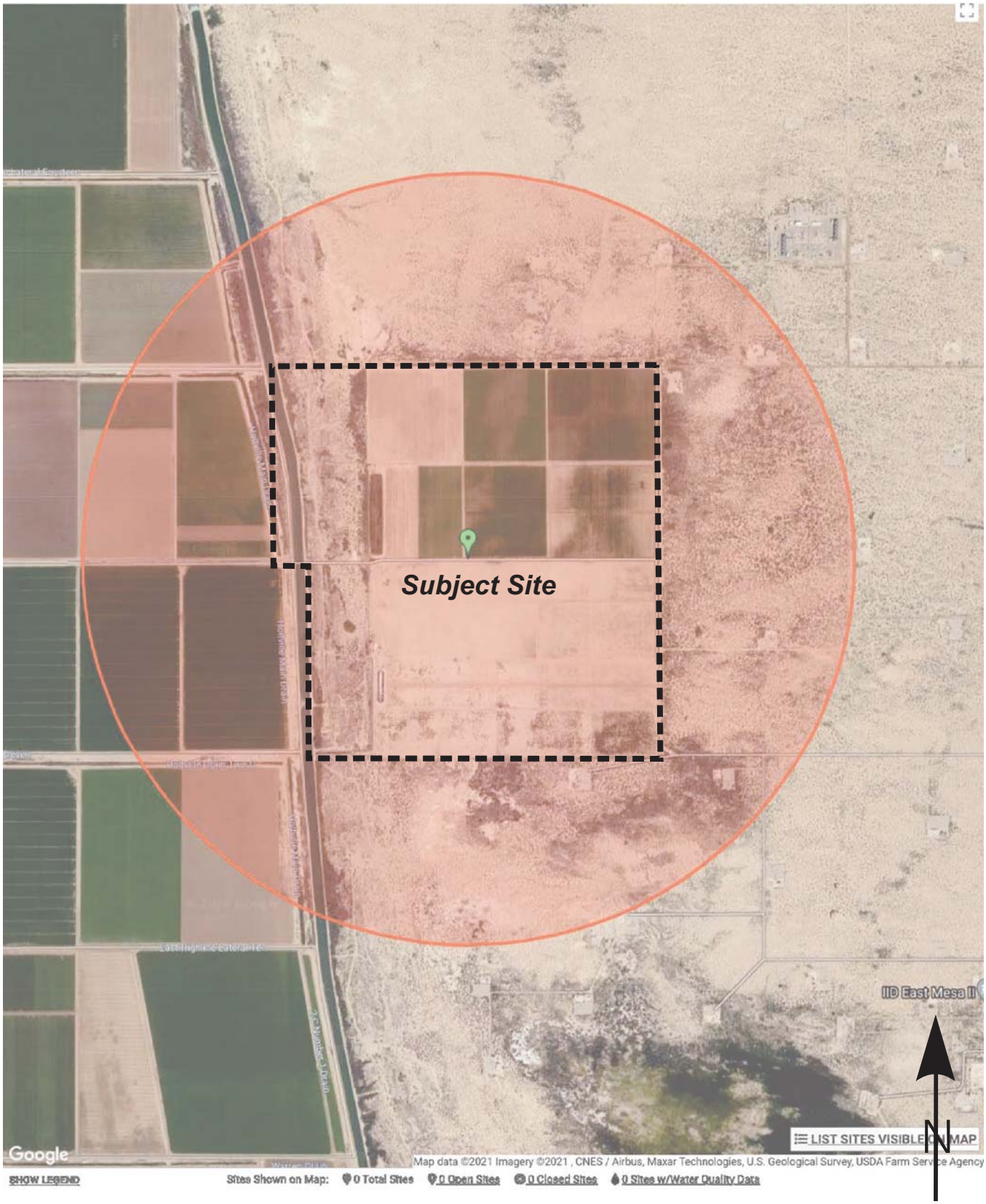
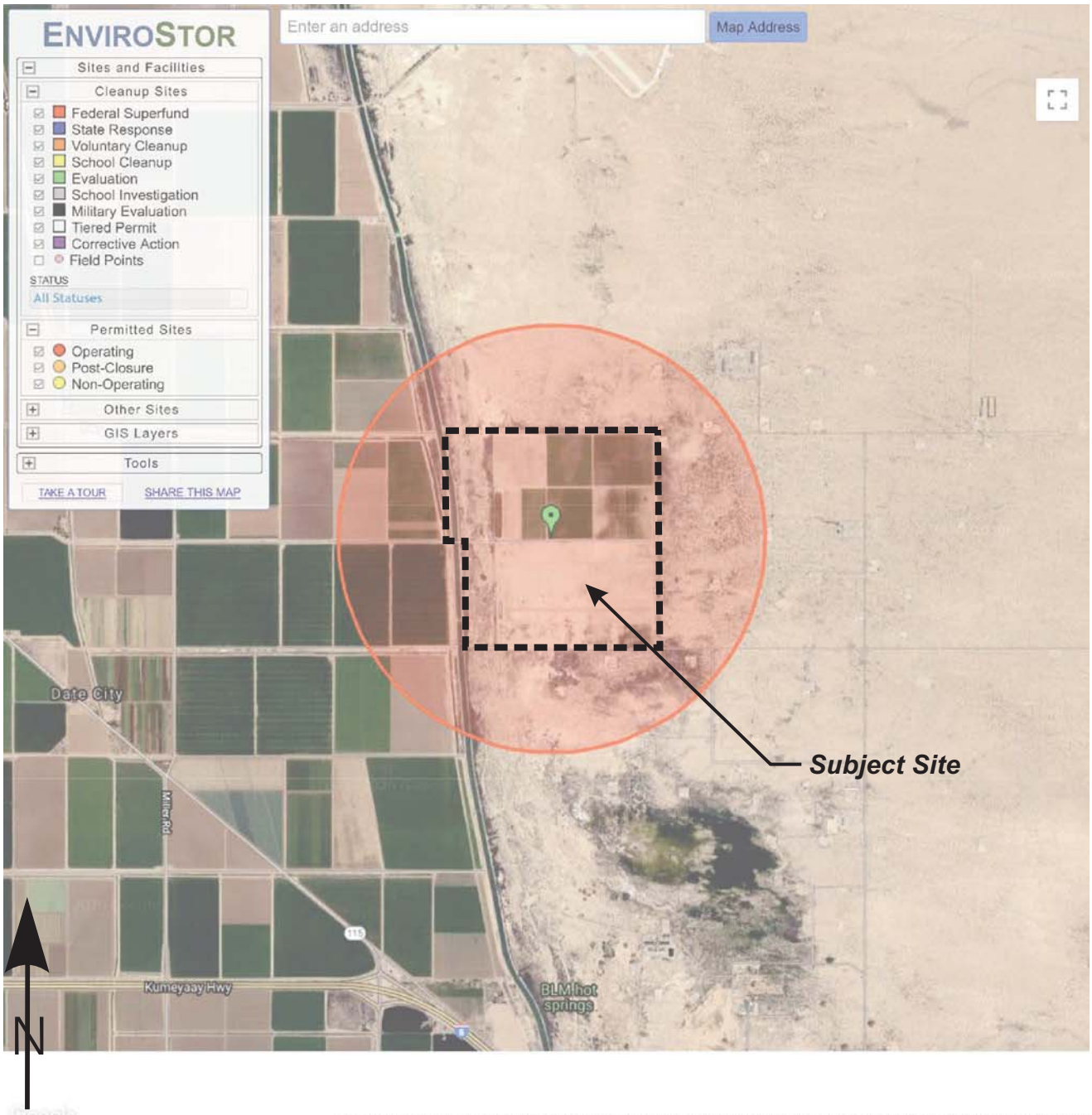


GS Lyon Project No.: GS2026	Geotracker Map	Plate 5



SITES FOUND IN SEARCH RADIUS — 0 SITES LISTED — EXPORT THIS LIST TO EXCEL

PROJECT NAME	STATUS	PROJECT TYPE	ADDRESS	CITY

GS Lyon Project No.: GS2026	Envirostor Map	Plate 6

stewart title
Real partners. Real possibilities.™

Kathy Crawford
Title Officer

Stewart Title of California, Inc.
11870 Pierce St, Ste 100
Riverside, CA 92505
Phone: (951) 276-2700
Fax: (951) 346-3395
kcrawfor@stewart.com

PRELIMINARY REPORT

Order No.: 869462
Your File No.:
Buyer/Borrower Name:
Seller Name: RL&R Strahm

Property Address: APN 050-070-018, 3000 E Nelsons Pit, Holtville, CA 92250

In response to the above referenced application for a Policy of Title Insurance, Stewart Title of California, Inc. hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a Stewart Title Guaranty Company Policy or Policies of Title Insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referenced to as an Exception on Schedule B or not excluded from coverage pursuant to the printed Schedules, Conditions, and Stipulations of said Policy forms.

The printed Exceptions and Exclusions from the coverage and Limitations on covered Risks of said policy or policies are set forth in Exhibit A attached. The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than that set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties. Limitations on Covered Risks applicable to the CLTA and ALTA Homeowner's Policies of Title Insurance which establish a Deductible Amount and a Maximum Dollar Limits of Liability for certain coverages are also set forth in Exhibit A. Copies of the policy forms should be read. They are available from the office which issued this report.

Please read the exceptions shown or referred to below and the exceptions and exclusions set forth in Exhibit A of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters, which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects, and encumbrances affecting title to the land.

This report, (and any supplements or amendments thereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance a binder or commitment should be requested.

Dated as of June 30, 2020 at 8:00AM	

When replying, please contact: Kathy Crawford, Title Officer

Stewart Title of California, Inc.
11870 Pierce St, Ste 100
Riverside, CA 92505
(951) 276-2700
kcrawfor@stewart.com

PRELIMINARY REPORT

The form of Policy of Title Insurance contemplated by this report is:

☐ CLTA Standard Coverage Policy

☐ CLTA/ALTA Homeowners Policy

☐ 2006 ALTA Owner's Policy

☐ 2006 ALTA Loan Policy

☐ ALTA Short Form Residential Loan Policy

☒ Preliminary Report

SCHEDULE A

The estate or interest in the land hereinafter described or referred to covered by this report is:

FEE

Title to said estate or interest at the date hereof is vested in:

RL&R Strahm, a California general partnership

LEGAL DESCRIPTION

The land referred to herein is situated in the State of California, County of Imperial, City of Holtville and described as follows:

Parcel 1:

The East half, and the East half of the Southwest quarter, and the Southeast quarter of the Northwest quarter of Section 36, Township 15 South, Range 16 East, San Bernardino Base and Meridian, County of Imperial, State of California, according to the United States Government Official Plat of Survey approved and on file in the District Land Office.

Excepting therefrom, an undivided 50% interest of all mineral and geothermal rights now held by the grantor appurtenant to the property, but without any right whatsoever to enter upon the surface of said land or any portion thereof within 500 feet vertical distance below the surface thereof, as reserved by The Nussbaum Family Limited Partnership, a California Limited Partnership, in deed recorded April 1, 2008 as Instrument No. 08-9138 of Official Records.

Parcel 2:

The Northeast quarter of the Northwest quarter of Section 36, Township 15 South, Range 16 East, San Bernardino Base and Meridian, County of Imperial, State of California, according to the a United States Government Official Plat of Survey approved and on file in the District Land Office;

Excepting therefrom all oil and mineral rights as reserved by J. Lillian Callander in deed recorded December 4, 1951 as Instrument No. 22 in Book 827, Page(s) 354 of Official Records.

Excepting therefrom, an undivided 50% interest of all mineral and geothermal rights now held by the grantor appurtenant to the property, but without any right whatsoever to enter upon the surface of said land or any portion thereof within 500 feet vertical distance below the surface thereof, as reserved by The Nussbaum Family Limited Partnership, a California Limited Partnership, in deed recorded April 1, 2008 as Instrument No. 08-9138 of Official Records.

APN: 050-070-018

Parcel 3:

A right of way for an underground tile line across the Northwest quarter of the Northwest quarter of Section 36, Township 15 South, Range 16 East, San Bernardino Base and Meridian, County of Imperial, State of California, according to the United States Government Official Plat of Survey approved and on file in the District Land Office, the centerline of which is described as follows:

Beginning at a point which is 1,262.25 feet South of the Northeast corner of the Northwest quarter of the Northwest quarter of said Section 36;
Thence North 76°22'00" West, 1,185 feet to a point in the East bank of the East Highline Canal, as now constructed across said property.

APN: 050-070-018

(End of Legal Description)

MAP

THE MAP CONNECTED HEREWITH IS BEING PROVIDED AS A COURTESY AND FOR INFORMATIONAL PURPOSES ONLY; THIS MAP SHOULD NOT BE RELIED UPON. FURTHERMORE, THE PARCELS SET OUT ON THIS MAP MAY NOT COMPLY WITH LOCAL SUBDIVISION OR BUILDING ORDINANCES. STEWART ASSUMES NO LIABILITY, RESPONSIBILITY OR INDEMNIFICATION RELATED TO THE MAPS NOR ANY MATTERS CONCERNING THE CONTENTS OF OR ACCURACY OF THE MAP.

SCHEDULE B

At the date hereof, exceptions to coverage in addition to the printed exceptions and exclusions contained in said policy or policies would be as follows:

Taxes:

A. Semi-annual water availability assessment in favor of the Imperial Irrigation District.

B. Confirmation of the tax figures must be made prior to close of escrow. Please contact the County Tax Collector prior to closing.

Exceptions:

1. Water rights, claims or title to water in or under the property, whether or not shown by the public records.

2. The lien of supplemental taxes, if any, assessed pursuant to the provisions of Chapter 3.5 (commencing with Section 75) of the Revenue and Taxation Code of the State of California.

3. Assessments for community facility districts which may exist by virtue of assessment maps or notices filed by those districts. Assessments are collected with the County Taxes.

4. Property is located within the boundary of the Imperial Irrigation District.

5. Rights or claims of easements for canals, drains, laterals, irrigation pipelines and gates not recorded in the public records.

6. Any interests (including rights of the public) in and to any portion of the property lying within roads, streets, alleys or highways.

7. Minerals of whatsoever kind, subsurface and surface substances, including but not limited to coal, lignite, oil, gas, geothermal resources, brine, uranium, clay, rock, sand and gravel in, on, under and that may be produced from the Land, together with all rights, privileges, and immunities relating thereto, whether or not appearing in the Public Records or listed in Schedule B. Stewart Title Guaranty Company makes no representation as to the present ownership of any such interests. There may be leases, grants, exceptions or reservations of interests that are not listed.

8. Matters contained in document entitled Agreement, by and between Imperial Irrigation District and W.J. Irwin and Katherine H. Irwin, recorded December 1, 1924 in Book 68 page 221 of Official Records. Affects Parcel 1.

9. Matters contained in document entitled Resolution, upon the terms therein provided, recorded July 20, 1948 in Book 713 page 531 of Official Records. Affects Parcel 1.

10. Matters contained in document entitled Resolution, upon the terms therein provided, recorded March 18, 1952 in Book 834 page 473 of Official Records. Affects Parcel 2.

11. Matters contained in document entitled Agreement, by and between Imperial Irrigation District and W.J. Irwin and Katherine H. Irwin, recorded February 28, 1955 in Book 904 page 410 of Official Records. Affects Parcel 1.

12. Matters contained in document entitled Agreement by and between Imperial Irrigation District and Vernon Nussbaum and Dinette Nussbaum, recorded February 5, 1962 in Book 1102 page 174 of Official Records.

13. Easement and rights incidental thereto for power lines and rights incidental thereto, to Imperial Irrigation District, as set forth in a document recorded June 19, 1985 as Instrument No. 50 in Book 1542 page 919 of Official Records.

14. Matters contained in Map Book 8, Page 27 of Records of Survey, which purports to show the herein described property.

15. A reservation of an undivided 50% interest of all mineral and geothermal rights now held by the grantor appurtenant to the property, but without any right whatsoever to enter upon the surface of said land or any portion thereof within 500 feet vertical distance below the surface thereof, by The Nussbaum Family Limited Partnership, a California limited partnership, in deed recorded April 1, 2008 as Instrument No. 08-9138 of Official Records.

16. Loss or damage by reason of the improvements, if any, located on the land described herein being declared to be personal property.

17. Rights or claims of parties in possession and easements or claims of easements not shown by the public records, conflicts in boundary lines, overlaps, shortage in area, encroachments, and any matters not of record which would be disclosed by an accurate survey or inspection of the property.

18. Rights of parties in possession whether or not recorded in the public record.

19. Please be advised that our search did not disclose any open deeds of trust of record. If you should have knowledge of any outstanding obligation, please contact your title officer immediately for further review.

20. In order to insure a conveyance, acquisition or encumbrance by the general partnership named below, you must provide a copy of the partnership agreement of RL&R Strahm, a California general partnership, and any amendments or modifications thereto. Additional requirements or items may be requested upon review of the required documents set forth above.

(End of Exceptions)

NOTES AND REQUIREMENTS

A. Property taxes for the fiscal year 2019 - 2020 shown below are paid. For proration purposes the amounts are:
1st Installment: $12,588.59
2nd Installment: $12,588.59
Parcel No.: 050-070-018-0
Code Area: 068005

B. There are no conveyances affecting said land, recorded with the County Recorder within 24 months of the date of this report.

C. If an Owners Policy will be requested, please be aware that unless instructed otherwise, we will issue a CLTA Standard Coverage Owners Policy. If a different form of policy is contemplated for this transaction, please advise and contact your title officer for additional requirements.

D. All Transactions - Seller(s) and Buyer(s) or Borrowers are provided as attachments Stewart Title's document entitled "Acknowledgement of Receipt, Understanding and Approval of STG Privacy Notice for Stewart Title Companies and Stewart's Affiliated Business Arrangement Disclosure Statement" along with those individually named documents for your review and acknowledgment prior to closing.

E. All Transactions - Buyer(s)/Seller(s)/Borrower(s) are provided Stewart Title's Preliminary report for review and acknowledgment prior to closing. Buyer(s) approval to include the Preliminary Report items that remain as exceptions to the title policy.

F. Purchase Transaction Only-Seller(s)/Owner(s) are provided Stewart Title's Owner Affidavit and Indemnity for completion prior to closing.

CALIFORNIA "GOOD FUNDS" LAW

California Insurance Code Section 12413.1 regulates the disbursement of escrow and sub-escrow funds by title companies. The law requires that funds be deposited in the title company escrow account and available for withdrawal prior to disbursement. Funds received by Stewart Title of California, Inc. via wire transfer may be disbursed upon receipt. Funds received via cashier's checks or teller checks drawn on a California Bank may be disbursed on the next business day after the day of deposit. If funds are received by any other means, recording and/or disbursement may be delayed, and you should contact your title or escrow officer. All escrow and sub-escrow funds received will be deposited with other escrow funds in one or more non-interest bearing escrow accounts in a financial institution selected by Stewart Title of California, Inc.. Stewart Title of California, Inc. may receive certain direct or indirect benefits from the financial institution by reason of the deposit of such funds or the maintenance of such accounts with the financial institution, and Stewart Title of California, Inc. shall have no obligation to account to the depositing party in any manner for the value of, or to pay to such party, any benefit received by Stewart Title of California, Inc.. Such benefits shall be deemed additional compensation to Stewart Title of California, Inc. for its services in connection with the escrow or sub-escrow.

If any check submitted is dishonored upon presentation for payment, you are authorized to notify all principals and/or their respective agents of such nonpayment.

EXHIBIT "A"

LEGAL DESCRIPTION

Order No.: 869462
Escrow No.: 869462

The land referred to herein is situated in the State of California, County of Imperial, City of Holtville and described as follows:

Parcel 1:

The East half, and the East half of the Southwest quarter, and the Southeast quarter of the Northwest quarter of Section 36, Township 15 South, Range 16 East, San Bernardino Base and Meridian, County of Imperial, State of California, according to the United States Government Official Plat of Survey approved and on file in the District Land Office.

Excepting therefrom, an undivided 50% interest of all mineral and geothermal rights now held by the grantor appurtenant to the property, but without any right whatsoever to enter upon the surface of said land or any portion thereof within 500 feet vertical distance below the surface thereof, as reserved by The Nussbaum Family Limited Partnership, a California Limited Partnership, in deed recorded April 1, 2008 as Instrument No. 08-9138 of Official Records.

Parcel 2:

The Northeast quarter of the Northwest quarter of Section 36, Township 15 South, Range 16 East, San Bernardino Base and Meridian, County of Imperial, State of California, according to the a United States Government Official Plat of Survey approved and on file in the District Land Office;

Excepting therefrom all oil and mineral rights as reserved by J. Lillian Callander in deed recorded December 4, 1951 as Instrument No. 22 in Book 827, Page(s) 354 of Official Records.

Excepting therefrom, an undivided 50% interest of all mineral and geothermal rights now held by the grantor appurtenant to the property, but without any right whatsoever to enter upon the surface of said land or any portion thereof within 500 feet vertical distance below the surface thereof, as reserved by The Nussbaum Family Limited Partnership, a California Limited Partnership, in deed recorded April 1, 2008 as Instrument No. 08-9138 of Official Records.

APN: 050-070-018

Parcel 3:

A right of way for an underground tile line across the Northwest quarter of the Northwest quarter of Section 36, Township 15 South, Range 16 East, San Bernardino Base and Meridian, County of Imperial, State of California, according to the United States Government Official Plat of Survey approved and on file in the District Land Office, the centerline of which is described as follows:

Beginning at a point which is 1,262.25 feet South of the Northeast corner of the Northwest quarter of the Northwest quarter of said Section 36;
Thence North 76°22'00" West, 1,185 feet to a point in the East bank of the East Highline Canal, as now constructed across said property.

APN: 050-070-018

(End of Legal Description)

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AFFILIATED BUSINESS ARRANGEMENT DISCLOSURE STATEMENT

Date: August 3, 2020

File No.: 869462

Property: APN 050-070-018, 3000 E Nelsons Pit, Holtville, CA 92250

From: Stewart Title of California, Inc.

This is to give you notice that Stewart Title of California, Inc. ("Stewart Title") has a business relationship with Stewart Solutions, LLC, DBA – Stewart Specialty Insurance Services, LLC ("Stewart Insurance"). Stewart Information Services Corporation owns 100% of Stewart Insurance and . Because of this relationship, this referral may provide Stewart Title a financial or other benefit.

Set forth below is the estimated charge or range of charges for the settlement services listed. You are NOT required to use the listed provider(s) as a condition for purchase, sale, or refinance of the subject Property. THERE ARE FREQUENTLY OTHER SETTLEMENT SERVICE PROVIDERS AVAILABLE WITH SIMILAR SERVICES. YOU ARE FREE TO SHOP AROUND TO DETERMINE THAT YOU ARE RECEIVING THE BEST SERVICES AND THE BEST RATE FOR THESE SERVICES.

Stewart Insurance Settlement Service	***Charge or range of charges***
Hazard Insurance	$400.00 to $6,500.00
Home Warranty	$255.00 to $ 780.00
Natural Hazard Disclosure Report	$ 42.50 to $ 149.50

ACKNOWLEDGEMENT OF RECEIPT, UNDERSTANDING AND APPROVAL OF STEWART TITLE GUARANTY COMPANY PRIVACY NOTICE FOR STEWART TITLE COMPANIES AND AFFILIATED BUSINESS ARRANGEMENT DISCLOSURE STATEMENT

The undersigned hereby acknowledge receipt of the Stewart Title Guaranty Company Privacy Notice for Stewart Title Companies and the Affiliated Business Arrangement Disclosure Statement that apply to this transaction. The undersigned further acknowledge that he/she/they have received, read, understand and accept these documents in connection with the above described transaction.

The undersigned have received a copy of this acknowledgement as evidenced by the signature below.

_____
RL&R Strahm

TBD

By:_____

CALIFORNIA LAND TITLE ASSOCIATION

STANDARD COVERAGE POLICY – 1990
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building or zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien, or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
   (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.

2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.

3. Defects, liens, encumbrances, adverse claims or other matters:
   a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
   b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
   c) resulting in no loss or damage to the insured claimant;
   d) attaching or created subsequent to Date of Policy; or
   e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage or for the estate or interest insured by this policy.

4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with the applicable doing business laws of the state in which the land is situated.

5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.

6. Any claim, which arises out of the transaction vesting in the insured the estate of interest insured by this policy or the transaction creating the interest of the insured lender, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws.

EXCEPTIONS FROM COVERAGE - SCHEDULE B, PART I

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.

   Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.

2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.

3. Easements, liens or encumbrances, or claims thereof, not shown by the public records.

4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records

5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.

6. Any lien or right to a lien for services, labor or material unless such lien is shown by the Public Records at Date of Policy.

CLTA/ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE (12-02-13)
EXCLUSIONS

In addition to the Exceptions in Schedule B, You are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of those portions of any law or government regulation concerning:
   a. building;
   b. zoning;
   c. land use;
   d. improvements on the Land;
   e. land division;
   f. environmental protection.

   This Exclusion does not limit the coverage described in Covered Risk 8.a., 14, 15, 16, 18, 19, 20, 23 or 27.

2. The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes. This Exclusion does not limit the coverage described in Covered Risk 14 or 15.
3. The right to take the Land by condemning it. This Exclusion does not limit the coverage described in Covered Risk 17.

4. Risks:
   a. that are created, allowed, or agreed to by You, whether or not they appear in the Public Records;
   b. that are Known to You at the Policy Date, but not to Us, unless they are recorded in the Public Records at the Policy Date;
   c. that result in no loss to You; or
   d. that first occur after the Policy Date - this does not limit the coverage described in Covered Risk 7, 8.e., 25, 26, 27 or 28.

5. Failure to pay value for Your Title.

6. Lack of a right:
   a. to any land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
   b. in streets, alleys, or waterways that touch the Land.

   This Exclusion does not limit the coverage described in Covered Risk 11 or 21.

7. The transfer of the Title to You is invalid as a preferential transfer or as a fraudulent transfer or conveyance under federal bankruptcy, state insolvency, or similar creditors' rights laws.

8. Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.

9. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

LIMITATIONS ON COVERED RISKS

Your insurance for the following Covered Risks is limited on the Owner's Coverage Statement as follows:
* For Covered Risk 16, 18, 19, and 21 Your Deductible Amount and Our Maximum Dollar Limit of Liability shown in Schedule A. The deductible amounts and maximum dollar limits shown on Schedule A are as follows:

	Your Deductible Amount	Our Maximum Dollar Limit of Liability
Covered Risk 16:	1% of Policy Amount or $2,500.00 (whichever is less)	$10,000.00
Covered Risk 18:	1% of Policy Amount or $5,000.00 (whichever is less)	$25,000.00
Covered Risk 19:	1% of Policy Amount or $5,000.00 (whichever is less)	$25,000.00
Covered Risk 21:	1% of Policy Amount or $2,500.00 (whichever is less)	$5,000.00

2006 ALTA LOAN POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.

3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.

4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.

5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.

6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.

7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

Except as provided in Schedule B - Part II, this policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses, that arise by reason of:

PART I

1. (a) taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
   (b) proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.

2. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.

3. Easements, liens or encumbrances, or claims thereof, which are not shown by the Public Records.

4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.

5. (a) unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.

6. Any lien or right to a lien for services, labor or material unless such lien is shown by the Public Records at Date of Policy.

PART II

In addition to the matters set forth in Part I of this Schedule, the Title is subject to the following matters, and the Company insures against loss or damage sustained in the event that they are not subordinate to the lien of the Insured Mortgage:

2006 ALTA OWNER'S POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.

3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.

4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
   (a) a fraudulent conveyance or fraudulent transfer; or
   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.

5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
   Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.

2. Any facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.

3. Easements, liens or encumbrances, or claims thereof, which are not shown by the public records.

4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and that are not shown by the Public Records.

5. (a) unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.

6. Any lien or right to a lien for services, labor or material unless such lien is shown by the Public Records at Date of Policy..

ALTA EXPANDED COVERAGE RESIDENTIAL LOAN POLICY – ASSESSMENTS PRIORITY (04-02-15)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys fees or expenses which arise by reason of:

1. a. Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions or location of any improvement now or hereafter erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection

   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.
   b. Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.

3. Defects, liens, encumbrances, adverse claims or other matters:

   (a) created, suffered, assumed or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting In no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27 or 28); or
   (e) resulting in loss or damage which would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.

4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing- business laws of the state where the Land is situated.

5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury, or any consumer credit protection or truth-in-lending law. This Exclusion does not modify or limit the coverage provided in Covered Risk 26.

6. Any claim of invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage as to Advances or modifications made after the Insured has Knowledge that the vestee shown in Schedule A is no longer the owner of the estate or interest covered by this policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11.

7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching subsequent to Date of Policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11(b) or 25.

8. The failure of the residential structure, or any portion of it, to have been constructed before, on or after Date of Policy in accordance with applicable building codes. This Exclusion does not modify or limit the coverage provided in Covered Risk 5 or 6.

9. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is

   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in Covered Risk 27(b) of this policy.

10 Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.

11. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

File No.: 869462

AVAILABLE DISCOUNTS DISCLOSURE STATEMENT

This is to give you notice that Stewart Title of California, Inc. ("Stewart Title") is pleased to inform you that upon proper qualification, there are premium discounts available upon the purchase of title insurance covering improved property with a one to four family residential dwelling.

Such discounts apply to and include:

Property located within an area proclaimed a state or federal disaster area;

Property purchased from a foreclosing beneficiary or successful bidder at a foreclosure sale;

Property being refinanced.

Please talk with your escrow or title officer to determine your qualification for any of these discounts.

Stewart Title Guaranty Company Privacy Notice
Stewart Title Companies

WHAT DO THE STEWART TITLE COMPANIES DO WITH YOUR PERSONAL INFORMATION?

Federal and applicable state law and regulations give consumers the right to limit some but not all sharing. Federal and applicable state law regulations also require us to tell you how we collect, share, and protect your personal information. Please read this notice carefully to understand how we use your personal information. This privacy notice is distributed on behalf of the Stewart Title Guaranty Company and its title affiliates (the Stewart Title Companies), pursuant to Title V of the Gramm-Leach-Bliley Act (GLBA).

The types of personal information we collect and share depend on the product or service that you have sought through us. This information can include social security numbers and driver's license number.

All financial companies, such as the Stewart Title Companies, need to share customers' personal information to run their everyday business—to process transactions and maintain customer accounts. In the section below, we list the reasons that we can share customers' personal information; the reasons that we choose to share; and whether you can limit this sharing.

Reasons we can share your personal information.	Do we share	Can you limit this sharing?
For our everyday business purposes— to process your transactions and maintain your account. This may include running the business and managing customer accounts, such as processing transactions, mailing, and auditing services, and responding to court orders and legal investigations.	Yes	No
For our marketing purposes— to offer our products and services to you.	Yes	No
For joint marketing with other financial companies	No	We don't share
For our affiliates' everyday business purposes— information about your transactions and experiences. Affiliates are companies related by common ownership or control. They can be financial and non-financial companies. *Our affiliates may include companies with a Stewart name; financial companies, such as Stewart Title Company*	Yes	No
For our affiliates' everyday business purposes— information about your creditworthiness.	No	We don't share
For our affiliates to market to you — For your convenience, Stewart has developed a means for you to opt out from its affiliates marketing even though such mechanism is not legally required.	Yes	Yes, send your first and last name, the email address used in your transaction, your Stewart file number and the Stewart office location that is handling your transaction by email to optout@stewart.com or fax to 1-800-335-9591.
For non-affiliates to market to you. Non-affiliates are companies not related by common ownership or control. They can be financial and non-financial companies.	No	We don't share

We may disclose your personal information to our affiliates or to non-affiliates as permitted by law. If you request a transaction with a non-affiliate, such as a third party insurance company, we will disclose your personal information to that non-affiliate. [We do not control their subsequent use of information, and suggest you refer to their privacy notices.]

SHARING PRACTICES

How often do the Stewart Title Companies notify me about their practices?	We must notify you about our sharing practices when you request a transaction.
How do the Stewart Title Companies protect my personal information?	To protect your personal information from unauthorized access and use, we use security measures that comply with federal law. These measures include computer, file, and building safeguards.
How do the Stewart Title Companies collect my personal information?	We collect your personal information, for example, when you request insurance-related services provide such information to us We also collect your personal information from others, such as the real estate agent or lender involved in your transaction, credit reporting agencies, affiliates or other companies.
What sharing can I limit?	Although federal and state law give you the right to limit sharing (e.g., opt out) in certain instances, we do not share your personal information in those instances.

Contact us: If you have any questions about this privacy notice, please contact us at: **Stewart Title Guaranty Company, 1360 Post Oak Blvd., Ste. 100, Privacy Officer, Houston, Texas 77056**

Privacy Notice for California Residents

Pursuant to the California Consumer Privacy Act of 2018 ("CCPA"), Stewart Information Services Corporation and its subsidiary companies (collectively, "Stewart") are providing this **Privacy Notice for California Residents** ("CCPA Notice"). This CCPA Notice supplements the information contained in Stewart's existing privacy notice and applies solely to all visitors, users and others who reside in the State of California or are considered California Residents ("consumers" or "you"). Terms used but not defined shall have the meaning ascribed to them in the CCPA.

Information Stewart Collects

Stewart collects information that identifies, relates to, describes, references, is capable of being associated with, or could reasonably be linked, directly or indirectly, with a particular consumer, household, or device. Most of the information that Stewart collects in the course of its regular business is already protected pursuant to the Gramm-Leach-Bliley Act (GLBA). Additionally, much of this information comes from government records or other information already in the public domain. Personal information under the CCPA does not include:

- Publicly available information from government records.
- Deidentified or aggregated consumer information.
- Certain personal information protected by other sector-specific federal or California laws, including but not limited to the Fair Credit Reporting Act (FCRA), GLBA and California Financial Information Privacy Act (FIPA).

Specifically, Stewart has collected the following categories of personal information from consumers within the last twelve (12) months:

Category	Examples	Collected?
A. Identifiers.	A real name, alias, postal address, unique personal identifier, online identifier, Internet Protocol address, email address, account name, Social Security number, driver's license number, passport number, or other similar identifiers.	YES
B. Personal information categories listed in the California Customer Records statute (Cal. Civ. Code § 1798.80(e)).	A name, signature, Social Security number, physical characteristics or description, address, telephone number, passport number, driver's license or state identification card number, insurance policy number, education, employment, employment history, bank account number, credit card number, debit card number, or any other financial information, medical information, or health insurance information. Some personal information included in this category may overlap with other categories.	YES
C. Protected classification characteristics under California or federal law.	Age (40 years or older), race, color, ancestry, national origin, citizenship, religion or creed, marital status, medical condition, physical or mental disability, sex (including gender, gender identity, gender expression, pregnancy or childbirth and related medical conditions), sexual orientation, veteran or military status, genetic information (including familial genetic information).	YES
D. Commercial information.	Records of personal property, products or services purchased, obtained, or considered, or other purchasing or consuming histories or tendencies.	YES
E. Biometric information.	Genetic, physiological, behavioral, and biological characteristics, or activity patterns used to extract a template or other identifier or identifying information, such as, fingerprints, faceprints, and voiceprints, iris or retina scans, keystroke, gait, or other physical patterns, and sleep, health, or exercise data.	YES
F. Internet or other similar network activity.	Browsing history, search history, information on a consumer's interaction with a website, application, or advertisement.	YES
G. Geolocation data.	Physical location or movements.	YES
H. Sensory data.	Audio, electronic, visual, thermal, olfactory, or similar information.	YES
I. Professional or employment-related information.	Current or past job history or performance evaluations.	YES
J. Non-public education information (per the Family Educational Rights and Privacy Act (20 U.S.C. Section 1232g, 34 C.F.R. Part 99)).	Education records directly related to a student maintained by an educational institution or party acting on its behalf, such as grades, transcripts, class lists, student schedules, student identification codes, student financial information, or student disciplinary records.	YES
K. Inferences drawn from other personal information.	Profile reflecting a person's preferences, characteristics, psychological trends, predispositions, behavior, attitudes, intelligence, abilities, and aptitudes.	YES

Stewart obtains the categories of personal information listed above from the following categories of sources:

- Directly and indirectly from customers, their designees or their agents (For example, realtors, lenders, attorneys, etc.)
- Directly and indirectly from activity on Stewart's website or other applications.
- From third-parties that interact with Stewart in connection with the services we provide.

Use of Personal Information

Stewart may use or disclose the personal information we collect for one or more of the following purposes:

- To fulfill or meet the reason for which the information is provided.
- To provide, support, personalize, and develop our website, products, and services.
- To create, maintain, customize, and secure your account with Stewart.
- To process your requests, purchases, transactions, and payments and prevent transactional fraud.
- To prevent and/or process claims.
- To assist third party vendors/service providers who complete transactions or perform services on Stewart's behalf.
- As necessary or appropriate to protect the rights, property or safety of Stewart, our customers or others.
- To provide you with support and to respond to your inquiries, including to investigate and address your concerns and monitor and improve our responses.
- To personalize your website experience and to deliver content and product and service offerings relevant to your interests, including targeted offers and ads through our website, third-party sites, and via email or text message (with your consent, where required by law).
- To help maintain the safety, security, and integrity of our website, products and services, databases and other technology assets, and business.
- To respond to law enforcement or regulator requests as required by applicable law, court order, or governmental regulations.
- Auditing for compliance with federal and state laws, rules and regulations.
- Performing services including maintaining or servicing accounts, providing customer service, processing or fulfilling orders and transactions, verifying customer information, processing payments, providing advertising or marketing services or other similar services.
- To evaluate or conduct a merger, divestiture, restructuring, reorganization, dissolution, or other sale or transfer of some or all of our assets, whether as a going concern or as part of bankruptcy, liquidation, or similar proceeding, in which personal information held by us is among the assets transferred.

Stewart will not collect additional categories of personal information or use the personal information we collected for materially different, unrelated, or incompatible purposes without providing you notice.

Disclosure of Personal Information to Affiliated Companies and Nonaffiliated Third Parties

Stewart does not sell your personal information to nonaffiliated third parties. Stewart may share your information with those you have designated as your agent in the course of your transaction (for example, a realtor or a lender). Stewart may disclose your personal information to a third party for a business purpose. Typically, when we disclose personal information for a business purpose, we enter a contract that describes the purpose and requires the recipient to both keep that personal information confidential and not use it for any purpose except performing the contract.

We share your personal information with the following categories of third parties:

- Service providers and vendors (For example, search companies, mobile notaries, and companies providing credit/debit card processing, billing, shipping, repair, customer service, auditing, marketing, etc.)
- Affiliated Companies
- Litigation parties and attorneys, as required by law.
- Financial rating organizations, rating bureaus and trade associations.
- Federal and State Regulators, law enforcement and other government entities

In the preceding twelve (12) months, Stewart has disclosed the following categories of personal information for a business purpose:

Category A: Identifiers
Category B: California Customer Records personal information categories
Category C: Protected classification characteristics under California or federal law
Category D: Commercial Information
Category E: Biometric Information
Category F: Internet or other similar network activity
Category G: Geolocation data
Category H: Sensory data
Category I: Professional or employment-related information
Category J: Non-public education information
Category K: Inferences

Consumer Rights and Choices

The CCPA provides consumers (California residents) with specific rights regarding their personal information. This section describes your CCPA rights and explains how to exercise those rights.

Access to Specific Information and Data Portability Rights

You have the right to request that Stewart disclose certain information to you about our collection and use of your personal information over the past 12 months. Once we receive and confirm your verifiable consumer request, Stewart will disclose to you:

- The categories of personal information Stewart collected about you.
- The categories of sources for the personal information Stewart collected about you.
- Stewart's business or commercial purpose for collecting that personal information.
- The categories of third parties with whom Stewart shares that personal information.
- The specific pieces of personal information Stewart collected about you (also called a data portability request).
- If Stewart disclosed your personal data for a business purpose, a listing identifying the personal information categories that each category of recipient obtained.

Deletion Request Rights

You have the right to request that Stewart delete any of your personal information we collected from you and retained, subject to certain exceptions. Once we receive and confirm your verifiable consumer request, Stewart will delete (and direct our service providers to delete) your personal information from our records, unless an exception applies.

Stewart may deny your deletion request if retaining the information is necessary for us or our service providers to:

1. Complete the transaction for which we collected the personal information, provide a good or service that you requested, take actions reasonably anticipated within the context of our ongoing business relationship with you, or otherwise perform our contract with you.
2. Detect security incidents, protect against malicious, deceptive, fraudulent, or illegal activity, or prosecute those responsible for such activities.
3. Debug products to identify and repair errors that impair existing intended functionality.
4. Exercise free speech, ensure the right of another consumer to exercise their free speech rights, or exercise another right provided for by law.
5. Comply with the California Electronic Communications Privacy Act (Cal. Penal Code § 1546 *seq.*).
6. Engage in public or peer-reviewed scientific, historical, or statistical research in the public interest that adheres to all other applicable ethics and privacy laws, when the information's deletion may likely render impossible or seriously impair the research's achievement, if you previously provided informed consent.
7. Enable solely internal uses that are reasonably aligned with consumer expectations based on your relationship with us.
8. Comply with a legal obligation.
9. Make other internal and lawful uses of that information that are compatible with the context in which you provided it.

Exercising Access, Data Portability, and Deletion Rights

To exercise the access, data portability, and deletion rights described above, please submit a verifiable consumer request to us either:

- Calling us Toll Free at 1-866-571-9270
- Emailing us at Privacyrequest@stewart.com
- Visiting http://stewart.com/ccpa

Only you, or someone legally authorized to act on your behalf, may make a verifiable consumer request related to your personal information. You may also make a verifiable consumer request on behalf of your minor child.

To designate an authorized agent, please contact Stewart through one of the methods mentioned above.

You may only make a verifiable consumer request for access or data portability twice within a 12-month period. The verifiable consumer request must:

- Provide sufficient information that allows us to reasonably verify you are the person about whom we collected personal information or an authorized representative.
- Describe your request with sufficient detail that allows us to properly understand, evaluate, and respond to it.

Stewart cannot respond to your request or provide you with personal information if we cannot verify your identity or authority to make the request and confirm the personal information relates to you.

Making a verifiable consumer request does not require you to create an account with Stewart.

Response Timing and Format

We endeavor to respond to a verifiable consumer request within forty-five (45) days of its receipt. If we require more time (up to an additional 45 days), we will inform you of the reason and extension period in writing.

A written response will be delivered by mail or electronically, at your option.

Any disclosures we provide will only cover the 12-month period preceding the verifiable consumer request's receipt. The response we provide will also explain the reasons we cannot comply with a request, if applicable. For data portability requests, we will select a format to provide your personal information that is readily useable and should allow you to transmit the information from one entity to another entity without hindrance.

Stewart does not charge a fee to process or respond to your verifiable consumer request unless it is excessive, repetitive, or manifestly unfounded. If we determine that the request warrants a fee, we will tell you why we made that decision and provide you with a cost estimate before completing your request.

Non-Discrimination

Stewart will not discriminate against you for exercising any of your CCPA rights. Unless permitted by the CCPA, we will not:

- Deny you goods or services.
- Charge you a different prices or rates for goods or services, including through granting discounts or other benefits, or imposing penalties.
- Provide you a different level or quality of goods or services.
- Suggest that you may receive a different price or rate for goods or services or a different level or quality of goods or services.

Changes to Our Privacy Notice

Stewart reserves the right to amend this privacy notice at our discretion and at any time. When we make changes to this privacy notice, we will post the updated notice on Stewart's website and update the notice's effective date. **Your continued use of Stewart's website following the posting of changes constitutes your acceptance of such changes.**

Contact Information

If you have questions or comments about this notice, the ways in which Stewart collects and uses your information described here, your choices and rights regarding such use, or wish to exercise your rights under California law, please do not hesitate to contact us at:

Phone: Toll Free at 1-866-571-9270

Website: **http://stewart.com/ccpa**

Email: Privacyrequest@stewart.com

Postal Address: Stewart Information Services Corporation

Attn: Mary Thomas, Deputy Chief Compliance Officer

1360 Post Oak Blvd., Ste. 100, MC #14-1

Houston, TX 77056

stewart title
Real partners. Real possibilities.™

Kathy Crawford
Title Officer

Stewart Title of California, Inc.
11870 Pierce St, Ste 100
Riverside, CA 92505
Phone: (951) 276-2700
Fax: (951) 346-3395
kcrawfor@stewart.com

PRELIMINARY REPORT

Order No.: 869471
Your File No.:
Buyer/Borrower Name:
Seller Name: ARB Inc

Property Address: APN 050-070-019, 2910 E Nelsons Pit, Holtville, CA 92250

In response to the above referenced application for a Policy of Title Insurance, Stewart Title of California, Inc. hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a Stewart Title Guaranty Company Policy or Policies of Title Insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referenced to as an Exception on Schedule B or not excluded from coverage pursuant to the printed Schedules, Conditions, and Stipulations of said Policy forms.

The printed Exceptions and Exclusions from the coverage and Limitations on covered Risks of said policy or policies are set forth in Exhibit A attached. The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than that set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties. Limitations on Covered Risks applicable to the CLTA and ALTA Homeowner's Policies of Title Insurance which establish a Deductible Amount and a Maximum Dollar Limits of Liability for certain coverages are also set forth in Exhibit A. Copies of the policy forms should be read. They are available from the office which issued this report.

Please read the exceptions shown or referred to below and the exceptions and exclusions set forth in Exhibit A of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters, which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects, and encumbrances affecting title to the land.

This report, (and any supplements or amendments thereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance a binder or commitment should be requested.

Dated as of June 30, 2020 at 8:00AM	

When replying, please contact: Kathy Crawford, Title Officer

Stewart Title of California, Inc.
11870 Pierce St, Ste 100
Riverside, CA 92505
(951) 276-2700
kcrawfor@stewart.com

PRELIMINARY REPORT

The form of Policy of Title Insurance contemplated by this report is:

☐ CLTA Standard Coverage Policy

☐ CLTA/ALTA Homeowners Policy

☐ 2006 ALTA Owner's Policy

☐ 2006 ALTA Loan Policy

☐ ALTA Short Form Residential Loan Policy

☒ Preliminary Report

SCHEDULE A

The estate or interest in the land hereinafter described or referred to covered by this report is:

FEE

Title to said estate or interest at the date hereof is vested in:

ARB, Inc., a California corporation, subject to Item 12 herein

LEGAL DESCRIPTION

The land referred to herein is situated in the State of California, County of Imperial, City of Holtville and described as follows:

The West half of the Northwest quarter of Section thirty-six (36), Township Fifteen (15) South, Range Sixteen (16) East, S.B.M., in the County of Imperial, State of California, according to the United States Government Plat of Resurvey approved November 4, 1908 and on file in the United States Land Office at Los Angeles, California.

APN: 050-070-19-00

APN: 050-070-019

(End of Legal Description)

MAP

THE MAP CONNECTED HEREWITH IS BEING PROVIDED AS A COURTESY AND FOR INFORMATIONAL PURPOSES ONLY; THIS MAP SHOULD NOT BE RELIED UPON. FURTHERMORE, THE PARCELS SET OUT ON THIS MAP MAY NOT COMPLY WITH LOCAL SUBDIVISION OR BUILDING ORDINANCES. STEWART ASSUMES NO LIABILITY, RESPONSIBILITY OR INDEMNIFICATION RELATED TO THE MAPS NOR ANY MATTERS CONCERNING THE CONTENTS OF OR ACCURACY OF THE MAP.

SCHEDULE B

At the date hereof, exceptions to coverage in addition to the printed exceptions and exclusions contained in said policy or policies would be as follows:

Taxes:

A. General and Special City and/or County taxes, including any personal property taxes and any assessments collected with taxes, for the fiscal year 2019 - 2020:
1st Installment : $962.53 Late
2nd Installment : $972.53 Late
Parcel No. : 050-070-019-000
Code Area : 068005

B. Said property has been declared tax defaulted for non-payment of delinquent taxes for the fiscal year 2020:

Amounts to redeem for the above stated fiscal year (and subsequent years, if any) are:
Amount: $ 2,002.56

C. Semi-annual water availability assessment in favor of the Imperial Irrigation District.

D. Confirmation of the tax figures must be made prior to close of escrow. Please contact the County Tax Collector prior to closing.

Exceptions:

1. Water rights, claims or title to water in or under the property, whether or not shown by the public records.

2. The lien of supplemental taxes, if any, assessed pursuant to the provisions of Chapter 3.5 (commencing with Section 75) of the Revenue and Taxation Code of the State of California.

3. Assessments for community facility districts which may exist by virtue of assessment maps or notices filed by those districts. Assessments are collected with the County Taxes.

4. Property is located within the boundary of the Imperial Irrigation District.

5. Rights or claims of easements for canals, drains, laterals, irrigation pipelines and gates not recorded in the public records.

6. Any interests (including rights of the public) in and to any portion of the property lying within roads, streets, alleys or highways.

7. Minerals of whatsoever kind, subsurface and surface substances, including but not limited to coal, lignite, oil, gas, geothermal resources, brine, uranium, clay, rock, sand and gravel in, on, under and that may be produced from the Land, together with all rights, privileges, and immunities relating thereto, whether or not appearing in the Public Records or listed in Schedule B. Stewart Title Guaranty Company makes no representation as to the present ownership of any such interests. There may be leases, grants, exceptions or reservations of interests that are not listed.

8. A grant of Deed to Rock, Sand, Gravel and Minerals, together with the appurtenant rights to use the surface of the land all of the rock, sand, gravel and similar substances, also all gold, silver,

precious metals, oil or any other minerals and hydrocarbon substances, by document recorded November 13, 1933 in Book 367 page 549 of Official Records.

9. Matters contained in document entitled "Agreement for Service Pipe" recorded August 18, 1955 in Book 917 page 236 of Official Records.

10. Easement and rights incidental thereto for a right of way for underground tile line, to Vernon Nussbaum and Dinette Nussbaum, as set forth in a document recorded October 5, 1964 in Book 1192 page 945 of Official Records.

11. Easement and rights incidental thereto for constructing, operating and maintaining a power line or lines, underground and/or overhead and necessary appurtenances attached thereto or as from time to time may be reconstructed, enlarged or otherwise changed, over and across, and incidental purposes, recorded November 25, 1987 in Book 1592 page 1543 of Official Records, to Imperial Irrigation District, its successors or assigns,

12. Any defect in, or invalidity of title to the estate or interest set forth in Schedule A arising out of, or occasioned by, that certain conveyance from Stellaris LLC, a Nevada limited liability company, as grantor to ARB, Inc., a California corporation, as grantee, recorded January 7, 2015 as Instrument No. 15-000235 of Official records. To remove this exception from Schedule B, Stewart Title Guaranty Company will require: (1) proof of the validity of this document prior to the issuance of any policy of title insurance; (2) a new deed, notarized in the current escrow office or any Stewart Title office; and (3) a statement of information from Stellaris LLC, a Nevada limited liability company. The deed and statement of information are subject to review and management approval.

13. Please be advised that our search did not disclose any open deeds of trust of record. If you should have knowledge of any outstanding obligation, please contact your title officer immediately for further review.

14. In order to insure a conveyance, acquisition or encumbrance by the corporation or unincorporated association named below you must provide the following:
Entity: ARB, Inc.
(a) A copy of the corporation By-Laws or Articles.
(b) An original or certified copy of the Resolution authorizing the subject transaction.
(c) If the By-Laws or Articles require approval by a "parent" organization, a copy of that entities' By-Laws or Articles.
(d) If an unincorporated association, a statement pursuant to applicable law (such as California Corporation Code Section 20002).
Additional requirements or items may be requested upon review of the required documents set forth above,

15. Rights or claims of parties in possession and easements or claims of easements not shown by the public records, conflicts in boundary lines, overlaps, shortage in area, encroachments, and any matters not of record which would be disclosed by an accurate survey or inspection of the property.

16. Rights of tenants in possession whether or not recorded in the public record.

(End of Exceptions)

NOTES AND REQUIREMENTS

A. There are no conveyances affecting said land, recorded with the County Recorder within 24 months of the date of this report.

B. If an Owners Policy will be requested, please be aware that unless instructed otherwise, we will issue a CLTA Standard Coverage Owners Policy. If a different form of policy is contemplated for this transaction, please advise and contact your title officer for additional requirements.

C. All Transactions - Seller(s) and Buyer(s) or Borrowers are provided as attachments Stewart Title's document entitled "Acknowledgement of Receipt, Understanding and Approval of STG Privacy Notice for Stewart Title Companies and Stewart's Affiliated Business Arrangement Disclosure Statement" along with those individually named documents for your review and acknowledgment prior to closing.

D. All Transactions - Buyer(s)/Seller(s)/Borrower(s) are provided Stewart Title's Preliminary report for review and acknowledgment prior to closing. Buyer(s) approval to include the Preliminary Report items that remain as exceptions to the title policy.

E. Purchase Transaction Only-Seller(s)/Owner(s) are provided Stewart Title's Owner Affidavit and Indemnity for completion prior to closing.

CALIFORNIA "GOOD FUNDS" LAW

California Insurance Code Section 12413.1 regulates the disbursement of escrow and sub-escrow funds by title companies. The law requires that funds be deposited in the title company escrow account and available for withdrawal prior to disbursement. Funds received by Stewart Title of California, Inc. via wire transfer may be disbursed upon receipt. Funds received via cashier's checks or teller checks drawn on a California Bank may be disbursed on the next business day after the day of deposit. If funds are received by any other means, recording and/or disbursement may be delayed, and you should contact your title or escrow officer. All escrow and sub-escrow funds received will be deposited with other escrow funds in one or more non-interest bearing escrow accounts in a financial institution selected by Stewart Title of California, Inc.. Stewart Title of California, Inc. may receive certain direct or indirect benefits from the financial institution by reason of the deposit of such funds or the maintenance of such accounts with the financial institution, and Stewart Title of California, Inc. shall have no obligation to account to the depositing party in any manner for the value of, or to pay to such party, any benefit received by Stewart Title of California, Inc.. Such benefits shall be deemed additional compensation to Stewart Title of California, Inc. for its services in connection with the escrow or sub-escrow.

If any check submitted is dishonored upon presentation for payment, you are authorized to notify all principals and/or their respective agents of such nonpayment.

EXHIBIT "A"

LEGAL DESCRIPTION

Order No.: 869471
Escrow No.: 869471

The land referred to herein is situated in the State of California, County of Imperial, City of Holtville and described as follows:

The West half of the Northwest quarter of Section thirty-six (36), Township Fifteen (15) South, Range Sixteen (16) East, S.B.M., in the County of Imperial, State of California, according to the United States Government Plat of Resurvey approved November 4, 1908 and on file in the United States Land Office at Los Angeles, California.

APN: 050-070-19-00

APN: 050-070-019

(End of Legal Description)

AFFILIATED BUSINESS ARRANGEMENT DISCLOSURE STATEMENT

Date: August 3, 2020

File No.: 869471

Property: APN 050-070-019, 2910 E Nelsons Pit, Holtville, CA 92250

From: Stewart Title of California, Inc.

This is to give you notice that Stewart Title of California, Inc. ("Stewart Title") has a business relationship with Stewart Solutions, LLC, DBA – Stewart Specialty Insurance Services, LLC ("Stewart Insurance"). Stewart Information Services Corporation owns 100% of Stewart Insurance and . Because of this relationship, this referral may provide Stewart Title a financial or other benefit.

Set forth below is the estimated charge or range of charges for the settlement services listed. You are NOT required to use the listed provider(s) as a condition for purchase, sale, or refinance of the subject Property. THERE ARE FREQUENTLY OTHER SETTLEMENT SERVICE PROVIDERS AVAILABLE WITH SIMILAR SERVICES. YOU ARE FREE TO SHOP AROUND TO DETERMINE THAT YOU ARE RECEIVING THE BEST SERVICES AND THE BEST RATE FOR THESE SERVICES.

Stewart Insurance Settlement Service	***Charge or range of charges***
Hazard Insurance	$400.00 to $6,500.00
Home Warranty	$255.00 to $ 780.00
Natural Hazard Disclosure Report	$ 42.50 to $ 149.50

ACKNOWLEDGEMENT OF RECEIPT, UNDERSTANDING AND APPROVAL OF STEWART TITLE GUARANTY COMPANY PRIVACY NOTICE FOR STEWART TITLE COMPANIES AND AFFILIATED BUSINESS ARRANGEMENT DISCLOSURE STATEMENT

The undersigned hereby acknowledge receipt of the Stewart Title Guaranty Company Privacy Notice for Stewart Title Companies and the Affiliated Business Arrangement Disclosure Statement that apply to this transaction. The undersigned further acknowledge that he/she/they have received, read, understand and accept these documents in connection with the above described transaction.

The undersigned have received a copy of this acknowledgement as evidenced by the signature below.

_____
ARB Inc

TBD

By:_____

CALIFORNIA LAND TITLE ASSOCIATION

STANDARD COVERAGE POLICY – 1990
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building or zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien, or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
   (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.

2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.

3. Defects, liens, encumbrances, adverse claims or other matters:
   a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
   b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
   c) resulting in no loss or damage to the insured claimant;
   d) attaching or created subsequent to Date of Policy; or
   e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage or for the estate or interest insured by this policy.

4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with the applicable doing business laws of the state in which the land is situated.

5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.

6. Any claim, which arises out of the transaction vesting in the insured the estate of interest insured by this policy or the transaction creating the interest of the insured lender, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws.

EXCEPTIONS FROM COVERAGE - SCHEDULE B, PART I

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.

   Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.

2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.

3. Easements, liens or encumbrances, or claims thereof, not shown by the public records.

4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records

5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.

6. Any lien or right to a lien for services, labor or material unless such lien is shown by the Public Records at Date of Policy.

CLTA/ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE (12-02-13)
EXCLUSIONS

In addition to the Exceptions in Schedule B, You are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of those portions of any law or government regulation concerning:
   a. building;
   b. zoning;
   c. land use;
   d. improvements on the Land;
   e. land division;
   f. environmental protection.

   This Exclusion does not limit the coverage described in Covered Risk 8.a., 14, 15, 16, 18, 19, 20, 23 or 27.

2. The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes. This Exclusion does not limit the coverage described in Covered Risk 14 or 15.
3. The right to take the Land by condemning it. This Exclusion does not limit the coverage described in Covered Risk 17.

4. Risks:
   a. that are created, allowed, or agreed to by You, whether or not they appear in the Public Records;
   b. that are Known to You at the Policy Date, but not to Us, unless they are recorded in the Public Records at the Policy Date;
   c. that result in no loss to You; or
   d. that first occur after the Policy Date - this does not limit the coverage described in Covered Risk 7, 8.e., 25, 26, 27 or 28.

5. Failure to pay value for Your Title.

6. Lack of a right:
   a. to any land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
   b. in streets, alleys, or waterways that touch the Land.

   This Exclusion does not limit the coverage described in Covered Risk 11 or 21.

7. The transfer of the Title to You is invalid as a preferential transfer or as a fraudulent transfer or conveyance under federal bankruptcy, state insolvency, or similar creditors' rights laws.

8. Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.

9. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

LIMITATIONS ON COVERED RISKS

Your insurance for the following Covered Risks is limited on the Owner's Coverage Statement as follows:
* For Covered Risk 16, 18, 19, and 21 Your Deductible Amount and Our Maximum Dollar Limit of Liability shown in Schedule A. The deductible amounts and maximum dollar limits shown on Schedule A are as follows:

	Your Deductible Amount	Our Maximum Dollar Limit of Liability
Covered Risk 16:	1% of Policy Amount or $2,500.00 (whichever is less)	$10,000.00
Covered Risk 18:	1% of Policy Amount or $5,000.00 (whichever is less)	$25,000.00
Covered Risk 19:	1% of Policy Amount or $5,000.00 (whichever is less)	$25,000.00
Covered Risk 21:	1% of Policy Amount or $2,500.00 (whichever is less)	$5,000.00

2006 ALTA LOAN POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.

3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.

4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.

5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.

6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.

7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

Except as provided in Schedule B - Part II, this policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses, that arise by reason of:

PART I

1. (a) taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
   (b) proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.

2. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.

3. Easements, liens or encumbrances, or claims thereof, which are not shown by the Public Records.

4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.

5. (a) unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.

6. Any lien or right to a lien for services, labor or material unless such lien is shown by the Public Records at Date of Policy.

PART II

In addition to the matters set forth in Part I of this Schedule, the Title is subject to the following matters, and the Company insures against loss or damage sustained in the event that they are not subordinate to the lien of the Insured Mortgage:

2006 ALTA OWNER'S POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.

3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.

4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
   (a) a fraudulent conveyance or fraudulent transfer; or
   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.

5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
   Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.

2. Any facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.

3. Easements, liens or encumbrances, or claims thereof, which are not shown by the public records.

4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and that are not shown by the Public Records.

5. (a) unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.

6. Any lien or right to a lien for services, labor or material unless such lien is shown by the Public Records at Date of Policy..

ALTA EXPANDED COVERAGE RESIDENTIAL LOAN POLICY – ASSESSMENTS PRIORITY (04-02-15)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys fees or expenses which arise by reason of:

1. a. Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions or location of any improvement now or hereafter erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection

   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.
   b. Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.

3. Defects, liens, encumbrances, adverse claims or other matters:

   (a) created, suffered, assumed or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting In no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27 or 28); or
   (e) resulting in loss or damage which would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.

4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing- business laws of the state where the Land is situated.

5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury, or any consumer credit protection or truth-in-lending law. This Exclusion does not modify or limit the coverage provided in Covered Risk 26.

6. Any claim of invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage as to Advances or modifications made after the Insured has Knowledge that the vestee shown in Schedule A is no longer the owner of the estate or interest covered by this policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11.

7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching subsequent to Date of Policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11(b) or 25.

8. The failure of the residential structure, or any portion of it, to have been constructed before, on or after Date of Policy in accordance with applicable building codes. This Exclusion does not modify or limit the coverage provided in Covered Risk 5 or 6.

9. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is

   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in Covered Risk 27(b) of this policy.

10 Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.

11. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

File No.: 869471

AVAILABLE DISCOUNTS DISCLOSURE STATEMENT

This is to give you notice that Stewart Title of California, Inc. ("Stewart Title") is pleased to inform you that upon proper qualification, there are premium discounts available upon the purchase of title insurance covering improved property with a one to four family residential dwelling.

Such discounts apply to and include:

Property located within an area proclaimed a state or federal disaster area;

Property purchased from a foreclosing beneficiary or successful bidder at a foreclosure sale;

Property being refinanced.

Please talk with your escrow or title officer to determine your qualification for any of these discounts.

Stewart Title Guaranty Company Privacy Notice
Stewart Title Companies

WHAT DO THE STEWART TITLE COMPANIES DO WITH YOUR PERSONAL INFORMATION?

Federal and applicable state law and regulations give consumers the right to limit some but not all sharing. Federal and applicable state law regulations also require us to tell you how we collect, share, and protect your personal information. Please read this notice carefully to understand how we use your personal information. This privacy notice is distributed on behalf of the Stewart Title Guaranty Company and its title affiliates (the Stewart Title Companies), pursuant to Title V of the Gramm-Leach-Bliley Act (GLBA).

The types of personal information we collect and share depend on the product or service that you have sought through us. This information can include social security numbers and driver's license number.

All financial companies, such as the Stewart Title Companies, need to share customers' personal information to run their everyday business—to process transactions and maintain customer accounts. In the section below, we list the reasons that we can share customers' personal information; the reasons that we choose to share; and whether you can limit this sharing.

Reasons we can share your personal information.	Do we share	Can you limit this sharing?
For our everyday business purposes— to process your transactions and maintain your account. This may include running the business and managing customer accounts, such as processing transactions, mailing, and auditing services, and responding to court orders and legal investigations.	Yes	No
For our marketing purposes— to offer our products and services to you.	Yes	No
For joint marketing with other financial companies	No	We don't share
For our affiliates' everyday business purposes— information about your transactions and experiences. Affiliates are companies related by common ownership or control. They can be financial and non-financial companies. *Our affiliates may include companies with a Stewart name; financial companies, such as Stewart Title Company*	Yes	No
For our affiliates' everyday business purposes— information about your creditworthiness.	No	We don't share
For our affiliates to market to you — For your convenience, Stewart has developed a means for you to opt out from its affiliates marketing even though such mechanism is not legally required.	Yes	Yes, send your first and last name, the email address used in your transaction, your Stewart file number and the Stewart office location that is handling your transaction by email to optout@stewart.com or fax to 1-800-335-9591.
For non-affiliates to market to you. Non-affiliates are companies not related by common ownership or control. They can be financial and non-financial companies.	No	We don't share

We may disclose your personal information to our affiliates or to non-affiliates as permitted by law. If you request a transaction with a non-affiliate, such as a third party insurance company, we will disclose your personal information to that non-affiliate. [We do not control their subsequent use of information, and suggest you refer to their privacy notices.]

SHARING PRACTICES

How often do the Stewart Title Companies notify me about their practices?	We must notify you about our sharing practices when you request a transaction.
How do the Stewart Title Companies protect my personal information?	To protect your personal information from unauthorized access and use, we use security measures that comply with federal law. These measures include computer, file, and building safeguards.
How do the Stewart Title Companies collect my personal information?	We collect your personal information, for example, when you request insurance-related services provide such information to us We also collect your personal information from others, such as the real estate agent or lender involved in your transaction, credit reporting agencies, affiliates or other companies.
What sharing can I limit?	Although federal and state law give you the right to limit sharing (e.g., opt out) in certain instances, we do not share your personal information in those instances.

Contact us: If you have any questions about this privacy notice, please contact us at: **Stewart Title Guaranty Company, 1360 Post Oak Blvd., Ste. 100, Privacy Officer, Houston, Texas 77056**

Privacy Notice for California Residents

Pursuant to the California Consumer Privacy Act of 2018 ("CCPA"), Stewart Information Services Corporation and its subsidiary companies (collectively, "Stewart") are providing this **Privacy Notice for California Residents** ("CCPA Notice"). This CCPA Notice supplements the information contained in Stewart's existing privacy notice and applies solely to all visitors, users and others who reside in the State of California or are considered California Residents ("consumers" or "you"). Terms used but not defined shall have the meaning ascribed to them in the CCPA.

Information Stewart Collects

Stewart collects information that identifies, relates to, describes, references, is capable of being associated with, or could reasonably be linked, directly or indirectly, with a particular consumer, household, or device. Most of the information that Stewart collects in the course of its regular business is already protected pursuant to the Gramm-Leach-Bliley Act (GLBA). Additionally, much of this information comes from government records or other information already in the public domain. Personal information under the CCPA does not include:

- Publicly available information from government records.
- Deidentified or aggregated consumer information.
- Certain personal information protected by other sector-specific federal or California laws, including but not limited to the Fair Credit Reporting Act (FCRA), GLBA and California Financial Information Privacy Act (FIPA).

Specifically, Stewart has collected the following categories of personal information from consumers within the last twelve (12) months:

Category	Examples	Collected?
A. Identifiers.	A real name, alias, postal address, unique personal identifier, online identifier, Internet Protocol address, email address, account name, Social Security number, driver's license number, passport number, or other similar identifiers.	YES
B. Personal information categories listed in the California Customer Records statute (Cal. Civ. Code § 1798.80(e)).	A name, signature, Social Security number, physical characteristics or description, address, telephone number, passport number, driver's license or state identification card number, insurance policy number, education, employment, employment history, bank account number, credit card number, debit card number, or any other financial information, medical information, or health insurance information. Some personal information included in this category may overlap with other categories.	YES
C. Protected classification characteristics under California or federal law.	Age (40 years or older), race, color, ancestry, national origin, citizenship, religion or creed, marital status, medical condition, physical or mental disability, sex (including gender, gender identity, gender expression, pregnancy or childbirth and related medical conditions), sexual orientation, veteran or military status, genetic information (including familial genetic information).	YES
D. Commercial information.	Records of personal property, products or services purchased, obtained, or considered, or other purchasing or consuming histories or tendencies.	YES
E. Biometric information.	Genetic, physiological, behavioral, and biological characteristics, or activity patterns used to extract a template or other identifier or identifying information, such as, fingerprints, faceprints, and voiceprints, iris or retina scans, keystroke, gait, or other physical patterns, and sleep, health, or exercise data.	YES
F. Internet or other similar network activity.	Browsing history, search history, information on a consumer's interaction with a website, application, or advertisement.	YES
G. Geolocation data.	Physical location or movements.	YES
H. Sensory data.	Audio, electronic, visual, thermal, olfactory, or similar information.	YES
I. Professional or employment-related information.	Current or past job history or performance evaluations.	YES
J. Non-public education information (per the Family Educational Rights and Privacy Act (20 U.S.C. Section 1232g, 34 C.F.R. Part 99)).	Education records directly related to a student maintained by an educational institution or party acting on its behalf, such as grades, transcripts, class lists, student schedules, student identification codes, student financial information, or student disciplinary records.	YES
K. Inferences drawn from other personal information.	Profile reflecting a person's preferences, characteristics, psychological trends, predispositions, behavior, attitudes, intelligence, abilities, and aptitudes.	YES

Stewart obtains the categories of personal information listed above from the following categories of sources:

- Directly and indirectly from customers, their designees or their agents (For example, realtors, lenders, attorneys, etc.)
- Directly and indirectly from activity on Stewart's website or other applications.
- From third-parties that interact with Stewart in connection with the services we provide.

Use of Personal Information

Stewart may use or disclose the personal information we collect for one or more of the following purposes:

- To fulfill or meet the reason for which the information is provided.
- To provide, support, personalize, and develop our website, products, and services.
- To create, maintain, customize, and secure your account with Stewart.
- To process your requests, purchases, transactions, and payments and prevent transactional fraud.
- To prevent and/or process claims.
- To assist third party vendors/service providers who complete transactions or perform services on Stewart's behalf.
- As necessary or appropriate to protect the rights, property or safety of Stewart, our customers or others.
- To provide you with support and to respond to your inquiries, including to investigate and address your concerns and monitor and improve our responses.
- To personalize your website experience and to deliver content and product and service offerings relevant to your interests, including targeted offers and ads through our website, third-party sites, and via email or text message (with your consent, where required by law).
- To help maintain the safety, security, and integrity of our website, products and services, databases and other technology assets, and business.
- To respond to law enforcement or regulator requests as required by applicable law, court order, or governmental regulations.
- Auditing for compliance with federal and state laws, rules and regulations.
- Performing services including maintaining or servicing accounts, providing customer service, processing or fulfilling orders and transactions, verifying customer information, processing payments, providing advertising or marketing services or other similar services.
- To evaluate or conduct a merger, divestiture, restructuring, reorganization, dissolution, or other sale or transfer of some or all of our assets, whether as a going concern or as part of bankruptcy, liquidation, or similar proceeding, in which personal information held by us is among the assets transferred.

Stewart will not collect additional categories of personal information or use the personal information we collected for materially different, unrelated, or incompatible purposes without providing you notice.

Disclosure of Personal Information to Affiliated Companies and Nonaffiliated Third Parties

Stewart does not sell your personal information to nonaffiliated third parties. Stewart may share your information with those you have designated as your agent in the course of your transaction (for example, a realtor or a lender). Stewart may disclose your personal information to a third party for a business purpose. Typically, when we disclose personal information for a business purpose, we enter a contract that describes the purpose and requires the recipient to both keep that personal information confidential and not use it for any purpose except performing the contract.

We share your personal information with the following categories of third parties:

- Service providers and vendors (For example, search companies, mobile notaries, and companies providing credit/debit card processing, billing, shipping, repair, customer service, auditing, marketing, etc.)
- Affiliated Companies
- Litigation parties and attorneys, as required by law.
- Financial rating organizations, rating bureaus and trade associations.
- Federal and State Regulators, law enforcement and other government entities

In the preceding twelve (12) months, Stewart has disclosed the following categories of personal information for a business purpose:

Category A: Identifiers
Category B: California Customer Records personal information categories
Category C: Protected classification characteristics under California or federal law
Category D: Commercial Information
Category E: Biometric Information
Category F: Internet or other similar network activity
Category G: Geolocation data
Category H: Sensory data
Category I: Professional or employment-related information
Category J: Non-public education information
Category K: Inferences

Consumer Rights and Choices

The CCPA provides consumers (California residents) with specific rights regarding their personal information. This section describes your CCPA rights and explains how to exercise those rights.

Access to Specific Information and Data Portability Rights

You have the right to request that Stewart disclose certain information to you about our collection and use of your personal information over the past 12 months. Once we receive and confirm your verifiable consumer request, Stewart will disclose to you:

- The categories of personal information Stewart collected about you.
- The categories of sources for the personal information Stewart collected about you.
- Stewart's business or commercial purpose for collecting that personal information.
- The categories of third parties with whom Stewart shares that personal information.
- The specific pieces of personal information Stewart collected about you (also called a data portability request).
- If Stewart disclosed your personal data for a business purpose, a listing identifying the personal information categories that each category of recipient obtained.

Deletion Request Rights

You have the right to request that Stewart delete any of your personal information we collected from you and retained, subject to certain exceptions. Once we receive and confirm your verifiable consumer request, Stewart will delete (and direct our service providers to delete) your personal information from our records, unless an exception applies.

Stewart may deny your deletion request if retaining the information is necessary for us or our service providers to:

1. Complete the transaction for which we collected the personal information, provide a good or service that you requested, take actions reasonably anticipated within the context of our ongoing business relationship with you, or otherwise perform our contract with you.
2. Detect security incidents, protect against malicious, deceptive, fraudulent, or illegal activity, or prosecute those responsible for such activities.
3. Debug products to identify and repair errors that impair existing intended functionality.
4. Exercise free speech, ensure the right of another consumer to exercise their free speech rights, or exercise another right provided for by law.
5. Comply with the California Electronic Communications Privacy Act (Cal. Penal Code § 1546 *seq.*).
6. Engage in public or peer-reviewed scientific, historical, or statistical research in the public interest that adheres to all other applicable ethics and privacy laws, when the information's deletion may likely render impossible or seriously impair the research's achievement, if you previously provided informed consent.
7. Enable solely internal uses that are reasonably aligned with consumer expectations based on your relationship with us.
8. Comply with a legal obligation.
9. Make other internal and lawful uses of that information that are compatible with the context in which you provided it.

Exercising Access, Data Portability, and Deletion Rights

To exercise the access, data portability, and deletion rights described above, please submit a verifiable consumer request to us either:

- Calling us Toll Free at 1-866-571-9270
- Emailing us at Privacyrequest@stewart.com
- Visiting http://stewart.com/ccpa

Only you, or someone legally authorized to act on your behalf, may make a verifiable consumer request related to your personal information. You may also make a verifiable consumer request on behalf of your minor child.

To designate an authorized agent, please contact Stewart through one of the methods mentioned above.

You may only make a verifiable consumer request for access or data portability twice within a 12-month period. The verifiable consumer request must:

- Provide sufficient information that allows us to reasonably verify you are the person about whom we collected personal information or an authorized representative.
- Describe your request with sufficient detail that allows us to properly understand, evaluate, and respond to it.

Stewart cannot respond to your request or provide you with personal information if we cannot verify your identity or authority to make the request and confirm the personal information relates to you.

Making a verifiable consumer request does not require you to create an account with Stewart.

Response Timing and Format

We endeavor to respond to a verifiable consumer request within forty-five (45) days of its receipt. If we require more time (up to an additional 45 days), we will inform you of the reason and extension period in writing.

A written response will be delivered by mail or electronically, at your option.

Any disclosures we provide will only cover the 12-month period preceding the verifiable consumer request's receipt. The response we provide will also explain the reasons we cannot comply with a request, if applicable. For data portability requests, we will select a format to provide your personal information that is readily useable and should allow you to transmit the information from one entity to another entity without hindrance.

Stewart does not charge a fee to process or respond to your verifiable consumer request unless it is excessive, repetitive, or manifestly unfounded. If we determine that the request warrants a fee, we will tell you why we made that decision and provide you with a cost estimate before completing your request.

Non-Discrimination

Stewart will not discriminate against you for exercising any of your CCPA rights. Unless permitted by the CCPA, we will not:

- Deny you goods or services.
- Charge you a different prices or rates for goods or services, including through granting discounts or other benefits, or imposing penalties.
- Provide you a different level or quality of goods or services.
- Suggest that you may receive a different price or rate for goods or services or a different level or quality of goods or services.

Changes to Our Privacy Notice

Stewart reserves the right to amend this privacy notice at our discretion and at any time. When we make changes to this privacy notice, we will post the updated notice on Stewart's website and update the notice's effective date. **Your continued use of Stewart's website following the posting of changes constitutes your acceptance of such changes.**

Contact Information

If you have questions or comments about this notice, the ways in which Stewart collects and uses your information described here, your choices and rights regarding such use, or wish to exercise your rights under California law, please do not hesitate to contact us at:

Phone: Toll Free at 1-866-571-9270

Website: **http://stewart.com/ccpa**

Email: Privacyrequest@stewart.com

Postal Address: Stewart Information Services Corporation

Attn: Mary Thomas, Deputy Chief Compliance Officer

1360 Post Oak Blvd., Ste. 100, MC #14-1

Houston, TX 77056

APPENDIX H

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Vikings Solar
Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283

Inquiry Number: 6320675.5
January 08, 2021

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

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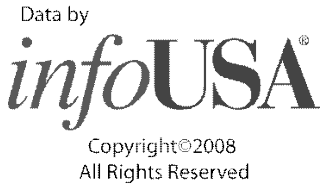

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2017	☐	☐	Haines Criss-Cross Directory
2014	☑	☐	EDR Digital Archive
2010	☐	☐	Haines Criss-Cross Directory
2005	☐	☐	Haines Criss-Cross Directory
2000	☐	☐	Haines Criss-Cross Directory
1995	☐	☐	Haines Criss-Cross Directory
1992	☐	☐	EDR Digital Archive

FINDINGS

TARGET PROPERTY STREET

Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283

Year	*CD Image*	*Source*	
EASTNELSON PIT RD			
2014	pg A1	EDR Digital Archive	
NELSON PIT RD			
2017	-	Haines Criss-Cross Directory	Target and Adjoining not listed in Source
2010	-	Haines Criss-Cross Directory	Street not listed in Source
2005	-	Haines Criss-Cross Directory	Street not listed in Source
2000	-	Haines Criss-Cross Directory	Street not listed in Source
1995	-	Haines Criss-Cross Directory	Street not listed in Source
1992	-	EDR Digital Archive	Target and Adjoining not listed in Source

FINDINGS

CROSS STREETS

No Cross Streets Identified

City Directory Images

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

EASTNELSON PIT RD 2014

2596 FUSI, LOURDES R

APPENDIX I

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Vikings Solar
Nelson Pit Road At East Highline Canal
Winterhaven, CA 92283

Inquiry Number: 6320675.7
January 06, 2021

EDR Environmental Lien and AUL Search

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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EDR Environmental Lien and AUL Search

The EDR Environmental Lien and AUL Search Report provides results from a search of available current land title records for environmental cleanup liens and other activity and use limitations, such as engineering controls and institutional controls.

A network of professional, trained researchers, following established procedures, uses client supplied address information to:

- search for parcel information and/or legal description;
- search for ownership information;
- research official land title documents recorded at jurisdictional agencies such as recorders' offices, registries of deeds, county clerks' offices, etc.;
- access a copy of the deed;
- search for environmental encumbering instrument(s) associated with the deed;
- provide a copy of any environmental encumbrance(s) based upon a review of key words in the instrument(s) (title, parties involved, and description); and
- provide a copy of the deed or cite documents reviewed.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction orforecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

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EDR Environmental Lien and AUL Search

TARGET PROPERTY INFORMATION

ADDRESS

Nelson Pit Road At East Highline Canal
Vikings Solar
Winterhaven, CA 92283

ENVIRONMENTAL LIEN

Environmental Lien: Found ☐ Not Found ☒

OTHER ACTIVITY AND USE LIMITATIONS (AULs)

AULs: Found ☐ Not Found ☒

RESEARCH SOURCE

Source 1:

Imperial Recorder
Imperial, CA

PROPERTY INFORMATION

Deed 1:

Type of Deed:	deed
Title is vested in:	RL & R Strahan
Title received from:	Cocpah Nurseries Inc
Deed Dated	4/19/2011
Deed Recorded:	5/31/2011
Book:	NA
Page:	na
Volume:	na
Instrument:	na
Docket:	NA
Land Record Comments:	
Miscellaneous Comments:	
Legal Description:	See Exhibit
Legal Current Owner:	RL & R Strahan
Parcel # / Property Identifier:	050-070-018
Comments:	See Exhibit

Deed Exhibit 1

RECORDING REQUESTED BY:
Stewart Title of California.
WHEN RECORDED MAIL TO
AND MAIL TAX STATEMENTS TO:
RL&R Strahm
2605 N Holt Road
Holtville, CA 92250

ORDER NO. 7434-377939
ESCROW NO. 7402-377939
APN. 050-070-018

Recorded in Official Records, Imperial County

Chuck Storey
County Clerk / Recorder

STC Stewart Title Company

Doc#: 2011–012936

5/31/2011
4:30 PM
AP

Titles: 1 **Pages: 3**

Fees	13.00
Taxes	2,200.00
Other	0.00
PAID	$2,213.00

SPACE ABOVE THIS LINE FOR RECORDER'S USE

3
1
SC1

GRANT DEED

THE UNDERSIGNED GRANTOR(s) DECLARE(s):
DOCUMENTARY TRANSFER TAX is: $2,200.00 CITY TAX
☐ Monument Preservation Fee is:
☒ computed on full value of property conveyed, or
☐ computed on full value less value of liens or encumbrances remaining at time of sale.
☒ Unincorporated area: ~~☒ City of Imperial County~~, and
FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,
Cocopah Nurseries Inc.,, a California Corporation

hereby **GRANT(S)** to
RL&R Strahm, a California general partnership

the following described real property in ~~the City of Imperial County~~, County of Imperial, State of California
LEGAL DESCRIPTION ON EXHIBIT A

DATE: April 19, 2011

Cocopah Nurseries Inc.,

Duane Lee Young

DUANE LEE YOUNG
Authorized Signer

STATE OF CALIFORNIA
COUNTY OF Riverside

On May 10, 2011 before me,
Phyllis R. Park a Notary
Public, personally appeared Duane Lee Young

, who proved to me on the basis of satisfactory evidence to be the person(s), whose name(s) is/~~are~~ subscribed to the within instrument and acknowledged to me that he/~~she~~/~~they~~ executed the same in his/~~her~~/~~their~~ authorized capacity(~~ies~~), and that by his/~~her~~/~~their~~ signature(~~s~~) on the instrument the person(~~s~~) or the entity upon behalf of which the person(~~s~~) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Phyllis R Park

PHYLLIS R. PARK
Commission # 1870892
Notary Public - California
Riverside County
My Comm. Expires Dec 6, 2013

MAIL TAX STATEMENTS AS DIRECTED ABOVE

EXHIBIT "A"
LEGAL DESCRIPTION

Order No.: 377939
Escrow No: 377939

The land referred to herein is situated in the State of California, County of Imperial, and described as follows:

Parcel 1:

The East half, *and* the East half of the Southwest quarter, *and* the Southeast quarter of the Northwest quarter of Section 36, Township 15 South, Range 16 East, San Bernardino Base and Meridian, County of Imperial, State of California, according to the United States Government Official Plat of Survey approved and on file in the District Land Office.

Excepting therefrom, an undivided 50% interest of all mineral and geothermal rights now held by the grantor appurtenant to the property, but without any right whatsoever to enter upon the surface of said land or any portion thereof within 500 feet vertical distance below the surface thereof, as reserved by The Nussbaum Family Limited Partnership, a California limited partnership in deed recorded April 1, 2008 as Instrument 2008-009138 of Official Records.

Parcel 2:

The Northeast quarter of the Northwest quarter of Section 36, Township 15 South, Range 16 East, San Bernardino Base and Meridian, County of Imperial, State of California, according to the United States Government Official Plat of Survey approved and on file in the District Land Office;

Excepting therefrom all oil and mineral rights as reserved by J. Lillian Callander in deed recorded December 4, 1951 as Instrument No. 22 in Book 827, Page 354 of Official Records.

Excepting therefrom, an undivided 50% interest of all mineral and geothermal rights now held by the grantor appurtenant to the property, but without any right whatsoever to enter upon the surface of said land or any portion thereof within 500 feet vertical distance below the surface thereof, as reserved by The Nussbaum Family Limited Partnership, a California limited partnership in deed recorded April 1, 2008 as Instrument 2008-009138 of Official Records.

(APN: 050-070-018)

Parcel 3:

A right of way for an underground tile line across the Northwest quarter of the Northwest quarter of Section 36, Township 15 South, Range 16 East, San Bernardino Base and Meridian, County of Imperial, State of California, according to the United States Government Official Plat of Survey approved and on file in the District Land Office, the centerline of which is described as follows:

Beginning at a point which is 1,262.25 feet South of the northeast corner of the Northwest quarter of the Northwest quarter of said Section 36; thence North 76°22'00" West, 1,185 feet to a point in the east bank of the East Highline Canal, as now constructed across said property.

(End of Legal Description)

APPENDIX J

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Jeffrey O. Lyon, PE
Principal Engineer

Education

B.S. Civil Engineering (Magna Cum Laude)
California Polytechnic University, Pomona Campus 1978

Registration

Registered Civil Engineer No. 31921, California
Registered Civil Engineer No. 16994, Arizona

Professional Experience

1987 - Present	Principal Engineer Southland Geotechnical, Inc.
1982 - 1987	Principal Engineer Lyon Engineers, Inc.
1978 - 1981	Partner/Senior Engineer Tesco Engineering
1974 - 1977	Survey Party Chief Tesco Engineering
1972 - 1973	Survey Party Chief Lyon & Associates

Summary of Experience

As Principal Engineer, Mr. Lyon is responsible for financial and technical management of all employees in Southland Geotechnical's four branch offices. Mr. Lyon has performed site investigations for residential subdivisions, geogrid-reinforced slopes, shopping centers, military airfields, roadways, administration and office buildings, elementary and high schools, goldmine mill processing facilities, hydro-electric plants, power transmission lines, electrical substations, co-generation power plants and geothermal power plants. He has provided design for drilled piers, driven piles, stone columns and floating (rigid) mats, and has performed seismic risk evaluations, ground shaking analyses, liquefaction studies and liquefaction induced settlements studies. Mr. Lyon has conducted Phase I and Phase II ESA's throughout the Imperial and Coachella Valleys for over 7 years. Mr. Lyon's experience also includes forensic investigations for foundation/structural distress to residential, commercial and educational facilities, and has performed pressure grout stabilization and lifting for distress remediation.

Selected Project Experience

- **Aten Road Improvements, Imperial, CA**

Performed Phase I environmental site assessment for improvements to Aten Road in accordance to CalTrans requirements.

- **Gateway to the Americas, Calexico, CA**

Conducted Phase I ESA, geologic hazards study and geotechnical investigation including liquefaction evaluation for 1,700 acre development associated with new Port of Entry east of Calexico

- **El Centro Magistrate Court, El Centro, CA**

Conducted geotechnical investigation and Phase I ESA for new Federal Magistrate Court building at site with soft soil conditions requiring foundation settlement analysis

- **El Centro Regional Medical Center, El Centro, CA**

Conducted Phase I ESA and geotechnical investigation for 50,000 sf, 2-story addition to the medical center's emergency room, operating rooms, and recovery rooms.

- **Brawley Union High School, Brawley, CA**

Conducted Phase II investigation for PCB and lead contamination of surficial soil and hydrocarbon contamination of subsurface soil of a property proposed for purchase.

- **EW Corporation Site, Westmorland, CA**

Conducted Phase II investigation for hydrocarbon contamination of subsurface soil of a service station site with leaking underground storage tanks prior to property purchase

- **Various Apartment Complexes, Imperial County, CA**

Conducted Phase I environmental investigation at numerous proposed apartment complex site within the Imperial Valley

- **Hwy 98 Improvements, Imperial, CA**

Performed Phase I environmental site assessment for improvements to Hwy 98 for a new intersection in accordance to CalTrans requirements.

Professional Affiliations

American Society of Civil Engineers, Member
American Society of Testing Materials, Member
American Concrete Institute, Certified Examiner
Association of Professional Firms Practicing in the Geosciences, Member

Steven K. Williams, CEG
Senior Engineering Geologist

Education
M.S. Geology
University of Utah, 1993
B.S. Geology
University of Utah, 1989

Registration
Registered Geologist
Arizona 3759
California 6975
Certified Engineering Geologist
California 2261

Professional Experience

2000 – Present	Project Geologist GS Lyon Consultants, Inc.
1994 - 2000	Staff Geologist GS Lyon Consultants, Inc.
1994	Field Geologist Bureau of Land Management
1991 - 1992	Exploration Geologist Kennecott Corporation

Summary of Experience
Mr. Williams has performed geotechnical investigations in southern California and southwestern Arizona. His field experience includes logging of soil borings and exploratory trenches, collection and documentation of soil samples, collection of field geotechnical data, and monitoring pile driving operations. Mr. Williams is also responsible for preparing computer generated data and figures, drafting and subsequent writing of geotechnical reports for a variety of projects including road improvements, fault studies, liquefaction potential evaluation, foundation preparation, seepage studies, structural distress, and soil investigations. He has performed geotechnical, geologic, and environmental studies for a wide variety of projects including correctional facilities, water and wastewater facilities, schools, residential subdivisions, commercial developments, and landfills throughout southern California and southwestern Arizona.

Mr. Williams also performs Phase I Environmental Site Assessments throughout the Imperial and Coachella Valleys. The scope of work for these projects typically include a site reconnaissance, review of government records pertaining to previous site uses, and preparation of a report identifying potential environmental risks.

He also conducts investigations for the potential of asbestos-containing materials and lead-based paint in old building projects and potential for soil contamination by hydrocarbons, pesticides, and other hazardous materials.

Professional Affiliations
Geological Society of America, Member

Selected Project Experience
- **El Centro Seniors Apartments, El Centro, CA**

Performed Phase I and Phase II environmental site assessments for apartment complex at old school district office site with underground storage tanks.
- **Central Main Canal Seepage Study, Imperial, CA**

Conducted 6-month groundwater seepage study for Imperial Irrigation District to evaluate high groundwater levels in Sandalwood Glen Subdivision
- **Gateway to the Americas, Calexico, CA**

Conducted Phase I ESA, geologic hazards study and geotechnical investigation including liquefaction evaluation for 1,700 acre development associated with new Port of Entry east of Calexico
- **El Centro Magistrate Court, El Centro, CA**

Conducted geotechnical investigation and Phase I ESA for new Federal Magistrate Court building at site with soft soil conditions requiring foundation settlement analysis
- **El Centro Regional Medical Center, El Centro, CA**

Conducted Phase I ESA and geotechnical investigation for 50,000 sf, 2-story addition to the medical center's emergency room, operating rooms, and recovery rooms.
- **Brawley Union High School, Brawley, CA**

Conducted Phase II investigation for PCB and lead contamination of surficial soil and hydrocarbon contamination of subsurface soil of a property proposed for purchase.
- **EW Corporation Site, Westmorland, CA**

Conducted Phase II investigation for hydrocarbon contamination of subsurface soil of a service station site with leaking underground storage tanks prior to property purchase
- **Various Apartment Complexes, Imperial County, CA**

Conducted Phase I environmental investigation at numerous proposed apartment complex site within the Imperial Valley
- **Oasis Elementary School, Mecca, CA**

Conducted PEA environmental investigation for the new Oasis Elementary School prior to construction of school

Peter LaBrucherie, PE
Staff Engineer

Education

B.S. Civil Engineering
California Polytechnic University, San Luis Obispo, 2011

M.S. Civil Engineering
California Polytechnic University, San Luis Obispo, 2012

Registration
Professional Engineer C84812, California

Professional Experience

2013 - Present	Staff Engineer GS Lyon, Inc.
2012 - 2013	Project Engineer BNBuilders.

Summary of Experience
As an Environmental Technician, Mr. LaBrucherie performs Phase I Environmental Site Assessments in Imperial County. The scope of work for these assessments typically includes site reconnaissance, review of government records pertaining to previous site uses, and preparation of a report identifying potential environmental risks.

Selected Project Experience

Seville Solar Farm, Westmorland, CA
Conducted Phase I environmental site assessment for solar project located about 9 miles northwest of Westmorland, Ca.

Clean Harbors Facility, Westmorland, CA
Conducted annual reports which included flood diversion, photo documentation and post closure for waste facility located about 5 miles west of Westmorland, Ca.

Ching Properties, Brawley, CA
Conducted Phase I environmental site assessment for vacant property located in Brawley, Ca.

Chelsea - 470 W. Wall Road, Imperial, CA
Conducted Phase I environmental site assessment for vacant property located in Imperial, Ca. Property is being proposed for apartment complex.

1409 E. Alamo Road, Holtville, CA
Conducted Phase I environmental site assessment for property (mostly vacant with some unused shop buildings and abandoned residential home) located west of Holtville, Ca.

BUSD School Site, Brawley, CA
Conducted Phase I environmental site assessment for school site proposal on a vacant property located in south Brawley, Ca.

CR&R Direct Transfer, El Centro, CA
Conducted Phase I environmental site assessment for commercial property (large warehouse and office with large laydown area) located in El Centro, Ca.

Villa Primavera Apartments, Calexico, CA
Conducted Phase I environmental site assessment for vacant property located in Calexico, Ca.

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K Water Supply Assessment

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2021

Water Supply Assessment

VIKING SOLAR ENERGY GENERATION FACILITY AND STORAGE PLANT

PREPARED BY: DUBOSE DESIGN GROUP

January 2021

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ACRONYMS

A-2 RE	Agricultural Zone – 2, Renewable Energy Overlay
AAC	All American Canal
AB	Assembly Bill
AC	Alternative Current
AF	Acre-Foot or Acre-Feet
AFY	Acre-Feet per Year
AOP	Annual Operations Plan
APN	Assessor's Parcel Number
APCD	Air Pollution Control District
BESS	Battery Energy Storage System
CAP	Central Arizona Project
CARB	California Air Resources Board
CDCR	California Department of Corrections and Rehabilitation
CDPH	California Department of Public Health
CDWR	California Department of Water Resources
CEQA	California Environmental Quality Act
CPUC	California Public Utility Commission
CRWDA	Colorado River Water Delivery Agreement
CU	Consumptive Use
CUP	Conditional Use Permit
CVWD	Coachella Valley Water District
CWC	California Water Code
DC	Direct Current
EDP	IID Equitable Distribution Plan
EHS	Environmental Health & Safety
EIS	Environmental Impact Statement
ESS	Energy Storage System

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ET	Envirotranspiration
Gen-Tie Line	Generation Tie Line
HSAT	horizontal single-axis tracker
ICPDS	Imperial County Planning and Development Services
ICS	Intentionally Created Surplus
IEEE	Institute of Electrical and Electronics Engineers
IID	Imperial Irrigation District
IOPP	Inadvertent Overrun Payback Policy
ISG	Interim Surplus Guidelines
IRWMP	Integrated Regional Water Management Plan
IVAPCD	Imperial Valley Air Pollution Control District
IWSP	Interim Water Supply Policy
KAF	Thousand Acre Feet
kV	Kilovolt
kVA	Kilovolt-amp
LAFCO	Local Agency Formation Commission
LCR	Lower Colorado Region
LCRWSP	Lower Colorado Water Supply Project
Li-ion	lithium ion
MCI	Municipal, commercial, industrial
MEER	Mechanical and Electrical Equipment Room
MGD	Million Gallons per Day
MW	Megawatt
MWAC	megawatt alternating current
MWh	Megawatt per hour
MWD	Metropolitan Water District of Southern California
NAF	Naval Air Facility
PCS	Power Conversion Station
PPA	Power Purchase Agreement

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PV	Photovoltaic
PE	Land Zoning Pre Existing
PVID	Palo Verde Irrigation District
QSA	Quantification Settlement Agreement and Related Agreements
RPS	Renewable Portfolio Standard
SB	Senate Bill
SCADA	Supervisory Control and Data Acquisition
SDCWA	San Diego County Water Authority
SNWA	Southern Nevada Water Authority
SWRCB	State Water Resources Control Board
TLCFP	Temporary Land Conversion Fallowing Policy
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
WSA	Water Supply Assessment

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PURPOSE OF WATER SUPPLY ASSESSMENT

This Water Supply Assessment (WSA) was prepared for the Imperial County Planning and Development Services (Lead Agency) by Dubose Design Group, regarding Viking Energy Farm, LLC (the "Applicant"). This study is a requirement of California law, specifically Senate Bill 610 (referred to as SB 610). 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 Water Code. 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 was approved by the Governor and filed with the Secretary of State on October 9, 2001, and became effective January 1, 2002.[1] SB 610 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 that may supply water for the project and to request the applicants to prepare a specified water supply assessment.

This study has been prepared pursuant to the requirements of CWC Section 10910, as amended by SB 610 (Costa, Chapter 643, Stats. 2001). The purpose of SB 610 is to advance water supply planning efforts in the State of California; therefore, SB 610 requires the Lead Agency, to identify any public water system or water purveyor that may supply water for the project and to prepare the WSA after a consultation. Once the water supply system is identified and water usage is established for construction and operations for the life of the project, the lead agency is then able to coordinate with the local water supplier and make informed land use decisions to help provide California's cities, farms and rural communities with adequate water supplies.

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[1]SB 610 amended Section 21151.9 of the California Public Resources Code, and amended Sections 10631, 10656, 10910, 10911, 10912, and 10915, repealed Section 10913, and added and amended Section 10657 of the Water Code. SB 610 was approved by California Governor Gray Davis and filed with the Secretary of State on October 9, 2001.

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Under SB 610, water supply assessments must be furnished to local governments for inclusion in any environmental documentation for certain projects (as defined in California Water Code (CWC) Section 10912 [a]) that are subject to the California Environmental Quality Act (CEQA). Due to increased water demands statewide, this water bill seeks to improve the link between information on water availability and certain land use decisions made by cities and counties. This bill takes a significant step toward managing the demand placed on California's water supply. It provides further regulations and incentives to preserve and protect future water needs. Ultimately, this bill will coordinate local water supply and land use decisions to help provide California's cities, farms, rural communities and industrial developments with adequate long-term water supplies. The WSA will allow the lead agency to determine whether water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses.

PROJECT DETERMINATION ACCORDING TO SB 610 - WATER SUPPLY ASSESSMENT

With the introduction of SB 610, any project under CEQA shall provide a WSA if the project meets the definition of CWC § 10912. CWC § 10911(c) requires for that the lead agency "determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses." Specifically, CWC § 10910(c)(3) states that "If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 30 year projection, will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses."

The Project would consist of a nominal 150-megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation facility with an integrated, not to exceed 300-MW battery

energy storage system (BESS). The electrical energy produced by the Project would be conducted through the proposed 230 kilovolt (kV) switching station and delivered to the Imperial Irrigation District (IID) 230 kV "KN & KS" transmission line. The solar energy generation facility, BESS and switching station are collectively referred to as the proposed Project and is deemed a project as it is considered an industrial water use project use that is considered an industrial plant of 40 acres or more in accordance to CWC § 10912a (5). The proposed project totals 604 acres which exceeds the 40 acre or less allowance.

EXECUTIVE SUMMARY

The IID and the Imperial County Planning & Development Services (ICPDS) Department have requested a WSA as part of the environmental review for the proposed Vikings Solar Energy Generation and Solar Project. This study is intended for use by the ICPDS in its evaluation of water supplies for existing and future land uses. The evaluation examines the following water elements:

- Water availability during a normal year
- Water availability during a single dry, and multiple dry water years
- Water availability during a 30-year projection to meet existing demands
- Expected 30-year water demands of the project for operations
- Reasonably foreseeable planned future water demands to be served by the IID

The Project site is located within IID's Imperial Unit and district boundary and as such is eligible to receive water service. IID has adopted an Interim Water Supply Policy (IWSP) for Non-Agricultural Projects, from which water supplies can be contracted to serve new developments within IID's water service area. For applications processed under the IWSP, applicants shall be required to pay a processing fee and, after IID board approval of the corresponding agreement, will be required to pay a reservation fee(s) and annual water supply development fees.

The IWSP sets aside 25,000 acre-feet annually (AFY) of IID's Colorado River water supply to serve new non- agricultural projects. As of January 2021, a balance of 23,800 AFY remain available under the IWSP for new non-agricultural projects ensuring reasonably sufficient supplies for such

projects. The proposed Project water demand for construction operation and decommissioning is expected to use approximately 853 AF (Table 1), representing .12% of the annual unallocated supply set aside for new non-agricultural projects (Table 2). Thus, the proposed Project's estimated water demand would not affect IID's ability to provide water to other users in IID's water service area.

Table 1 Project Water Use Summary

Water Use	Total AF
Construction	275 AF
Processing, Daily Plant Operations & Mitigation	11AF
Project Decommissioning	275 AF
Total Water Usage for Project	**859 AF**

Table 2: *Amortized Project Water Summary*

Project Water Use – Life of Project	Years	IWSP (AFY)	% of Remaining Unallocated IWSP per Year**
859 AF	30 year	23,800 AFY	.12%

**(853 AF/ YR/23,800 AF/YR x 100)

*X AF/Year x 30 Years)

**(X AF/ YR/23,800 AF/YR x 100)

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PROJECT DESCRIPTION

The proposed Project would consist of a nominal 150-solar PV energy generation project with an integrated, not to exceed 300-MW battery storage project. The electrical energy produced by the Project would be conducted through the proposed 230 kV switching station and delivered to the IID 230 kV "KN & KS" transmission line. The solar energy generation facility, BESS and switching station are collectively referred to as the “proposed project” or “project.”

PROJECT SITE AND LOCATION

The proposed project is located on approximately 604 acres of private and Imperial County-owned land located at the intersection of Nelson Pit Road and Graeser Road in the western part of unincorporated Imperial County. It is approximately 5.5 miles east of the City of Holtville in Section 36 within Township 15 South, and Range 16 East of the San Bernardino Base and Meridian {SBB&M) of the "Holtville East" (Figures 1 and 2).

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Figure 1: Project Site Regional Location

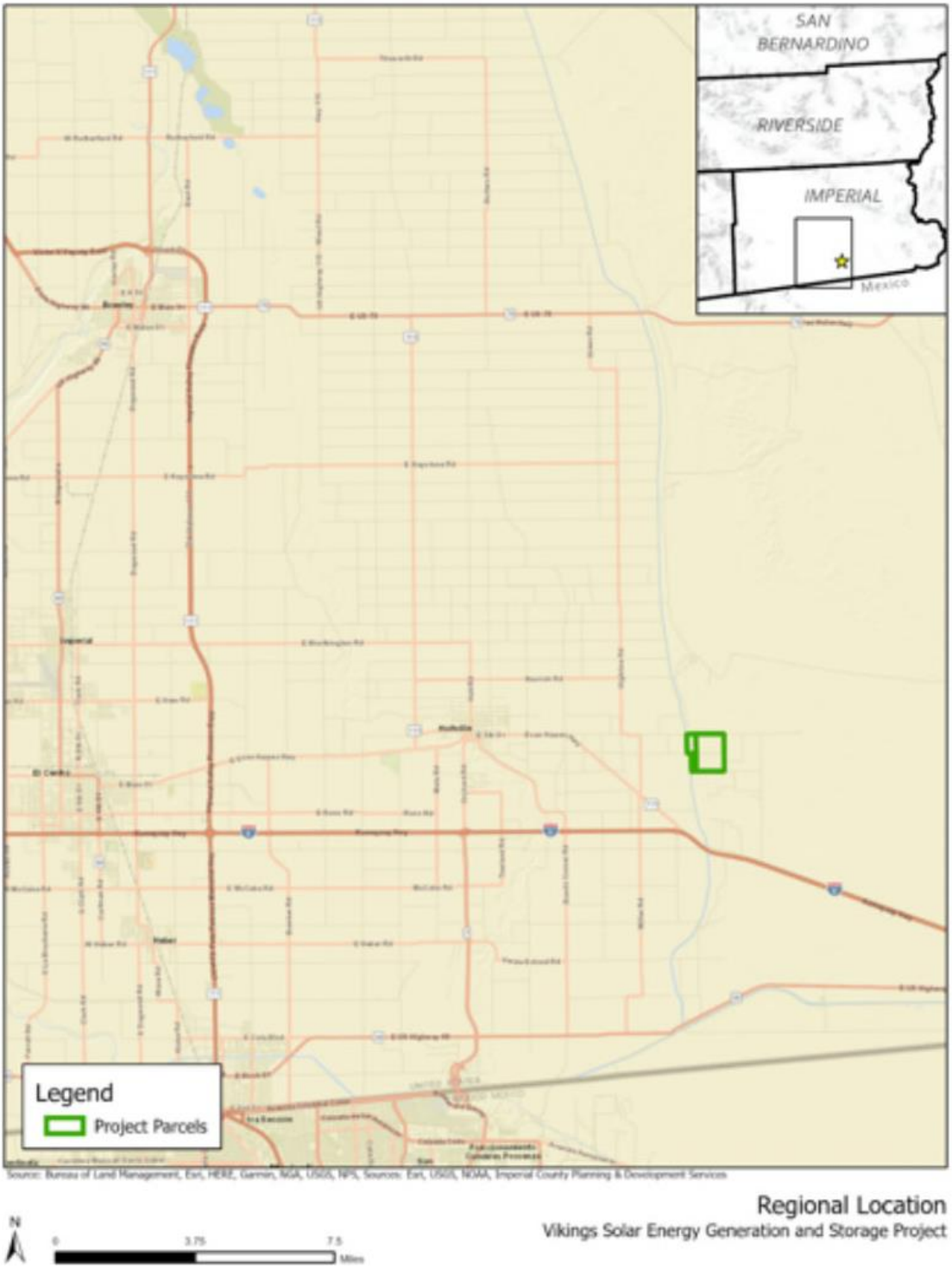
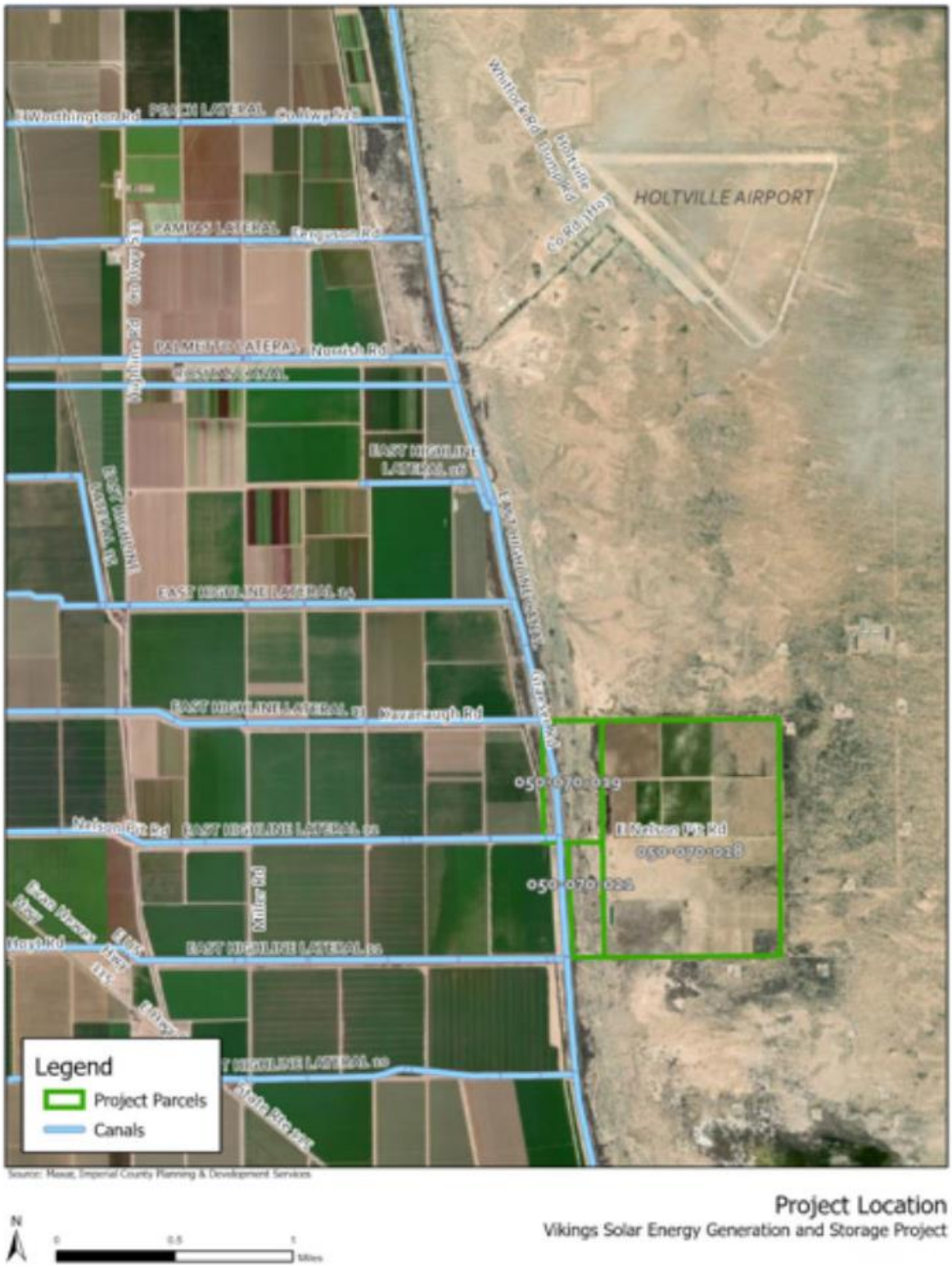


Figure 2: Aerial Map of Project Vicinity



Solar Energy Facility

The proposed Project is comprised of three parcels that are contiguous with one another, assessor parcel numbers (APNs) 050-070-018 (approximately 480 acres) (Figure 2), 050-070-019 (approximately 80 acres) and 050-070-021 (approximately 44 acres). Table 3 identifies the individual APNs with their respective acreage and zoning. The solar energy facility site is also located adjacent to the existing East Highline Canal and the IID 230 kV "KN & KS" transmission line. The project site plan is shown in Figure 3.

Table 3: *Project APNs, Canals and Gates and Land Relationship to Project*

IID Gate/ Canal	APN/Acres	Zoning	Purpose of Water Usage
East High Line/ 11	050-070-018	A-2-RE	Construction and operation of Viking Solar Generation Storage Project, and mitigation measures.
East High Line/ 12	050-070-019	A-2-RE	Construction and operation of Viking Solar Generation Storage Project, and mitigation measures. This parcel contains the Battery Storage Facility and a substation located at the southern portion of the parcel.
NA	050-070-021	GS-RE	Construction and operation of Viking Solar Generation Storage Project, and mitigation measures.

Battery Energy Storage System (BESS)

The proposed Project includes a BESS constructed on the southern boundary of APN 050-070-019. The BESS would be constructed as a multiple structure facility, consisting of up to 20 battery modules at full build out, the footprint of which would be up to 450 square feet per module. Each module will house the batteries, mounting racks and associated electrical equipment. Each module will be of a metal frame construction, retrofitted to add insulation, air-conditioning, and fire suppression for battery reliability, with separate rooms for the electronic controls, inverters, and rectifiers.

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The electrical energy produced by the Project would be conducted through a new Project substation would be constructed on the southern boundary of APN 050-070-019 (Figure 3). This substation would take the delivery of the up to 34.5 kV power from the Project and increase the voltage of the electricity to 230 kV, where it would feed into the interconnection switching station for metering and delivery to the IID 230 kV "KN & KS" Line.

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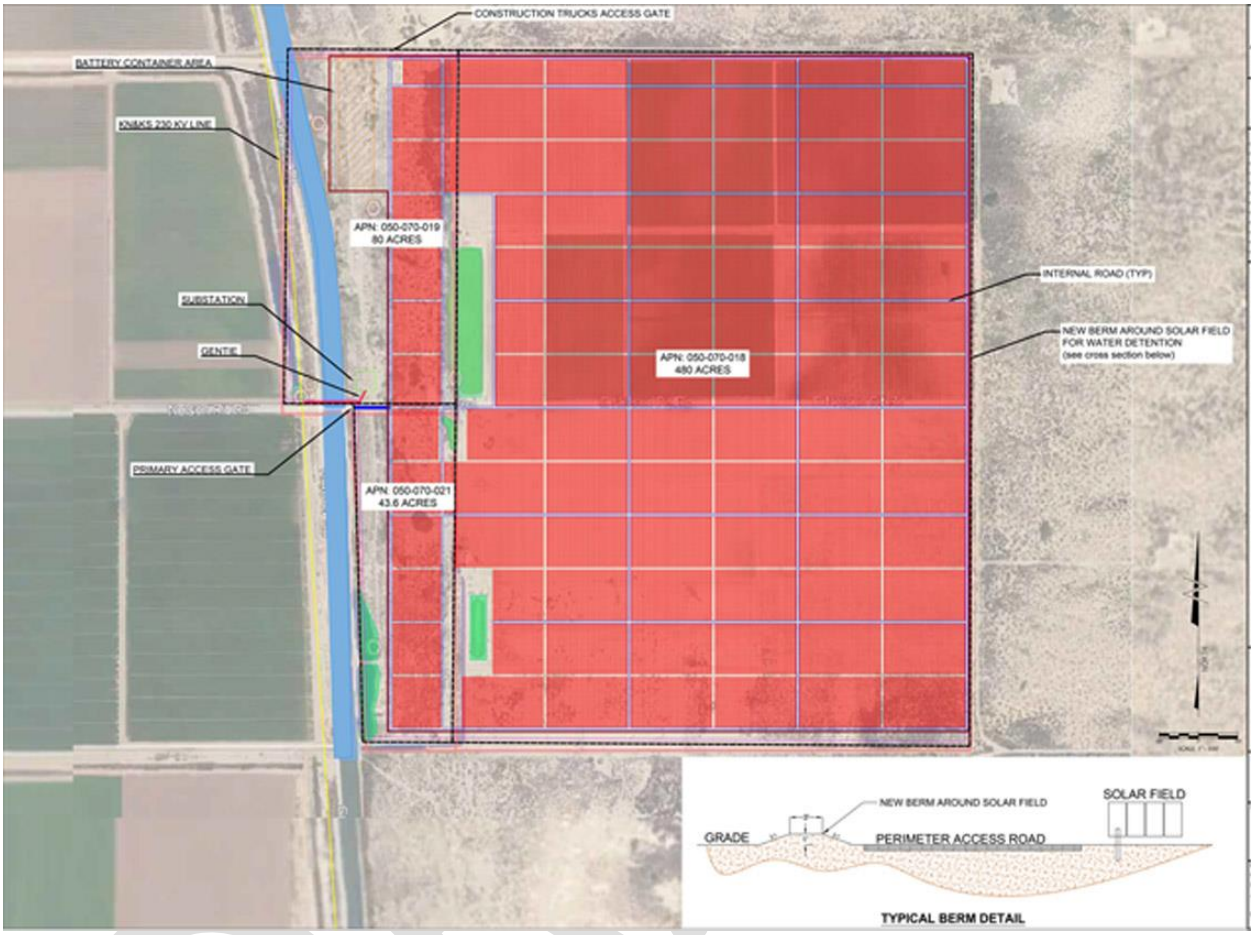
Figure 3: Project Layout/ Site Plan



Zoning

Two of the Project parcels are designated as "Agriculture" in the Imperial County General Plan and are zoned A-2-RE (General Agriculture with a Renewable Energy Overlay-areas). These areas are suitable and intended primarily for agricultural uses [limited] and agricultural related compatible uses. The third Project parcel is designated as "Recreation/Open Space " and is zoned GS-RE (Government/Special Public Zone). These areas allow for the construction, development and operation of governmental facilities and special public facilities. Primarily this zone allows for all types of government owned and/or government operated facilities, be they office or other uses. It also allows for special public uses such as security facilities, jails, solid and/or hazardous wastes

facilities and other similar special public benefit uses. A Conditional Use Permit (CUP) will be required to facilitate development of this Project.

Project Characteristics

The proposed Project involves the construction of a 150 MW PV solar energy facility with an integrated, not to exceed 300 MW BESS on approximately 604 gross acres of land. Of the total 604 gross acres, approximately 560 acres would be developed with a ground mounted PV solar power generating system, supporting structures, on-site substation, BESS, and internal access roads. The project would employ the use of PV power systems to convert solar energy into electricity using non-reflective technology.

The major components of the facility are PV modules, fixed-frame or horizontal single-axis tracker (HSAT) support structures, and electronic/electrical equipment to convert the electricity from the PV modules from direct current (DC) electricity to alternating current (AC) electricity and transfer the electricity to the to the new Project substation and ultimately IID's 230 kV "KN & KS" line. Ancillary equipment includes switch/fuse panels, control and protection equipment, and communications hardware. Additional auxiliary facilities would include lighting and security systems.

Photovoltaic Panels/Solar Arrays

PV solar cells convert sunlight directly into DC electricity. The process of converting light (photons) to electricity (voltage) in a solid-state process is called the PV effect. A number of individual PV cells are electrically arranged and connected into solar PV modules, sometimes referred to as solar panels.

The Project proposes to utilize either thin film or crystalline solar PV technology modules mounted either on fixed frames or HSAT systems. The fixed frame PV module arrays would be mounted on racks that would be supported by driven piles. The depth of the piles would be dependent on the recommendations of the geotechnical report prepared for the Project. The fixed-frame racks would be secured at a fixed tilt of 20 to 30 degrees from horizontal facing a southerly direction. Current Project designs would have individual PV modules, mounted two high on a fixed frame,

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providing a two-foot ground clearance and resulting in the tops of the panels at approximately 7.5 feet above the ground. The fixed PV modules would be arranged in arrays spaced approximately 15 to 25 feet apart (pile-to-pile) to maximize performance and to allow access for panel cleaning (if necessary). These arrays would be separated from each other and the perimeter security fence by up to 30-foot-wide interior roads. If HSAT technology is used, the PV modules would rotate around the north-south HSAT axis so that the PV modules would continue to face the sun as the sun moves across the sky throughout the day. The PV modules would reach their maximum height (up to nine [9] feet above the ground, depending on the final design) at both sunrise and sunset, when the HSAT is rotated to point the modules at the rising or setting sun. At noon, or when stowed during high winds, when the HSAT system is rotated so that the PV modules are horizontal, the nominal height would be about six (6) feet above the ground, depending on the final design. The individual PV systems would be arranged in large arrays by placing them in columns spaced approximately ten feet apart to maximize operational performance and to allow access for panel cleaning and maintenance.

Current Project designs would have individual HSAT PV modules, each approximately two feet wide by four feet long (depending on the specific PV technology selected}, mounted on a frame which is attached to an HSAT system. These HSAT arrays would be separated from each other and the perimeter security fence by up to 30-foot-wide roads, consistent with agency emergency access requirements.

Electrical Power System

Electricity generated by the PV modules would be collected by a DC collection system routed underground in trenches. This DC power would be delivered to one of the pad-mounted inverters in weatherproof enclosures located within the arrays. The inverters would convert the DC power to three-phase AC. The inverters could be connected to AC interconnection facilities which, if needed, would raise the voltage to 34.5 kV, or the interconnection voltage selected by the project. Underground or overhead collection lines (up to 34.5 kV) would transmit the electricity to the new project substation.

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Battery Energy Storage System (BESS)

The BESS would be constructed as a multiple structure facility, consisting of up to 20 battery modules at full build out, the footprint of which would be up to 450 square feet per module. Each module will house the batteries, mounting racks and associated electrical equipment. Each module will be of a metal frame construction, retrofitted to add insulation, air-conditioning, and fire suppression for battery reliability, with separate rooms for the electronic controls, inverters, and rectifiers. Due to the slightly positive pressure required within each module to ensure functionality of the fire suppression system, the modules will not be vented. Each module will utilize a supply and return air conditioning system; this system has a fresh air (economizer mode) intake system and is also referred to as a closed loop system.

Interconnection Facilities

A new Project substation would be constructed on the southern boundary of APN 050-070-019 (See Figure 3). This substation would take the delivery of the up to 34.5 kV power from the Project and increase the voltage of the electricity to 230 kV, where it would feed into the interconnection switching station for metering and delivery to the IID 230 kV "KN & KS" Line. The substation would include a transformer, circuit breakers, meters, disconnect switches, and microwave or other communication facilities.

A new interconnection switching station would be constructed at the southern boundary of APN 050-070-019, immediately adjacent to the Project substation. The interconnection switching station would include circuit breakers, switches, overhead bus work, protective relay equipment and an electrical control building. This station would operate at 230 kV and be equipped with two circuit breakers, allowing for looping in of the IID 230 kV "KN & KS" transmission line as well as connection to the project substation. The Project substation and interconnection switching station would be connected via a single overhead 230 kV, gen-tie line. The gen-tie line would not exceed 120 feet in height. The interconnection switching station would be enclosed within its own fence.

To connect to the Projects' interconnection facilities, the medium voltage power produced by the Project would be conveyed underground, or above ground where necessary, to cross over any sensitive site features. The Projects' interconnection facilities design would meet all necessary

utility standards and requirements. As required, surge arrestors would be used to protect facilities and auxiliary equipment from lightning strikes or other disturbances. Distribution from the site would be via an overhead connection.

Auxiliary Facilities

This section describes the auxiliary facilities that would be constructed and operated in conjunction with the Project solar array facility.

Site Security and Fencing

Six-foot high security fencing would be installed around the perimeter of each of the Project sites at the commencement of construction and site access would be limited to authorized site workers. In addition, a motion detection system and closed-circuit camera system may also be installed. The site would be remotely monitored 24 hours per day, 7 days per week. In addition, routine unscheduled security rounds may be made by the security team monitoring the site security.

Lighting System

Project lighting may be installed for security reasons and on-going maintenance. Project lighting, triggered by motion sensors, may be installed at ingress and egress gates and at strategic locations around the facility for security reasons and ongoing maintenance. All Project lighting would be shielded and directed downward to minimize the potential for glare or spillover onto adjacent ownerships. Project lighting would conform to National Electric Safety Code (NESC) requirements and all applicable outdoor lighting codes per the local ordinance.

Fire Protection

The Project site is located within the jurisdiction of the Imperial County Fire Department. four 10,000[2]-gallon above groundfire water tanks would be constructed across the solar energy facility site and kept filled during operations for on-site fire protection. Portable fire extinguishers would be provided at various locations throughout the solar energy facility site and at the BESS. Both the

[2] Per Imperial County Fire Department 40,000 Gallons onsite water for Fire Suppression will be acceptable

access and service roads (along the perimeter of the solar energy facility site) would have turnaround areas at any dead-ends to allow clearance for fire trucks per fire department standards (70 feet by 70 feet, and 20-foot-wide access road).

For the BESS, air conditioning equipment will be used to maintain safe ambient operating temperature conditions. An effective method for Li-ion battery storage is to use a fire containment and suppression system that would deal with a battery fire event. Such systems contain the fire event and encourage suppression through cooling, isolation, and containment. The Project would include a gaseous fire suppressant agent (e.g., 3M™ Novec™ 1230 Fire Protection Fluid or similar) and an automatic fire extinguishing system with sound and light alarms (external alarms, plus automatic notification to an Underwriters Laboratory Listed central station and corresponding fire department notification).

Historically, water has been recommended as fire suppression because of its ability to cool and limited side effects. This risk will be mitigated through monitoring and a fire suppression system that includes water and or a suppression agent (e.g.,FM-200, Novatech) with smoke detectors, control panel, alarm, piping and nozzles. The fire protection system will be designed by a certified fire protection engineer and installed by a fire protection system contractor licensed in California and in accordance with all relevant building and fire codes in effect in the County at the time of building permit submission.

Water Supply, Treatment and Storage

Water for construction (primarily for dust control) would be obtained from local IID irrigation canals or laterals in conformance with IID construction water acquisition requirements. Water would be picked up from a nearby lateral canal and delivered to the construction location by a water truck capable of carrying approximately 4,000 gallons per load. It is estimated that up to 275 acre-feet (AF) of water would be needed for site grading and dust control over the expected construction period. The actual amount of water required to be brought on site will vary depending upon site conditions such as wind speed, direction, and the amount and timing of rainfall. Once the Project is operational, water would be required for solar panel washing and fire

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protection. The Project site is within the IID's boundary and therefore would receive water service from the IID. Water would be purchased from the IID and delivered to the Project site by water trucks. The volume of water to be used for solar panel washing and dust control is estimated at up to 10 AF per year.

Bottled water would be provided to the construction workers. Additionally, on-site restroom facilities (temporary sanitation facilities) for the construction workers would be provided by portable units to be serviced by licensed providers; no connection to a public sewer system is required for Project construction, and therefore, water for such purposes is not required.

Retention Basins

To retain the total volume of a 3-inch precipitation covering the solar energy facility site with no reduction from infiltration, the proposed onsite roads will be built up to a finish grade elevation above the existing ground and act as berms to allow onsite ponding and make the project site a "retention basin". These retention basins would be sized to empty within 72 hours (through draining, evaporation, or infiltration, or any combination thereof) in order to provide mosquito abatement. In the unlikely event that conditions prevent removal of accumulated storm water from any of the retention basins within 72 hours, measures would be implemented to control mosquito breeding in the affected basin consistent with the requirements of the Imperial County Health Department, Environmental Health and Consumer Protection Services, Vector Control Program.

Site Operations and Maintenance

Once construction is completed the Project would be remotely controlled. No employees would be based at the Project sites. Primary security-related monitoring would be done remotely. Security personnel may conduct unscheduled security rounds and would be dispatched to the site in response to a fence breach or other alarm. Site maintenance workers may access the Project site periodically to clean the panels and maintain the equipment and project area. The public would not have access to the facility. Access to the Project site would be infrequent and limited to authorized personnel.

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Access Roads

The Project site would include one primary access driveway, currently contemplated on East Nelson Pit Road, bisecting the Project site. This driveway would be provided with a minimum of 30-foot double swing gates with "Knox Box" for keyed entry. Internal to the Project site up to 20-foot-wide roads would be provided between the PV arrays. These would be provided as well as around the perimeter of the Project site inside the six-foot high perimeter security fence. This would provide access to all areas of each site for maintenance and emergency vehicles. A secondary access driveway (if required) would be located at the northwest corner of the Project site, with access provided from Norrish Road.

To accommodate emergency access, PV panels would be spaced to maintain proper clearance. A 20-foot-wide access road would be constructed along the perimeter fence and solar panels to facilitate vehicle access and maneuverability for emergency unit vehicles. The internal access road would be graded and compacted (native soils) as required for construction, operations, maintenance, and emergency vehicle access.

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Site Construction

Project Phasing

The Project could be constructed in up to three phases, with the solar PV, the BESS, and the Project substation each substantiating a potential phase. Each phase could be constructed individually on a serial basis, or multiple phases could be constructed concurrently as appropriate to accommodate market demand and project economics. The construction equipment, materials, and labor involved in building the Project remain similar whether the Project is constructed in single or concurrent phases over time versus over a single full buildout. The buildout of the entire Project at once results in greater intensity of labor and equipment during the construction period.

The number of on–site construction workers for the solar project facilities is not expected to exceed 150 workers during the work day. The number of on-site construction workers for the BESS and the substation is not expected to exceed 100 workers during the work day.

Site Preparation

Construction activities would primarily involve demolition and grubbing; grading of the Project area to establish access roads and pads for electrical equipment (inverters and step-up transformers); trenching for underground electrical collection lines; and the installation of solar equipment and security fencing. Dust generated during construction would be controlled by watering and, as necessary, the use of other dust suppression methods and materials accepted by the Imperial County Air Pollution Control District (APCD) or the California Air Resources Board (CARB). A temporary, portable construction supply container would be located at the Project sites at the beginning of construction and removed at the end of construction. The number of on-site construction workers for the solar project facilities is not expected to exceed 150 workers during the work day. The number of on-site construction workers for the BESS and the substation is not expected to exceed 100 workers during the work day. If the two components (Solar PV and BESS) were constructed at the same time, the on- site construction workers is not expected to exceed 250 workers during the work day. Onsite parking would be provided for all construction workers.

System Installation

Construction activities would primarily involve demolition and grubbing; grading of the Project site to establish access roads and pads for electrical equipment (inverters and step–up transformers); trenching for underground electrical collection lines; and the installation of equipment and security fencing. Construction work would be limited to daylight hours, Monday through Friday unless otherwise necessary due to scheduling or deliveries. If construction does occur during the summer months, then starting time may be during early morning darkness for the safety of employees. There will be temporary construction offices during the construction phase, but these would be removed upon completion of the Project. Onsite parking would be provided for all construction workers. All equipment such as PV modules, mounting structures, and BESS systems would be manufactured off-site and delivered to the Project site for installation.

Facility Commissioning

Facility commissioning includes final inspections testing, start-up and certification. Once all of the equipment and components have been installed and inspected, all mechanical and electrical connections would be inspected. The facility would be brought on-line in stages starting at low power levels and methodically increasing the capacity until the facility is operating at full power. Testing would occur at every stage to correlate electricity output to weather conditions.

Existing Utilities

The Project applicant's contractors would implement an underground services alert to identify existing underground utilities and service connections prior to commencing any excavation work. Existing utility locations would be determined by hand-excavated test pits dug at locations determined and approved by the construction manager (also referred to as "potholing"). Service on such lines would not be disrupted until prior approval is received from the construction manager and the service provider.

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Traffic

The construction worker traffic is expected to travel to the site from either Highway 115 east or Highway 8 east, to north on Miller Road and east on Nelson Pit. An estimated two delivery trucks would arrive at the Project site each day during the first few weeks of the construction of the solar generating facility. Since the bridge on the Nelson Pit Road, which would be used by construction workers, has a weight capacity of 55,000 to 60,000 pounds. Delivery trucks in excess of the 60,000 pounds range would the use bridge on the Evan Hewes Highway and backroads to access the Project site. If any non-public roads are used to access the Project site, the Applicant will obtain written approval from any private owners or other agencies for their use. As a condition of the Project, a copy of such written approval shall be submitted to the Imperial County Department of Public Works prior to the approval of grading plans.

Storm Water

Applicable local, state, and federal requirements and best management practices (BMPs) would be implemented during the construction phase. Consistent with the County's Code of Ordinances (Title 9, Division 8, Chapter 11 Grading Regulations) and with guidelines provided in the California Stormwater Quality Association's Best Management Practice Handbook, BMPs would be implemented, including preparation of a SWPPP including soil erosion and sedimentation controls to reduce the potential for erosion and to minimize effects on stormwater quality. Stabilized construction entrances and exits would be installed at the entrances to each site to reduce the tracking of sediment onto adjacent public roadways.

Additionally, site preparation would occur in conformance with Imperial County APCD rules for dust control.

Dust Control

Fugitive dust would be controlled during construction as required by Imperial County APCD Regulation VIII. A Construction Dust Control Plan would be prepared in conformance with Imperial County APCD requirements to address construction and earthmoving activities, track-out, open areas and unpaved roads.

Waste

Relatively small amounts of trash would be generated during construction from. Inert solid waste from construction activities may include packaging from materials delivered to the site, excess concrete, metal, glass scrap, and empty non-hazardous containers. Management of these wastes would be the responsibility of the construction contractor(s). Typical management practices required for non-hazardous waste management include recycling in compliance with state and County mandates, proper storage of waste and debris to prevent wind dispersion, and weekly pickup and transport of waste to local Class III landfills.

Construction related waste would be transported to a local landfill authorized to receive this waste for disposal. Portable toilets would be located on-site during construction and sanitary waste would be removed from the site by a local contractor.

Small quantities of hazardous wastes would be generated over the course of construction. These may include paint, spent solvents, and spent welding materials, spent oil filters and used oils from equipment maintenance, rags, or other cleanup materials.

All hazardous wastes generated during facility construction and operation would be handled and disposed of in accordance with applicable laws, ordinances, regulations, and standards. Any hazardous wastes generated during construction would be collected in hazardous waste accumulation containers near the point of generation and moved daily to the contractor's 90-day hazardous waste storage area located on site. The accumulated waste would be delivered to an authorized waste management facility. Hazardous wastes would be recycled or managed and disposed of properly in a licensed Class I waste disposal facility authorized to accept the waste.

Restoration of the Project Site

The projected life of the Vikings Solar Energy and Battery Storage Project is 30 years. At the end of the Project's operational term, the Project proponent may determine that the Project should be decommissioned and deconstructed, or it may seek an extension of the CUP. Because the solar energy storage system's supporting equipment would sit on the surface of the land when they are

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removed after the Project's lifetime the land would be largely unaltered from its natural state. The Project proponent would work with County of Imperial to put an agreement in place that would ensure decommissioning of the Project after its productive lifetime.

The Project would use BMPs to ensure the collection and recycling of PV modules and batteries and minimize the potential for such materials to be disposed of as municipal waste.

Prior to issuance of the initial grading permit for the Project, a Site Reclamation Plan in conformance with County of Imperial requirements would be prepared for review and approval by the ICPDS. This plan would be implemented at the end of power operations and would describe the proposed equipment dismantling, removal and site restoration program, in conformance with County requirements. Decommissioning and reclamation may include: 1) packaging PV modules and batteries for removal and recycling or otherwise ensuring removal and disposal in a permitted facility; 2) removing ancillary facilities; and 3) reclamation, re-vegetation, restoration, and soil stabilization to return the site to pre-Project/agricultural conditions.

The PV modules are expected to still have useful life and would still be capable of producing electricity; these would be marketed for resale. Material and equipment such as the racking structures and mechanical assemblies would be recycled. The inverters and transformer(s) would also be reused or recycled. The concrete equipment pads would be crushed and recycled. Any underground conduit and wire would be removed by uncovering the trenches and backfilling when done. The remaining balance of material and/or waste generated from the Project would either be recycled as appropriate for the type of material or disposed of at the local transfer station and/or landfill facility.

The Project parcels would be restored to a condition for future agricultural and public and government uses.

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Permit Requirements

The following permits/approvals may be required for the Project from the specified agencies, although some may not be applicable:

- Transportation Permit for oversized/overweight vehicles (Caltrans District II)
- CUP {Imperial County Planning & Development Services Department)
- Grading Permits (Imperial County Planning & Development Services Department)
- Building Permits (Imperial County Planning & Development Services Department)
- Dust Control Plan (Imperial County Air Pollution Control District)
- Rule 310 Exemption (Imperial County Air Pollution Control District)
- Encroachment Permits (Caltrans)
- Encroachment Permits (Imperial County Public Works Department)
- Traffic Control Plan (Imperial County Public Works Department)
- Encroachment Permits (Imperial Irrigation District)
- Right-of-Way Permit (Imperial Irrigation District)
- Water Supply Agreement (Imperial Irrigation District)
- General Construction Storm Water Permit Notice of Intent/Storm Water Pollution Prevention Plan (California State Water Resource Control Board)

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DESCRIPTION OF THE IID SERVICE AREA

The proposed Project site is located in Imperial County in the southeastern corner of California. The County is comprised of approximately 4,597 square miles or 2,942,080 acres.[3] Imperial County is bordered by San Diego County to the west, Riverside County to the north, the Colorado River/Arizona boundary to the east, and 84 miles of International Boundary with the Republic of Mexico to the south. Approximately fifty percent of Imperial County is undeveloped land under federal ownership and jurisdiction. The Salton Sea accounts for approximately 11 percent of Imperial County's surface area. In 2020, sixteen percent (16%) of the area was in irrigated agriculture (466,952 acres), including 14,676 acres of the Yuma Project, some 35 sections or 6,227 acres served by Palo Verde Irrigation District (PVID), and 446,049 acres served by IID.[4], [5]

The area served by IID is located in the Imperial Valley, which is generally contiguous with IID's Imperial Unit, lies south of the Salton Sea, north of the U.S./Mexico International Border, and generally in the 658,942 acre area between IID's Westside Main and East Highline Canals.[6] In 2020, IID delivered untreated water to 494,921 net irrigated acres, predominantly in the Imperial Valley, along with small areas of East and West Mesa land , including non-agricultural areas.

The developed area consists of seven incorporated cities (Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial and Westmorland), three unincorporated communities (Heber, Niland, Seeley), and three institutions (Naval Air Facility [NAF] El Centro, Calipatria California Department of Corrections and Rehabilitation [CDCR], and Centinela CDCR) and supporting facilities. **Figure 4** provides a map of the IID Imperial Unit boundary, as well as cities, communities, and main canals.

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[3] *Imperial County General Plan*, Land Use Element 2008 Update

[4] *USBR website: Yuma Project. 7 June 2017, PVID website: About Us, Acreage Map. 7 June 2017.*

[5] Palo Verde Irrigation District Acreage Map <http://www.pvid.org/pviddocs/acreage_2012.pdf> 7 June 2013

[6] *IID Annual Inventory of Areas Receiving Water Years 2017, 2016, 2015*

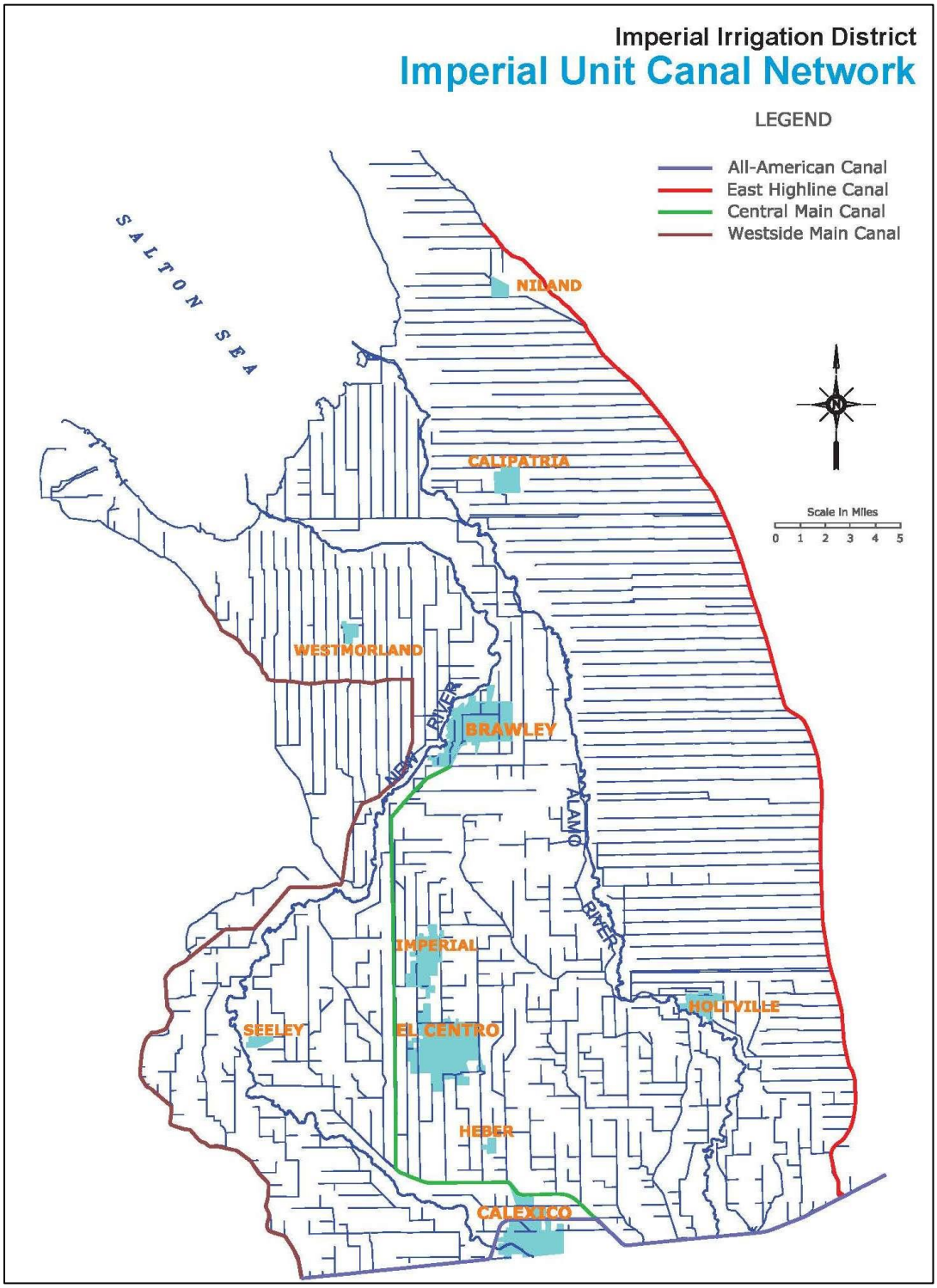

Figure 4 IID Imperial Unit Boundary and Canal Network

Climate Factors

Imperial Valley, located in the Northern Sonoran Desert, which has a subtropical desert climate is 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 4. 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 Table 5. The thirty-year, 1991-2020, average annual air temperature was 73.7°F, and average annual rainfall was 2.70 inches, Table 5 and Table 6. This record shows that while average annual rainfall has fluctuated, the 10-year average temperatures have slightly increased over the 30-year averages.

Table 4 Climate Characteristics, Imperial, CA 100-Year Record, 1921-2020

Climate Characteristic	Annual Value
Average Precipitation (100-year record, 1921-2020)	2.79 inches (In)
Minimum Temperature, Jan 1937	16 °F
Maximum Temperature, July 1995	121 °F
Average Minimum Temperature, 1921-2020	48.2 °F
Average Maximum Temperature, 1921-2020	98.3 °F
Average Temperature, 1921-2020	73.0 °F

Source: IID Imperial Weather Station Record

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Table 5: IID Areawide Annual Precipitation (In), (1990-2020)

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				
1.305	3.017	2.673				

Source: Computation based on polygon average of CIMIS as station came online in the WIS.[7]

Notable from Table 5 (above) and Table 6 (below) is that while average annual rainfall measured at IID Headquarters in Imperial, CA, has been decreasing, monthly average temperatures are remarkably consistent.

Table 6: Monthly Mean Temperature (°F) – Imperial, CA 10-Year, 30-Year & 100-Year (2010-2019, 1990-2019, 1921-2020)

	Jan			Feb			Mar			Apr		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
10-year	82	32	57	84	35	60	93	42	67	100	47	73
30-year	81	34	57	84	37	60	92	41	66	99	47	71
100-year	80	31	55	86	34	60	91	40	64	99	46	71
	May			**Jun**			**Jul**			**Aug**		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
10-year	105	53	76	115	61	87	115	70	92	114	70	92
30-year	105	54	78	112	60	86	115	68	92	114	69	92
100-year	105	53	78	113	59	86	114	68	92	113	68	92
	Sep			**Oct**			**Nov**			**Dec**		
	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
10-year	111	62	87	101	52	76	91	39	64	80	32	55
30-year	110	62	87	102	50	76	90	39	64	79	32	55
100-year	110	60	86	101	49	75	89	38	63	80	32	56

[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.

Table 7 Monthly Mean Rainfall (In) – Imperial, CA 10-Year, 30-Year & 100-Year (2010-2019, 1990-2019, 1921-2020)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
10-year	0.33	0.26	0.22	0.12	0.08	0.01	0.22	0.30	0.28	0.02	0.26	0.42	2.44
30-year	0.50	0.43	0.31	0.09	0.06	0.00	0.14	0.19	0.26	0.15	0.22	0.40	2.70
100-year	0.39	0.38	0.25	0.11	0.03	0.00	0.12	0.33	0.36	0.25	0.21	0.51	2.79

Source: IID WIS: CIMIS stations polygon calculation (Data provided by IID staff).

Imperial Valley depends on the Colorado River for its water, which IID transports, untreated, to delivery gates for agricultural, municipal, industrial (including geothermal and solar energy), environmental (managed marsh), recreational (lakes), and other non-agricultural uses. IID supplies the cities, communities, institutions, and Golden State Water (which includes all or portions Calipatria, Niland, and some adjacent Imperial County territory) with untreated water that they treat to meet state and federal drinking water guidelines before distribution to their customers. Industries outside the municipal areas treat the water to required standards of their industry. To comply with U.S. Environmental Protection Agency (USEPA) requirements and avoid termination of canal water service, residents in the IID water service area who do not receive treated water service must obtain alternative water service for drinking and cooking from a state-approved provider. To avoid penalties that could exceed $25,000 a day, IID strictly enforces this rule. The IID Water Department tracks nearly 3,000 raw water service accounts required by the California Department of Public Health (CDPH) to have alternate state approved drinking water service. IID maintains a small-acreage pipe and drinking water database and provides an annual compliance update to CDPH.

Imperial Valley Historic and Future Land and Water Uses

Agricultural development in the Imperial Valley began at the turn of the twentieth century. In 2020, gross agricultural production for Imperial County was valued at $2,026,427,000, of which

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approximately $1,772,462,950[8] was produced in the IID water service area.[9] While the agriculture-based economy is expected to continue, land use is projected to change somewhat over the years as industrial and/or alternative energy development and urbanization occur in rural areas and in areas adjacent to existing urban centers, respectively.

The proposed Project would benefit the Imperial Valley by way of supporting the goals of diversification of a growing renewable energy economy and supplying the State of California with additional renewable energy.

Imperial Valley's economy is gradually diversifying. Agriculture will likely continue to be the primary industry within the valley; however, two principal factors anticipated to reduce crop acreage are renewable energy (geothermal and solar) and urban development. Over the next twenty years, urbanization is expected to slightly decrease agriculture land use to provide space for an increase in residential, commercial and industrial uses. The transition from agricultural land use typically results in a net decrease in water demand for municipal, commercial, and solar energy development; and a net increase in water demand for geothermal energy development Local energy resources include geothermal, wind, biomass and solar. The County General Plan provides for development of energy production centers or energy parks within Imperial County. Alternative energy facilities will help California meet its statutory and regulatory goals for increasing renewable power generation and use and decrease water demands in Imperial County.

The IID Board has adopted the following policies and programs to address how to accommodate water demands under the terms of the Quantification Settlement Agreement and Related

[8] IID Service Area Acre (not including Palo Verde Irrigation District and Yuma Project) 446,049/ 2019 Imperial County Crop Report Total Harvested Acres of 527,860 , Take Total Gross Value of $2,026,427,000 multiplied by .85 and multiply by 100 which equates to 1,772,462,950 to get the approximate value.

[9] 2020 Imperial County Crop and Livestock Report

Agreements (QSA) / Transfers Agreements and minimize potential negative impacts on agricultural water uses:

Imperial Integrated Regional Water Management Plan (IRWMP): adopted by the board on December 18, 2012, and by the County, the City of Imperial, to meet the basic requirement of California Department of Water Resources (CDWR) for an IRWM plan. In all, 14 local agencies adopted the 2012 Imperial IRWMP.

Interim Water Supply Policy (IWSP) for Non-Agricultural Projects: adopted by the board on September 29, 2009, to ensure sufficient water will be available for new development, in particular, anticipated renewable energy projects until the board selects and implements capital development projects such as those considered in the Imperial IRWMP.

Temporary Land Conversion Fallowing Policy (TLCFP): adopted by the board on May 8, 2012, and revised on March 29, 2016, to provide a framework for a temporary, long-term fallowing program to work in concert with the IWSP and IID's coordinated land use/water supply strategy.

Equitable Distribution Plan (EDP): adopted by the board on October 28, 2013, to provide a mechanism for IID to administer apportionment of the district's quantified annual supply of Colorado River water; IID board approved a resolution repealing the Equitable Distribution Plan (EDP) on February 6, 2018.

In addition, water users within the IID service area are subject to the statewide requirement of reasonable and beneficial use of water under the California Constitution, Article X, § 2.

Imperial Integrated Regional Water Management Plan (October 2021)

The Imperial Integrated Regional Water Management Plan (IRWMP) serves as the governing document for regional water planning to meet present and future water resource needs and demands by addressing such issues as additional water supply options, demand management and determination and prioritization of uses and classes of service provided. In November 2012, the Imperial County Board of Supervisors approved the Imperial IRWMP, and the City of Imperial City Council and the IID Board of Directors approved it in December 2012. Approval by these three (3)

stakeholders meets the basic requirement of California Department of Water Resources (CDWR) for an IRWMP. Through the IRWMP process, IID presented to the region stakeholders options in the event long-term water supply augmentation is needed, such as water storage and banking, recycling of municipal wastewater, and desalination of brackish water. As discussed herein, long term water supply augmentation is not anticipated to be necessary to meet proposed Project demands.

Chapter 5 of the 2012 Imperial IRWMP addresses water supplies (Colorado River and groundwater), demand, baseline and forecasted through 2050; and IID water budget. Chapter 12 addresses projects, programs and policies, and funding alternatives. Chapter 12 of the IRMWP lists, and Appendix N details, a set of capital projects that IID might pursue, including the amount of water that might result (AFY) and cost ($/AF) if necessary. These also highlight potential capital improvement projects that could be implemented in the future.

Imperial Valley historic 2015 and 2020 and the forecasted future for 2025 to 2055 non-agricultural water demand, are provided in Table 8 in five-year increments. Total water demand for non-agricultural uses is projected to be 201.4 KAF in the year 2055. This is a forecasted increase in the use of non-agricultural water from 107.4 KAF for the period of 2015 to 2055.[10] These values were modified from Chapter 5 of the Imperial IRWMP to reflect updated conditions from the IID Provisional Water Balance for calendar year 2015 and 2020. Due to the recession in 2009 and other factors, non-agricultural growth projections have lessened since the 2012 Imperial IRWMP. Projections in Table 8 have been adjusted (reduced by 3%) to reflect IID 2015 and 2020 delivery data adjustments. Even with these adjustments, the Table 8 projections for non-agricultural water demand within the IID water service area continue to reflect an unlikely aggressive growth.

[10] Wistaria Solar Ranch, Final Environmental Impact Report, December 2014

Table 8: Non-Agricultural Water Demand within IID Water Service Area, 2015-2055 (KAFY)

	2015	2020	2025	2030	2035	2040	2045	2050	2055
Municipal	30.0	30.9	36.8	39.8	41.5	46.3	51.7	57.8	61.9
Industrial	26.4	26.0	39.8	46.5	53.2	59.9	66.6	73.3	80.0
Other	5.5	6.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Feedlots/Dairies	17.8	19.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Envr Resources	8.3	9.2	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Recreation	7.4	9.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Service Pipes	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Total Non Ag	**107.4**	**113.1**	**136.1**	**145.8**	**154.2**	**165.7**	**177.8**	**190.6**	**201.4**

Notes: 2015 non-agricultural water demands are from IID 2015 Provisional Water Balance rerun 03/28/2019 2020-2055 demands are modified from 2012 Imperial IRWMP Chapter 5, Table 5-22 p 5-50 based on IID 2015 Provisional Water Balance. 2020 non-agricultural water demands are from IID2020 Provisional Water Balance rerun on 01/25/2021 2025-2055 demands are modified from 2012 Imperial IRWMP Chapter 5, Table 5-22 P5-50 based on IID 2020 Provisional Water Balance. Industrial Demand includes geothermal, but not solar, energy production.

Agricultural evapotranspiration (ET) demand of approximately 1,476.4 KAF in 2015, decreased in 2020 to around 1,442.2 KAF. The termination of fallowing programs provided 103.5 KAF of water for Salton Sea mitigation in 2017. Forecasted agricultural ET remains constant, as reductions in water use are to come from efficiency conservation not reduction in agricultural production. Market forces and other factors may impact forecasted future water demand.

Table 9 provides the 2015 and 2020 historic and 2025-2055 forecasted agricultural consumptive use and delivery demand within the IID water service area. When accounting for agriculture ET, tailwater and tilewater, total agricultural consumptive use (CU) demand ranges from 2,157.9 KAF in 2015 to 2,208.5 KAF in 2055. Forecasted total agricultural delivery demand is around 1 KAFY higher than the CU demand, ranging from 2,158.9 KAF in 2015 to 2,209.5 KAF in 2055.

Table 9: Historic and forecasted Agricultural Water Consumptive Use and Delivery Demand within IID Water Service Area, 2015-2055 (KAFY)

	2015	2020	2025	2030	2035	2040	2045	2050	2055
Ag ET from Delivered & Stored Soil Water	1,476.4	1,442.2	1,567.5	1,567.5	1,567.5	1,567.5	1,567.5	1,567.5	1,567.5
Ag Tailwater to Salton Sea	282.9	312.9	268.0	218.0	218.0	218.0	218.0	218.0	218.0
Ag Tilewater to Salton Sea	398.6	410.2	423.0	423.0	423.0	423.0	423.0	423.0	423.0
Total Ag CU Demand	**2,157.9**	**2,165.4**	**2,258.5**	**2,208.5**	**2,208.5**	**2,208.5**	**2,208.5**	**2,208.5**	**2,208.5**
Subsurface Flow to Salton Sea	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
Total Ag Delivery Demand	**2,158.9**	**2,166.4**	**2,259.5**	**2,209.5**	**2,209.5**	**2,209.5**	**2,209.5**	**2,209.5**	**2,209.5**

Notes: 2015 record from IID 2015 Provisional Water Balance rerun 06/28/2019; 2020-2055 forecasts from spreadsheet used to develop Figure 19, et seq. in Imperial IRWMP Chapter 5 (Data provided by IID staff).

In addition to agricultural and non-agricultural water demands, system operational demands must be included to account for operational discharge, main and lateral canal seepage; and for All American Canal (AAC) seepage, river evaporation and phreatophyte ET from Imperial Dam to IID's measurement site at AAC Mesa Lateral 5. These system operation demands are shown in Table 10. IID measures system operational uses and at All-American Canal Station 2900 just upstream of Mesa Lateral 5 Heading. Total system operational use for 2020 was 167.0 KAF, including 10 KAF of Lower Colorado River Water Supply Project (LCRWSP) input, 39.8 KAF of seepage interception input, and 40 KAF of unaccounted canal water input.

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Table 10 IID System Operations Consumptive Use within IID Water Service Area and from AAC at Mesa Lateral 5 to Imperial Dam, (KAF), 2020

Delivery System Evaporation	24.4
Canal Seepage	90.8
Canal Spill	10.1
Lateral Spill	121.5
Seepage Interception	-39.0
Unaccounted Canal Water	-40.0
Total System Operational Use, In valley	**167.8**
Imperial Dam to AAC @ Mesa Lat 5	9.2
LCWSP	-10
Total System Operational Use in 2020	**167.0**
Source: 2020 Water Balance rerun 01/25/2021	

IID INTERIM WATER SUPPLY POLICY FOR NON-AGRICULTURAL PROJECTS (SEPTEMBER 2009)

The IID IWSP provides a mechanism to address water supply requests for projects being developed within the IID service area. The IWSP designates up to 25,000 AFY of IID's annual Colorado River water supply for new non-agricultural projects, provides a mechanism and process to develop a water supply agreement for any appropriately permitted project, and establishes a framework and set of fees to ensure the supplies used to meet new demands do not adversely affect existing users by funding water conservation or augmentation projects as needed. [11]

Depending on the nature, complexity and water demands of the proposed project, new projects may be charged a one-time Reservation Fee and an annual Water Supply Development Fee for the contracted water volume used solely to assist in funding new water supply projects. The applicability of the fee to certain projects will be determined by IID on a case-by-case basis,

[11] *IID website: Municipal, Industrial and Commercial Customers.*

depending on the proportion of types of land uses and water demand proposed for a project. The 2021 fee schedule is shown in Table 11.

Table 11 Interim Water Supply Policy 2021 Annual Non-Agricultural Water Supply Development Fee Schedule

Annual Demand (AF)	Reservation Fee ($/AF)*	Development Fee ($/AF)*
0-500	$75.40	$301.59
501-1000	$106.16	$424.64
1001-2500	$133.30	$533.22
2501-5000	$164.67	$658.68

Adjusted annually in accordance with the Consumer Price Index (CPI).

IID customers with new projects receiving water under the IWSP will be charged the appropriate water rate based on measured deliveries, see IID Water Rate Schedules. As of September 2021, IID has issued one Water Supply Agreement for 1,200 AFY, leaving a balance of 23,800 AFY of supply available for contracting under the IWSP.

IID Temporary Land Conversion Fallowing Policy (May 2012)

Imperial County planning officials determined that renewable energy facilities were consistent with the county's agricultural zoning designation and began issuing CUPs for these projects with ten- to twenty-year terms. These longer-term, but temporary, land use designations were not conducive to a coordinated land use/water supply policy as envisioned in the Imperial IRWMP, because temporary water supply assignments during a conditional use permit (CUP) term were not sufficient to meet the water supply verification requirements for new project approvals. Agricultural landowners also sought long-term assurances from IID that, at project termination, irrigation service would be available for them to resume their farming operations.

Based on these conditions, IID determined it had to develop a water supply policy that conformed to the local land use decision-making in order to facilitate new development and economic diversity in Imperial County which has resulted in the IID Temporary Land Conversion Fallowing Policy

(TLCFP).[12] IID concluded that certain lower water use projects could still provide benefits to local water users. The resulting benefits; however, may not be to the same categories of use (e.g., MCI) but to the district as a whole.

At the general manager's direction, staff developed a framework for a fallowing program that could be used to supplement the IWSP and meet the multiple policy objectives envisioned for the coordinated land use/water supply strategy. Certain private projects that, if implemented, will temporarily remove land from agricultural production within the district's water service area include renewable solar energy and other non-agricultural projects. Such projects may need a short-term water supply for construction and decommissioning activities and longer-term water service for facility operation and maintenance or for treating to potable water standards. Conserved water will be credited to the extent that water use for the project is less than historic water use for the project site's footprint as determined by the ten year water use history.[13]

Water demands for certain non-agricultural projects are typically less than that required for agricultural production; this reduced demand allows water to be made available for other users under IID's annual consumptive use cap. This allows the district to avail itself of the ability during the term of the QSA/Transfer Agreements under CWC Section 1013 to create conserved water through projects such as temporary land fallowing conservation measures. This conserved water can then be used to satisfy the district's conserved water transfer obligation and for environmental mitigation purposes.

Under the terms of the legislation adopted to facilitate the QSA/Transfer Agreements and enacted in CWC Section 1013, the TLCFP was adopted by the IID board on May 8, 2012 and revised on March 29, 2016 to update the fee schedule for 2016. This policy provides a framework for a

[12] *IID website: Temporary Land Conversion Fallowing Policy (TLCFP), and The TLCFP are the sources of the text for this section.*

[13] For details of how water conservation yield attributable to land removed from agricultural production and temporarily fallowed is computed, see TLCFP for Water Conservation Yield.

temporary, long-term fallowing program to work in concert with the IWSP. While conserved water generated from the TLCFP is limited by law for use for water transfer or environmental purposes, by satisfying multiple district objectives the TLCFP serves to reduce efficiency conservation and water use reduction demands on IID water users, thus providing district wide benefits.

IMPERIAL IRRIGATION DISTRICT'S WATER RIGHTS

The laws and regulations that influence IID's water supply are noted in this section. The Law of the River (as described below), along with the 2003 QSA serve as the laws, regulations and agreements that primarily influence the findings of this WSA. These agreements grant California the most senior water rights along the Colorado River and IID specify that IID has access to 3.1 million acre-feet (MAF) per year. These two components will influence future decisions in terms of water supply during periods of shortages.

California Law

IID has had a longstanding right to divert Colorado River water, and IID holds legal titles to all of its water and water rights in trust for landowners within the district (CWC §§ 20529 and 22437; *Bryant v. Yellen*, 447 U.S. 352, 371 (1980), fn.23.). Beginning in 1885, a number of individuals, as well as the California Development Company, made a series of appropriations of Colorado River water under California law for use in the Imperial Valley. The rights to these appropriations were among the properties acquired by IID from the California Development Company.

Law of the River

Colorado River water rights are governed by numerous compacts, state and federal laws, court decisions and decrees, contracts, and regulatory guidelines collectively known as the "Law of the River." Together, these documents form the basis for allocation of the water, regulation of land use, and management of the Colorado River water supply among the seven basin states and Mexico.

Of all regulatory literature that governs Colorado River water rights, the following are the specifics that impact IID:

- Colorado River Compact (1922)
- Boulder Canyon Project Act (1928)
- California Seven-Party Agreement (1931)
- Arizona v. California US Supreme Court Decision (1964, 1979)
- Colorado River Basin Project Act (1968)
- Quantification Settlement Agreement and Related Agreements (2003)
- 2003 Colorado River Water Delivery Agreement: Federal QSA for purposes of § 5(b) Interim Surplus Guidelines (CRWDA)
- 1970 Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs
- Annual Operating Plan (AOP) for Colorado River Reservoirs
- 2007 Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lakes Powell and Mead (2007 Interim Guidelines)

Colorado River Compact (1922)

With authorization of their legislatures and urging of the federal government, representatives from the seven Colorado River basin states began negotiations regarding distribution of water from the Colorado River in 1921. In November 1922, an interstate agreement called the "Colorado River Compact" was signed by the representatives giving the Lower Basin perpetual rights to annual apportionments of 7.5 MAF of Colorado River water (75 MAF over ten years). The Upper Basin was to receive the remainder, which based on the available hydrological record was also expected to be 7.5 MAF annually, with enough left over to provide 1.5 MAF annually to Mexico.

Boulder Canyon Project Act (1928)

Provisions in the 1928 Boulder Canyon Project Act made the compact effective and authorized construction of Hoover Dam and the AAC and served as the United States' consent to accept the Compact. Through a Presidential Proclamation on June 25, 1929, this act resulted in ratification of the Compact by six of the basin states and required California to limit its annual consumptive use to 4.4 MAF of the lower basin's apportionment plus not less than half of any excess or surplus water unportioned by the Compact. A lawsuit was filed by the State of Arizona after its refusal to sign. Through the implementation of its 1929 Limitation Act, California abided by this federal

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mandate. The Boulder Canyon Act authorized the Secretary of the Interior (Secretary) to "contract for the storage of water… and for the delivery thereof… for irrigation and domestic uses," and additionally defined the lower basin's 7.5 MAF apportionment split, with an annual allocation 0.3 MAF to Nevada, 2.8 MAF to Arizona, and 4.4 MAF to California. Even though the three states never formally settled or agreed to these terms, a 1964 Supreme Court decision (*Arizona v. California*, 373 U.S. 546) declared the three states' consent to be insignificant since the Boulder Canyon Project Act was authorized by the Secretary.

California Seven-Party Agreement (1931)

Following implementation of the Boulder Canyon Project Act, the Secretary requested that California make recommendations regarding distribution of its apportionment of Colorado River water. In August 1931, under chairmanship of the State Engineer, the California Seven-Party Agreement was developed and authorized by the affected parties to prioritize California water rights. The Secretary accepted this agreement and established these priorities through General Regulations issued in September of 1931. The first four (4) priority allocations account for California's annual apportionment of 4.4 MAF, with agricultural entities using 3.85 MAF of that total. Additional priorities are defined for years in which the Secretary declares that excess waters are available.

Arizona V. California U.S. Supreme Court Decision (1964, 1979)

The 1964 Supreme Court decision settled a 25-year disagreement between Arizona and California that stemmed from Arizona's desire to build the Central Arizona Project to enable use of its full apportionment. California's argument was that as Arizona used water from the Gila River, which is a Colorado River tributary, it was using a portion of its annual Colorado River apportionment. An additional argument from California was that it had developed a historical use of some of Arizona's apportionment, which, under the doctrine of prior appropriation, precluded Arizona from developing the project. California's arguments were rejected by the U.S. Supreme Court. Under direction of the Supreme Court, the Secretary was restricted from delivering water outside of the framework of apportionments defined by law. Preparation of annual reports documenting consumptive use of water in the three lower basin states was also mandated by the Supreme

Court. In 1979, present perfected water rights (PPRs) referred to in the Colorado River Compact and in the Boulder Canyon Project Act were addressed by the Supreme Court in the form of a Supplemental Decree.

In March of 2006, a Consolidated Decree was issued by the Supreme Court to provide a single reference to the conditions of the original 1964 decrees and several additional decrees in 1966, 1979, 1984 and 2000 that stemmed from the original ruling. The Consolidated Decree also reflects the settlements of the federal reserved water rights claim for the Fort Yuma Indian Reservation.

Colorado River Basin Project Act (1968)

In 1968, various water development projects in both the upper and lower basins, including the Central Arizona Project (CAP) were authorized by Congress. Under the Colorado River Basin Project Act, priority was given to California's apportionment over (before) the CAP water supply in times of shortage. Also under the act, the Secretary was directed to prepare long-range criteria for the Colorado River reservoir system in consultation with the Colorado River Basin States.

Quantification Settlement Agreement and Related Agreements (2003)

With completion of a large portion of the CAP infrastructure in 1994, creation of the Arizona Water Banking Authority in 1995, and the growth of Las Vegas in the 1990s, California encountered increasing pressure to live within its rights under the Law of the River. After years of negotiating among Colorado River Compact States and affected California water delivery agencies, a QSA and Related Agreements and documents were signed on October 10, 2003, by the Secretary of Interior, IID, Coachella Valley Water District (CVWD), Metropolitan Water District of Southern California (MWD), San Diego County Water Authority (SDCWA), and other affected parties.

The Quantification Settlement Agreement and Related Agreements (QSA/Transfer Agreements) are a set of interrelated contracts that resolve certain disputes among the United States, the State of California, IID, MWD, CVWD and SDCWA, for a period of 35 to 75 years, regarding the reasonable and beneficial use of Colorado River water; the ability to conserve, transfer and acquire conserved

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Colorado River water; the quantification and priority of Priorities 3(a) and 6(a)[14] within California for use of Colorado River water; and the obligation to implement and fund environmental impact mitigation.

Conserved water transfer agreements between IID and SDCWA, IID and CVWD, and IID and MWD are all part of the QSA/Transfer Agreements. For IID, these contracts identify conserved water volumes and establish transfer schedules along with price and payment terms. As specified in the agreements, IID will transfer nearly 415,000 AF annually over a 35-year period (or loner), as follows:

- to MWD 110,000 AF [modified to 105,000 AF in 2007],
- to SDCWA 200,000 AF,
- to CVWD and MWD combined 103,000 AF, and
- to certain San Luis Rey Indian Tribes 11,500 AFY of water.

All of the conserved water will ultimately come from IID system and on-farm efficiency conservation improvements. In the interim, IID has implemented a Fallowing Program to generate water associated with Salton Sea mitigation related to the impacts of the IID/SDCWA water transfer, as required by the SWRCB, which is to run from 2003 through 2017. In return for its QSA/Transfer Agreements programs and deliveries, IID will receive payments totaling billions of dollars to fund needed efficiency conservation measures and to pay growers for conserved on-farm water, so IID can transfer nearly 14.5 MAF of water without impacting local productivity. In addition, IID will transfer to SDCWA 67,700 AFY annually of water conserved from the lining of the AAC in exchange for payment of lining project costs and a grant to IID of certain rights to use the conserved water. In addition to the 105,000 acre-feet of water currently being conserved under the 1988 IID/MWD Conservation Program, these more recent agreements define an additional

[14] Priorities 1, 2, 3(b), 6(b), and 7 of current Section 5 Contracts for the delivery of Colorado River water in the State of California and Indian and miscellaneous Present Perfected Rights within the State of California and other existing surplus water contracts are not affected by the QSA Agreement.

303,000 AFY to be conserved by IID from on-farm and distribution system conservation projects for transferred to SDCWA, CVWD and MWD.

COLORADO RIVER WATER DELIVERY AGREEMENT (2003)[15]

As part of QSA/Transfer Agreements among California and federal agencies, the Colorado River Water Delivery Agreement: Federal QSA for purposes of § 5(b) Interim Surplus Guidelines (CRWDA) was entered into by the Secretary of the Interior, IID, CVWD, MWD and SDCWA. This agreement involves the federal government because of the change in place of diversion from Imperial Dam into the All-American Canal to Parker Dam into MWD's Colorado River Aqueduct. The CRWDA assists California to meet its "4.4 Plan" goals by quantifying deliveries for a specific number of years for certain Colorado River entitlements so transfers may occur. In particular, for the term of the CRWDA, quantification of Priority 3(a) was affected through caps on water deliveries to IID (CU of 3.1 MAF per year) and CVWD (CU of 330 KAF per year). In addition, California's Priority 3(a) apportionment between IID and CVWD, with provisions for transfer of supplies involving IID, CVWD, MWD and SDCWA are quantified in the CRWDA for a period of 35 years or 45 years (assumes SDCWA does not terminate in year 35) or 75 years (assumes SDCWA and IID mutually consent to renewal term of 30 years).

Allocations for consumptive use of Colorado River water by IID, CVWD and MWD that will enable California to stay within its basic annual apportionment (4.4 MAF plus not less than half of any declared surplus) are defined by the terms of the QSA/Transfer Agreements (Table 12). As specified in the QSA/Transfer Agreements, by 2026, IID annual use within (Imperial Valley) is to be reduced to just over 2.6 MAF of its 3.1 MAF quantified annual apportionment. The remaining nearly 500,000 AF (which includes the 67,000 AF from AAC lining) are to be transferred annually to urban water users outside of the Imperial Valley.

[15] *CRWDA: Federal QSA accessed 7 June 2017.*

Table 12 CRWDA Annual 4.4 MAF Apportionment (Priorities 1 to 4) for California Agencies (AFY)

User	Apportionment (AFY)
Palo Verde Irrigation District and Yuma Project*	420,000
Imperial Irrigation District	3,100,000
Coachella Valley Water District	330,000
Metropolitan Water District of Southern California*	550,000
Total:	4,400,000

* PVID and Yuma Project did not agree to a cap; value represents a contractual obligation by MWD to assume responsibility for any overages or be credited with any volume below this value.
Notes: All values are consumptive use at point of Colorado River diversion: Palo Verde Diversion Dam (PVID), Imperial Dam (IID and CVWD), and Parker Dam (MWD). Source: IID Annual Water Report

Quantification of Priority 6(a) was effected through quantifying annual consumptive use amounts to be made available in order of priority to MWD (38 KAF), IID (63 KAF), and CVWD (119 KAF) with the provision that any additional water available to Priority 6(a) be delivered under IID's and CVWD's existing water delivery contract with the Secretary.[16] The CRWDA provides that the underlying water delivery contract with the Secretary remain in full force and effect (*Colorado River Documents 2008*, Chapter 6, pages 6-12 and 6-13). The CRWDA also provides a source of water to effect a San Luis Rey Indian Water rights settlement. Additionally, the CRWDA satisfies the requirement of the 2001 Interim Surplus Guidelines (ISG) that a QSA be adopted as a prerequisite to the interim surplus determination by the Secretary in the ISG.

Inadvertent Overrun Payback Policy (2003)

The CRWDA Inadvertent Overrun Payback Policy (IOPP), adopted by the Secretary contemporaneously with the execution of the CRWDA, provides additional flexibility to Colorado River management and applies to entitlement holders in the Lower Division States **(Arizona, California and Nevada)**.[17] The IOPP defines inadvertent overruns as "Colorado River water diverted, pumped, or received by an entitlement holder of the Lower Division States that is in excess of the water users' entitlement for the year." An entitlement holder is allowed a maximum overrun of 10 percent (10%) of its Colorado River water entitlement.

[16] When water levels in the Colorado River reservoirs are low, Priority 5, 6 and 7 apportionments are not available for diversion.

[17] *USBR, 2003 CRWDA ROD Implementation Agreement, IOPP and Related Federal Actions Final EIS. Section IX. Implementing the Decision A. Inadvertent Overrun and Payback Policy. Pages 16-19 of 34.*

In the event of an overrun, the IOPP provides a mechanism to payback the overrun. When the Secretary has declared a normal year for Colorado River diversions, a contractor has from one to three years to pay back its obligation, with a minimum annual payback equal to 20 percent of the entitlement holder's maximum allowable cumulative overrun account or 33.3 percent of the total account balance, whichever is greater. However, when Lake Mead is below 1125 feet on January 1, the terms of the IOPP require that the payment of the inadvertent overrun obligation be made in the calendar year after the overrun is reported in the USBR Lower Colorado Region Colorado River Accounting and Water Use Report [for] Arizona, California, and Nevada (Decree Accounting Report)..[18]

1970 Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs

The 1970 Operating Criteria control operation of the Colorado River reservoirs in compliance with requirements set forth in the Colorado River Compact of 1922, the United States-Mexico Water Treaty of 1944, the Colorado River Storage Project Act of 1956, the Boulder Canyon Projects Act (Lake Mead) and the Colorado River Basin Project Act (Upper Basin Reservoirs) of 1968, and other applicable federal laws. Under these Operating Criteria, the Secretary makes annual determinations published in the USBR Annual Operating Plan for Colorado River Reservoirs (discussed below) regarding the release of Colorado River water for deliveries to the lower basin states. A requirement to equalize active storage between Lake Powell and Lake Mead when there is sufficient storage in the Upper Basin is included in these operating criteria. **Figure 5** identifies the major storage facilities at the upper and lower basin boundaries.

Annual Operating Plan for Colorado River Reservoirs (Applicable Only if Lake Mead has Surplus/Shortage)

The AOP is developed in accordance with Section 602 of the Colorado River Basin Project Act (Public Law 90-537); the Criteria for Coordinated Long-Range Operations of Colorado River

[18] *2003 CRWDA ROD. Section IX. A.6.c,, page 18 of 34.*

Reservoirs Pursuant to the Colorado River Basin Project Act of 1968, as amended, promulgated by the Secretary of the Interior; and Section 1804(c)(3) of the Grand Canyon Protection Act (Public Law 102-575). As part of the AOP process, the Secretary makes determinations regarding the availability of Colorado River water for deliveries to the lower basin states, including whether normal, surplus, and shortage conditions are in effect on the lower portion of the Colorado River.

2007 Colorado River Interim Guidelines for Lower Basin Shortages (2007 Interim Guidelines)

A multi-year drought in the Colorado River Upper Basin triggered the need for the 2007 Interim Shortage Guidelines. In the summer of 1999, Lake Powell was essentially full with reservoir storage at 97 percent of capacity. However, precipitation fell off starting in October 1999 and 2002 inflow was the lowest recorded since Lake Powell began filling in 1963.[19],[20] By August 2011, inflow was 279 percent (279%) of average; however, drought resumed in 2012 and continued through calendar year 2020. Using the record in **Table 13,** average unregulated inflow to Lake Powell for water years 2000-2020 is 75.47 percent (75.5%); or if 2011 is excluded, 72.45 percent (72.5%) of the historic average, see Table 13.

Table 13: Unregulated Inflow to Lake Powell, Percent of Historic Average, 2000-2019

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
62%	59%	25%	51%	49%	105%	73%	68%	102%	88%	73%
2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	
136%	35%	49%	90%	83%	80%	101%	36%	120%	540%	

Source UCR Water Operations: Historic Data (2000-2020)

[19] Water Year: October 1 through September 30 of following year, so water year ending September 30, 1999

[20] Drought in the Upper Colorado River Basin. August 2011

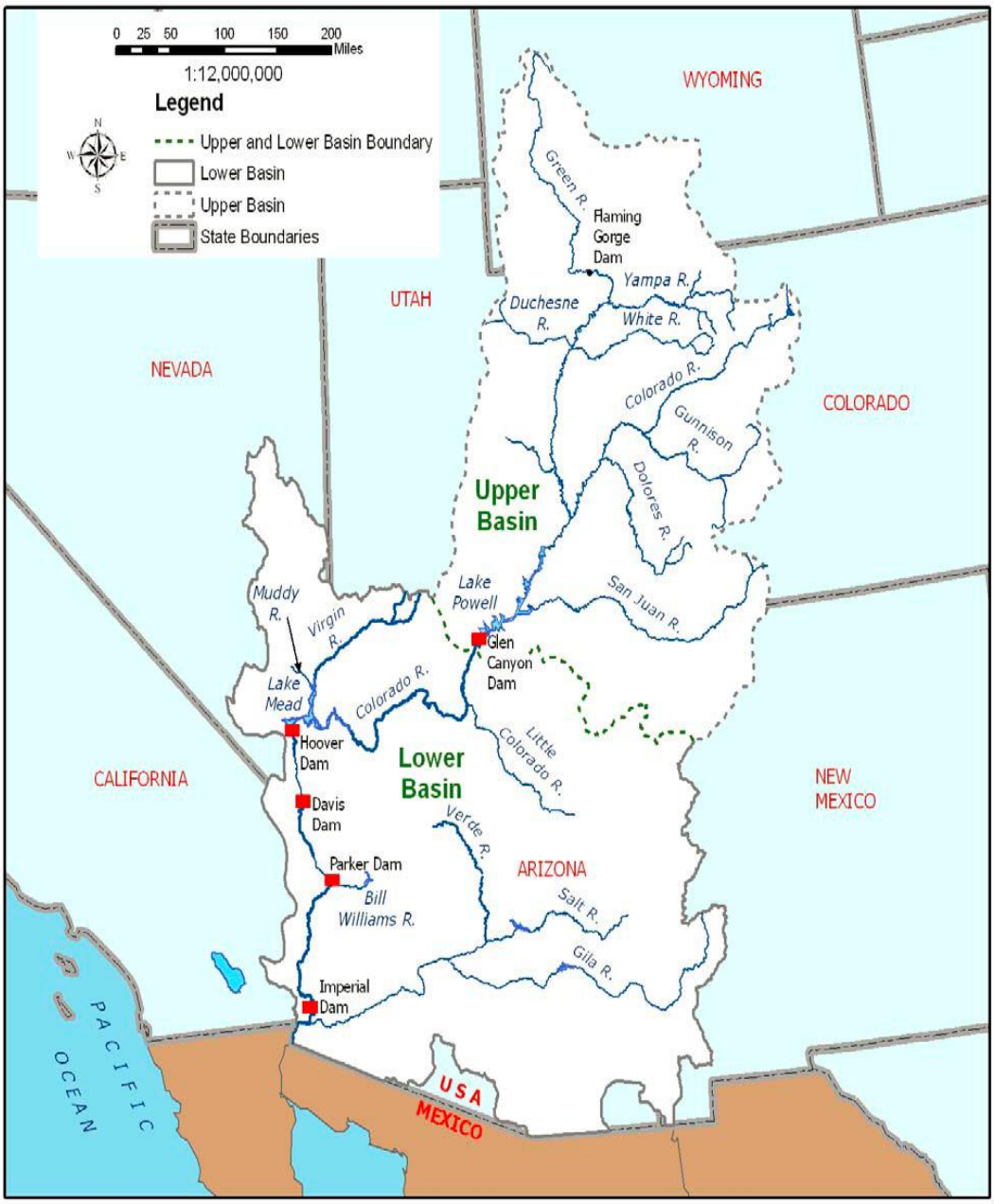

Figure 5 Major Colorado River Reservoir Storage Facilities and Basin Location Map

Source: Final EIS – Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead, Volume 1 Chapter 1 Purpose and Need , p I-10.

In the midst of the drought period, USBR developed 2007 Interim Guidelines with consensus from the seven basin states, which selected the Draft EIS Preferred Alternative as the basis for USBR's final determination. The basin states found the Preferred Alternative best met all aspects of the purpose and need for the federal action.[21]

The 2007 interim Guidelines Preferred Alternative highlights the following:

1. The need for the Interim Guidelines to remain in place for an extended period of time.
2. The desirability of the Preferred Alternative based on the facilitated consensus recommendation from the basin states.
3. The likely durability of the mechanisms adopted in the Preferred Alternative in light of the extraordinary efforts that the basin states and water users have undertaken to develop implementing agreements that will facilitate the water management tools (shortage sharing, forbearance, and conservation efforts) identified in the Preferred Alternative.
4. That the range of elements in the Preferred Alternative will enhance the Secretary's ability to manage the Colorado River reservoirs in a manner that recognizes the inherent tradeoffs between water delivery and water storage.

In June 2007, USBR announced that a preferred alternative for Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations of Lake Powell and Lake Mead (Final Preferred Alternative) had been determined. The Final Preferred Alternative, based on the basin states' consensus alternative and an alternative submitted by the environmental interests called "Conservation Before Shortage," is comprised of four key operational elements which are to guide operations of Lake Powell and Lake Mead through 2026 are:

1. Shortage strategy for Lake Mead and Lower Division states: The Preferred Alternative proposed discrete levels of shortage volumes associated with Lake Mead elevations to conserve reservoir storage and provide water users and managers in the Lower Basin with

[21] USBR *Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead* <http://www.usbr.gov/lc/region/programs/strategies.html>

greater certainty to know when, and by how much, water deliveries will be reduced during low reservoir conditions.

2. Coordinated operations of Lake Powell and Lake Mead: The Preferred Alternative proposed a fully coordinated operation of the reservoirs to minimize shortages in the Lower Basin and to avoid risk of curtailments of water use in the Upper Basin.
3. Mechanism for storage and delivery of conserved water in Lake Mead: The Preferred Alternative proposed the Intentionally Created Surplus (ICS) mechanism to provide for the creation, accounting, and delivery of conserved system and non-system water thereby promoting water conservation in the Lower Basin. Credits for Colorado River or non-Colorado River water that has been conserved by users in the Lower Basin creating an ICS would be made available for release from Lake Mead at a later time. The total amount of credits would be 2.1 MAF, but this amount could be increased up to 4.2 MAF in future years.
4. Modifying and extending elements of the Interim Surplus Guidelines (ISG). The ISG determines conditions under which surplus water is made available for use within the Lower Division states. These modifications eliminate the most liberal surplus conditions thereby leaving more water in storage to reduce the severity of future shortages.

With respect to the various interests, positions and views of the seven basin states, this provision adds an important element to the evolution of the legal framework for prudent management of the Colorado River. Furthermore, the coordinated operation element allows for adjustment of Lake Powell releases to respond to low reservoir storage conditions in either Lake Powell or Lake Mead.[22] States found the Preferred Alternative best met all aspects of the purpose and need for

[22] *For a discussion of the 2007 Interim Guidelines, see: Intermountain West Climate Summary by The Western Water Assessment, issued Jan. 21, 2008, Vol. 5, Issue 1, January 2009 Climate Summary, Feature Article, pages 5-7, 22 Mar 2013.*

the federal action.[23] The 2007 Interim Guidelines are in place from 2008 through December 31, 2025 (through preparation of the 2026 Annual Operating Plan).

Lower Colorado Region Water Shortage Operations

The drought in the Colorado River watershed has continued through 2021 despite an increase in observed runoff in August 2011 when unregulated inflow to Lake Powell was 279 percent of the average. Since 2000, Lake Mead has been below the "average" level of lake elevations (see **Figure 6**). Such conditions have caused the preparation of shortage plans for waters users in Arizona and Nevada, and in Mexico.

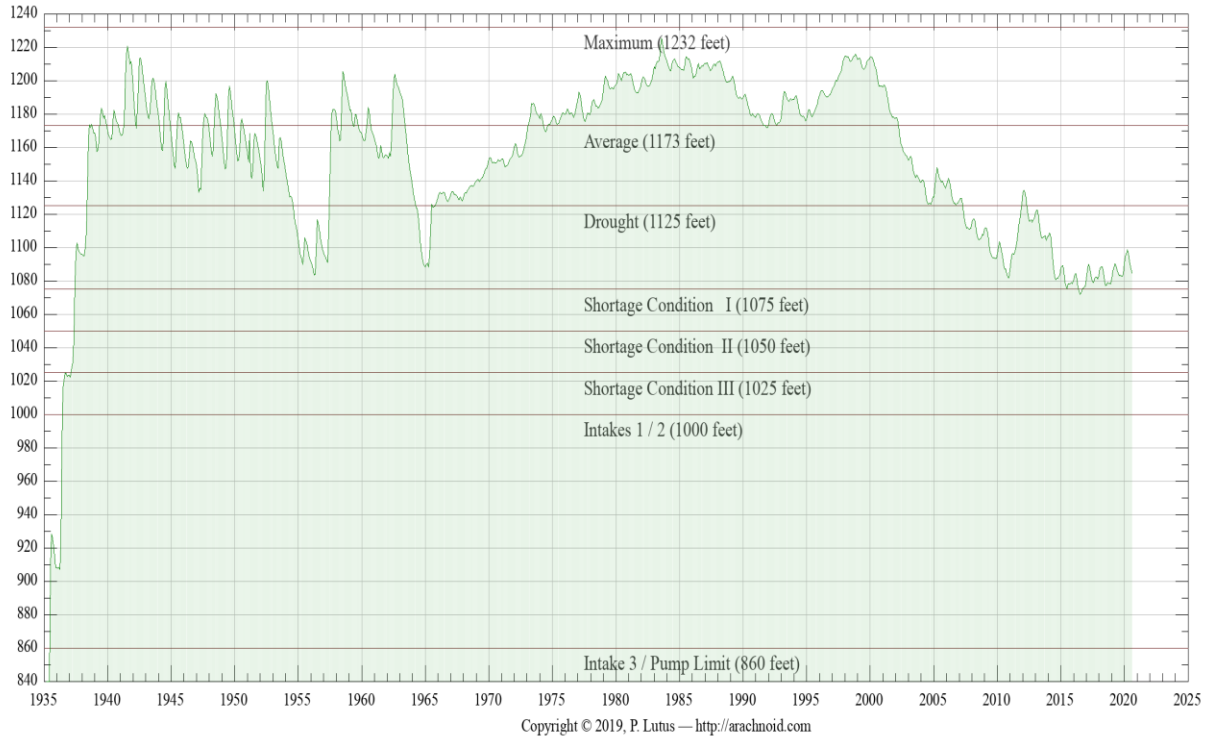

Figure 6: Lake Mead Water Elevation Levels 2020

visit<http://www.arachnoid.com/NaturalResources/index.html>

[23] *USBR Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead.*

According to guidelines put in place in 2007, Arizona and Nevada begin to take shortages when the water elevation in Lake Mead falls below 1,075 feet. The volumes of shortages increase as water levels fall to 1,050 feet and again at 1,025 feet. In 2012, Mexico agreed to participate in a 5-year pilot agreement to share specific volumes of shortages at the same elevations. The 2007 interim shortage guidelines contain no reductions for California, which has senior water rights to the Central Arizona Project water supply, through 2025 when the guidelines expire. If Lake Mead's elevation drops to 1,025 feet, a re-consultation process would be triggered among the basin states to address next steps. Consultation would start out within each state, then move to the three lower basin states, followed by all seven states and the USBR. Mexico will then be brought into the process unless they choose to participate earlier.

IMPERIAL IRRIGATION DISTRICT WATER SUPPLY AND DEMAND

SB 610 requires an analysis of a normal, single dry, and multiple dry water years to show that adequate water is available for the proposed Project in various climate scenarios. Water availability for this Project in a normal year is no different from water availability during a single-dry and multiple-dry year scenarios. This is due to the small effect rainfall has on water availability in IID's arid environment along with IID's strong entitlements to the Colorado River water supply. Local rainfall does have some impact on how much water is consumed (i.e. if rain falls on agricultural lands, those lands will not demand as much irrigation), but does not impact the definition of a normal year, a single-dry year or a multiple-dry year scenario.

Water Availability – Normal Year

IID is entitled to annual net consumptive use of 3.1 MAF of Colorado River, less its QSA/Transfer Agreement obligations. Imperial Dam, located north of Yuma, Arizona, serves as a diversion structure for water deliveries throughout southeastern California, Arizona and Mexico. Water is transported to the IID water service area through the AAC for use throughout the Imperial Valley. IID historic and forecast net consumptive use volumes at Imperial Dam from CRWDA Exhibit B are shown in Table 14. Volumes for 2003-2020 are adjusted for USBR Decree Accounting historic records. Volumes for 2021-2077 are from CRWDA Exhibit B modified to reflect 2014 Letter Agreement changes to the 1988 IID/MWD Water Conservation Agreement.[24]

[24] 2014 Imperial Irrigation District Letter Agreement for Substitution and Conservation Modifications to the IID/MWD Water Conservation Agreement - December 17, 2014.

Table 14 IID Historic and Forecast Net Consumptive Use for Normal Year, Single-Dry Year and Multiple-Dry Year Water Supply, 2003-2037, et seq. (CRWDA Exhibit B)

IID Quantification and Transfers, Volumes in KAF at Imperial Dam [1]										
Col 1	2	3	4	5	6	7	8	9	10	11
	IID Priority 3(a)									
		IID Reductions								
Year	IID 3(a) Quantified Amount	1988 MWD Transfer [2]	SDCWA Transfer	AAC Lining	Salton Sea Mitigation SDCWA Transfer [3]	Intra-Priority 3 CVWD Transfer	MWD Transfer w\ Salton Sea Restoration [4]	Misc. PPRs	IID Total Reduction (Σ Cols 3-9) [5]	IID Net [Available for] Consumptive Use (Col 2 - 10)
2003	3,100	105.1	10.0	0.0	0.0	0.0	0.0	11.5	126.6	2978.2
2004	3,100	101.9	20.0	0.0	15.0	0.0	0.0	11.5	148.4	2743.9
2005	3,100	101.9	30.0	0.0	15.0	0.0	0.0	11.5	158.4	2756.8
2006	3,100	101.2	40.0	0.0	20.0	0.0	0.0	11.5	172.7	2909.7
2007	3,100	105.0	50.0	0.0	25.0	0.0	0.0	11.5	191.5	2872.8
2008	3,100	105.0	50.0	8.9	26.0	4.0	0.0	11.5	205.4	2825.1
2009	3,100	105.0	60.0	65.5	30.1	8.0	0.0	11.5	280.1	2566.7
2010	3,100	105.0	70.0	67.7	33.8	12.0	0.0	11.5	294.8	2540.5
2011	3,100	103.9	63.3	67.7	0.0	16.0	0.0	11.5	262.4	2915.8
2012	3,100	104.1	106.7	67.7	15.2	21.0	0.0	11.5	326.2	2,903.2
2013	3,100	105.0	100.0	67.7	71.4	26.0	0.0	11.5	381.6	2,554.9
2014	3,100	104.1	100.0	67.7	89.2	31.0	0.0	11.5	403.5	2,533.4
2015	3,100	107.82	100.0	67.7	153.3	36.0	0.0	11.5	476.3	2,480.9
2016	3,100	105.0	100.0	67.7	130.8	41.0	0.0	11.5	456.0	2,504.3
2017	3,100	105.0	100.0	67.7	105.3	45.0	0.0	9.9	432.9	2,667.1
2018	3,100	105	130	67.7	0.1	63	0.0	9.7	375.5	2,724.5
2019	3,100	105	160	67.7	46.55	68	0.0	6.9	454.2	2,645.8
2020	3,100	105	192.5	67.7	0.0	73	0.0	9.8	448.0	2.652.0
2021	3,100	105	205	67.7	0	78	0.0	11.5	467.2	2,632.8
2022	3,100	105	203	67.7	0	83	0.0	11.5	470.2	2,629.8
2023	3,100	105	200	67.7	0	88	0.0	11.5	472.2	2,627.8
2024	3,100	105	200	67.7	0	93	0.0	11.5	477.2	2,622.8
2025	3,100	105	200	67.7	0	98	0.0	11.5	482.2	2,617.8
2026	3,100	105	200	67.7	0	103	0.0	11.5	487.2	2,612.8
2027	3,100	105	200	67.7	0	103	0.0	11.5	487.2	2,612.8
2028	3,100	105	200	67.7	0	103	0.0	11.5	487.2	2,612.8
2029-37	3,100	105	200	67.7	0	103	0.0	11.5	487.2	2,612.8
2038-47 [6]	3,100	105	200	67.7	0	103	0.0	11.5	487.2	2,612.8
2048-77 [7]	3,100	105	200	67.7	0	50 [8]	0.0	11.5	434.2	2,665.8

1. 2003 through 2020, volumes are adjusted for actual USBR Decree Accounting values; IID Total Reduction and Net Available for Consumptive Use may not equal Col 2 minus Col 10, if IID conservation/use was not included in Exhibit B.
2. 2014 Letter of Agreement provides that, effective January 2016 total amount of conserved water available is 105 KAFY
3. Salton Sea Mitigation volumes may vary based on conservation volumes and method of conservation.
4. *This transfer is not likely given lack of progress on Salton Sea restoration as of 2018; shaded entries represents volumes that may vary..*
5. Reductions include conservation for 1988 IID/MWD Transfer, IID/SDCWA Transfer, AAC Lining; SDCWA Transfer Mitigation, MWD Transfer w/Salton Sea Restoration (if any); Misc. PPRs. Amounts are independent of increases and reductions as allowed by the IOPP.
6. Assumes SDCWA does not elect termination in year 35.
7. Assumes SDCWA and IID mutually consent to renewal term of 30 years.
8. Modified from 100 KAFY in CRWDA Exhibit B; stating in 2018 MWD will provide CVWD 50 KAFY of the 100 KAFY.

Source: CRWDA: Federal QSA Exhibit B, p 13; updated values from 2019 QSA Implementation Report

Due to limits on annual CU of Colorado River water under the QSA/Transfer Agreements, IID's water supply during a normal year is best represented by the CRWDA Exhibit B Net Available for Consumptive Use (Table 14, Column 11). The annual volume is IID Priority 3(a) Quantified Amount of 3.1 million acre-feet (MAF) (Table 14, Column 2) less the IID transfer program reductions for each year (Table -14, Columns 3-9). IID suggests Table 14 which assumes full use of IID's quantified water supply, be used in determining base normal year water availability.

CRWDA Exhibit B Net Available for CU volumes less system operation demand represents the amount of water available for delivery by IID Water Department to its customers each year. In a normal year, perhaps 50,000 to 100,000 AF of effective rainfall would fall in the IID water service area. However, rainfall is not evenly distributed throughout the IID water service area and is not taken into account by IID in the submittal of its Estimate of Diversion (annual water order) to the USBR.

Expected Water Availability – Single Dry and Multiple Dry Years

When drought conditions exist within the IID water service area, as has been the case for the past decade or so, the water supply available to meet agricultural and non-agricultural water demands remains the same as normal year water supply because IID continues to rely solely on its entitlement for Colorado River water. Due to the priority of IID water rights and other agreements, drought conditions affecting Colorado River water supplies cause shortages for Arizona, Nevada and Mexico, before impacting California and IID. Accordingly, the Net Available for CU volumes in Table 14 Column 11 represents the water supply at Imperial Dam available for diversion by IID in single-dry year and multiple-dry year scenarios.

Under CRWDA IOPP, IID has some flexibility to manage its water use. When the water level in Lake Mead is above 1,125 feet, an overrun of its USBR approved annual water order is permissible, and IID has up to three years to pay water use above the annual water order. When Lake Mead's water level is at or below 1,125 feet on January 1 in the calendar year after the overrun is reported in the USBR Lower Colorado Region Decree Accounting Report, the IOPP prohibits additional

overruns and requires that outstanding overruns be paid back in the subsequent calendar year rather than in three years as allowed under normal conditions; that is, the payback is to be made in the calendar year following publication of the overrun in the USBR Decree Accounting Report. For historic IID annual rainfall, net consumptive use, transfers and IID underrun/overrun amounts see Table 14. For the purposes of the WSA, years with a shortage condition that impacts non-agricultural projects such as an IOPP payback obligation constitute "dry" years for IID.

In years of inadvertent overrun payback, conditions such as those in Sections 3.7 and 3.8 of the 2012 IWSP Water Agreement may go into effect, with the result that less water would be available for non-agricultural development contractors. Under such conditions, IID has requested that Project's management work with IID to ensure it can manage the reduction. IID has further indicated that, provided a water supply agreement is approved and executed by IID under the provisions of the IWSP, IID will have sufficient water to support the water of this Project.

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Table 15: IID Annual Rainfall (In), Net Consumptive Use and Underrun/Overrun Amounts (AF), 1988-2020

Year	IID Total Annual Rainfall	IID Water Users	IID/MWD Transfer	IID/ SDCWA Transfer	SDCWA Transfer Salton Sea Mitigation	IID Underrun / Overrun	IID/CVWD Transfer	AAC Lining
1988		2,947,581						
1989		3,009,451						
1990	91,104	3,054,188	6,110					
1991	192,671	2,898,963	26,700					
1992	375,955	2,575,659	33,929					
1993	288,081	2,772,148	54,830					
1994	137,226	3,048,076	72,870					
1995	159,189	3,070,582	74,570					
1996	78,507	3,159,609	90,880					
1997	64,407	3,158,486	97,740					
1998	100,092	3,101,548	107,160					
1999	67,854	3,088,980	108,500					
2000	29,642	3,112,770	109,460					
2001	12,850	3,089,911	106,880					
2002	12,850	3,152,984	104,940					
2003	116,232	2,978,223	105,130	10,000	0	**6,555**		
2004	199,358	2,743,909	101,900	20,000	15,000	-166,408		
2005	202,983	2,756,846	101,940	30,000	15,000	-159,881		
2006	19,893	2,909,680	101,160	40,000	20,000	**12,414**		
2007	64,580	2,872,754	105,000	50,000	25,021	**6,358**		
2008	63,124	2,825,116	105,000	50,000	26,085	-47,999	4,000	8,898
2009	30,0354	2,566,713	105,000	60,000	30,158	-237,767	8,000	65,577
2010	189,566	2,545,593	105,000	70,000	33,736	-207,925	12,000	67,700
2011	109,703	2,915,784	103,940	63,278	0	**82,662**	16,000	67,700
2012	133,526	2,903,216	104,140	106,722	15,182	**134,076**	21,000	67,700
2013	134,497	2,554,845	105,000	100,000	71,398	-65,981	26,000	67,700
2014	53,517	2,533,414	104,100	100,000	89,168	-797	31,000	67,700
2015	97,039	2,480,933	107,820	100,000	153,327	-97,188	36,000	67,700
2016	90,586	2,504,258	105,000	100,000	130,796	-62,497	41,000	67,700
2017	105,919	2,548,164	105,000	100,000	105,311	-30,227	45,000	67,700
2018	63,318	2,625,422	105,000	130,000	0	0	63,000	67,700
2019	146,384	2,558,136	105,000	160,000	46,555	-34,215	68,000	67,700
2020	129,693	2,493,661	105,000	192,500	0	-95,715	73,000	67,000

Notes: Volumes in acre-feet and except Total Annual Rainfall are USBR Decree Accounting Report record at Imperial Dam.
IID Total Annual Rainfall from IID Provisional Water Balance, first available calculations are for 1990
Not all IID QSA programs are shown on this table.
Source: USBR Decree Accounting reports, except IID Total Rainfall and IID Overrun/Underrun is a separate calculation
Source: 2019 IID QSA Implementation Report and 2020 IID SWRCB Report, page 31 of 335; IID Total Rainfall and IID Overrun/ Underrun is a separate calculation

Equitable Distribution Plan

A 2006 study by Hanemann and Brookes suggested that such conditions were likely to occur 40-50% of the years during the decade following the report. On November 28, 2006, the IID Board of

Directors adopted Resolution No 22-2006 approving development and implementation of an EDP to deal with times when customers' demand would exceed IID's Colorado River supply. The EDP, adopted in 2007 allows the IID Board to institute an apportionment program. As part of this Resolution, the IID Board directed the General Manager to prepare the rules and regulations necessary or appropriate to implement the plan within the district, which the board adopted in November 2006. The 2009 Regulations for EDP were created to enable IID to implement a water management tool (apportionment) to address years in which water demand is expected to exceed supply. So far, for the 17 years from 2003 through 2020, demand has exceeded supply by some amount for a total of five years (see Table 15**,** above). IID has not experienced any overruns since 2012.

The IID 2013 Revised EDP, adopted by the Board on October 28, 2013, further allowed IID to pay back its outstanding overruns using an EDP Apportionment, and it was expected that an annual EDP Apportionment would be established for each of the next several years, if not for the duration of the QSA/Transfer Agreements. For purposes of this WSA, years with a shortage condition that impacts non-agricultural projects such as an IOPP payback obligation constitute "dry" years for IID. For single-dry year and multiple-dry water year assessments, IID's EDP shall govern. IOPP payback, EDP Apportionment, and the IWSP are further discussed under single-dry and multiple-dry year projections. However, the implementation of the EDP apportionment was legally challenged, and on February 6, 2018, the IID board approved a resolution repealing the EDP until the issue is resolved. As of the date of this WSA, a resolution had been reached, but a modified EDP has yet to be re-instated.

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Water Management Under Inadvertent Overrun Payback Policy (IOPP)

On January 1, 2013, the water level in Lake Mead was 1,120.5 feet and for the first time since the IOPP came into effect, Lower Colorado River Basin water users faced a shortage condition (Figure 6). For IID, this means that outstanding overruns must be paid back to the river in calendar years following the shortage (2013 and 2014) as described below and shown in Table 16.

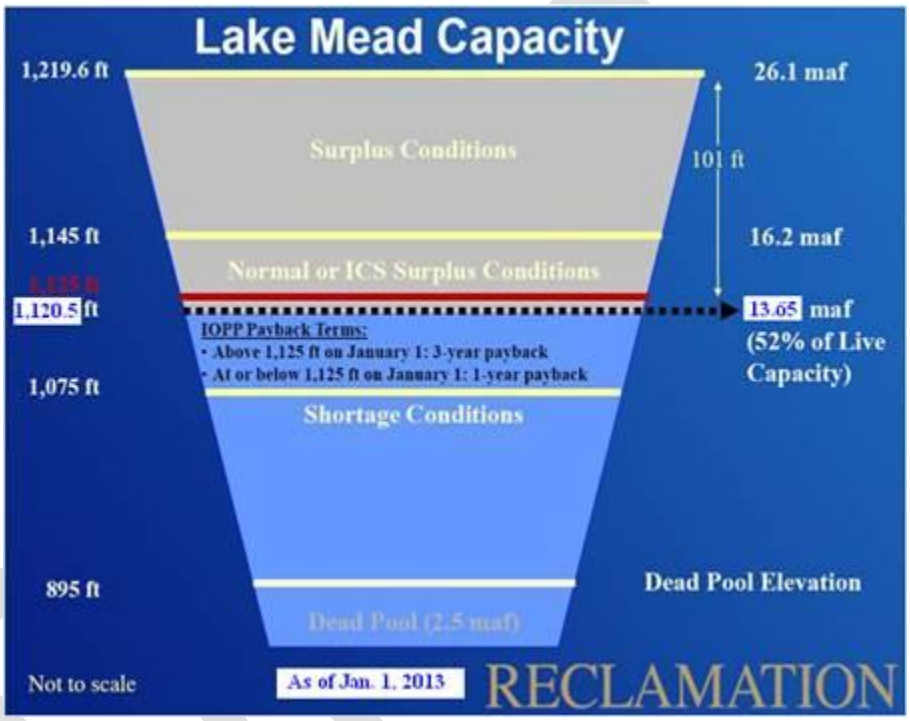

Figure 7 Lake Mead IOPP Schematic

IID's maximum allowable cumulative overrun account is 62,000 AF.[25] Thus, for IID's 2011 overrun of 82,662 AF (which was published in 2012), 62,000 AF were paid back at the river in calendar year 2013, with the remaining 20,662 AF paid back in 2014; however, due to an early payback of 6,290 AF in 2012, IID had 55,710 AF to pay back in 2013 and 20,662 AF of the 2011 overrun to pay back in 2014. In addition, because of the low level of Lake Mead on Jan 1, 2013, IID's entire 2012

[25] For IID Quantified Amount: 3.1 MAFY *10 percent = 310,000 AF allowable cumulative overrun account amount; minimum repayment in a calendar year is the less of 310,000 * 20 percent = 62,000 or the amount in the account, if less than 62,000 AF.

overrun of 134,076 AF was paid back in 2014, for a total of 154,738 AF in 2014. Furthermore, under the terms of the IOPP, no overruns are allowed in year when payback is required. IID has not experienced any overrun payback since 2014.

Table 16; IID Inadvertent Overrun Payback to the Colorado River under the IOPP, 2012-2020

Calendar Year of Payback	2011 Overrun Payback (AF)	2012 Overrun Payback (AF)	Payback Total for 2014 Calendar Year (AF)
2013	55,710	-	55,710
2014	20,662	134,076	154,738
Total Payback	76,372	134,076	210,448

The 2013 IOPP payback obligation and prohibition on overruns in payback years, led the IID Board to implement an apportionment program pursuant to the 2009 Regulations for EDP, which were subsequently revised and modified. The Revised 2013 EDP was version approved and adopted by the IID Board on October 28, 2013 (see Attachment B). The Revised 2013 EDP also establishes an agriculture water clearinghouse to facilitate the movement of apportioned water between agricultural water users and between farm units. This is to allow growers and IID to balance water demands for different types of crops and soils with the apportionment s that are made. IID's Water Conservation Committee agreed on a July 1, 2013 start date for the agricultural water clearinghouse.

Generally, the EDP Apportionment is not expected to impact industrial use. However, given the possibility of continuing drought on the Colorado River and other stressors, provisions such as the 2012 IWSP Water Agreement §§ 3.7 and 3.8 as well for dry and multiple dry year water assessment may come into effect. However, IID has agreed to work with Project proponents to ensure to the extent possible that the IWSP Water Agreement terms will not negatively impact Project operation.

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PROJECT WATER AVAILABILITY FOR A 30-YEAR PERIOD TO MEET PROJECTED DEMANDS

The proposed Project water will be used solely for processing plant operations, mitigation measures as previously stated. The applicant will be accepting an agreement with a local vendor for potable water needs. The Applicant is proposing to draw water primarily from the East Highline The applicant is required to enter into a(n) IWSP Water Supply Agreement with IID and Schedule 7. General Industrial Use.

Interim Water Supply Policy Water

At the present time, IID is providing water for use by solar energy generation projects under Water Rate Schedule 7 General Industrial Use. If IID determines that the proposed Project should obtain water under IID's Interim Water Supply Policy (IWSP) for non-agricultural projects rather than Schedule 7 General Industrial Use, the Applicant will do so. IID will determine whether the Project should obtain water under IID's Interim Water Supply Policy (IWSP) for non-agricultural projects in addition to Schedule 7 General Industrial Water.

The IWSP, provided herein as Attachment A, designates up to 25,000 AFY of water for potential Non-Agricultural Projects within IID's water service area. As of September 2021, IID has 23,800 AF available under the IWSP for new projects such as the proposed project. The IWSP establishes a schedule for Processing Fees, Reservation Fees, and Connection Fees that change each year for all non-agricultural projects, and annual Water Supply Development fees for some non-agricultural projects. The proposed Project's water use will be subject to the annual Water Supply Development fee if IID determines that water for the Project is to be supplied under the IWSP.

The likelihood that IID will not receive its annual 3.1 MAF apportionment less QSA/Transfer Agreement obligations of Colorado River water is low due to the high priority of the IID entitlement relative to other Colorado River contractors, see IID's Water Rights section on page 17. If such

reductions were to come into effect within the 20-year Project life, the Applicants are to work with IID to ensure any reduction can be managed.

As such, lower Colorado River water shortage does not present a material risk to the available water supply that would prevent the County from making the findings necessary to approve this WSA. IID, like any water provider, has jurisdiction to manage the water supply within its service area and impose conservation measures during a period of temporary water shortage. Furthermore, without the proposed Project, IID's task of managing water supply under the QSA/Transfer Agreements would be more difficult, because agricultural use on the proposed Project site would be significantly higher than the proposed demand for the proposed Project as explained in the Expected Water Demands for the Proposed Project on the section that follows.

Water for construction (primarily for dust control) would be obtained from IID canals or laterals in conformance with IID rules and regulations for MCI temporary water use.[26] Water would be picked up from a nearby canal or lateral and delivered to the construction location by a water truck capable of carrying approximately 4,000 gallons per load. To obtain water delivery service, the Project proponent will complete an IID-410 Certificate of Ownership and Authorization (Water Card), which allows the Water Department to provide the district with information needed to manage the district apportioned supply. Water cards are used for Agriculture, Municipal, Industrial and Service Pipe accounts. If water is to be provided under IWSP in addition to Schedule 7. General Industrial Use, the Applicant will seek to enter into a IWSP Water Supply Agreement.

[26] *Complete the Application for Temporary Water Use and submit to Division office. Complete encroachment permit through Real Estate – non-refundable application fee of $250, se. IID website: Real Estate / Encroachments, Permissions, and Other Permitting. Fee for temporary service water: Schedule No. 7 General Industrial Use / Temporary Service Minimum charge for up to 5 AF, pay full flat fee for 5 AF at General Industrial Use rate ($425); use more than 5 AF, pay fee for actual use at General Industrial Rate ($85/AF).*

EXPECTED WATER DEMANDS FOR THE APPLICANT

Untreated Colorado River water will be supplied to the Project via the adjacent East Highline Canal Gates 11 & 12 under an IWSP Water Supply Agreement with IID. The Current land use is A2-RE for APNs 050-070-018, and 050-070-019 the additional APN 050-070-018 . is zoned GS-RE As described in the project description. The proposed Project intends to enter into an agreement with a local vendor to provide potable water needs which has the ability to provide the applicant with treated water for drinking and temporary restroom facilities (i.e porta potties). Therefore, the proposed Project will only need the water requested in this WSA. The Project will need to contract with IID to deliver water from East Highline Canal, Gates 11 & 12 AFY of untreated water. The Project is anticipated to use approximately 10 AFY of water annually for necessary plant operation mitigation. Project raw water uses are summarized in Table 17.

Table 17 Project Water Uses (AFY)

Water Use	Acre-Feet Per Year
Raw Water for Operations & Mitigation (Years 28)	11 AFY
Construction Water (1 Year)	275 AFY
Decommissioning Water (1 Year)	275 AFY

IID delivers untreated Colorado River water to the proposed Project site for geothermal energy uses through the following gates and laterals. The 10-year record for 2011-2020 of water delivery accounting is shown in Table 18 and has a ten-year historic average in AFY.

Table 18 Ten-Year Historic Delivery (AFY), 2010-2020

Canal/Gate	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
East Highline/ 11	446.5	532.5	259.2	231.7	215.3	199.3	182.6	189.7	148.6	7.7
East Highline/ 12	354.2	497.2	43.4	146.6	NA	NA	NA	NA	NA	NA
Total	800.7	1029.7	302.6	378.3	215.3	199.3	182.6	189.7	148.6	7.7

Source: *IID Staff, June 22, 2021 (Justina Arce)*

It is important to note that the historical water use of 345.5 AFY for the East Highline Canal Gate 11 & 12 represents water use for current operations. The proposed Project is anticipated to have

an estimated water demand of 275 AF during construction, 10 AFY for operations as well as an additional 275 AF for decommissioning. The proposed Project 29 AFY amortized over a 30-year term, Thus, the proposed Project demand is a decrease of 317 AFY from the historical 10-year average annual delivery of 345.5 AFY or 92%[13] less than the historical 10-year average annual delivery for the proposed Project site. The proposed Project's estimated water demand represents 0.12 percent (0.12%) of the 23,800 AYF balance of supply available for contracting under the IWSP.

Table 19: Total Historical Delivery for Proposed Project Delivery Gates (AF), 10- Year Total, 10 Year Average, 2013-2020

Historic Delivery Yield	10 -Year Total (AF)	10-Year Average (AFY)
	3454.5 AF	345.5 AFY

Source: *IID Staff, Jose Moreno June 2, 2021*

IID's ABILITY TO MEET DEMANS WITH WATER SUPPLY

Non-agricultural water demands for the IID water service area are projected for 2025-2055 in Table 8, and IID agricultural demands including system operation are projected for 2025-2055 in Table 9, all volumes within the IID water service area. IID water supplies available for consumptive use after accounting for mandatory transfers are projected to 2077 in Table 14 (Column 11), volumes at Imperial Dam. To assess IID's ability to meet future water demands, IID historic and forecasted demands are compared with CRWDA Exhibit B net availability, volumes at Imperial Dam Table 14 (Column 11). The analysis requires accounting for system operation consumptive use within the IID water service area, from AAC at Mesa Lateral 5 to Imperial Dam, and for water pumped for use by the USBR Lower Colorado Water Supply Project (LCRWSP), an IID consumptive use component in the USBR Decree Accounting Report. IID system operation consumptive use for 2015 is provided in Table 15 to show the components included in the calculation and their 2015 volumes.

[13] Project Anticipated Water Use decrease –Historical Average/ Historical Average *100 =% Increase

IID's ability to meet customer water demands through 2055 as shown in Table 21.

- Non-agricultural use from Table 8
- Agricultural and Salton Sea mitigation uses from Table 9
- CRWDA Exhibit B net available for IID consumptive use from Table 14

System operation consumptive use from Table 20

Table 20 IID System Operations Consumptive Use within IID Water Service Area and from AAC at Mesa Lateral 5 to Imperial Dam, (KAF), 2019

	Consumptive Use (KAF)
IID Delivery System Evaporation	24.4
IID Canal Seepage	90.8
IID Main Canal Spill	10.1
IID Lateral Canal Spill	121.5
IID Seepage Interception	-39.0
IID Unaccounted Canal Water	-40.0
Total IID System Operational Use, within water service area	**167.8**
"Losses" from AAC @ Mesa Lat 5 to Imperial Dam	9.2
LCWSP pumpage	-10
Total System Operational Use in 2019	**167.0**

Sources: 2015 Water Balance rerun 04/22/2020, and 2016 IID Water Conservation Plan

Table 21: IID Historic and Forecasted Consumptive Use vs CRWDA Exhibit B IID Net Available Consumptive Use, volumes at Imperial Dam (KAFY), 2015-2055-

	2015	2020	2025	2030	2035	2040	2045	2050	2055
Non-Ag Delivery	**110.1**	115.2	133.1	142.9	151.4	163.2	175.4	188.4	199.3
Ag Delivery	**2,156.8**	2,165.4	2,259.5	2,209.5	2,209.5	2,209.5	2,209.5	2,209.5	2,209.5
QSA SS Mitigation Delivery	**153.3**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
System Op CU in IID & to Imperial Dam	**220.2**	167.0	230.5	225.4	225.4	225.4	225.4	225.4	225.4
IID CU at Imperial Dam	**2,480.9**	2,493.7	2,623.1	2,577.8	2,586.3	2,598.1	2,610.3	2,623.3	2,634.2
Exhibit B IID Net Available for CU at Imperial Dam	**2,480.9**	**2,652.0**	**2,617.8**	**2,612.8**	**2,612.8**	**2,612.8**	**2,612.8**	**2,665.8**	**2,665.8**
IID Underrun/Overrun at Imperial Dam	**-90.0**	-98.1	-5.30	35.00	26.50	14.70	2.50	42.50	31.60

Notes: 2015 Provisional Water Balance rerun 06/28/2019
Non-Ag Delivery CI 15.0%, Ag Delivery CI 3.0%, QSA SS mitigation CI 15%
QSA Salton Sea Mitigation Delivery terminates on 12/31/2017
Underrun /Overrun = IID CU at Imperial Dam minus CRWDA Exhibit B Net Available
Notes: Ag Delivery for 2020-2055 does not take into account land conversion for solar use nor reduction in agricultural land area due to urban expansion.

As shown above, IID forecasted demand has the potential to exceed CRWDA Exhibit B Net CU volumes during several time intervals through the lifespan projection for the Project. However,

due to temporary land conversion for solar use and urban land expansion that will reduce agricultural acres in the future, a water savings of approximately 217,000 AFY will be generated into the future and for the lifetime of the Project.

In addition, USBR 2020 Decree Accounting Report states that IID Consumptive Use is 2,493.7 KAF (excludes 1,579 AF of ICS for Storage in Lake Mead and an additional 49,444 AF of conserved water left on the Colorado River system) with an underrun of -98.1 KAF, as reported by IID in 2020 Annual SWRCB Report per WRO 2002-2013; that is, IID uses less than the amount in its approved Water Order (2,615,300 AF).

Table 22: 2020 Approved Water Order, Actual CU (Decree Accounting Report) and IID Underrun, KAF at Imperial Dam

IID Approved Water Order	2,625.3 less 10 supplied by LCWSP and less 26 of additional conserved water
IID Consumptive Use	2,493.7
IID **Underrun /Overrun**	**-98.1**
Sources: 2020 IID Revised Water Order, approved on March 10, 2020, 2019 Decree Accounting Report, and 2020 Annual Report of IID Pursuant to SWRCB Revised Order WRO 2002-2013	

As reported in the 2020 QSA Implementation Report and 2019 SWRCB IID Report and presented in **Table 20** from 2013 to 2020 IID consumptive use (CU) resulted in underruns; i.e., annual CU was less than the district's QSA Entitlement of 3.1 MAFY minus QSA/Transfer Agreements obligations. This would indicate that even though **Table 10** shows IID Overrun/Underrun at Imperial Dam exceeding CRWDA Exhibit B Net Available for CU, for the 30-year life of the proposed Project, IID consumptive use may be less than forecasted. However, with repeal of the IID EDP in February 2018, it is uncertain whether underruns will continue.

Meanwhile, forecasted Agricultural Delivery reductions presented in **Table 9** are premised on implementation of on-farm practices that will result in efficiency conservation. These reductions do not take into account land conversion for solar projects nor reduction in agricultural land area

due to urban expansion; that is to say, the forecasted Agricultural Delivery is for acreage in 2003 with reduction for projected on-farm conservation efficiency. Thus, Agricultural Delivery demand may well be less than forecasted in **Table 9**. In any case, the proposed Project will use less water than the historical agricultural demand of proposed Project site, so the proposed Project will ease rather than exacerbate overall IID water demands.

In the event that IID has issued water supply agreements that exhaust the 25 KAFY IWSP set aside, and it becomes apparent that IID delivery demands due to non-agriculture use are going to cause the district to exceed its quantified 3.1 MAFY entitlement less QSA/Transfer Agreements obligations, IID has identified options to meet these new non-agricultural demands. These options include (1) tracking water yield from temporary land conversion from agricultural to non-agricultural land uses (renewable solar energy); and (2) only if necessary, developing projects to expand the size of the district's water supply portfolio.

These factors will be discussed in the next two sections, **Tracking Water Savings from Growth of Non-Agricultural land Uses** and **Expanding Water Supply Portfolio**.

Tracking Water Savings from Growth of Non-Agricultural Land Uses

The Imperial County Board of Supervisors has targeted up to 25,000 acres of agricultural lands, about 5 percent (5%) of the farmable acreage served by IID, for temporary conversion to solar farms; because the board found that this level of reduction would not adversely affect agricultural production. As reported for IID's 2020 TLCFP existing solar developments at the end of 2020 have converted 12,404 acres of farmland. These projects had a yield at-river of 65,964 AF of water in 2020. The balance of the 25,000-acre agriculture-to-solar policy is 12,596 acres. On average, each agricultural acre converted reduces agricultural demand by 5.1 AFY, which results in a total at-river yield (reduction in consumptive use) of 127,500 AFY.

However, due to the nature of the CUPs under which solar farms are developed, IID cannot rely on this supply being permanently available. In fact, should a solar project decommission early, that land may go immediately back to agricultural use (it remains zoned an agricultural land).

Nevertheless, during their operation, the solar farms do ameliorate pressure on IID to implement projects to meet demand from new non-agricultural projects.

Unlike the impact of solar projects, other non-agricultural uses are projected to grow, as reflected in the nearly 55 percent (76%) increase in non-agricultural water demand from 107.2 KAF in 2015 to 198.4 KAF in 2055 reflected herein in Table 8. This increase in demand of 91.2 KAF will more than likely be met by solar development; however, as the land remains zoned as agricultural land, that source is not reliable to be permanently available to IID.

The amount of land developed for residential, commercial, and industrial purposes is projected to grow by 55,733 acres from 2015 to 205013 within the sphere of influence of the incorporated cities and specific plan areas in Imperial County. A conservative estimate is that such development will displace at least another 24,500 acres of farmland based on the Imperial County Local Agency Formation Commission (LAFCO) sphere of influence maps and existing zoning and land use in Imperial County. At 5.13 AFY yield at-river, there would be a 125,000 AFY reduction IID net CU.

The total foreseeable solar project temporary yield at-river (91,800 AFY) and municipal development permanent yield at-river (125,000 AFY) is to reduce forecasted IID net CU at-river 216,800 AFY, which is more than enough to meet the forecast Demand minus Exhibit B Net Available volumes shown in Table 14. This Yield at-river is sufficient to meet the forecasted excess of non-agricultural use over Net Available supply within the IID service area for the next 20 years, as is required for SB 610 analysis.

Farmland retirement associated with municipal development would reduce IID agricultural delivery requirements beyond the efficiency conservation projections shown in Table 9. Therefore, in the event that Schedule 7 General Industrial Use water is unavailable, the Applicants will rely on IID IWSP water to supply the Project, as discussed above in the section **IID Water Supply Policy for Non-Agricultural Projects (September 2009)**.

[13] IRWMP, Chapter 5, Table 5-14.

Expanding Water Supply Portfolio

While forecasted long-term annual yield-at-river from the reduction in agricultural acreage due to municipal development in the IID service area is sufficient to meet the forecasted excess of non-agricultural use over CRWDA Net Available supply (Table 14) without expanding IID's Water Supply Portfolio, IID has also evaluated the feasibility of a number of capital projects to increase its water supply portfolio.

As reported in 2012 Imperial IRWMP Chapter 12, IID contracted with GEI Consultants, Inc. to identify a range of capital project alternatives that the district could implement. Qualitative and quantitative screening criteria and assumptions were developed in consultation with IID staff. Locations within the IID water service area with physical, geographical, and environmental characteristics most suited to implementing short- and long-term alternatives were identified. Technical project evaluation criteria included volumes of water that could be delivered and/or stored by each project, regulatory and permitting complexity, preliminary engineering components, land use requirements, and costs.

After preliminary evaluation, a total of 27 projects were configured:

- (17) groundwater or drain water desalination
- (2) groundwater blending
- (6) recycled water
- (1) groundwater banking
- (1) IID system conservation (concrete lining)

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Projects were assessed at a reconnaissance level to allow for comparison of project costs. IID staff and the board identified key factors to categorize project alternatives and establish priorities. Lower priority projects were less feasible due to technical, political, or financial constraints. Preferential criteria were features that increased the relative benefits of a project and grant it a higher priority. Four criteria were used to prioritize the IID capital projects:

1. **Financial Feasibility.** Projects whose unit cost was more than $600/AF were eliminated from further consideration.
2. **Annual Yield.** Project alternatives generating 5,000 AF or less of total annual yield were determined not to be cost-effective and lacking necessary economies of scale.
3. **Groundwater Banking.** Groundwater banking to capture and store underruns is recognized as a beneficial use of Colorado River water. Project alternatives without groundwater banking were given a lower priority.
4. **Partnering.** Project alternatives in which IID was dependent on others (private and/or public agencies) for implementation were considered to have a lower priority in the IID review; this criterion was reserved for the IRWMP process, where partnering is a desirable attribute.

Based on these criteria, the top ten included six desalination, two groundwater blending, one system conservation, and one groundwater storage capital projects. These capital projects are listed **Table 23** which follows.

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Table 23 IID Capital Project Alternatives and Cost (May 2009 price levels $)

Name	Description	Capital Cost	O&M Cost	Equivalent Annual Cost	Unit Cost ($/AF)	In-Valley Yield (AF)
GW 18	Groundwater Blending E. Mesa Well Field Pumping to AAC	$39,501,517	$198,000	$2,482,000	$99	25,000
GW 19	Groundwater Blending: E. Mesa Well Field Pumping to AAC w/Percolation Ponds	$48,605,551	$243,000	$3,054,000	$122	25,000
WB 1	Coachella Valley Groundwater Storage	$92,200,000	$7,544,000	$5,736,746	$266	50,000
DES 8	E. Brawley Desalination with Well Field and Groundwater Recharge	$100,991,177	$6,166,000	$12,006,000	$480	25,000
AWC 1	IID System Conservation Projects	$56,225,000	N/A	$4,068,000	$504	8,000
DES 12	East Mesa Desalination with Well Field and Groundwater Recharge	$112,318,224	$6,336,000	$12,831,000	$513	25,000
DES 4	Keystone Desalination with IID Drainwater/ Alamo River	$147,437,743	$15,323,901	$23,849,901	$477	50,000
DES 14	So. Salton Sea Desalination with Alamo River Water and Industrial Distribution	$158,619,378	$15,491,901	$24,664,901	$493	50,000
DES 15	So. Salton Sea Desalination with Alamo River Water and MCI Distribution	$182,975,327	$15,857,901	$26,438,901	$529	50,000
DES 2	Keystone Desalination with Well Field and Groundwater Recharge	$282,399,468	$13,158,000	$29,489,000	$590	50,000

Source: Imperial IRWMP, Chapter 12; see also Imperial IRWMP Appendix N, IID Capital Projects

IID Near Term Water Supply Projections

As mentioned above, IID's quantified Priority 3(a) water right under the QSA/Transfer Agreements secures 3.1 MAF per year, less transfer obligations of water for IID's use from the Colorado River, without relying on rainfall in the IID service area. Even with this strong entitlement to water, IID actively promotes on-farm efficiency conservation and is implementing system efficiency conservation measures including seepage recovery from IID canals and the All-American Canal (ACC) and measures to reduce operational discharge. As the IID website Water Department states:

Through the implementation of extraordinary conservation projects, the development of innovative efficiency measures and the utilization of progressive management tools, the IID Water Department is working to ensure both the long-term viability of agriculture and the continued protection of water resources within its service area.

Overall, agricultural water demand in the Imperial Valley will decrease due to IID system and grower on-farm efficiency conservation measures that are designed to maintain agricultural productivity at pre-QSA levels while producing sufficient yield-at-river to meet IID's QSA/Transfer Agreements obligations. These efficiencies combined with the conversion of some agricultural land uses to non-agricultural land uses (both solar and municipal), ensure that IID can continue to meet the water delivery demand of its existing and future agricultural and non-agricultural water users, including this Project for the next 30 years and for the life of the proposed Project.

PUBLIC WATER SYSTEM/ LEAD AGENCY FINDINGS

IID serves as the regional wholesale water supplier, importing raw Colorado River water and delivering it, untreated, to agricultural, municipal, industrial, environmental, and recreational water users within its Imperial Unit water service area. The County of Imperial serves as the responsible agency with land use authority over the proposed project. Water Assessment findings are summarized as follows:

1. IID's annual entitlement to consumptive use of Colorado River water is capped at 3.1 MAF less water transfer obligations, pursuant to the QSA and Related Agreements. Under the terms of the CRWDA, IID is implementing efficiency conservation measure to reduce net consumptive use of Colorado River water needed to meet its QSA/Transfer Agreements obligations while retaining historical levels of agricultural productivity.
2. In 2019 IID consumptively used 2,588,136 AF of Colorado River water (volume at Imperial Dam); 2,315,988 AF were delivered to customers of which 2,225,089 AF or 96 percent went to agricultural users.
3. Reduction of IID's net consumptive use of Colorado River water under the terms of the CRWDA is to be the result of efficiency conservation measures. Agricultural consumptive

use in the Imperial Valley will not decline. However, IID operational spill and tailwater will decline, impacting the Salton Sea.

4. Due to the dependability of IID's water rights, Colorado River flows, and Colorado River storage facilities for Colorado River water, it is unlikely that the water supply of IID would be disrupted, even in dry years or under shortage conditions because Mexico, Arizona and Nevada have lower priority and are responsible for reducing their water use during a declared Colorado River water shortage before impacting California.
5. Historically, IID has never been denied the right to use the annual volume of water it has available for its consumptive uses under its entitlement. Nevertheless, IID is participating in discussions for possible actions in response to extreme drought on the Colorado River.
6. The proposed Project has an estimated total water demand of 859 AF, 29 AFY amortized over a 30-year term (for all delivery gates for proposed Project). Thus, the proposed Project demand is an decrease of 317 AFY from the historical 10-year average, or **92%** less than the historical 10-year average annual delivery of **345.5** AF of historic water use at the proposed Project Site.
7. The Project's water use will be covered under the Schedule 7 General Industrial Use. In the event that IID determines that the proposed Project is to utilize IWSP for Non-Agricultural Projects water, the Applicant will enter into an IWSP Water Supply Agreement with IID. In which case, the proposed Project would use .3 percent (.3%) of the 23,800 AFY of IWSP water.
8. Based on the Environmental Impact Report (EIR) prepared for this Project pursuant to the CEQA, California Public Resources Code §s 21000, *et seq*., the Lead Agency hereby finds that the IID projected water supply will be sufficient to satisfy the demands of this proposed Project in addition to existing and planned future uses, including agricultural and non-agricultural uses for a 30-year WSA period and for the 30 -year proposed Project life with a 1 year construction and 1 year of decommissioning water consumption life. California State Clearing House Number: 2021050036.

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ASSESSMENT CONCLUSION

This WSA has determined that IID water supply is adequate for Viking Solar Energy Generation and Storage Project the proposed Project. The Imperial Irrigation District's IWSP for Non-Agricultural Projects dedicates 25,000 AF of IID's annual water supply to serve new projects. As of July 2020, 23,800 AF per year remain available for new projects ensuring reasonably sufficient supplies for new non-agricultural water users. The project water demand of approximately 359 AF and 29 AFY amortized represents .12% of the unallocated supply set aside in the IWSP for non-agricultural project, and approximately (.12%) of forecasted future non-agricultural water demands planned in the Imperial IRWMP through 2055. The water demand for the Project is an increase in the overall historic demand for the project site.

For all the reasons described herein, the amount of water available and the stability of the IID water supply along with on-farm and system efficiency conservation and other measures being undertaken by IID and its customers ensure that Vikings Solar Energy Generation and Storage Project water needs will be met for the next 30 years as assessed for compliance under SB-610.

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Attachment A: IID Interim Water Supply Policy for Non-Agricultural Projects

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Attachment A: IID Interim Water Supply Policy for Non-Agricultural Projects[27]

1.0 Purpose.

Imperial Irrigation District (the District) is developing an Integrated Water Resources Management Plan (IWRMP)[28] that will identify and recommend potential programs and projects to develop new water supplies and new storage, enhance the reliability of existing supplies, and provide more flexibility for District water department operations, all in order to maintain service levels within the District's existing water service area. The first phase of the IWRMP is scheduled to be completed by the end of 2009 and will identify potential projects, implementation strategies and funding sources. Pending development of the IWRMP, the District is adopting this Interim Water Supply Policy (IWSP) for Non-Agricultural Projects, as defined below, in order to address proposed projects that will rely upon a water supply from the District during the time that the IWRMP is still under development. It is anticipated that this IWSP will be modified and/or superseded to take into consideration policies and data developed by the IWRMP.

2.0 Background.

The IWRMP will enable the District to more effectively manage existing water supplies and to maximize the District's ability to store or create water when the available water supplies exceed the demand for such water. The stored water can be made available for later use when there is a higher water demand. Based upon known pending requests to the District for water supply assessments/verifications and pending applications to the County of Imperial for various Non-Agricultural Projects, the District currently estimates that up to 50,000 acre feet per year (AFY) of water could potentially be requested for Non-Agricultural Projects over the next ten to twenty years. Under the IWRMP the District shall evaluate the projected water demand of such projects and the potential means of supplying that amount of water. This IWSP currently designates up to 25,000 AFY of water for potential Non-Agricultural Projects within IID's water service area. Proposed Non-Agricultural projects may be required to pay a Reservation Fee, further described below. The reserved water shall be available for other users until such Non-Agricultural projects are implemented and require the reserved water supply. This IWSP shall remain in effect pending the approval of further policies that will be adopted in association with the IWRMP.

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Paleontological Resources Assessment for the Vikings Solar Energy Storage Project, Imperial County, California

JANUARY 2022

PREPARED FOR

Vikings Energy Farm, LLC.

PREPARED BY

SWCA Environmental Consultants

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PALEONTOLOGICAL RESOURCES ASSESSMENT FOR THE VIKINGS SOLAR ENERGY STORAGE PROJECT, IMPERIAL COUNTY, CALIFORNIA

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SWCA Project No. 64085

January 2022

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MANAGEMENT SUMMARY

Purpose and Scope: Vikings Energy Farm, LLC. (applicant), retained SWCA Environmental Consultants (SWCA) to conduct a paleontological resources assessment in support of the proposed Viking Solar Energy Storage Project (project) in Imperial County, California. The Applicant is proposing to develop the Vikings Solar Energy Storage Project, a nominal 150-megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project with an integrated up to 300 megawatts (MW) battery storage system on approximately 604 acres of land in the County of Imperial, California. The following assessment was conducted to analyze the project's potential impacts on paleontological resources that may be located in the project area, in compliance with the California Environmental Quality Act (CEQA). This report documents the methods, including a confidential records search of the Natural History Museum of Los Angeles County (LACM) and a review of the relevant scientific literature and geologic mapping, used to evaluate the likelihood of paleontological resources within the project area.

Dates of Investigation: SWCA received the results of a museum records search from the LACM on November 19, 2020.

Summary of Findings: Geologic mapping shows the surficial geology of the project area consists of alluvial, lacustrine, and eolian deposits that date from recent times to the late Pleistocene. The LACM records search indicates the museum has a number of localities in similar sediments in the vicinity of the project area. A review of the scientific literature provided context for these and other fossil discoveries. SWCA used these data to assign Society of Vertebrate Paleontology categories for paleontological potential of Low to High, increasing with depth, to the sediments present at the surface of the project area.

Conclusion: Project activities would entail grading and trenching, which could impact sediments with high paleontological potential in the subsurface. Therefore, this report contains measures designed to reduce potential impacts to less-than-significant levels. These measures include implementing a Worker Environmental Awareness Program; and the salvage and museum curation of any significant fossils encountered during project activities. Regulatory compliance and adherence to these measures will reduce impacts of the project on paleontological resources to a less-than-significant level as required by CEQA.

Disposition of Data: This report will be on file with SWCA's San Diego Office.

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INTRODUCTION

Vikings Energy Farm, LLC. (applicant), retained SWCA Environmental Consultants (SWCA) to conduct a paleontological resources assessment in support of the proposed Viking Solar Energy Storage Project (project) in Imperial County, California. The Applicant is proposing to develop the Vikings Solar Energy Storage Project, a nominal 150-megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project with an integrated up to 300 megawatts (MW) battery storage system on approximately 604 acres of land in the County of Imperial, California. The following assessment was conducted to analyze the project's potential impacts on paleontological resources that may be located in the project area, in compliance with the California Environmental Quality Act (CEQA). This report documents the methods, including a confidential records search from the Natural History Museum of Los Angeles County (LACM) and a review of the relevant scientific literature and geologic mapping, used to evaluate the likelihood of paleontological resources within the project area.

SWCA Paleontological Principal Investigator Alyssa Bell, Ph.D., conducted the paleontological assessment presented herein and authored this report. SWCA Paleontological Principal Investigator Russell Shapiro, Ph.D., reviewed the report. Ian Todd served as project manager. Figures were generated by SWCA GIS technician Kevin Howen. Copies of the report are on file with SWCA's San Diego Office.

PROJECT DESCRIPTION

The project site is at the intersection of Nelson Pit Road and Graeser Road, approximately 5.5 miles east of the City of Holtville in Section 36 of Township 15 South and Range 16 East of the San Bernardino Base and Meridian of the Holtville East 7.5-minute topographic quadrangle. The project area is located on Imperial County Assessor's Parcel Numbers (APNs) 050-070-018-000 (approximately 480.00 acres), 050-070-019 (approximately 80.00 acres), and 050-070-021 (approximately 43.61 acres), owned by RL&R Strahm, ARB Inc., and the County of Imperial, respectively.

The project proposes to utilize either thin film or crystalline solar photovoltaic (PV) technology modules mounted on fixed frames or horizontal single-axis tracker (HSAT) systems. The fixed frame PV module arrays would be mounted on racks that would be supported by driven piles. The fixed PV modules would be arranged in arrays spaced approximately 15 to 25 feet apart (pile to pile) to maximize performance and to allow access for panel cleaning (if necessary). These arrays would be separated from each other and the perimeter security fence by up to 30-foot-wide interior roads.

Electricity generated by the PV modules would be collected by a direct current (DC) collection system routed underground in trenches. This DC power would be delivered to one of the pad-mounted inverters in weatherproof enclosures located within the arrays. Underground or overhead 12.5-kilovolt (kV) or 34.5-kV collection lines would transmit the electricity to the new project substation. The substation would be constructed on the southern boundary of APN 050-070-019. A new interconnection switching station would be constructed at the southern boundary of APN 050-070-019, immediately adjacent to the project substation. The project substation and interconnection switching station would be connected via a single overhead 230-kV line, a tie line. The interconnection switching station would be enclosed within its own fence.

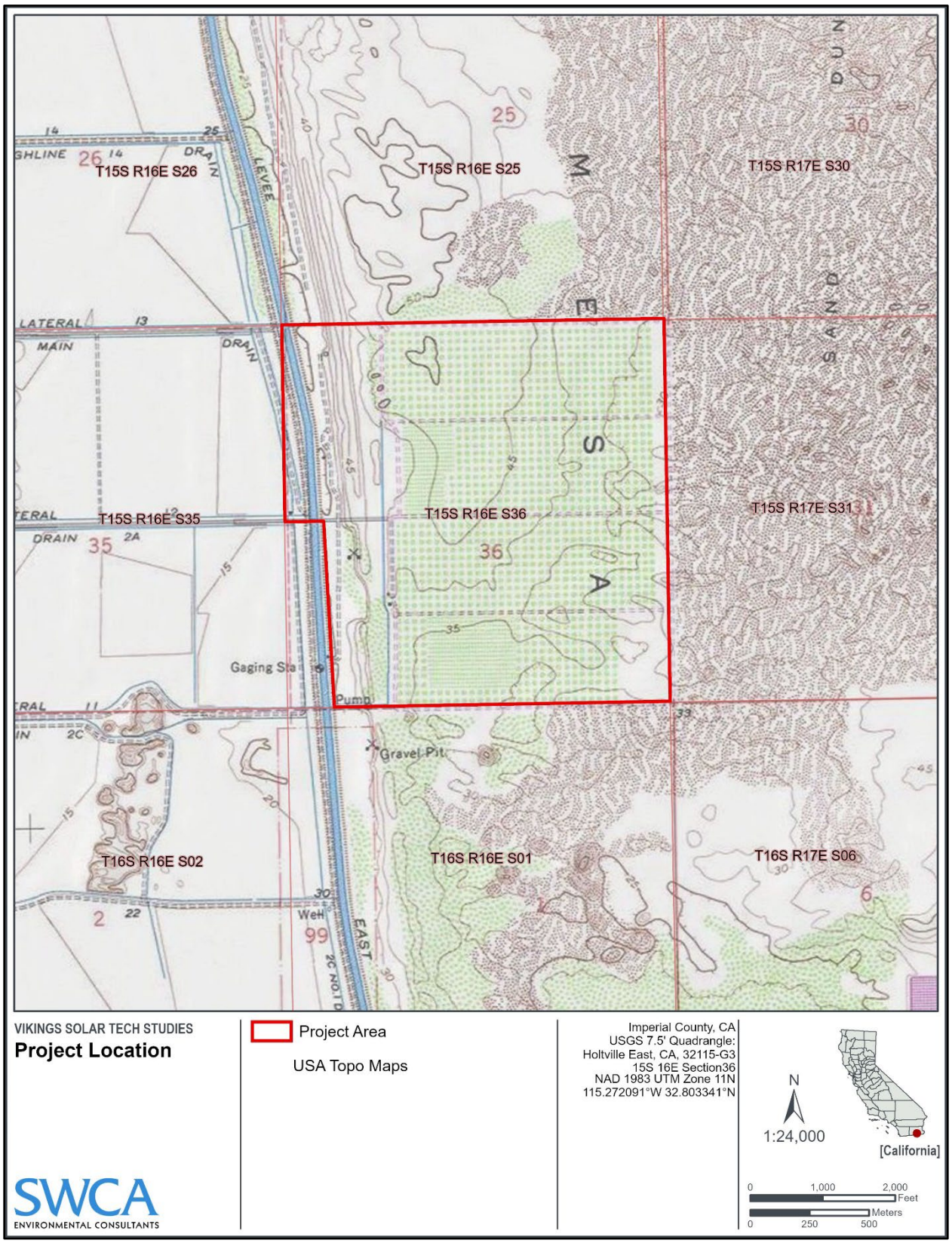

Figure 1. Project location.

To connect to the project's interconnection facilities, the medium voltage power produced by the project would be conveyed underground, or above ground where necessary, to cross over any sensitive site features. Distribution from the site would be via an overhead connection. The electrical energy produced by the project would be conducted through the project interconnection facilities to the proposed 230-kV generator intertie ("gen-tie") line and delivered to the existing IID approved point of interconnection (POI) on the 230-kV "KN & KS" Line. The proposed battery energy storage system (BESS or ESS) would be constructed adjacent to the project's solar facilities and would consist of either lithium ion (Li-ion) or flow batteries. Underground trenches with conduits would be used to connect the batteries to the control and monitoring systems, and inverters would be used to convert the PV-produced DC power to alternating current power.

The piles for the solar arrays will be driven into the ground to a depth of approximately 5, 6, or 8 feet by vibratory pile hammer. Trenching for underground electrical lines will be to a depth of approximately 48 inches within fallow agricultural disturbance.

Six-foot-high security fencing would be installed around the perimeter of each of the project sites at the commencement of construction, and site access would be limited to authorized site workers.

REGULATORY SETTING

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under federal and state laws and regulations. This study satisfies project requirements in accordance with state regulations and was conducted as a means of characterizing the existing conditions consistent with the application of the screening criteria defined in Appendix G of the CEQA Guidelines (as amended December 28, 2018). This analysis also complies with guidelines and criteria specified by the Society of Vertebrate Paleontology (2010).

State Regulations

California Environmental Quality Act

The California Environmental Quality Act (CEQA) is the principal statute governing environmental review of projects occurring in the state and is codified at Public Resources Code (PRC) Section 21000 et seq. CEQA requires lead agencies to determine if a proposed project would have a significant effect on the environment, including significant effects on paleontological resources. Guidelines for the Implementation of CEQA, as amended December 1, 2016 (Title 14, Chapter 3, California Code of Regulations 15000 et seq.), define procedures, types of activities, persons, and public agencies required to comply with CEQA. Section VII(f) of the Environmental Checklist asks whether a project would directly or indirectly destroy a unique paleontological resource and result in impacts to the environment.

Public Resources Code Section 5097.5

Requirements for paleontological resource management are included in the PRC Division 5, Chapter 1.7, Section 5097.5, and Division 20, Chapter 3, Section 30244, which states:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands,

> except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

These statutes prohibit the removal, without permission, of any paleontological site or feature from lands under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, local agencies are required to comply with PRC 5097.5 for their own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others. PRC Section 5097.5 also establishes the removal of paleontological resources as a misdemeanor and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state, county, city, and district) lands.

METHODS

This section presents an overview of the methodology used to identify the potential for paleontological resources within the project area. This report is based on a desktop review of available scientific literature, geologic maps, and a records search from the Natural History Museum of Los Angeles County (LACM). This report conforms to industry standards as developed by the Society of Vertebrate Paleontology (SVP) (2010) and described in Murphey et al. (2019). The purpose of this analysis is to 1) determine whether any previously recorded fossil localities occur in the project area; 2) if so, assess the potential for these localities to be disturbed during construction; and 3) evaluate the paleontological potential of the project area.

Professional Standards

The SVP has established standard guidelines that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation (2010). Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most state regulatory agencies with paleontological laws, ordinances, regulations, and standards accept and use the professional standards set forth by the SVP.

As defined by the SVP (2010:11), significant paleontological resources are:

> fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years).

Numerous paleontological studies have developed criteria for the assessment of significance for fossil discoveries (e.g., Eisentraut and Cooper 2002; Murphey et al. 2019; Scott and Springer 2003). In general, these studies assess fossils as significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;

3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life; or
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

A geologic unit known to contain significant fossils is considered sensitive to adverse impacts if there is a high probability that earth-moving or ground-disturbing activities in that rock unit will either disturb or destroy fossil remains directly or indirectly. This definition of sensitivity differs fundamentally from the definition for archaeological resources as follows:

> It is extremely important to distinguish between archaeological and paleontological (fossil) resource sites when defining the sensitivity of rock units. The boundaries of archaeological sites define the areal extent of the resource. Paleontological sites, however, indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontological potential in each case. [SVP 1995]

Many archaeological sites contain features visually detectable on the surface. In contrast, fossils are often contained within surficial sediments or bedrock, and are therefore not observable or detectable unless exposed by erosion or human activity.

In summary, paleontologists cannot know either the quality or quantity of fossils prior to natural erosion or human-caused exposure. As a result, even in the absence of fossils on the surface, it is necessary to assess the sensitivity of rock units based on their known potential to produce significant fossils elsewhere within the same geologic unit (both within and outside the study area), a similar geologic unit, or based on whether the unit in question was deposited in a type of environment known to be favorable for fossil preservation. Monitoring by experienced paleontologists greatly increases the probability that fossils will be discovered during ground-disturbing activities and that, if these remains are significant, successful mitigation and salvage efforts may be undertaken to prevent adverse impacts to these resources.

Paleontological Potential

Paleontological potential is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. In its "Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources," the SVP (2010:1–2) defines four categories of paleontological sensitivity (potential) for rock units: high, low, undetermined, and no potential:

> **High Potential**. "Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rock units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ash or tephra), and some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstone, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstone, fine-grained marine sandstone, etc.). Paleontological potential consists of both a) the potential for yielding abundant or significant vertebrate fossils or

for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential."

Low Potential. "Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections, or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e.g. basalt flows or Recent colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils."

Undetermined Potential. "Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy."

No Potential. "Some rock units have no potential to contain significant paleontological resources, for instance high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Rock units with no potential require no protection or impact mitigation measures relative to paleontological resources." (SVP 2010:1–2)

RESULTS

Geological Setting

The project area is located in the Colorado Desert geomorphic province. This area is bounded by the active San Andreas Fault on the west and the southern extension of the Mojave Desert on the east. The dominant feature is a tectonically down-dropped graben, the Salton Trough, that is largely occupied by the Salton Sea today, and ancient Lake Cahuilla in the past (Norris and Webb 1990). The Salton Trough is an active rift valley that includes the Imperial Valley in California and the west half of the Mexicali Valley and the Colorado River delta in Mexico. Formed by rifting along the East Pacific Rise, the structure of the Salton Trough today is largely a product of ongoing tectonic activity within the San Andreas fault system (Alles 2004; Buckles et al. 2002). The strike-slip fault system runs from central to southern California and forms the eastern wall of the Salton Trough. The San Andreas fault system terminates at the Brawley seismic zone, a spreading center in the southeastern corner of the Salton Sea (Alles 2004). This spreading center accounts for all the active seismicity in the region, is responsible for a large number of young volcanic and geothermal features, and formed pull-apart basins on both sides of the international border (Norris and Webb 1990). The western wall of the Salton Trough is formed by the highly active San Jacinto fault zone and the Elsinore fault zone, which is historically much less active than either the San Andreas or San Jacinto fault zones.

The divergence along the East Pacific Rise that created the Gulf of California began in the late Miocene, between 5 and 10 million years ago (Ma). This activity coincided with an uplift of the Colorado Plateau, which strengthened the flow of the Colorado River, allowing it to carry more sediment. The Colorado

River eventually dammed the entrance of the gulf and created the Salton Trough. The trough was episodically inundated by marine water during the Pliocene and Pleistocene and fresh water during the Holocene, the last lake cycle of which formed Lake Cahuilla, believed to have existed intermittently from 470 years before present (BP) to approximately 6,000 years BP (Van de Kamp 1973; Waters 1983; Whistler et al. 1995). Around the margins of the Salton Trough, at approximately 40 feet above mean sea level, the ancient highstand shoreline of Lake Cahuilla is visible. At this elevation, the water depth of Lake Cahuilla would have been approximately 300 feet. The 40-foot level of Lake Cahuilla was most likely established by the crest of the Colorado River delta. Evidence for this lake level is visible at Travertine Rock on the western margin of the Salton Trough, where 30-inch-thick travertine deposits indicate that the 40-foot water level persisted for a long period of time. Older discontinuous terrace deposits within the Salton Trough indicate the existence of other large lakes that may have been connected to the Gulf of California prior to the existence of Lake Cahuilla. The Salton Sea, which occupies the center of the Salton Trough today, is not a remnant of Lake Cahuilla, but resulted from an irrigation canal accident that diverted the full flow of the Colorado River into the Salton Trough for two years between 1905 and 1907 (Alles 2004).

The geology in the project area has been mapped by Strand (1962) at a scale of 1:250,000 (Figure 2). The surficial geology of the project area consists of younger alluvial sediments (Qal), lacustrine sediments (Ql), and dune deposits (Qs). These units and their paleontological potential are discussed below and shown in Table 1. Middle Holocene and older sediments in the subsurface of the project area are known to preserve fossil resources in the Salton Trough and Imperial County. The records of the LACM indicate they have several fossil localities represented in their collection from this area. The closest of these is from Holtville, approximately 10 kilometers to the west of the project area, where two invertebrate localities have been recorded. Other fossil localities in Pleistocene-aged sediments in the vicinity of the project area include Mt. Signal, the Yuha basin, the Anza-Borrego Desert, and south of Salton City (Table 2).

Younger alluvium (Qal). Younger alluvium dates from recent times and consists of unconsolidated gravel, sand, silt, and clay that is uncemented, derived as eroded sediment deposited by streams (Strand 1962). Younger alluvium occurs in the central portion of the project area. As defined by the SVP (2010), these sediments are too young to preserve fossils in the upper layers (i.e., under 5,000 years old); however, they increase in age with depth and therefore may preserve fossil resources in deeper layers.

Older alluvial sediments have a rich fossil history in southern California (Jefferson 1991a and b; McDonald and Jefferson 2008; Miller 1971; Reynolds and Reynolds 1991; Scott 2010; Scott and Cox 2008). The most common Pleistocene terrestrial mammal fossils include the bones of mammoth, bison, deer, and small mammals, but other taxa, including horse, lion, cheetah, wolf, camel, antelope, peccary, mastodon, capybara, and giant ground sloth, have been reported (Graham and Lundelius 1994), as well as reptiles such as frogs, salamanders, and snakes (Hudson and Brattstrom 1977). In addition to illuminating the striking differences between Southern California in the early Holocene to Pleistocene and today, this abundant fossil record has been vital in studies of extinction (e.g., Barnosky et al. 2004; Sandom et al. 2014; Scott 2010), ecology (e.g., Connin et al. 1998), and climate change (e.g., Roy et al. 1996). While the exact depth to older alluvium is not known in the project area, it is reasonable to believe this transition would have occurred by 1.5 m (5 feet) depth below ground surface (bgs), based on other localities in the region. Therefore, the alluvial sediments present at the project area have Low to High paleontological potential, increasing with depth.

Lacustrine Deposits (Ql). Lacustrine deposits date from recent times to the late Pleistocene and consist of sand, silt, and clay deposited by Lake Cahuilla and as modern playa deposits (Strand 1962). These deposits are found at the surface in the western project area. Like the younger alluvium described above, these sediments are too young at the surface to preserve fossil

resources; however, they increase in age with depth and therefore may preserve fossil resources in deeper layers. Additionally, these beds also likely underlie the younger alluvium and dune sand present in the central and eastern project area.

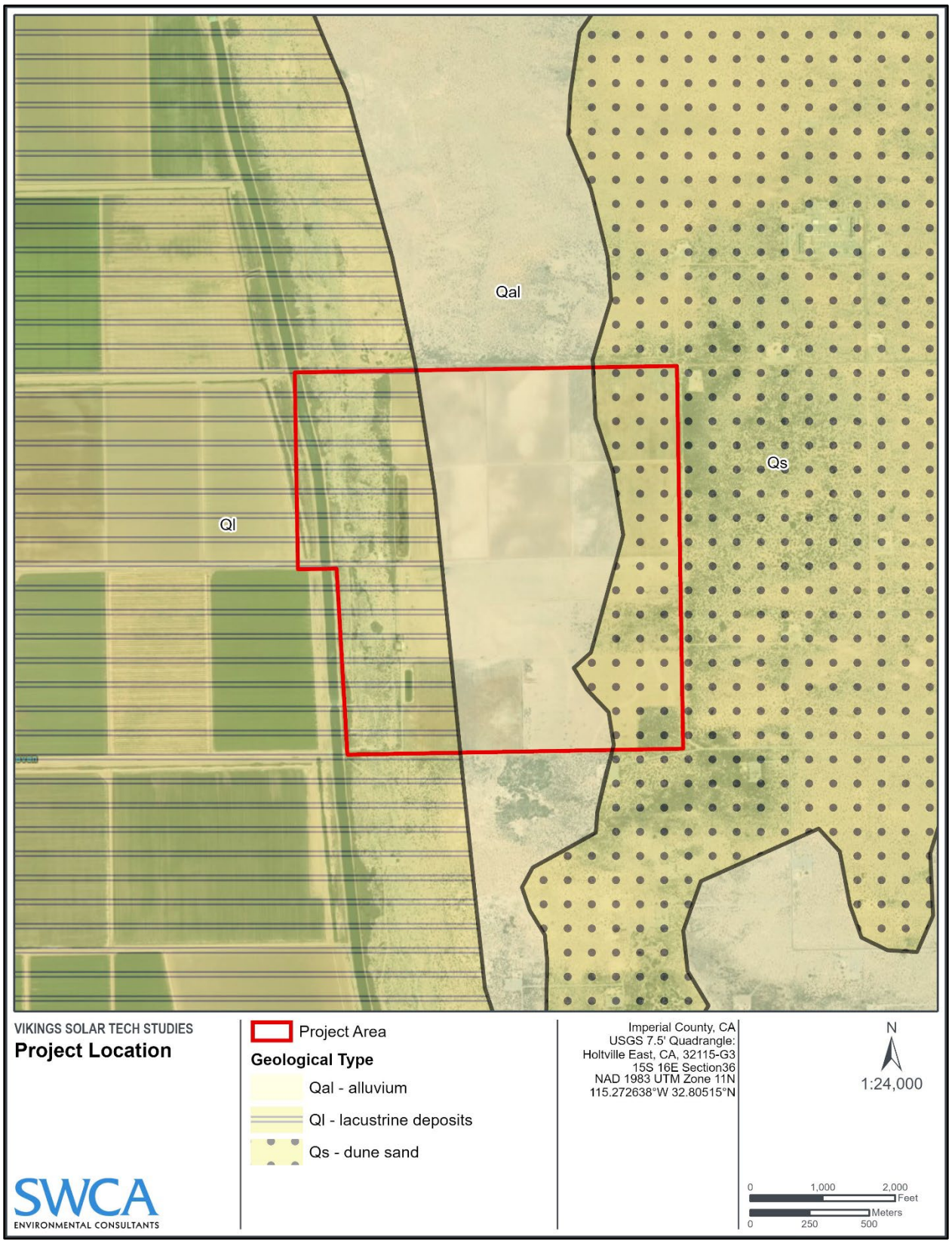

Figure 2. Geological map of the project area, after Strand (1962).

The fluvial and lacustrine Lake Cahuilla Beds comprise a thick sequence of tan and gray fossiliferous clay, silt, sand, and gravel in conjunction with alluvium (Morton 1966). The fluvial component of the Lake Cahuilla Beds was deposited during intervening lake lowstands (Whistler et al. 1995), and are generally composed of thinly bedded, poorly sorted, fine-grained, light grayish-brown, fluvial sandstone. The lacustrine mudstone is generally massive, poorly sorted sand and silt that is often highly bioturbated.

In addition to the fauna described above for older alluvial deposits, lacustrine deposits in the project area are well known for preserving a variety of aquatic invertebrate and vertebrate taxa. The most abundant molluscan taxa, *Tryonia protea, Fontelicella longinqua,* and *Physa humerosa,* are characteristic of shallow water lakes in the Colorado Desert with sandy and muddy bottoms and abundant aquatic vegetation (Bowersox 1974). Fossil remains of diatoms, land plants, sponges, ostracods, mollusks, fish, and small terrestrial vertebrates have been recovered from the Lake Cahuilla Beds (Whistler et al. 1995). In their study at La Quinta, Whistler et al. (1995) reported that the terrestrial vertebrate remains they collected include small desert animals very similar to the fauna that currently inhabit the Salton Trough. Species that required aquatic habitats, such as frogs, toads, aquatic turtles, watersnakes, waterfowl, or muskrats among others, were absent from the sample, suggesting that at that particular time, Lake Cahuilla did not persist long enough for these species to migrate to the lake from Colorado River habitats (Whistler et al. 1995). Due to the abundant recovery of significant fossils from Lake Cahuilla Beds from the middle and early Holocene, this geologic unit is considered to have Low to High paleontological potential, increasing with depth.

Dune Sand (Qs). Dune sand dates from recent times and consists of unconsolidated, well-sorted fine- and medium-grained sands deposited through eolian processes (Strand 1962). Dune sand occurs in the eastern portion of the project area. As defined by the SVP (2010), these sediments are too young to preserve fossils in the upper layers (i.e., under 5,000 years old); however, they increase in age with depth and therefore may preserve fossil resources in deeper layers. Older dune sands may preserve a wide range of terrestrial fossils, such as described above for older alluvium. Therefore, dune sands have Low to High paleontological potential, increasing with depth.

Table 1. Geologic Units Underlying the Project Area

Formation	Abbreviation (Figure 2)	Paleontological Potential	Presence in the Project Area
Alluvium	Qal	Low to High, increasing with depth	Surface – central project area
Lacustrine Deposits	Ql	Low to High, increasing with depth	Surface – western project area; Subsurface – throughout project area
Dune Sand	Qs	Low to High, increasing with depth	Surface – Eastern project area

Table 2. LACM Fossil Localities Nearest the APE

Locality Number	Location	Formation	Age	Taxa
LACM IP 4774, 4780	Holtville (more specific data not available)	Unknown formation	Pleistocene	Invertebrates
LACM VP 1719	Mt. Signal; Imperial County	Unknown Formation (gravel pit)	Pleistocene	Horse (Equidae)
LACM VP 1718	Yuha Basin	Palm Spring Formation (sandstone concretion)	Pleistocene	Horse (Equidae)

Locality Number	Location	Formation	Age	Taxa
LACM VP 6733, 5850	Superstition Hills, Anza-Borrego Desert	Brawley Formation (Coarse dark brown sandstone)	Pleistocene	Camel family (*Lamini*); other unidentified vertebrates
LACM VP 1726	16 miles south of Salton City, 1 block west of Highway 99	Unknown formation	Pleistocene	Ground sloth (*Megalonyx*)
LACM VP 4098-4100	Yuha Basin	Unknown formation	Pleistocene	Cat (*Felis*); Camel family (Camelidae); Carnivore (Carnivora); horse (*Equus*)

CONCLUSION

While no previously recorded paleontological resources have been identified within the project area, the proximity of numerous fossil localities in the vicinity of the project area indicates the younger alluvium, lacustrine deposits, and dune sands present in the project area have Low to High paleontological potential, increasing with depth. While the exact depth at which the transition from Low to High potential occurs is not known in the project area, the review of scientific literature presented here indicates it may be as shallow as 1.5 m (5 feet) bgs. Should fossils be encountered during grading and trenching, or other soil-disturbing activities from the project, they would be at risk for damage or destruction from construction activities, which would constitute an impact under CEQA. The depth of vibratory pile driving, grading, and trenching for underground electrical lines for the project is up to approximately 8 feet below the surface, however, pile driving does not create spoils or drilling cuttings to verify the presence or absence of fossils. Therefore, the project may encounter fossils during construction. In the event that a previously undiscovered fossil is uncovered by the project, the implementation of appropriate mitigation measures will ensure that such fossils are assessed for significance and, if significant, salvaged and curated with an accredited repository. This will reduce the potentially significant impacts to fossil resources from the project to a less-than-significant level with mitigation incorporated.

Accordingly, SWCA recommends the mitigation measures outlined below. The mitigation measures have been developed in accordance with, and incorporate the performance standards of, the SVP (2010) and industry best practices (Murphy et al. 2019). These measures will reduce potentially significant impacts to paleontological resources to a less than significant level.

> **Pal-1:** The Project Paleontologist will develop a Worker's Environmental Awareness Program (WEAP) to train the construction crew on the legal requirements for preserving fossil resources as well as procedures to follow in the event of a fossil discovery. This training program will be given to the crew before ground-disturbing work commences and will include handouts to be given to new workers as needed.
>
> **Pal-2:** In the event of a fossil discovery by a member of the construction crew, all work will cease in a 15-m (50-foot) radius of the find while the Project Paleontologist assesses the significance of the fossil and documents its discovery. Should the fossil be determined significant, it will be salvaged following the procedures and guidelines of the SVP (2010). Recovered fossils will be prepared to the point of curation, identified by qualified experts, listed in a database to facilitate analysis, and deposited in a designated paleontological curation facility. The most likely repository is the LACM. A repository will be identified and a curatorial arrangement will be signed prior to collection of the fossils.

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APPENDIX A

Natural History Museum of Los Angeles County
Paleontological Records Search Results

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Research & Collections

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November 19, 2020

SWCA Environmental Consultants

Attn: Alyssa Bell

re: Paleontological resources for the Viking Solar Project, 64085

Dear Alyssa:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the Viking Solar project area as outlined on the portion of the Holtville East USGS topographic quadrangle map that you sent to me via e-mail on November 11, 2020. We do not have any fossil localities that lie directly within the proposed project area, but we do have fossil localities nearby from the same sedimentary deposits that occur in the proposed project area, either at the surface or at depth.

The following table shows the closest known localities in the collection of the Natural History Museum of Los Angeles County.

Locality Number	Location	Formation	Taxa	Depth
LACM IP 4774, 4780	Holtville (more specific data not available)	unknown formation, Pleistocene	Invertebrates	Unknown
LACM VP 1719	Mt. Signal; Imperial County	Unknown Formation (Pleistocene, gravel pit)	Horse (Equidae)	Unknown
LACM VP 1718	Yuha basin	Palm Spring Formation (sandstone concretion)	Horse (Equidae)	Unknown
LACM VP 6733, 5850	Superstition Hills, Anza-Borrego Desert	Brawley Formation (Coarse dark brown sandstone)	Camel family (*Lamini*); other unidentified vertebrates	Unknown
LACM VP 1726	16 miles south of Salton City, 1 block west of highway 99	Unknown Formation (Pleistocene)	Ground sloth (*Megalonyx*)	Unknown

LACM VP 4098-4100	Yuha Basin	Unknown Formation (Pleistocene)	Cat (*Felis*); Camel family (Camelidae); Carnivore (Carnivora); horse (*Equus*)	Unknown

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

This records search covers only the records of the Natural History Museum of Los Angeles County ("NHMLA"). It is not intended as a paleontological assessment of the project area for the purposes of CEQA or NEPA. Potentially fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a full paleontological assessment of the project area be conducted by a paleontologist meeting Bureau of Land Management or Society of Vertebrate Paleontology standards.

Sincerely,

Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County

enclosure: invoice

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M Transportation Study

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KITTELSON & ASSOCIATES

VIKINGS SOLAR ENERGY STORAGE PROJECT TRANSPORTATION STUDY

January 12, 2022

Inside front cover

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Vikings Solar Energy Storage Project Transportation Study

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Project Number 25871

January 12, 2022

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APPENDICES

APPENDIX A: Traffic Counts
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INTRODUCTION

Apex Energy Solutions LLC. (project sponsor) is proposing to develop the Vikings Solar Energy Storage (project), a nominal 150-megawatt alternating current (MWAC) solar photovoltaic (PV) energy generation project with an integrated 300 MW battery storage project on approximately 603.61 acres of land in the county of Imperial, California. The project would be located on the intersection of Nelson Pit Road and Graeser Road. It is approximately 5.5 miles east of the city of Holtville. The project would be located on Imperial County Assessor's Parcel Numbers (APNs) 050-070-018-000 (approximately 480.00 acres), 050-070-019 (approximately 80.00 acres) and 050-070-021 (approximately 43.61 acres), owned by RL&R Strahm, ARB Inc., and the County of Imperial, respectively.

Two of the project area parcels are designated as "Agriculture" in the Imperial County General Plan and are zoned A-2-RE (General Agriculture with a Renewable Energy Overlay - areas that are suitable and intended primarily for agricultural uses [limited] and agricultural related compatible uses). The third project area parcel is designated as "Recreation/Open Space" and is zoned GS-RE (Government/Special Public Zone - areas that allow for the construction, development and operation of governmental facilities and special public facilities). The project site plan is showed in Figure 1.

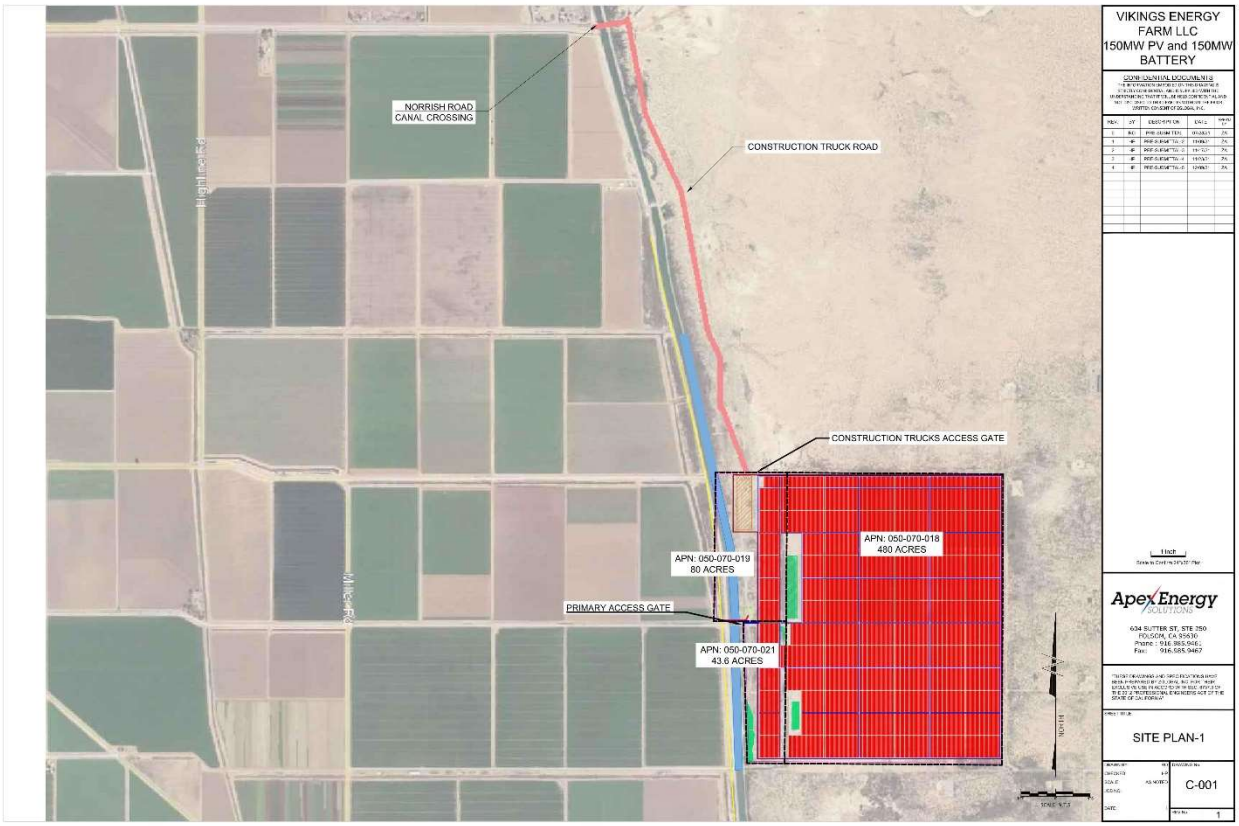
This report was prepared to evaluate potential transportation impacts and support environmental review for the Project, and includes the following:

- review of the existing circulation network and existing traffic conditions
- discussion of the applicable regulations
- estimate of vehicle trips to and from the site during construction and long-term operations
- Vehicle Miles Travelled (VMT) analysis

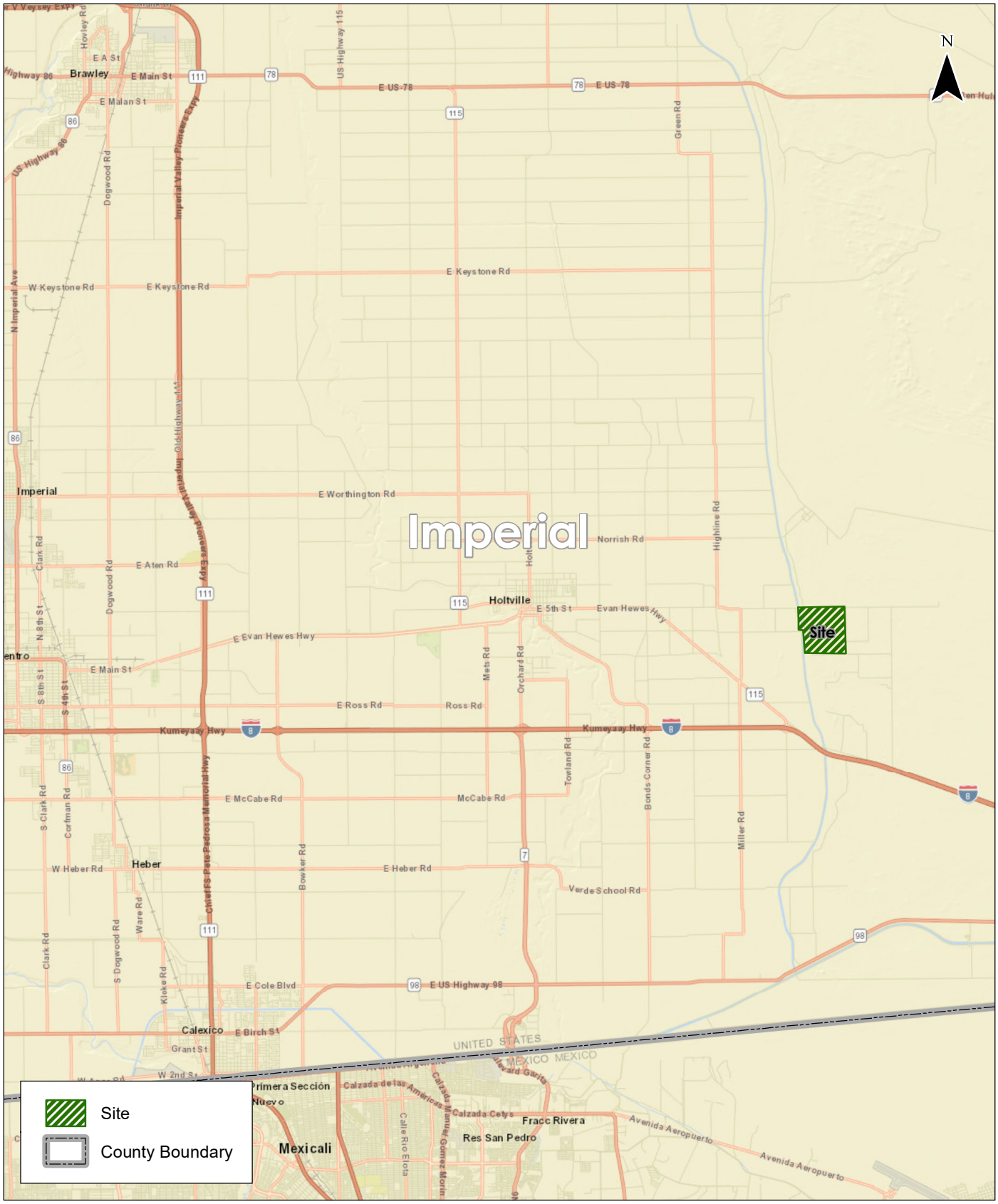
The study area and project site are shown in Figure 2. This transportation study is therefore subject to the regulations and standards currently in place in Imperial County. The analysis methodology and study locations included in this report were prepared according to the County's guidelines for the preparation of transportation analysis[1] and in consultation with County Transportation Public Works transportation staff.

[1] County of Imperial Department of Public Works Traffic Study and Report Policy dated March 12, 2007, revised June 29, 2007 and approved by the Board of Supervisors of the County of Imperial on August 7, 2007.

Figure 1: Site Plan



Source: ZGlobal Inc., 2021



Project Site | **Figure 2**

Coordinate System: NAD83 California zone 6 ftUS
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EXISTING CONDITIONS

This section discusses the existing conditions of roadways and study intersections near the project site.

ROADWAYS

The roadway system in the study area consists of interstate freeways, state routes and arterial, collector, and local roadways that serve local and regional traffic demand. The vehicular facilities in the study area are discussed below.

Interstate and State Roadways

Interstate 8 is the primary east-west route through Imperial County, running from San Diego, California to Arizona. It is a four-lane facility with complete grade separation and a speed limit of 70 miles per hour (mph).

State Route 115 (SR 115) has a distance of 33.6 miles and facilitates interregional agricultural goods movement and provides intraregional travel between various cities within Imperial County. For the most part, State Route 115 is a two-lane conventional highway, although some short segments are four lanes. The posted speed limit of 65 mph.

Evan Hewes Highway (State Route 115) is an east-west, two-lane undivided paved road from Austin Road to La Brucherie Road. Bike lanes or bus stops are not provided, and the posted speed limit is 40 mph.

State Route 7 is a four-lane highway that connects I-8 to the border of Mexico in Calexico. The posted speed limit is 65 mph.

Arterial Roadways

Kavanaugh Road is an east-west, two-lane roadway with a posted speed limit of 65 mph. The road merges with SR 115 for approximately one mile, and this road connects Graeser Road. It is a paved road west of Miller Road and becomes an unpaved road east of Miller Road.

Bonds Corner Road is a two-lane, north-south facility which connects from SR 98 in Calexico to the city of Holtville. It connects to I-8 via a diamond interchange with stop sign controls on the east and west approaches. The posted speed limit is 55 mph.

Orchard Road is a two-lane, north-south road that connects I-8 to the city of Holtville. The interchange at I-8 is a partial cloverleaf interchange with stop sign controls on the east-west approaches. The posted speed limit is 55 mph.

Collector Roadways

Snyder Road is a two-lane, north-south road that is 24 feet wide with unpaved shoulders.

Miller Road, also known as County Highway S33 in the study area, is a two-lane, north-south road with unpaved shoulders.

Local Roadways

Norrish Road is a two-lane, east-west road that runs from SR 115 to Graeser Road.

Nelson Pit Road is a two-lane, east-west road with unpaved shoulders.

Fust Road is an unpaved two-lane, north-south road.

Graeser Road is an unpaved two-lane local road that runs east from Miller Road until the irrigation channel, where it runs north parallel to the channel.

Ogier Road is an unpaved two-lane local road that connects Snyder Road and Miller Road. It becomes Graeser Road west of Miller Road.

Transit, bicycle, and pedestrian facilities are not available in the study area.

Study Segments

A total of seven study segments (listed in Table 1 and shown in Figure 3) were selected for the purposes of this analysis.

Table 1: Study Segments

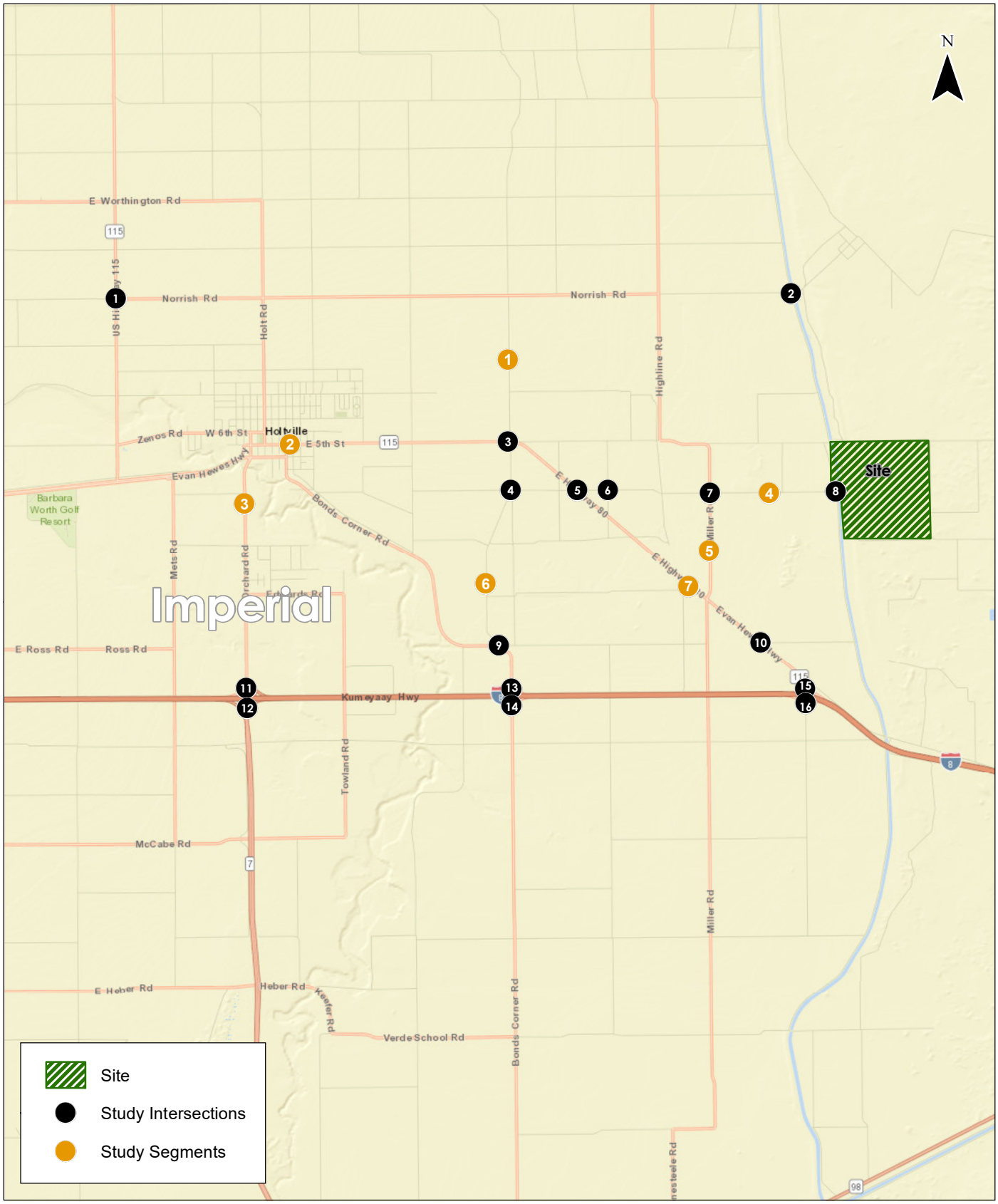
#	Roadway	Segment	Roadway Type
1	Snyder Road	Nelson Pit Road and Norrish Road	Collector 2 lane
2	SR 115	Walnut Avenue and Maple Avenue	Minor Arterial 2 Lane
3	Orchard Road	S7 and SR 115	Major Collector 2 Lane
4	Nelson Pit Road	Evan Hewes Highway and Project Site	Collector 2 lane
5	Miller Road	Evan Hewes Highway and Nelson Pit Road	Collector 2 lane
6	Snyder Road	Evan Hewes Highway and Nelson Pit Road	Collector 2 lane
7	Evan Hewes Highway	Snyder Road and Van Der Linden Road	Minor Arterial 2 Lane

Source: Kittelson & Associates, Inc., 2021

INTERSECTIONS

Study Intersections

A total of 16 study intersections (listed in Table 2 and shown in Figure 3) were selected; these locations were identified in consultation with the County. All intersection vehicle turning movement counts were collected on Friday, December 18, 2020 during the weekday morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak periods.



Study Locations | **Figure 3**

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Coordinate System: NAD83 California zone 6 ftUS
Data Source: Delete if there isn't one.

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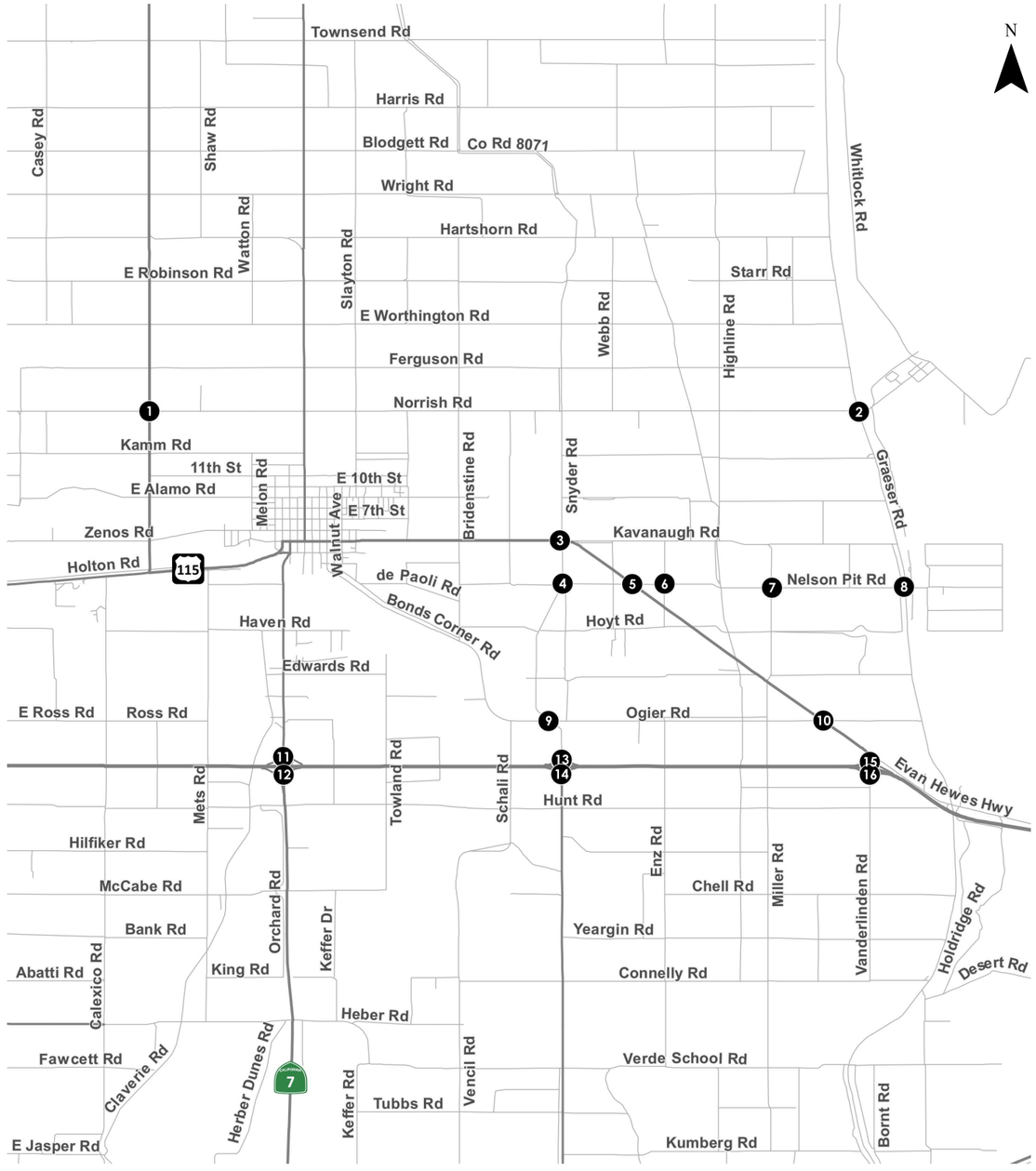
Table 2: Study Intersections

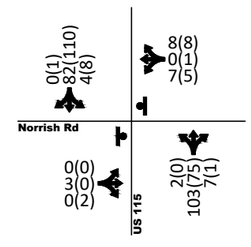
	Intersection	Traffic Control
1	SR 115 & Norrish Road	TWSC
2	Graeser Road & Norrish Road	TWSC
3	Snyder Road & Evan Hewes Highway	TWSC
4	Snyder Road & Nelson Pit Road	TWSC
5	SR 115 & Nelson Pit Road	TWSC
6	Fust Road & Nelson Pit Road	TWSC
7	Miller Road & Nelson Pit Road	TWSC
8	Graeser Road & Nelson Pit Road	TWSC
9	Bonds Corner Road/Ogier Road & Snyder Road	TWSC
10	Evan Hewes Highway & Graeser Road	TWSC
11	Orchard Road (S7) & I-8 Westbound Ramps	TWSC
12	Orchard Road (S7) & I-8 Eeastbound Ramps	TWSC
13	Bonds Corner Road & I-8 Westbound Ramp	TWSC
14	Bonds Corner Road & I-8 Eeastbound Ramps	TWSC
15	SR 115 & I-8 Westbound Ramps	TWSC
16	SR 115 & I-8 Eastbound Ramps	TWSC

Source: Kittelson & Associates, Inc., 2021
Note: TWSC signifies a two-way stop-controlled intersection.

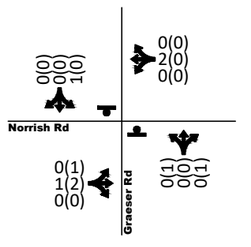
Figure 4 shows automobile peak hour volumes at the study intersections. Intersection control (i.e., signalized or stop-controlled) and lane geometries are also shown. Appendix A contains the field-collected count sheets.



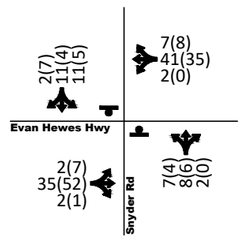
1 US 115 & Norrish Rd



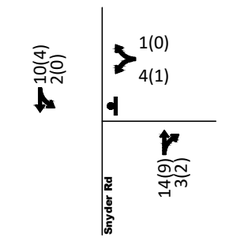
2 Graeser Rd & Norrish Rd



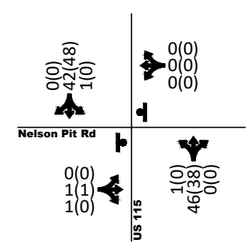
3 Snyder Rd & Evan Hewes Hwy



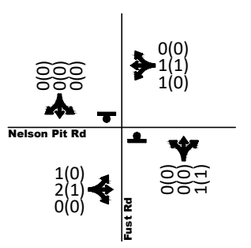
4 Snyder Rd & Nelson Pit Rd



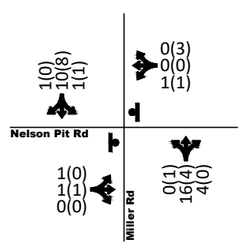
5 US 115 & Nelson Pit Rd



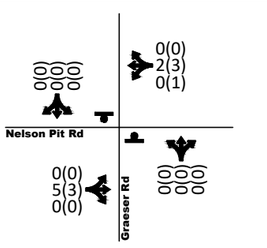
6 Fust Rd & Nelson Pit Rd



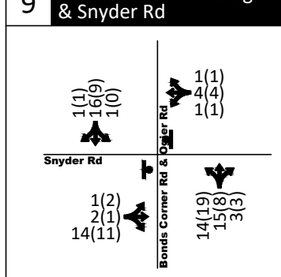
7 Miller Rd & Nelson Pit Rd



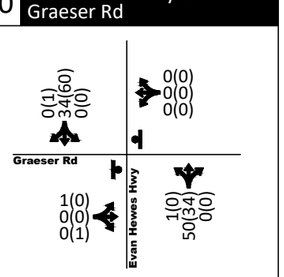
8 Graeser Rd & Nelson Pit Rd



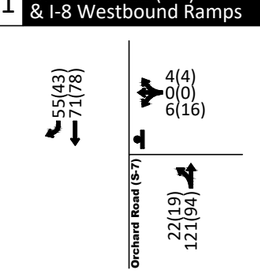
9 Bonds Corner Rd & Ogier Rd & Snyder Rd



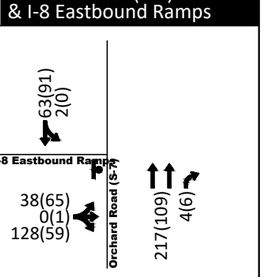
10 Evan Hewes Hwy & Graeser Rd



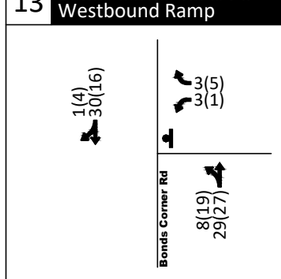
11 Orchard Road (S-7) & I-8 Westbound Ramps



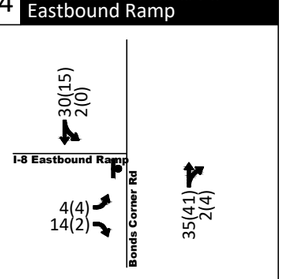
12 Orchard Road (S-7) & I-8 Eastbound Ramps



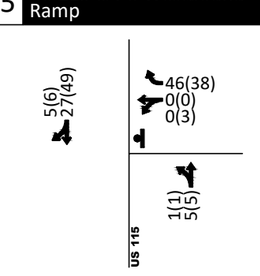
13 Bonds Corner Rd & I-8 Westbound Ramp



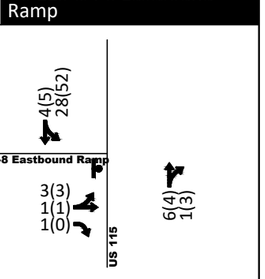
14 Bonds Corner Rd & I-8 Eastbound Ramp



15 US 115 & I-8 Westbound Ramp



16 US 115 & I-8 Eastbound Ramp



AM(PM) - Traffic Volume

- Stop Sign

Existing Traffic Volumes
AM and PM Peak

Figure
4

H:\25\25871 - Vikings Solar Project Traffic Analysis\report\figs\Fig bubble\bubble_20210126.dwg Jan 29, 2021 - 9:58am - jsuhaimi Layout Tab: Existing Peak

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ANALYSIS METHDOLOGY AND IMPACT SIGNIFICANT CRITERIA

Under Senate Bill (SB) 743, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, level of service (LOS) and other similar vehicle delay or capacity metrics may no longer serve as transportation impact metrics for California Environmental Quality Act (CEQA) impact analyses. The Governor's Office of Planning and Research (OPR) has updated the CEQA Guidelines and provided a final technical advisory in December 2018 which recommends vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts under CEQA. For land use and transportation projects, SB 743-compliant CEQA analysis became mandatory on July 1, 2020. Automobile delay, as described solely by LOS or similar measure of traffic congestion, is no longer considered a significant impact under CEQA. However, the County of Imperial Department of Public Works requires transportation analyses to review roadway capacity in terms of LOS to identify deficiencies and require improvements to the circulation system outside of CEQA. The rest of this chapter discusses the criteria and thresholds of VMT and LOS analysis.

LEVEL OF SERVICE STANDARDS

As discussed above, a project's effect on roadway capacity and LOS does not constitute a significant environmental impact under CEQA. However, a LOS evaluation is required per County guidelines to determine if the project would cause any negative effects on roadway operations. The Imperial County Traffic Study and Report Policy, and the County's General Plan Circulation and Scenic Highway Element[2] requires intersections and roadway segments to maintain a peak-hour LOS of C or better.

Intersection Level of Service Definitions

In this report, LOS is based on the *Highway Capacity Manual* (HCM) 6th edition definitions, included as Table 3: Level of Service Standards for ease of reference. The HCM methodology assigns a LOS grade to an intersection based on the delay for vehicles at the intersection, ranging from LOS A to LOS F; LOS A signifies very slight delay with no approach phase fully utilized, while LOS F signifies very high delays and congestion, frequent cycle failures, and long queues. For signalized and all-way stop-controlled intersections, the average control delay for all vehicles is assessed; for two-way stop-controlled intersections, the intersection approach with the highest delay is utilized. Table 3 shows the LOS thresholds from HCM.

Table 3: Level of Service Standards

Level of Service	Delay Per Vehicle (Seconds)	
	Signalized Intersection	Unsignalized Intersection
A	< 10.0	< 10.0
B	> 10.0 to 20.0	> 10.0 to 15.0
C	> 20.0 to 35.0	> 15.0 to 25.0
D	> 35.0 to 55.0	> 25.0 to 35.0
E	> 55.0 to 80.0	> 35.0 to 50.0
F	> 80.0	> 50.0

Source: Highway Capacity Manual, 6th edition,2016

[2] Circulation and Scenic Highways Element dated January 29, 2008, which states "The County's goal for an acceptable traffic service standard on an ADT basis and during AM and PM peak periods for all County-Maintained Road shall be LOS C for all street segment links and intersections.

Roadway Segment Level of Service Definitions

Roadway segment operations were also determined on a daily traffic volume basis. Operations were assigned a Level of Service letter grade ranging from LOS A to LOS F (from better to worse congestion), with A signifying free-flow traffic and F signifying volumes that are over roadway capacity. The Circulation and Scenic Highway Element of the Imperial County General Plan has provided roadway capacities. For this analysis, the LOS and ADT corresponding table (Table 4) from the Circulation and Scenic Highway Element of the Imperial County General Plan was utilized.

Table 4: Roadway Segment Level of Service

Street Classification	Level of Service and ADT Volume Correspondence[1]				
	A	B	C	D	E
Prime Arterial	22,200	37,000	44,600	50,000	57,000
Minor Arterial	14,800	24,700	29,600	33,400	37,000
Major Collector	13,700	22,800	27,400	30,800	34,220
Minor Collector	1,900	4,100	7,100	10,900	16,200

Source: Imperial County General Plan, Circulation and Scenic Highway Element, 2008

Notes: 1 ADT = Average Daily Traffic

VMT IMPACT SIGNIFICANCE CRITERIA

The County has not adopted its own VMT thresholds, thus the OPR's Technical Advisory[3] was used to evaluate VMT impacts.

OPR's Technical Advisory provides guidance for lead agencies to evaluate transportation impacts from projects based on VMT metrics. It provides screening criteria, which can be used to quickly identify whether a project should be expected to cause a less-than-significant impact related to VMT. Per OPR's Technical Advisory, projects may be screened out as follows:

- Small Projects: projects generate fewer than 110 trips per day
- Local Serving Retail (generally less than 50,000 square feet in building area)
- Location-Based (low VMT areas, within ½ mile of an existing major transit stop, or along a high-quality transit corridor)
- Provision of affordable housing

If further VMT analysis is required, recommended thresholds are set for residential, office, and retail projects. The thresholds for a significant transportation impacts are summarized in Table 5.

[3] Technical Advisory on Evaluating Transportation Impacts in CEQA, California Office of Planning and Research, December 2018

Table 5: Recommended Numeric Thresholds

Land Use	Threshold
Residential	Exceeding a level of 15 percent below existing VMT per capita
Office	Exceeding a level of 15 percent below existing regional VMT per employee
Retail	A net increase in total VMT

Source: Technical Advisory on Evaluating Transportation Impacts in CEQA by OPR, December 2018

LEVEL OF SERVICE ANALYSIS

EXISTING TRAFFIC CONDITIONS

The existing conditions analysis is based on the traffic count data methodologies described above. The following provides a summary of existing traffic conditions on study roadways and intersections.

AUTOMOBILE LEVEL OF SERVICE

As previously discussed, LOS at the study intersections was evaluated based on the HCM 6th Edition methodology, as implemented in the Synchro 10 software package. LOS analysis was performed for the weekday AM and PM peak hours using traffic counts collected in the field. Table 6 provides a summary of the existing automobile level of service. Appendix B contains the Existing Conditions LOS worksheets at the study intersections. As shown in Table 6, all study intersections operate acceptably (LOS C or better) under existing conditions.

Table 6: Automobile Level of Service, Existing Conditions

#	Intersection	Traffic Control	Weekday AM		Weekday PM	
			Delay (Sec)	LOS	Delay (Sec)	LOS
1	SR 115 & Norrish Road	TWSC	10.4	B	9.4	A
2	Graeser Road & Norrish Road	TWSC	8.6	A	8.5	A
3	Snyder Road & Evan Hewes Highway	TWSC	9.6	A	9.7	A
4	Snyder Road & Nelson Pit Road	TWSC	8.7	A	8.6	A
5	SR 115 & Nelson Pit Road	TWSC	9.1	A	9.6	A
6	Fust Road & Nelson Pit Road	TWSC	8.3	A	8.3	A
7	Miller Road & Nelson Pit Road	TWSC	9.1	A	9.1	A
8	Graeser Road & Nelson Pit Road	TWSC	0.0	A	7.2	A
9	Bonds Corner Road/Ogier Road & Snyder Road	TWSC	9.3	A	9.3	A
10	Evan Hewes Highway & Graeser Road	TWSC	9.1	A	8.6	A
11	Orchard Road (S7) & I-8 WB Ramps	TWSC	9.0	A	8.9	A
12	Orchard Road (S7) & I-8 EB Ramps	TWSC	9.2	A	9.1	A
13	Bonds Corner Road & I-8 WB Ramp	TWSC	8.8	A	8.6	A
14	Bonds Corner Road & I-8 EB Ramps	TWSC	8.6	A	8.7	A
15	SR 115 & I-8 WB Ramps	TWSC	8.5	A	8.5	A
16	SR 115 & I-8 EB RAMPS	TWSC	8.9	A	9.3	A

Source: Kittelson & Associates, Inc., 2021
Note: Delay of 0.0 second means that the traffic volumes are zero or no conflicts

Roadway segment operations LOS are determined on a daily traffic volume basis. Table 7 provides a summary of existing roadway segment operations. All roadway segments operate acceptably under existing conditions.

Table 7: Existing Roadway Segment Level of Service

#	Roadway	Segment	Roadway Type	ADT	V/C Ratio	LOS C Capacity	LOS
1	Snyder Rd	Nelson Pit Rd and Norrish Rd	Minor Collector	964	0.14	7,100	A
2	SR 115	Walnut Ave and Maple Ave	Minor Arterial	5,957	0.20	29,600	A
3	Orchard Rd	S7 and SR 115	Major Collector	4,527	0.17	27,400	A
4	Nelson Pit Rd	Evan Hewes Highway and Project Site	Minor Collector	77	0.01	7,100	A
5	Miller Rd	Evan Hewes Highway and Nelson Pit Rd	Minor Collector	466	0.07	7,100	A
6	Snyder Rd	Evan Hewes Highway and Nelson Pit Rd	Minor Collector	536	0.08	7,100	A
7	Evan Hewes Highway	Snyder Rd and Van Der Linden Rd	Minor Arterial	2,273	0.08	29,600	A

Source: Kittelson & Associates, Inc., 2021

TRAFFIC IMPACT ANALYSIS

LONG-TERM OPERATIONAL IMPACTS

Once construction of the project is completed, the project requires minimal operations and maintenance activities and would not require presence of full- time employees. However, for estimation of operational emissions, it is conservatively assumed that for day-to-day inspection and minor maintenance, some employees would commute to the site. These are very conservative assumptions since no travel to the site is anticipated during operations. The annual operations are assumed to be as follows:

- For site inspection and minor repairs, up to 2 one-way worker trips per day would be generated.
- Routine maintenance activities would include panel washing, which is expected to occur two times annually each taking 2 days. Panel washing activities are estimated to require additional daily trips of 10 workers (which includes the truck transporting the water) during each event for a total of 24 one-way worker trips per day (weekdays) during a peak operational maintenance event. However, this does not occur on a daily basis and will only occur during such maintenance events. Panel washing was assumed to require the use one water truck operating 8 hours/day and 4 days/year.
- The default model generated trip lengths for commercial-work (C-W) were used for the workers commute, a medium heavy-duty truck was chosen to represent the worker vehicles and the truck transporting the water, and trip purpose was designated as 100% primary trips.

In addition, as demonstrated above, the traffic volumes in the study area are very low, and all facilities operate at LOS A and B. Once constructed, the project will generate very few trips. Therefore, operation of the project would not result in traffic that would cause a detriment in traffic conditions in the area, and no improvements would be needed.

TEMPORARY CONSTRUCTION IMPACTS

The project is expected to generate vehicular trips during the construction phase. Construction activities will be the primary generator of trips for the project. Therefore, to identify any impacts the addition of construction trips may cause, the LOS analyses of the study intersections and roadway segments during project construction were conducted.

Construction-Related Trip Generation and Distribution

This section provides the vehicle trip generation and distribution estimates for the proposed project during construction. The number of on-site workers for the solar project and battery storage facilities is not expected to exceed 180 workers at any one time. As a worst-case condition, it is assumed that every construction worker would drive solo, there would be no carpooling, and all trips would coincide with the commute peak hour traffic hours (7-9AM and 4-6PM). In reality, it is likely that some workers will carpool and/or travel outside the commuter traffic peak hours. Under this worst-case assumption, project construction is estimated to generate 180 in-bound trips during the AM peak hour, and 180 out-bound trips during the PM Peak hour. Onsite parking would be provided for all construction workers.

Based on the information provide by project sponsor, the construction worker traffic is expected to travel to the site from either Highway 115 east or Highway 8 east, to north on Miller Road and east on Nelson Pit Road to the project site. Construction trips are assigned based on the above information, satellite images to identify major origins/destinations near the project, and the Google Maps shortest routes from the site to the major origins/destinations during AM and PM peak hours.

The AM peak trip distribution for the project is as follows:

- 10 percent from the north via SR 115, Norrish Road, and Graeser Road
- 5 percent from the north via SR 115, Snyder Road, and Nelson Pit Road
- 20 percent from the west via SR 115, Evan Hewes Highway, and Nelson Pit Road
- 65 percent from I-8 (60 percent from the west, 5 percent from the south) via Exit 128 - Bonds Corner Road
    - 20 percent via Snyder Road and Nelson Pit Road
    - 45 percent via Ogier Road, Miller Road, and Nelson Pit Road

The PM peak trip distribution for the project is slightly different due to the shortest route showed in Google Maps that drivers are likely to take I-8 during the PM peak hour:

- 10 percent from the north via SR 115, Norrish Road, and Graeser Road
- 5 percent from the north via SR 115, Snyder Road, and Nelson Pit Road
- 20 percent from the west via SR 115, Evan Hewes Highway, and Nelson Pit Road
- 65 percent from I-8 (60 percent from the west, 5 percent from the south) via Nelson Pit Road, Miller Road, and SR 115 to Exit 131 – SR 115 and Van Der Linden Road

All trip distribution destinations of construction workers total up to 100 percent.

In additional to trips generated by construction workers, an estimated two delivery trucks would arrive at the project site each day during the first few weeks of the construction of the solar generating facility. To be conservative, the truck delivery window is assigned to the PM peak hour.

Since the bridge on the Nelson Pit Road, which is used by construction workers, has a weight capacity of 55,000 to 60,000 pounds, delivery trucks are prohibited from crossing it. Delivery trucks beyond the 60,000

pounds range are expected to use the bridge on Norrish Road to access the site. Figure 5 shows the delivery truck trip distribution.

Figure 6 presents the weekday AM and PM project-only turning movements that were derived from the trip generation of construction worker and delivery trucks and trip distribution discussed in this section.

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Figure 5: Truck Trip Distribution

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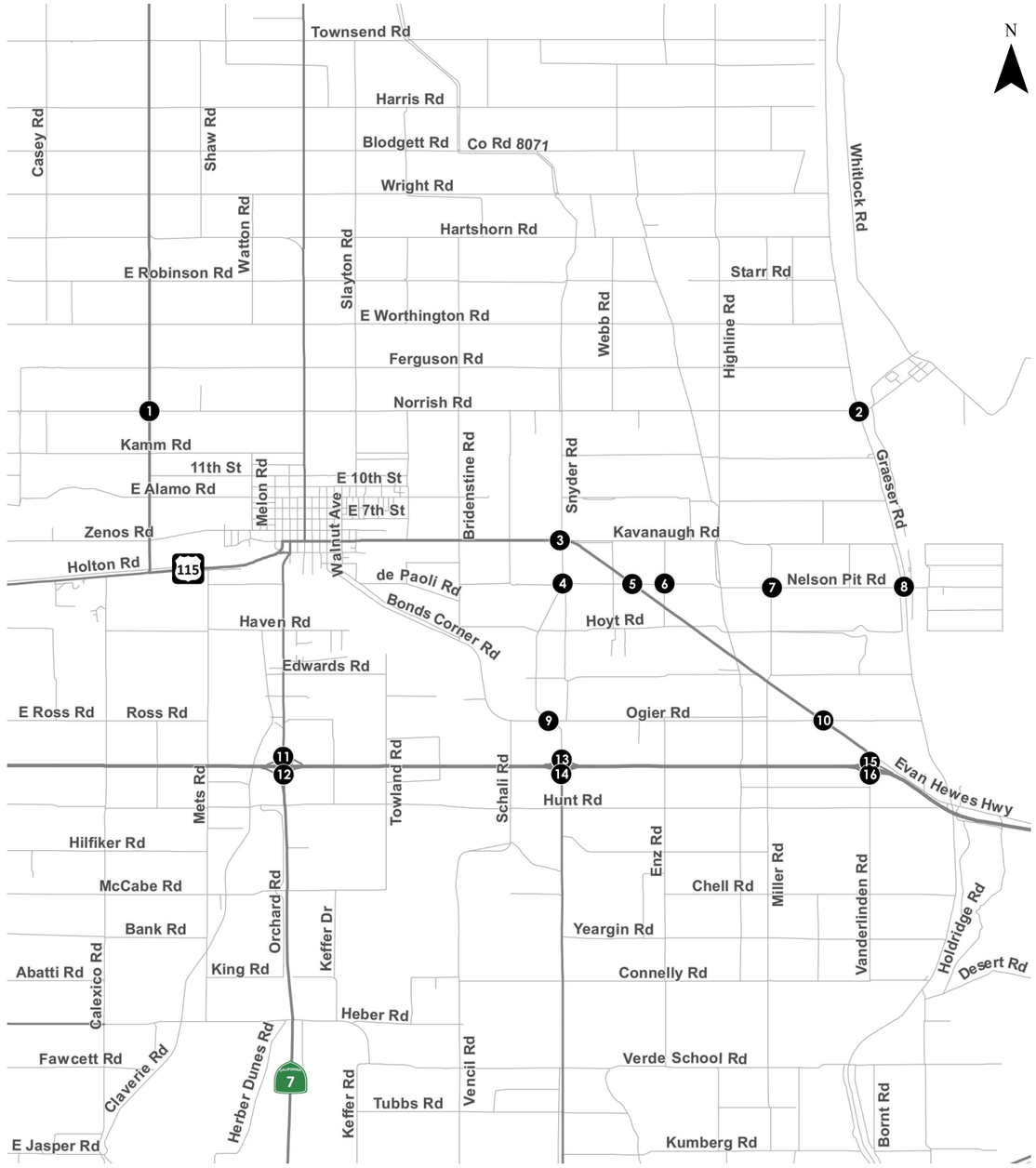
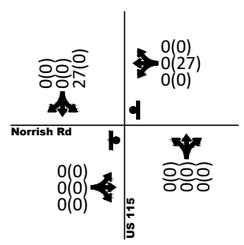
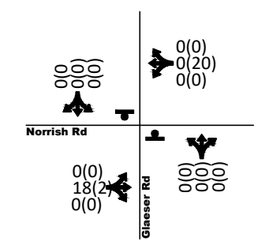


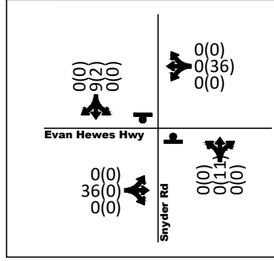
1 US 115 & Norrish Rd



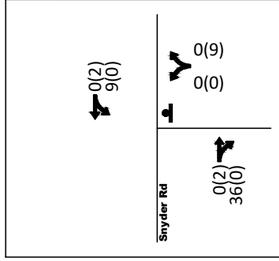
2 Graeser Rd & Norrish Rd



3 Snyder Rd & Evan Hewes Hwy



4 Snyder Rd & Nelson Pit Rd



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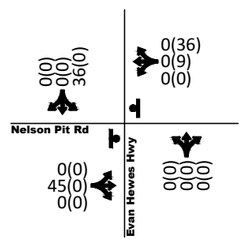

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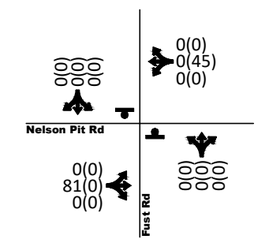

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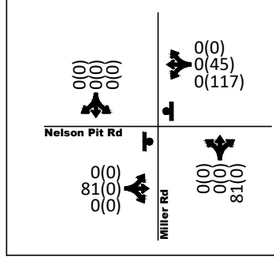

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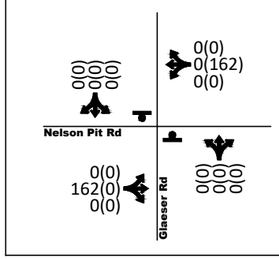
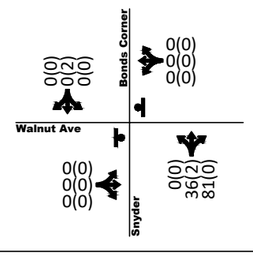
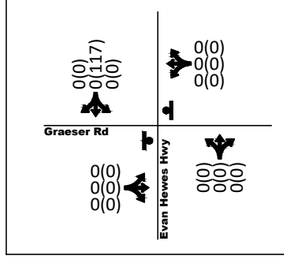


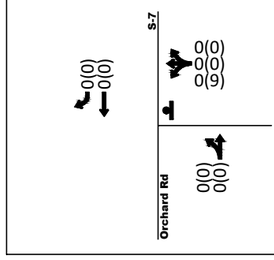
9 Bonds Corner Rd & Ogier Rd & Snyder Rd



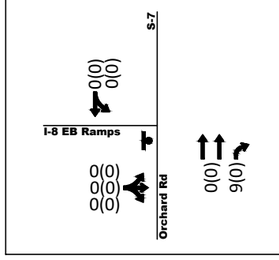
10 Evan Hewes Hwy & Graeser Rd



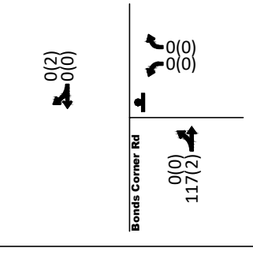
11 Orchard Road (S-7) & I-8 Westbound Ramps



12 Orchard Road (S-7) & I-8 Eastbound Ramps



13 Bonds Corner Rd & I-8 Westbound Ramp



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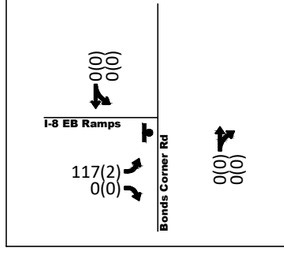
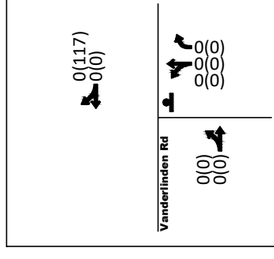


15 US 115 & I-8 Westbound Ramp



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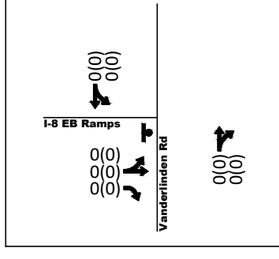

AM(PM) - Traffic Volume

- Stop Sign

Project Construction Only Volumes
AM and PM Peak

Figure
6

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Existing Plus Project Construction Traffic Conditions

The following presents the results of the Existing Plus Construction traffic operations analysis.

Existing Plus Construction Automobile Level of Service

The automobile turning movement counts for the Existing Plus Construction scenario were developed from summing the Existing Conditions turning movement counts and the Construction Only turning movements. Figure 7 presents the Existing Plus Construction turning movements. The lane configuration during the Existing Plus Construction traffic conditions remains the same as the Existing Conditions (shown in Figure 4).

Table 8 presents the Existing Plus Construction delays and LOS for the study intersections. The table also compares the changes in delay between the Existing and Existing Plus Construction scenarios. Appendix C contains the Existing Plus Construction LOS worksheets.

Table 8: Automobile Level of Service, Existing Plus Construction Conditions

#	Intersection	Traffic Control	Weekday AM			Weekday PM		
			Delay (Sec)	LOS	Change	Delay (Sec)	LOS	Change
1	SR 115 & Norrish Road	TWSC	10.9	B	0.5	10.5	B	1.1
2	Graeser Road & Norrish Road	TWSC	8.7	A	0.1	8.5	A	0.0
3	Snyder Road & Evan Hewes Highway	TWSC	10.1	B	0.5	10.2	B	0.5
4	Snyder Road & Nelson Pit Road	TWSC	8.9	A	0.2	8.5	A	-0.1
5	SR 115 & Nelson Pit Road	TWSC	10.7	B	1.6	9.6	A	0.0
6	Fust Road & Nelson Pit Road	TWSC	9.1	A	0.8	8.3	A	0.0
7	Miller Road & Nelson Pit Road	TWSC	11.2	B	2.1	9.6	A	0.5
8	Graeser Road & Nelson Pit Road	TWSC	0.0	A	0.0	7.2	A	0.0
9	Bonds Corner Road/Ogier Road & Snyder Road	TWSC	9.5	A	0.2	9.3	A	0.0
10	Evan Hewes Highway & Graeser Road	TWSC	9.1	A	0.0	9.4	A	0.8
11	Orchard Road (S7) & I-8 WB Ramps	TWSC	9.0	A	0.0	9.1	A	0.2
12	Orchard Road (S7) & I-8 EB Ramps	TWSC	9.2	A	0.0	9.2	A	0.1
13	Bonds Corner Road & I-8 WB Ramp	TWSC	9.5	A	0.7	8.6	A	0.0
14	Bonds Corner Road & I-8 EB Ramps	TWSC	9.7	A	1.1	8.7	A	0.0
15	SR 115 & I-8 WB Ramps	TWSC	8.5	A	0.0	8.6	A	0.1
16	SR 115 & I-8 EB RAMPS	TWSC	8.9	A	0.0	9.3	A	0.0

Source: Kittelson & Associates, Inc. 2021
Bold signifies unacceptable operations.
Shading indicates intersection improvement required.

As shown in the Table 8, all study intersections are expected to operate acceptably (LOS C or better) under Existing Plus Construction conditions.

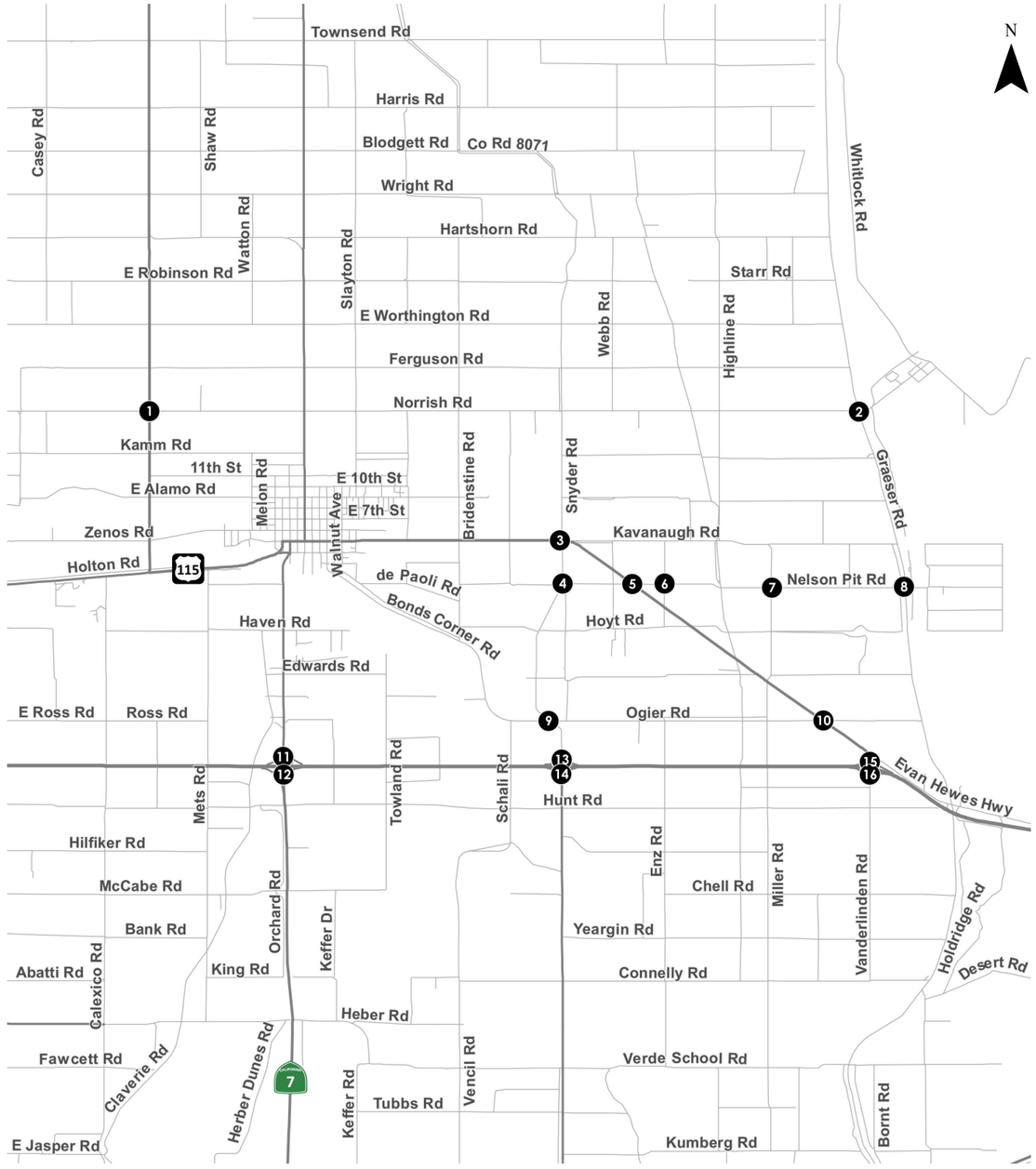
Roadway segments were also analyzed for the Existing Plus Construction scenario. All roadway segments operate acceptably (LOS C or better) under the Existing Plus Construction scenario.

In summary, construction traffic would not result in congestion and excessive delays at study intersections and roadways.

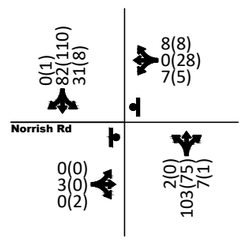
Table 9: Roadway Segment Level of Service, Existing Plus Construction

#	Roadway	Segment	Roadway Type	ADT	V/C Ratio	LOS C Capacity	LOS
1	Snyder Rd	Nelson Pit Rd and Norrish Rd	Minor Collector	986	0.14	7,100	A
2	SR 115	Walnut Ave and Maple Ave	Minor Arterial	6,029	0.20	29,600	A
3	Orchard Rd	S7 and SR 115	Major Collector	4,527	0.17	27,400	A
4	Nelson Pit Rd	Evan Hewes Highway and Project Site	Minor Collector	401	0.06	7,100	A
5	Miller Rd	Evan Hewes Highway and Nelson Pit Rd	Minor Collector	664	0.09	7,100	A
6	Snyder Rd	Evan Hewes Highway and Nelson Pit Rd	Minor Collector	576	0.08	7,100	A
7	Evan Hewes Highway	Snyder Rd and Van Der Linden Rd	Minor Arterial	2,273	0.08	29,600	A

Source: Kittelson & Associates, Inc., 2021



1 US 115 & Norrish Rd



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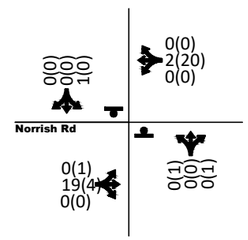

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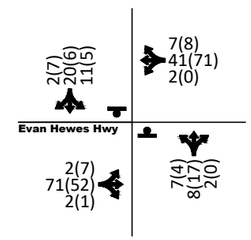

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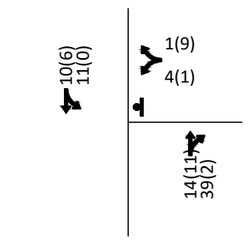

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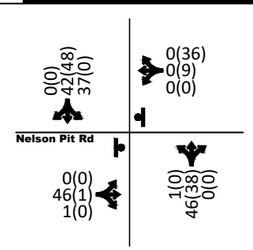

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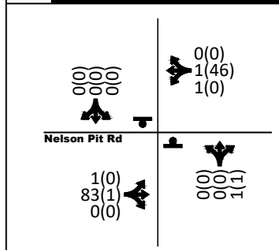

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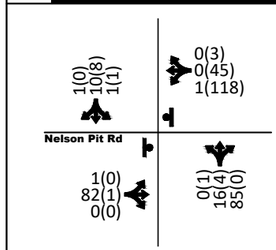

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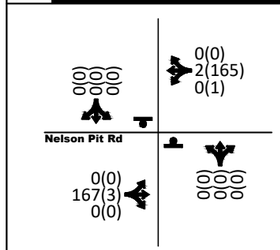

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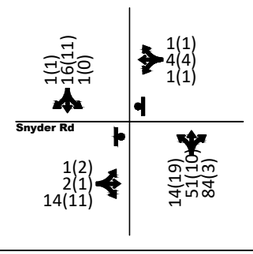

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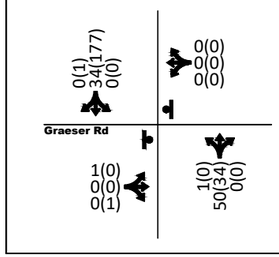
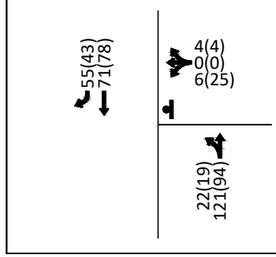


11 Orchard Road (S-7) & I-8 Westbound Ramps



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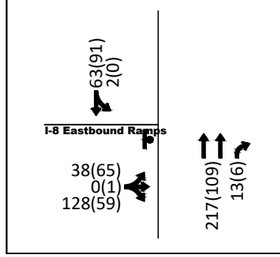

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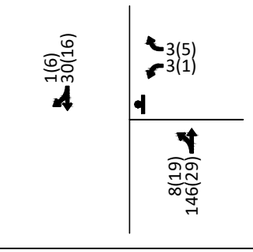

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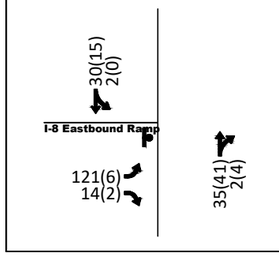

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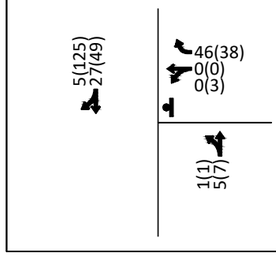
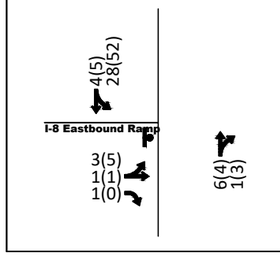


16 US 115 & I-8 Eastbound Ramp



AM(PM) - Traffic Volume

- Stop Sign

Existing Plus Construction Volumes
AM and PM Peak

Figure
7

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VMT IMPACT ANALYSIS

As discussed previously, OPR provides screening criteria that allow small projects (from a traffic standpoint) to screen out of a detailed VMT analysis based on the number of daily trips it generates. Projects that generate fewer than 110 trips per day can be presumed to result in less than significant VMT impacts.

The project would be remotely controlled. No employees would be based at the project site. Security-related monitoring would be done remotely. Personnel may conduct unscheduled security rounds, and maintenance workers may access the site periodically to clean the panels and maintain the equipment and project area. The public would not have access to the facility. Thus, the project will not generate more than 110 trips per day. Therefore, the project meets the small project screening criteria, and it will not have significant VMT impact.

ACCESS ANALYSIS

The project site would include two primary access driveways, one is currently contemplated on Nelson Pit Road, bisecting the project area and a secondary access driveway is from Norrish Road to the north of the Project site. These driveways would be provided with a minimum of 30-foot double swing gates with a "Knox Box" for keyed entry. Internal to the project site, up to 30-foot-wide roads would be provided between the crystalline solar photovoltaic arrays, as well as around the perimeter of each project site inside the perimeter security fence to provide access to all areas of each site for maintenance and emergency vehicles. Because the conceptual plans lack sufficient detail of site aisles and parking spaces, the design assessment is limited to a high-level basis. It is expected that the project driveways and drive aisles are sufficient to accommodate existing plus construction workers' vehicles (167 vehicles maximum). In addition, the exiting vehicle queues at the project driveway are not expected to exceed the available storage; therefore, no conflict is expected between queuing vehicles, parking spaces, and internal drive aisle intersections.

SUMMARY OF FINDINGS

Apex Energy Solutions LLC. is proposing to develop the Vikings Solar Energy Storage on the intersection of Nelson Pit Road and Graeser Road, in the county of Imperial, California. It is approximately 5.5 miles east of the city of Holtville.

By analyzing the traffic operation conditions under the County guidelines, study roadway segments and intersections all operate with a LOS B or better under the worst-case traffic scenario during existing and existing plus construction conditions. Thus, the LOS impact of the project during construction phase still meets acceptable LOS criteria.

As detailed in the VMT analysis section, the project can be screened out of a further VMT analysis under the latest OPR VMT criteria. Therefore, it was determined that the project would have a **less-than-significant** VMT impact. No mitigation measures have been identified.

For the project site access, the exiting and existing plus construction vehicle queues at the project driveway and drive aisles are not expected to exceed the available storage; therefore, no conflict is expected between queuing vehicles, parking spaces, and internal drive aisle intersections.

APPENDIX A: TRAFFIC COUNTS

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Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

County of Imperial
N/S: US-115
E/W: Norrish Road
Weather: Clear

File Name : 12_CIM_US-115_Norrish AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

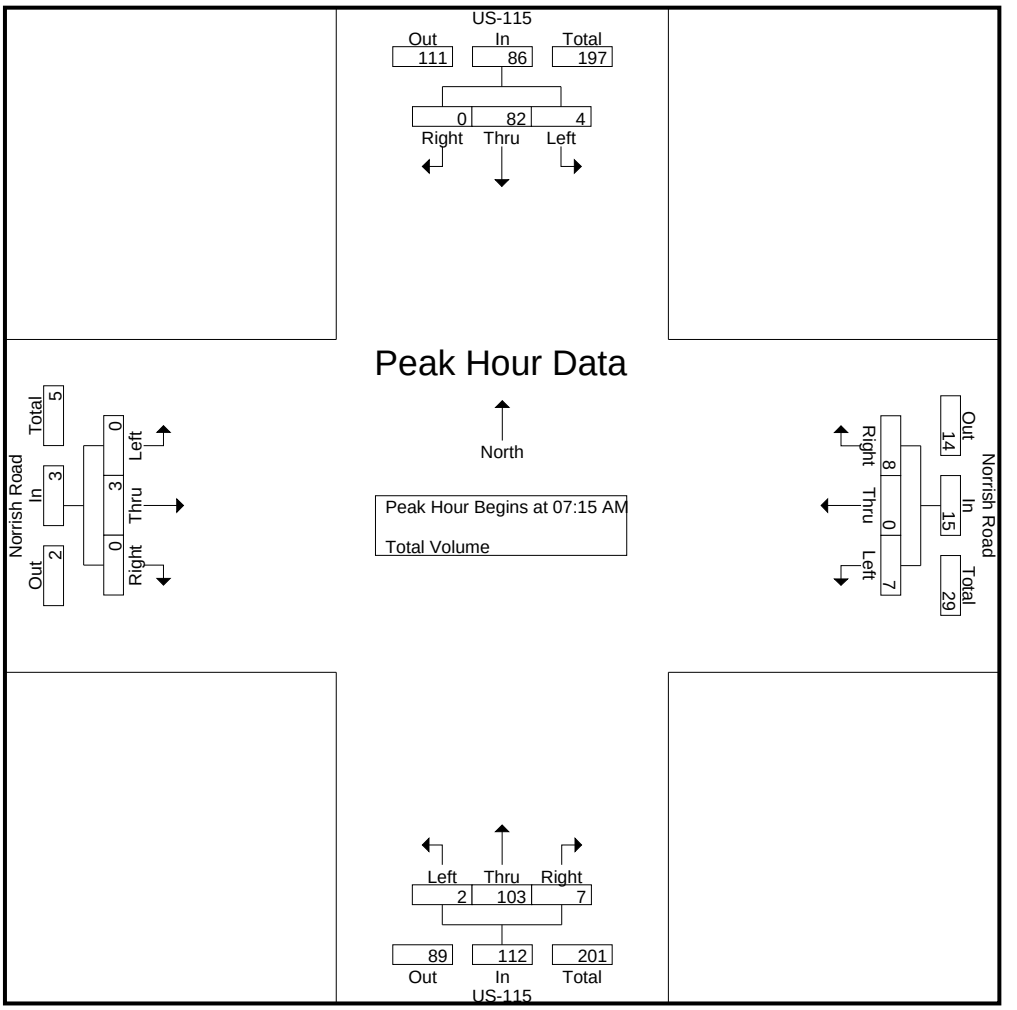
	US-115 Southbound				Norrish Road Westbound				US-115 Northbound				Norrish Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	16	0	18	0	0	4	4	0	28	5	33	0	0	0	0	55
07:15 AM	2	21	0	23	1	0	2	3	2	24	1	27	0	1	0	1	54
07:30 AM	0	17	0	17	0	0	6	6	0	23	2	25	0	0	0	0	48
07:45 AM	0	23	0	23	2	0	0	2	0	27	3	30	0	0	0	0	55
Total	4	77	0	81	3	0	12	15	2	102	11	115	0	1	0	1	212
08:00 AM	2	21	0	23	4	0	0	4	0	29	1	30	0	2	0	2	59
08:15 AM	2	17	0	19	0	0	1	1	0	20	1	21	0	1	0	1	42
08:30 AM	3	8	0	11	0	0	0	0	0	22	0	22	0	1	0	1	34
08:45 AM	3	15	0	18	0	1	0	1	0	16	1	17	0	1	0	1	37
Total	10	61	0	71	4	1	1	6	0	87	3	90	0	5	0	5	172
Grand Total	14	138	0	152	7	1	13	21	2	189	14	205	0	6	0	6	384
Apprch %	9.2	90.8	0		33.3	4.8	61.9		1	92.2	6.8		0	100	0		
Total %	3.6	35.9	0	39.6	1.8	0.3	3.4	5.5	0.5	49.2	3.6	53.4	0	1.6	0	1.6	

	US-115 Southbound				Norrish Road Westbound				US-115 Northbound				Norrish Road 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**2**	21	0	**23**	1	0	2	3	**2**	24	1	27	0	1	0	1	54
07:30 AM	0	17	0	17	0	0	**6**	**6**	0	23	2	25	0	0	0	0	48
07:45 AM	0	**23**	0	23	2	0	0	2	0	27	**3**	**30**	0	0	0	0	55
08:00 AM	2	21	0	23	**4**	0	0	4	0	**29**	1	30	0	**2**	0	**2**	**59**
Total Volume	4	82	0	86	7	0	8	15	2	103	7	112	0	3	0	3	216
% App. Total	4.7	95.3	0		46.7	0	53.3		1.8	92	6.2		0	100	0		
PHF	.500	.891	.000	.935	.438	.000	.333	.625	.250	.888	.583	.933	.000	.375	.000	.375	.915

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

County of Imperial
N/S: US-115
E/W: Norrish Road
Weather: Clear

File Name : 12_CIM_US-115_Norrish AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				08:00 AM			
+0 mins.	**2**	21	0	**23**	0	0	4	4	0	**28**	**5**	**33**	0	**2**	0	**2**
+15 mins.	0	17	0	17	1	0	2	3	**2**	24	1	27	0	1	0	1
+30 mins.	0	**23**	0	23	0	0	**6**	**6**	0	23	2	25	0	1	0	1
+45 mins.	2	21	0	23	**2**	0	0	2	0	27	3	30	0	1	0	1
Total Volume	4	82	0	86	3	0	12	15	2	102	11	115	0	5	0	5
% App. Total	4.7	95.3	0		20	0	80		1.7	88.7	9.6		0	100	0	
PHF	.500	.891	.000	.935	.375	.000	.500	.625	.250	.911	.550	.871	.000	.625	.000	.625

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

County of Imperial
N/S: US-115
E/W: Norrish Road
Weather: Clear

File Name : 12_CIM_US-115_Norrish PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	US-115 Southbound				Norrish Road Westbound				US-115 Northbound				Norrish Road 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
04:00 PM	0	28	0	28	2	1	0	3	1	22	3	26	0	0	0	0	57
04:15 PM	3	23	0	26	2	0	1	3	0	18	0	18	0	0	1	1	48
04:30 PM	2	35	1	38	0	0	4	4	0	20	0	20	0	0	1	1	63
04:45 PM	1	23	0	24	1	1	1	3	0	10	0	10	0	0	0	0	37
Total	6	109	1	116	5	2	6	13	1	70	3	74	0	0	2	2	205
05:00 PM	2	29	0	31	2	0	2	4	0	27	1	28	0	0	0	0	63
05:15 PM	2	20	0	22	1	0	2	3	0	10	0	10	0	0	0	0	35
05:30 PM	0	33	0	33	1	0	0	1	0	20	1	21	0	0	0	0	55
05:45 PM	0	19	0	19	1	0	1	2	0	12	1	13	0	0	0	0	34
Total	4	101	0	105	5	0	5	10	0	69	3	72	0	0	0	0	187
Grand Total	10	210	1	221	10	2	11	23	1	139	6	146	0	0	2	2	392
Apprch %	4.5	95	0.5		43.5	8.7	47.8		0.7	95.2	4.1		0	0	100		
Total %	2.6	53.6	0.3	56.4	2.6	0.5	2.8	5.9	0.3	35.5	1.5	37.2	0	0	0.5	0.5	

	US-115 Southbound				Norrish Road Westbound				US-115 Northbound				Norrish Road 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**3**	23	0	26	**2**	0	1	3	0	18	0	18	0	0	**1**	**1**	48
04:30 PM	2	**35**	**1**	**38**	0	0	**4**	**4**	0	20	0	20	0	0	1	1	**63**
04:45 PM	1	23	0	24	1	**1**	1	3	0	10	0	10	0	0	0	0	37
05:00 PM	2	29	0	31	2	0	2	4	0	**27**	**1**	**28**	0	0	0	0	63
Total Volume	8	110	1	119	5	1	8	14	0	75	1	76	0	0	2	2	211
% App. Total	6.7	92.4	0.8		35.7	7.1	57.1		0	98.7	1.3		0	0	100		
PHF	.667	.786	.250	.783	.625	.250	.500	.875	.000	.694	.250	.679	.000	.000	.500	.500	.837

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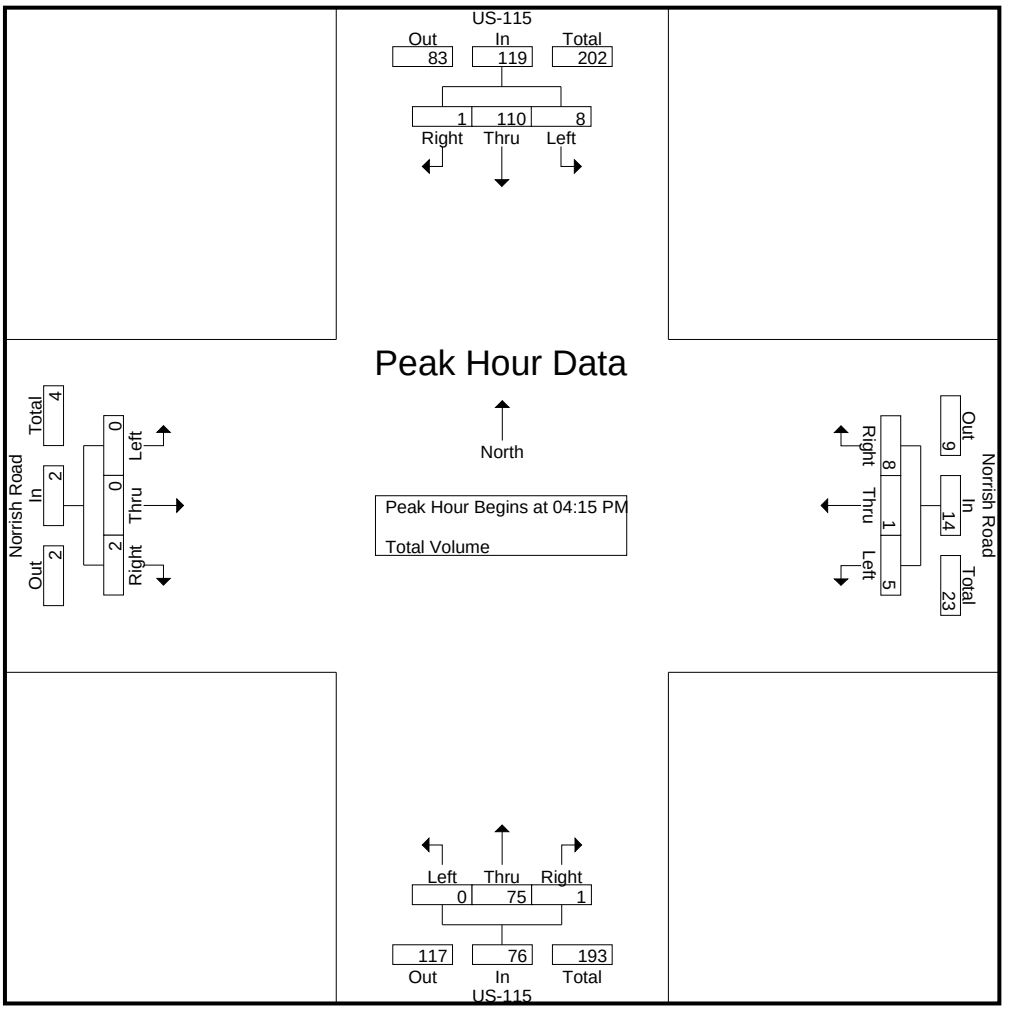
County of Imperial
N/S: US-115
E/W: Norrish Road
Weather: Clear

File Name : 12_CIM_US-115_Norrish PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:15 PM				04:15 PM				04:00 PM			
+0 mins.	**3**	23	0	26	**2**	0	1	3	0	18	0	18	0	0	0	0
+15 mins.	2	**35**	**1**	**38**	0	0	**4**	**4**	0	20	0	20	0	0	**1**	**1**
+30 mins.	1	23	0	24	1	**1**	1	3	0	10	0	10	0	0	1	1
+45 mins.	2	29	0	31	2	0	2	4	0	**27**	**1**	**28**	0	0	0	0
Total Volume	8	110	1	119	5	1	8	14	0	75	1	76	0	0	2	2
% App. Total	6.7	92.4	0.8		35.7	7.1	57.1		0	98.7	1.3		0	0	100	
PHF	.667	.786	.250	.783	.625	.250	.500	.875	.000	.694	.250	.679	.000	.000	.500	.500

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County of Imperial
N/S: Graeser Road
E/W: Norrish Road
Weather: Clear

File Name : 11_CIM_Graeser_Norrish AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Graeser Road Southbound				Norrish Road Westbound				Graeser Road Northbound				Norrish Road 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
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
07:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
08:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2
Total	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1	2	3
Grand Total	1	0	0	1	0	2	0	2	0	0	0	0	0	2	1	3	6
Apprch %	100	0	0		0	100	0		0	0	0		0	66.7	33.3		
Total %	16.7	0	0	16.7	0	33.3	0	33.3	0	0	0	0	0	33.3	16.7	50	

	Graeser Road Southbound				Norrish Road Westbound				Graeser Road Northbound				Norrish Road 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	**1**	0	**1**	**2**
07:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	1	0	2	0	2	0	0	0	0	0	1	0	1	4
% App. Total	100	0	0		0	100	0		0	0	0		0	100	0		
PHF	.250	.000	.000	.250	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.000	.250	.500

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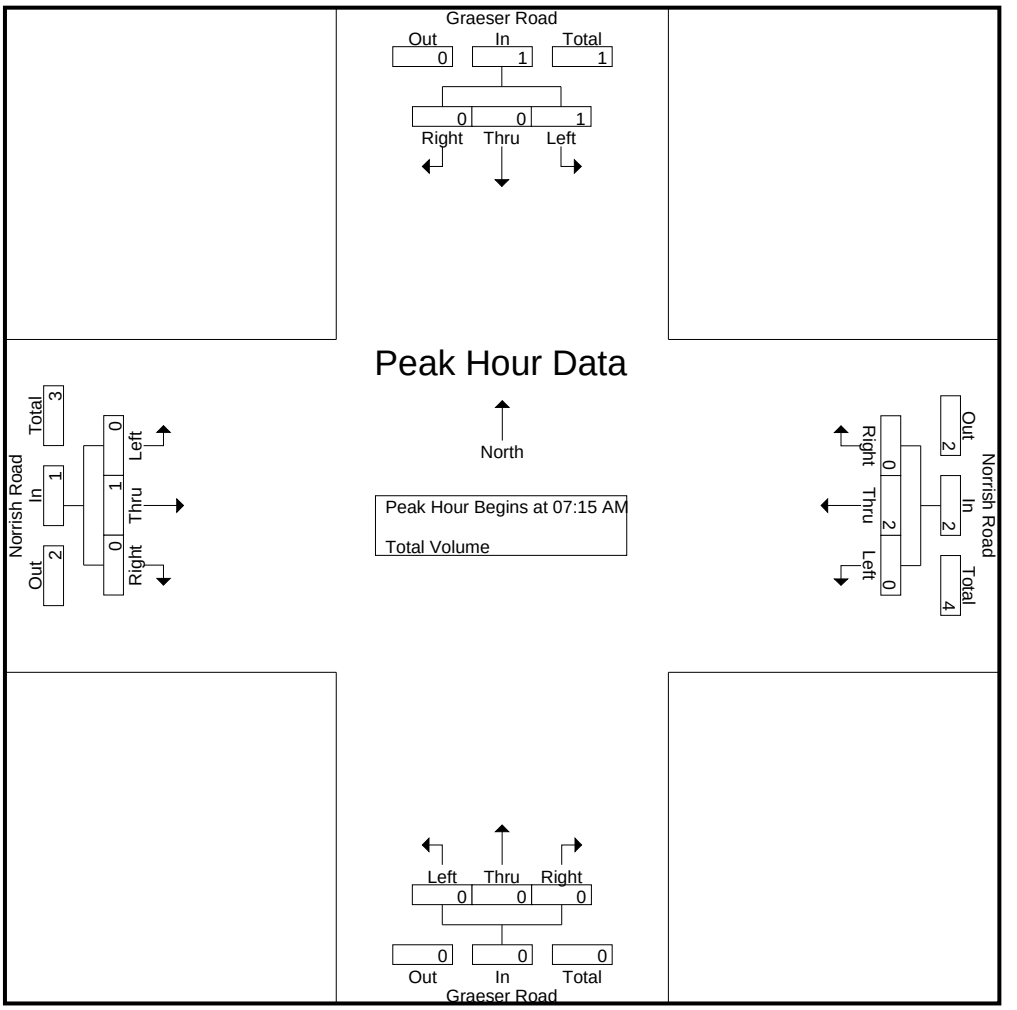
County of Imperial
N/S: Graeser Road
E/W: Norrish Road
Weather: Clear

File Name : 11_CIM_Graeser_Norrish AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
+45 mins.	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	**1**	**1**	**2**
Total Volume	1	0	0	1	0	2	0	2	0	0	0	0	0	1	1	2
% App. Total	100	0	0		0	100	0		0	0	0		0	50	50	
PHF	.250	.000	.000	.250	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.250	.250

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County of Imperial
N/S: Graeser Road
E/W: Norrish Road
Weather: Clear

File Name : 11_CIM_Graeser_Norrish PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Graeser Road Southbound				Norrish Road Westbound				Graeser Road Northbound				Norrish Road 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
04:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
Total	0	1	0	1	0	0	0	0	1	0	1	2	0	1	0	1	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	2	3
Grand Total	0	1	0	1	0	0	0	0	2	0	1	3	1	2	0	3	7
Apprch %	0	100	0		0	0	0		66.7	0	33.3		33.3	66.7	0		
Total %	0	14.3	0	14.3	0	0	0	0	28.6	0	14.3	42.9	14.3	28.6	0	42.9	

	Graeser Road Southbound				Norrish Road Westbound				Graeser Road Northbound				Norrish Road 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	**1**	0	0	**1**	0	**1**	0	1	**2**
04:45 PM	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	1	0	**2**	2
Total Volume	0	0	0	0	0	0	0	0	1	0	1	2	1	2	0	3	5
% App. Total	0	0	0		0	0	0		50	0	50		33.3	66.7	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.500	.250	.500	.000	.375	.625

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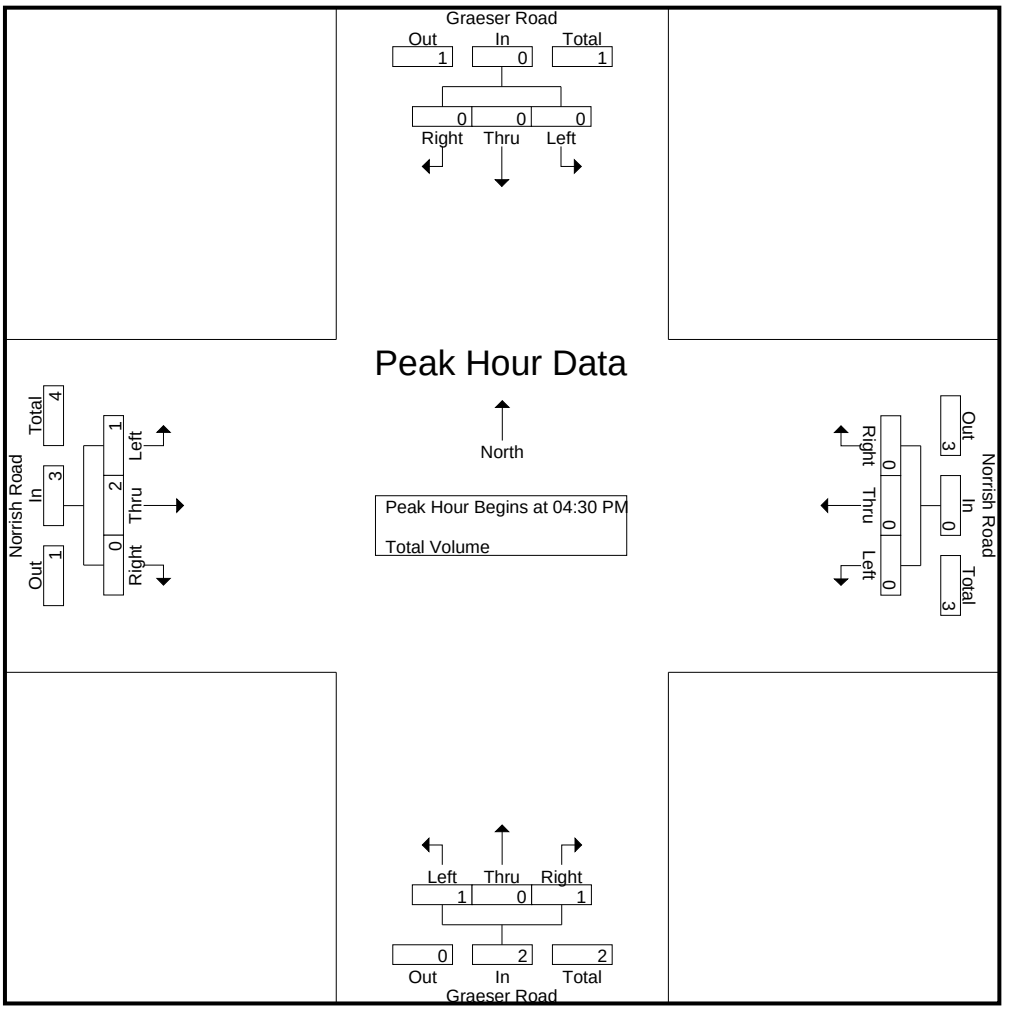
County of Imperial
N/S: Graeser Road
E/W: Norrish Road
Weather: Clear

File Name : 11_CIM_Graeser_Norrish PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:30 PM			
+0 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	**1**	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	**1**	1	**1**	1	0	**2**
Total Volume	0	1	0	1	0	0	0	0	1	0	1	2	1	2	0	3
% App. Total	0	100	0		0	0	0		50	0	50		33.3	66.7	0	
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.250	.000	.250	.500	.250	.500	.000	.375

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County of Imperial
N/S: Snyder Road
E/W: Evan Hewes Highway (SR-115)
Weather: Clear

File Name : 05_CIM_Snyder_Even AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Snyder Road Southbound				Evan Hewes Highway Westbound				Snyder Road Northbound				Evan Hewes Highway 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
07:00 AM	1	0	0	1	0	9	3	12	2	8	0	10	0	5	1	6	29
07:15 AM	4	0	2	6	0	4	5	9	1	0	2	3	2	3	1	6	24
07:30 AM	2	3	0	5	0	15	5	20	0	4	1	5	1	12	1	14	44
07:45 AM	4	2	1	7	0	9	0	9	1	1	0	2	1	9	1	11	29
Total	11	5	3	19	0	37	13	50	4	13	3	20	4	29	4	37	126
08:00 AM	2	4	1	7	0	8	1	9	3	2	0	5	0	9	0	9	30
08:15 AM	3	2	0	5	2	9	1	12	3	1	1	5	0	5	0	5	27
08:30 AM	2	1	0	3	0	5	3	8	1	0	2	3	0	7	1	8	22
08:45 AM	5	1	0	6	0	6	1	7	1	1	0	2	2	9	1	12	27
Total	12	8	1	21	2	28	6	36	8	4	3	15	2	30	2	34	106
Grand Total	23	13	4	40	2	65	19	86	12	17	6	35	6	59	6	71	232
Apprch %	57.5	32.5	10		2.3	75.6	22.1		34.3	48.6	17.1		8.5	83.1	8.5		
Total %	9.9	5.6	1.7	17.2	0.9	28	8.2	37.1	5.2	7.3	2.6	15.1	2.6	25.4	2.6	30.6	

	Snyder Road Southbound				Evan Hewes Highway Westbound				Snyder Road Northbound				Evan Hewes Highway 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	2	3	0	5	0	**15**	**5**	**20**	0	**4**	**1**	**5**	**1**	**12**	**1**	**14**	**44**
07:45 AM	**4**	2	**1**	**7**	0	9	0	9	1	1	0	2	1	9	1	11	29
08:00 AM	2	**4**	1	7	0	8	1	9	**3**	2	0	5	0	9	0	9	30
08:15 AM	3	2	0	5	**2**	9	1	12	3	1	1	5	0	5	0	5	27
Total Volume	11	11	2	24	2	41	7	50	7	8	2	17	2	35	2	39	130
% App. Total	45.8	45.8	8.3		4	82	14		41.2	47.1	11.8		5.1	89.7	5.1		
PHF	.688	.688	.500	.857	.250	.683	.350	.625	.583	.500	.500	.850	.500	.729	.500	.696	.739

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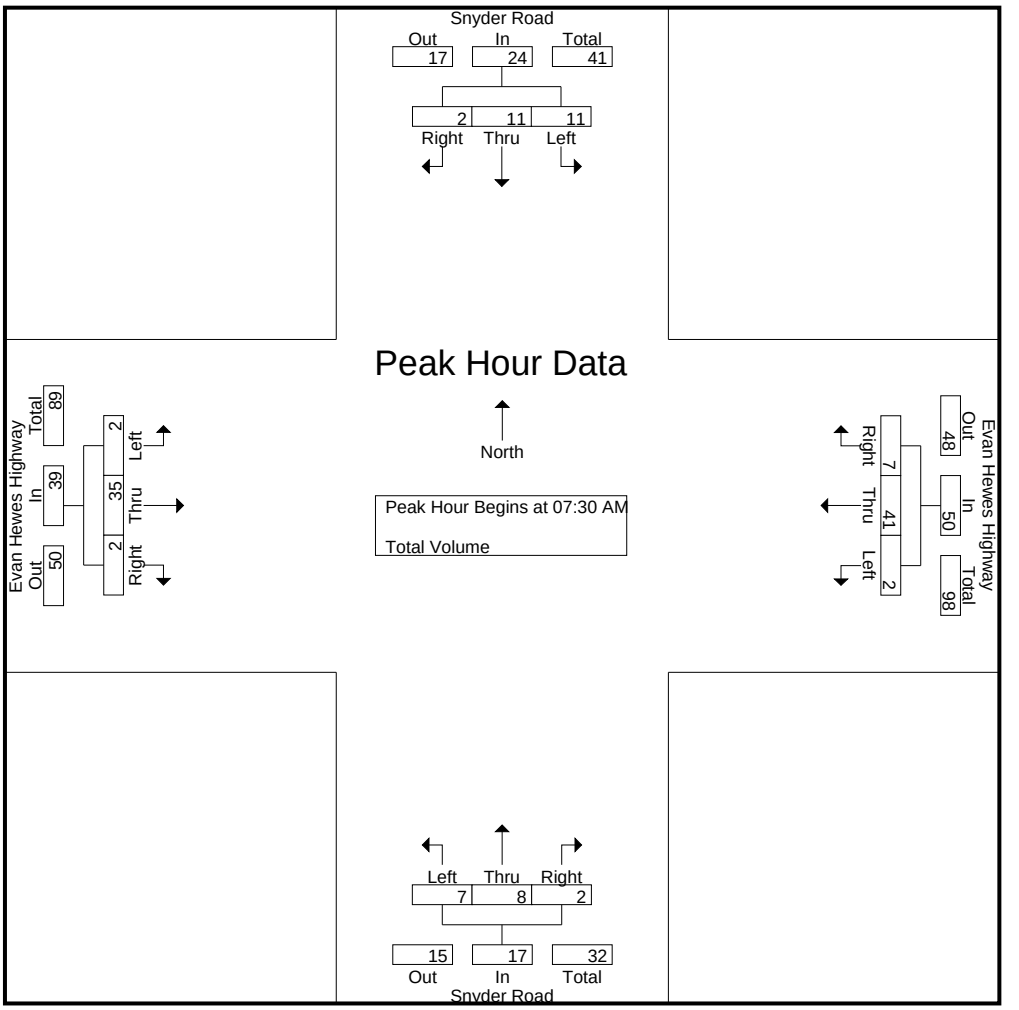
County of Imperial
N/S: Snyder Road
E/W: Evan Hewes Highway (SR-115)
Weather: Clear

File Name : 05_CIM_Snyder_Even AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	**4**	0	**2**	6	0	9	3	12	**2**	**8**	0	**10**	**2**	3	**1**	6
+15 mins.	2	3	0	5	0	4	**5**	9	1	0	**2**	3	1	**12**	1	**14**
+30 mins.	4	2	1	**7**	0	**15**	5	**20**	0	4	1	5	1	9	1	11
+45 mins.	2	**4**	1	7	0	9	0	9	1	1	0	2	0	9	0	9
Total Volume	12	9	4	25	0	37	13	50	4	13	3	20	4	33	3	40
% App. Total	48	36	16		0	74	26		20	65	15		10	82.5	7.5	
PHF	.750	.563	.500	.893	.000	.617	.650	.625	.500	.406	.375	.500	.500	.688	.750	.714

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County of Imperial
N/S: Snyder Road
E/W: Evan Hewes Highway (SR-115)
Weather: Clear

File Name : 05_CIM_Snyder_Even PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Snyder Road Southbound				Evan Hewes Highway Westbound				Snyder Road Northbound				Evan Hewes Highway 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
04:00 PM	0	0	4	4	0	8	3	11	4	2	0	6	1	18	0	19	40
04:15 PM	2	1	0	3	0	13	0	13	0	2	0	2	1	9	1	11	29
04:30 PM	2	1	2	5	0	5	5	10	0	1	0	1	5	16	0	21	37
04:45 PM	1	2	1	4	0	9	0	9	0	1	0	1	0	9	0	9	23
Total	5	4	7	16	0	35	8	43	4	6	0	10	7	52	1	60	129
05:00 PM	0	0	0	0	0	9	3	12	0	0	0	0	0	17	0	17	29
05:15 PM	2	0	1	3	0	11	1	12	1	0	0	1	1	11	2	14	30
05:30 PM	3	2	2	7	0	10	2	12	0	0	0	0	2	13	0	15	34
05:45 PM	0	0	1	1	0	8	0	8	0	0	1	1	0	1	1	2	12
Total	5	2	4	11	0	38	6	44	1	0	1	2	3	42	3	48	105
Grand Total	10	6	11	27	0	73	14	87	5	6	1	12	10	94	4	108	234
Apprch %	37	22.2	40.7		0	83.9	16.1		41.7	50	8.3		9.3	87	3.7		
Total %	4.3	2.6	4.7	11.5	0	31.2	6	37.2	2.1	2.6	0.4	5.1	4.3	40.2	1.7	46.2	

	Snyder Road Southbound				Evan Hewes Highway Westbound				Snyder Road Northbound				Evan Hewes Highway 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	**4**	4	0	8	3	11	**4**	**2**	0	**6**	1	**18**	0	19	**40**
04:15 PM	**2**	1	0	3	0	**13**	0	**13**	0	2	0	2	1	9	**1**	11	29
04:30 PM	2	1	2	**5**	0	5	**5**	10	0	1	0	1	**5**	16	0	**21**	37
04:45 PM	1	**2**	1	4	0	9	0	9	0	1	0	1	0	9	0	9	23
Total Volume	5	4	7	16	0	35	8	43	4	6	0	10	7	52	1	60	129
% App. Total	31.2	25	43.8		0	81.4	18.6		40	60	0		11.7	86.7	1.7		
PHF	.625	.500	.438	.800	.000	.673	.400	.827	.250	.750	.000	.417	.350	.722	.250	.714	.806

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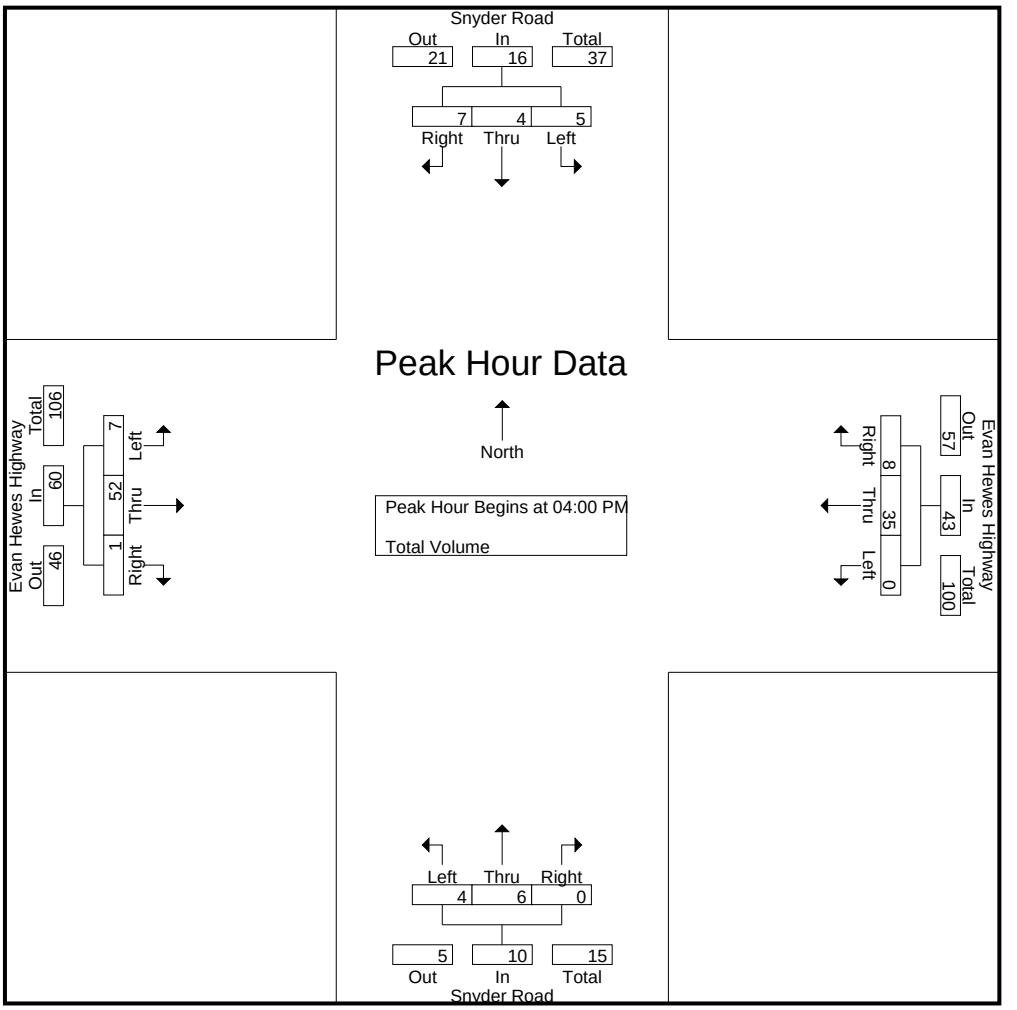
County of Imperial
N/S: Snyder Road
E/W: Evan Hewes Highway (SR-115)
Weather: Clear

File Name : 05_CIM_Snyder_Even PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				04:00 PM				04:30 PM			
+0 mins.	0	0	**4**	4	0	9	0	9	**4**	**2**	0	**6**	**5**	16	0	**21**
+15 mins.	**2**	1	0	3	0	9	**3**	**12**	0	2	0	2	0	9	0	9
+30 mins.	2	1	2	**5**	0	**11**	1	12	0	1	0	1	0	**17**	0	17
+45 mins.	1	**2**	1	4	0	10	2	12	0	1	0	1	1	11	**2**	14
Total Volume	5	4	7	16	0	39	6	45	4	6	0	10	6	53	2	61
% App. Total	31.2	25	43.8		0	86.7	13.3		40	60	0		9.8	86.9	3.3	
PHF	.625	.500	.438	.800	.000	.886	.500	.938	.250	.750	.000	.417	.300	.779	.250	.726

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County of Imperial
N/S: Evan Hewes Highway (SR-115)
E/W: Nelson Pit Road
Weather: Clear

File Name : 08_CIM_Evan_Nelson AM
Site Code : 99920467
Start Date : 12/18/2020

Groups Printed- Total Volume

	Evan Hewes Highway Southbound				Nelson Pit Road Westbound				Evan Hewes Highway Northbound				Nelson Pit Road 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
07:00 AM	0	6	0	6	0	0	0	0	0	13	0	13	0	0	0	0	19
07:15 AM	0	7	0	7	0	0	0	0	1	9	0	10	0	1	0	1	18
07:30 AM	0	11	0	11	0	0	0	0	0	16	0	16	0	0	0	0	27
07:45 AM	1	13	0	14	0	0	0	0	0	10	0	10	0	0	1	1	25
Total	1	37	0	38	0	0	0	0	1	48	0	49	0	1	1	2	89
08:00 AM	0	11	0	11	0	0	0	0	0	11	0	11	0	0	0	0	22
08:15 AM	0	6	0	6	0	0	0	0	0	10	0	10	0	0	0	0	16
08:30 AM	0	9	0	9	0	0	0	0	0	7	0	7	0	0	0	0	16
08:45 AM	0	8	0	8	0	0	0	0	0	5	0	5	0	0	0	0	13
Total	0	34	0	34	0	0	0	0	0	33	0	33	0	0	0	0	67
Grand Total	1	71	0	72	0	0	0	0	1	81	0	82	0	1	1	2	156
Apprch %	1.4	98.6	0		0	0	0		1.2	98.8	0		0	50	50		
Total %	0.6	45.5	0	46.2	0	0	0	0	0.6	51.9	0	52.6	0	0.6	0.6	1.3	

	Evan Hewes Highway Southbound				Nelson Pit Road Westbound				Evan Hewes Highway Northbound				Nelson Pit Road 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	7	0	7	0	0	0	0	**1**	9	0	10	0	**1**	0	**1**	18
07:30 AM	0	11	0	11	0	0	0	0	0	**16**	0	**16**	0	0	0	0	**27**
07:45 AM	**1**	**13**	0	**14**	0	0	0	0	0	10	0	10	0	0	**1**	1	25
08:00 AM	0	11	0	11	0	0	0	0	0	11	0	11	0	0	0	0	22
Total Volume	1	42	0	43	0	0	0	0	1	46	0	47	0	1	1	2	92
% App. Total	2.3	97.7	0		0	0	0		2.1	97.9	0		0	50	50		
PHF	.250	.808	.000	.768	.000	.000	.000	.000	.250	.719	.000	.734	.000	.250	.250	.500	.852

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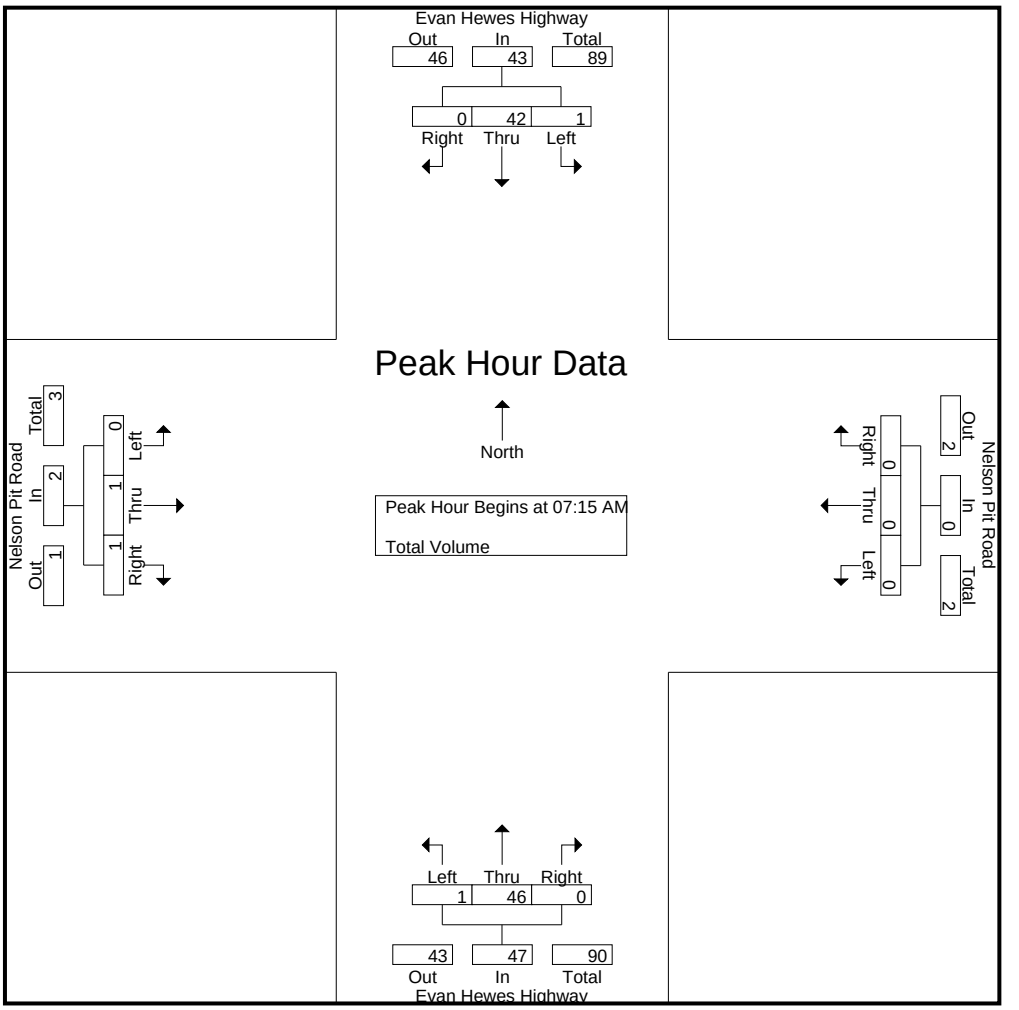
County of Imperial
N/S: Evan Hewes Highway (SR-115)
E/W: Nelson Pit Road
Weather: Clear

File Name : 08_CIM_Evan_Nelson AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	7	0	7	0	0	0	0	0	13	0	13	0	0	0	0
+15 mins.	0	11	0	11	0	0	0	0	**1**	9	0	10	0	**1**	0	**1**
+30 mins.	**1**	**13**	0	**14**	0	0	0	0	0	**16**	0	**16**	0	0	0	0
+45 mins.	0	11	0	11	0	0	0	0	0	10	0	10	0	0	**1**	1
Total Volume	1	42	0	43	0	0	0	0	1	48	0	49	0	1	1	2
% App. Total	2.3	97.7	0		0	0	0		2	98	0		0	50	50	
PHF	.250	.808	.000	.768	.000	.000	.000	.000	.250	.750	.000	.766	.000	.250	.250	.500

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County of Imperial
N/S: Evan Hewes Highway (SR-115)
E/W: Nelson Pit Road
Weather: Clear

File Name : 08_CIM_Evan_Nelson PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Evan Hewes Highway Southbound				Nelson Pit Road Westbound				Evan Hewes Highway Northbound				Nelson Pit Road 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
04:00 PM	0	18	0	18	0	0	0	0	0	7	0	7	0	0	0	0	25
04:15 PM	0	12	0	12	0	0	0	0	0	12	0	12	0	0	0	0	24
04:30 PM	0	8	0	8	0	0	0	0	0	12	0	12	0	0	0	0	20
04:45 PM	0	10	0	10	0	0	0	0	0	7	0	7	0	1	0	1	18
Total	0	48	0	48	0	0	0	0	0	38	0	38	0	1	0	1	87
05:00 PM	0	12	0	12	0	0	0	0	0	10	0	10	0	0	0	0	22
05:15 PM	0	9	0	9	0	0	0	0	0	12	0	12	0	0	0	0	21
05:30 PM	0	13	0	13	0	0	0	0	0	12	0	12	0	0	0	0	25
05:45 PM	0	1	0	1	0	0	0	0	0	5	0	5	0	0	0	0	6
Total	0	35	0	35	0	0	0	0	0	39	0	39	0	0	0	0	74
Grand Total	0	83	0	83	0	0	0	0	0	77	0	77	0	1	0	1	161
Apprch %	0	100	0		0	0	0		0	100	0		0	100	0		
Total %	0	51.6	0	51.6	0	0	0	0	0	47.8	0	47.8	0	0.6	0	0.6	

	Evan Hewes Highway Southbound				Nelson Pit Road Westbound				Evan Hewes Highway Northbound				Nelson Pit Road 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**18**	0	**18**	0	0	0	0	0	7	0	7	0	0	0	0	**25**
04:15 PM	0	12	0	12	0	0	0	0	0	**12**	0	**12**	0	0	0	0	24
04:30 PM	0	8	0	8	0	0	0	0	0	12	0	12	0	0	0	0	20
04:45 PM	0	10	0	10	0	0	0	0	0	7	0	7	0	**1**	0	**1**	18
Total Volume	0	48	0	48	0	0	0	0	0	38	0	38	0	1	0	1	87
% App. Total	0	100	0		0	0	0		0	100	0		0	100	0		
PHF	.000	.667	.000	.667	.000	.000	.000	.000	.000	.792	.000	.792	.000	.250	.000	.250	.870

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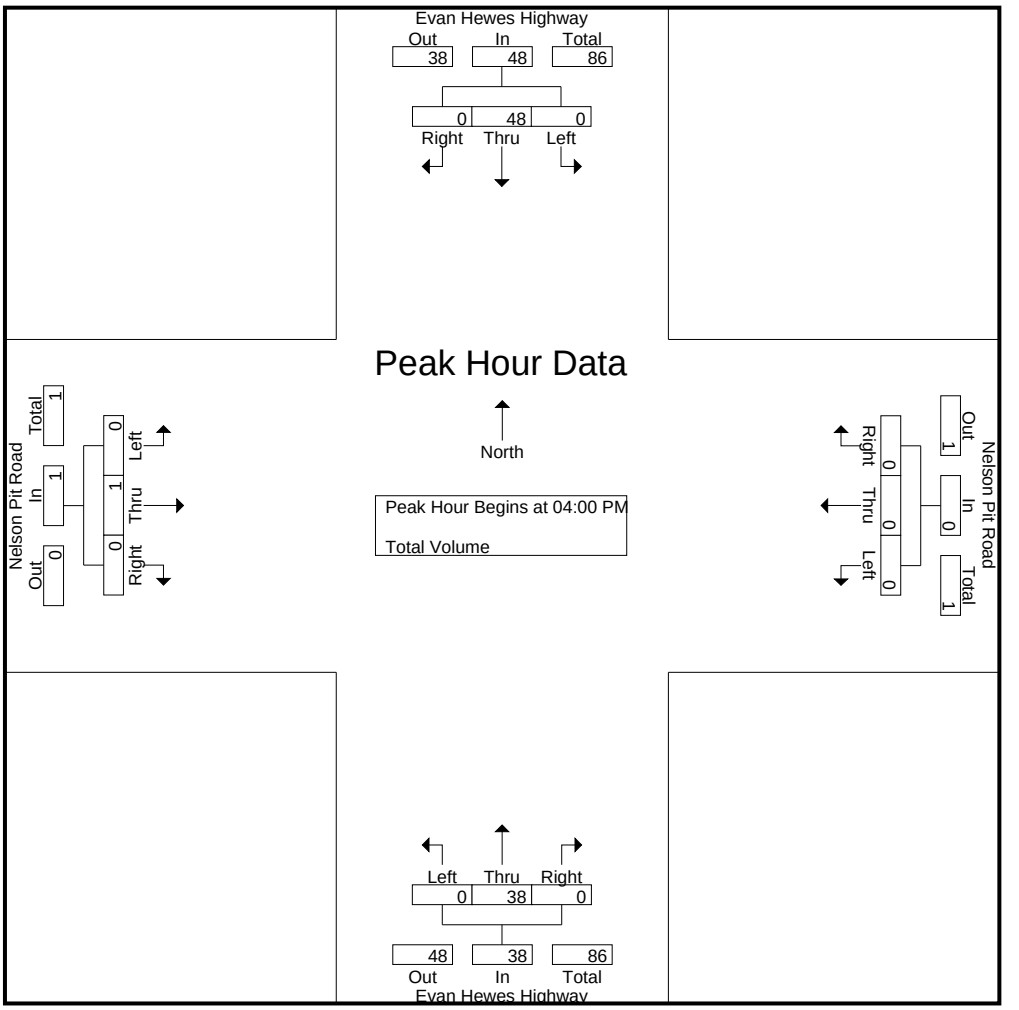
County of Imperial
N/S: Evan Hewes Highway (SR-115)
E/W: Nelson Pit Road
Weather: Clear

File Name : 08_CIM_Evan_Nelson PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:15 PM				04:00 PM			
+0 mins.	0	**18**	0	**18**	0	0	0	0	0	**12**	0	**12**	0	0	0	0
+15 mins.	0	12	0	12	0	0	0	0	0	12	0	12	0	0	0	0
+30 mins.	0	8	0	8	0	0	0	0	0	7	0	7	0	0	0	0
+45 mins.	0	10	0	10	0	0	0	0	0	10	0	10	0	**1**	0	**1**
Total Volume	0	48	0	48	0	0	0	0	0	41	0	41	0	1	0	1
% App. Total	0	100	0		0	0	0		0	100	0		0	100	0	
PHF	.000	.667	.000	.667	.000	.000	.000	.000	.000	.854	.000	.854	.000	.250	.000	.250

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County of Imperial
N/S: Fust Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 16_CIM_Fust_Nelson AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Fust Road Southbound				Nelson Pit Road Westbound				Fust Road Northbound				Nelson Pit Road 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
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
07:45 AM	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	2	3
Total	0	0	0	0	1	1	0	2	0	0	1	1	1	2	0	3	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
08:45 AM	0	1	0	1	0	0	1	1	0	0	1	1	0	0	0	0	3
Total	0	1	0	1	0	0	1	1	0	0	1	1	0	1	0	1	4
Grand Total	0	1	0	1	1	1	1	3	0	0	2	2	1	3	0	4	10
Apprch %	0	100	0		33.3	33.3	33.3		0	0	100		25	75	0		
Total %	0	10	0	10	10	10	10	30	0	0	20	20	10	30	0	40	

	Fust Road Southbound				Nelson Pit Road Westbound				Fust Road Northbound				Nelson Pit Road 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 07:00 AM to 08:45 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	0	0	0	0
07:15 AM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	**1**	0	1	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	1
07:45 AM	0	0	0	0	**1**	0	0	1	0	0	0	0	**1**	1	0	**2**	**3**
Total Volume	0	0	0	0	1	1	0	2	0	0	1	1	1	2	0	3	6
% App. Total	0	0	0		50	50	0		0	0	100		33.3	66.7	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.500	.000	.000	.250	.250	.250	.500	.000	.375	.500

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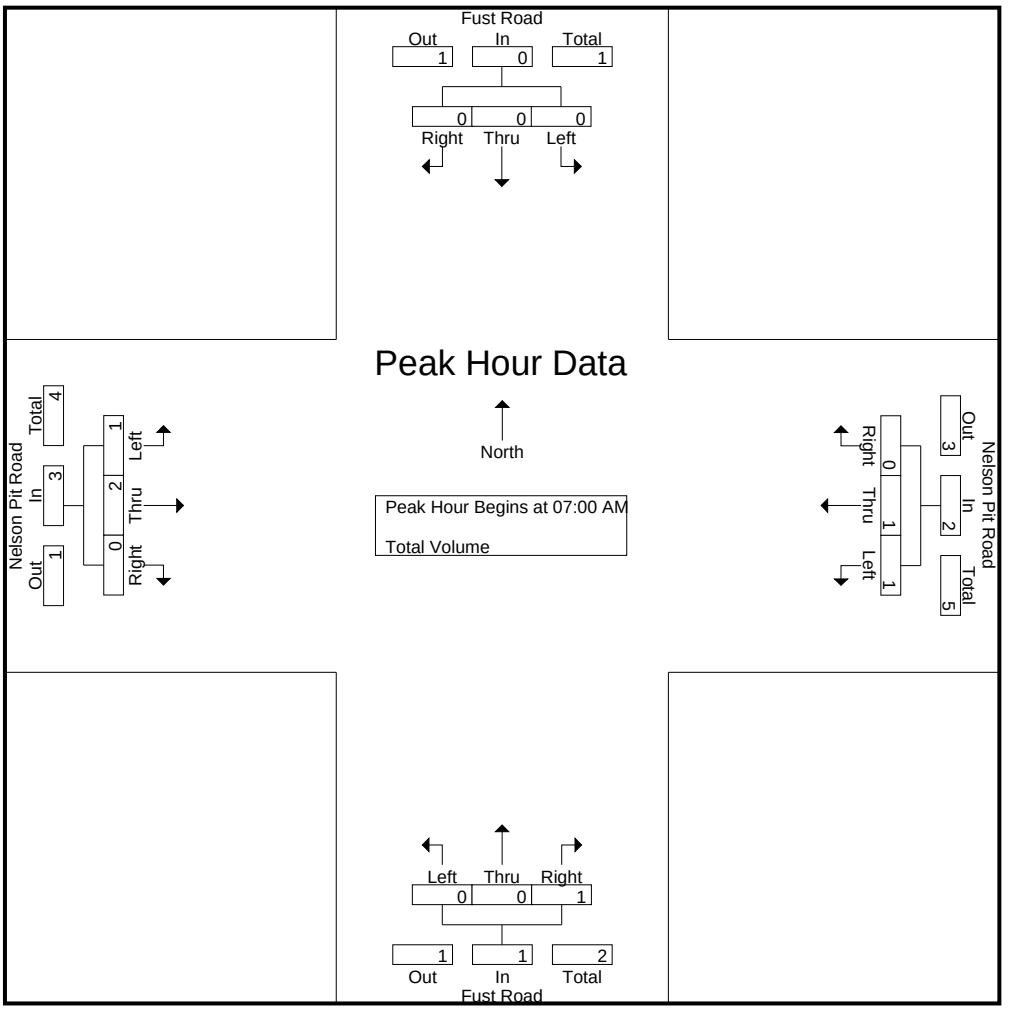
County of Imperial
N/S: Fust Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 16_CIM_Fust_Nelson AM
Site Code : 99920467
Start Date : 12/18/2020



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	**1**	0	1
+30 mins.	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0
+45 mins.	0	**1**	0	**1**	**1**	0	0	1	0	0	0	0	**1**	1	0	**2**
Total Volume	0	1	0	1	1	1	0	2	0	0	1	1	1	2	0	3
% App. Total	0	100	0		50	50	0		0	0	100		33.3	66.7	0	
PHF	.000	.250	.000	.250	.250	.250	.000	.500	.000	.000	.250	.250	.250	.500	.000	.375

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County of Imperial
N/S: Fust Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 16_CIM_Fust_Nelson PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Fust Road Southbound				Nelson Pit Road Westbound				Fust Road Northbound				Nelson Pit Road 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
04:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	3
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	1	1	2	0	0	1	1	0	1	0	1	4
Apprch %	0	0	0		0	50	50		0	0	100		0	100	0		
Total %	0	0	0	0	0	25	25	50	0	0	25	25	0	25	0	25	

	Fust Road Southbound				Nelson Pit Road Westbound				Fust Road Northbound				Nelson Pit Road 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	**1**
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	1
Total Volume	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	3
% App. Total	0	0	0		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.250	.250	.000	.250	.000	.250	.750

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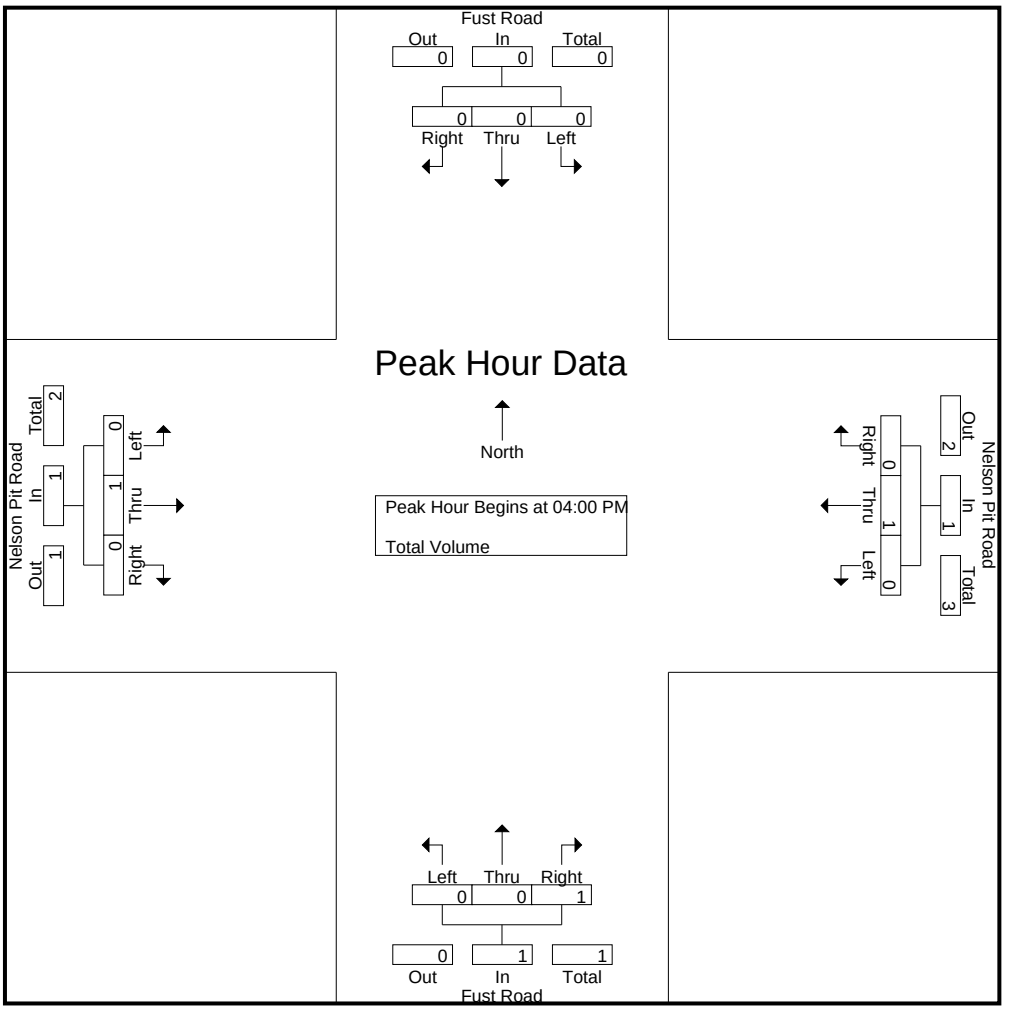
County of Imperial
N/S: Fust Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 16_CIM_Fust_Nelson PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**
Total Volume	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1
% App. Total	0	0	0		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.250	.250	.000	.250	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
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County of Imperial
N/S: Miller Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 07_CIM_Miller_Nelson AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Miller Road Southbound				Nelson Pit Road Westbound				Miller Road Northbound				Nelson Pit Road 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
07:00 AM	0	1	0	1	0	0	0	0	0	3	0	3	0	0	0	0	4
07:15 AM	0	2	1	3	0	1	0	1	0	2	1	3	0	1	0	1	8
07:30 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
07:45 AM	0	1	1	2	0	0	0	0	0	8	3	11	1	0	0	1	14
Total	0	4	2	6	0	1	0	1	0	16	4	20	1	1	0	2	29
08:00 AM	1	2	0	3	1	0	0	1	0	3	0	3	0	1	0	1	8
08:15 AM	0	5	0	5	0	0	0	0	0	1	1	2	0	0	0	0	7
08:30 AM	0	2	0	2	0	0	0	0	0	4	0	4	0	0	0	0	6
08:45 AM	2	2	0	4	2	0	0	2	0	4	0	4	0	0	1	1	11
Total	3	11	0	14	3	0	0	3	0	12	1	13	0	1	1	2	32
Grand Total	3	15	2	20	3	1	0	4	0	28	5	33	1	2	1	4	61
Apprch %	15	75	10		75	25	0		0	84.8	15.2		25	50	25		
Total %	4.9	24.6	3.3	32.8	4.9	1.6	0	6.6	0	45.9	8.2	54.1	1.6	3.3	1.6	6.6	

	Miller Road Southbound				Nelson Pit Road Westbound				Miller Road Northbound				Nelson Pit Road 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	1	**1**	2	0	0	0	0	0	**8**	**3**	**11**	**1**	0	0	**1**	**14**
08:00 AM	**1**	2	0	3	**1**	0	0	**1**	0	3	0	3	0	**1**	0	1	8
08:15 AM	0	**5**	0	**5**	0	0	0	0	0	1	1	2	0	0	0	0	7
08:30 AM	0	2	0	2	0	0	0	0	0	4	0	4	0	0	0	0	6
Total Volume	1	10	1	12	1	0	0	1	0	16	4	20	1	1	0	2	35
% App. Total	8.3	83.3	8.3		100	0	0		0	80	20		50	50	0		
PHF	.250	.500	.250	.600	.250	.000	.000	.250	.000	.500	.333	.455	.250	.250	.000	.500	.625

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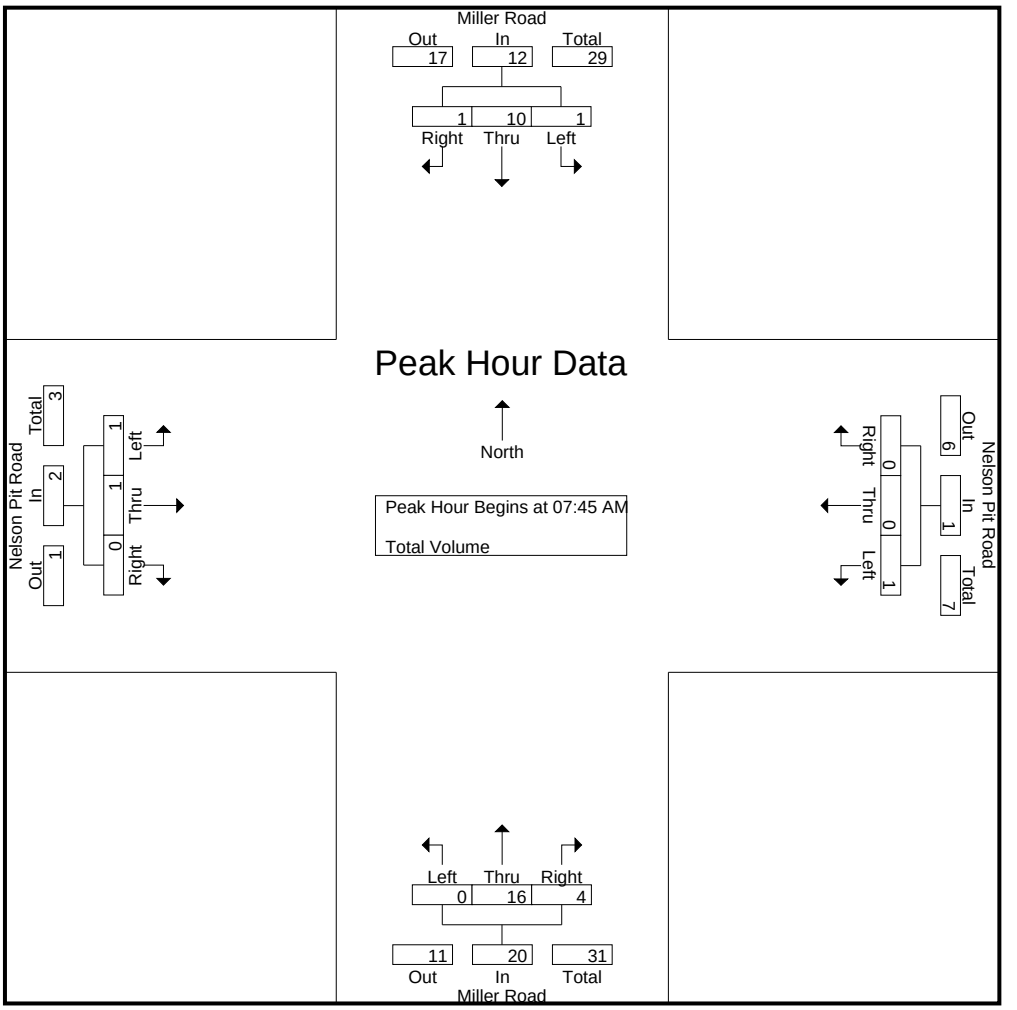
County of Imperial
N/S: Miller Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 07_CIM_Miller_Nelson AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				07:00 AM				07:15 AM			
+0 mins.	1	2	0	3	1	0	0	1	0	3	0	3	0	**1**	0	**1**
+15 mins.	0	**5**	0	**5**	0	0	0	0	0	2	1	3	0	0	0	0
+30 mins.	0	2	0	2	0	0	0	0	0	3	0	3	**1**	0	0	1
+45 mins.	**2**	2	0	4	**2**	0	0	**2**	0	**8**	**3**	**11**	0	1	0	1
Total Volume	3	11	0	14	3	0	0	3	0	16	4	20	1	2	0	3
% App. Total	21.4	78.6	0		100	0	0		0	80	20		33.3	66.7	0	
PHF	.375	.550	.000	.700	.375	.000	.000	.375	.000	.500	.333	.455	.250	.500	.000	.750

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County of Imperial
N/S: Miller Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 07_CIM_Miller_Nelson PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Miller Road Southbound				Nelson Pit Road Westbound				Miller Road Northbound				Nelson Pit Road 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
04:00 PM	0	2	0	2	0	0	1	1	0	2	0	2	0	0	0	0	5
04:15 PM	1	2	0	3	0	0	1	1	0	0	0	0	0	0	0	0	4
04:30 PM	0	4	0	4	0	0	0	0	0	1	0	1	0	0	0	0	5
04:45 PM	0	0	0	0	1	0	1	2	1	1	0	2	0	1	0	1	5
Total	1	8	0	9	1	0	3	4	1	4	0	5	0	1	0	1	19
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
05:15 PM	1	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
05:30 PM	1	1	0	2	0	0	1	1	0	0	0	0	0	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	2	1	0	3	0	0	1	1	0	2	0	2	0	0	1	1	7
Grand Total	3	9	0	12	1	0	4	5	1	6	0	7	0	1	1	2	26
Apprch %	25	75	0		20	0	80		14.3	85.7	0		0	50	50		
Total %	11.5	34.6	0	46.2	3.8	0	15.4	19.2	3.8	23.1	0	26.9	0	3.8	3.8	7.7	

	Miller Road Southbound				Nelson Pit Road Westbound				Miller Road Northbound				Nelson Pit Road 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	2	0	2	0	0	**1**	1	0	**2**	0	**2**	0	0	0	0	**5**
04:15 PM	**1**	2	0	3	0	0	1	1	0	0	0	0	0	0	0	0	4
04:30 PM	0	**4**	0	**4**	0	0	0	0	0	1	0	1	0	0	0	0	5
04:45 PM	0	0	0	0	**1**	0	1	**2**	**1**	1	0	2	0	**1**	0	**1**	5
Total Volume	1	8	0	9	1	0	3	4	1	4	0	5	0	1	0	1	19
% App. Total	11.1	88.9	0		25	0	75		20	80	0		0	100	0		
PHF	.250	.500	.000	.563	.250	.000	.750	.500	.250	.500	.000	.625	.000	.250	.000	.250	.950

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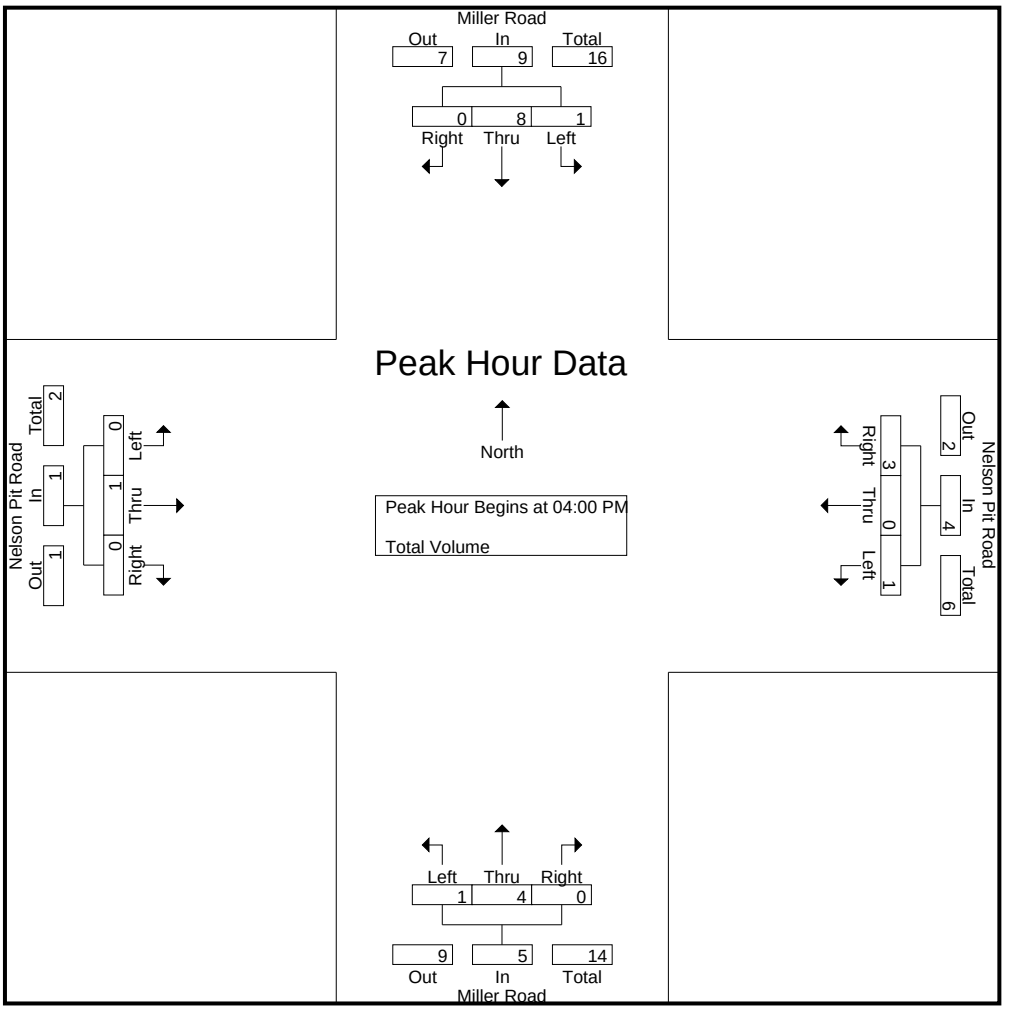
County of Imperial
N/S: Miller Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 07_CIM_Miller_Nelson PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:15 PM			
+0 mins.	0	2	0	2	0	0	**1**	1	0	**2**	0	**2**	0	0	0	0
+15 mins.	**1**	2	0	3	0	0	1	1	0	0	0	0	0	0	0	0
+30 mins.	0	**4**	0	**4**	0	0	0	0	0	1	0	1	0	**1**	0	**1**
+45 mins.	0	0	0	0	**1**	0	1	**2**	**1**	1	0	2	0	0	**1**	1
Total Volume	1	8	0	9	1	0	3	4	1	4	0	5	0	1	1	2
% App. Total	11.1	88.9	0		25	0	75		20	80	0		0	50	50	
PHF	.250	.500	.000	.563	.250	.000	.750	.500	.250	.500	.000	.625	.000	.250	.250	.500

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County of Imperial
N/S: Graeser Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 04_CIM_Graeser_Nelson AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Graeser Road Southbound				Nelson Pit Road Westbound				Graeser Road Northbound				Nelson Pit Road 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
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	2	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	4	0	4	5
08:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	2	0	2	0	0	0	0	0	3	0	3	5
Grand Total	0	0	0	0	0	3	0	3	0	0	0	0	0	7	0	7	10
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0		
Total %	0	0	0	0	0	30	0	30	0	0	0	0	0	70	0	70	

	Graeser Road Southbound				Nelson Pit Road Westbound				Graeser Road Northbound				Nelson Pit Road 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	**2**	0	**2**	**3**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
08:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Total Volume	0	0	0	0	0	2	0	2	0	0	0	0	0	5	0	5	7
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.625	.000	.625	.583

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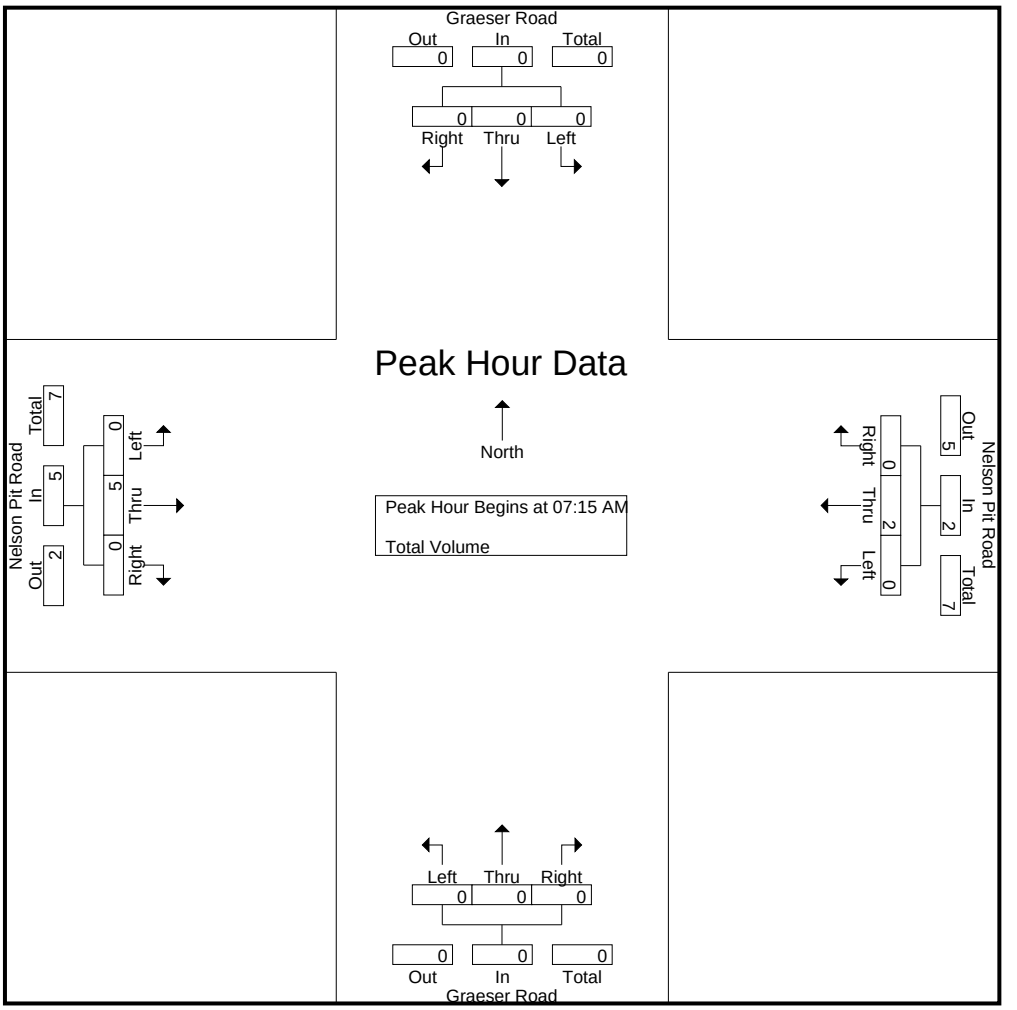
County of Imperial
N/S: Graeser Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 04_CIM_Graeser_Nelson AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:00 AM				07:15 AM			
+0 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	**2**	0	**2**
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	2	0	2	0	0	0	0	0	5	0	5
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.625	.000	.625

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County of Imperial
N/S: Graeser Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 04_CIM_Graeser_Nelson PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Graeser Road Southbound				Nelson Pit Road Westbound				Graeser Road Northbound				Nelson Pit Road 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
04:00 PM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
Total	0	1	1	2	0	3	0	3	0	0	0	0	0	1	0	1	6
05:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	2	0	0	0	0	0	3	0	3	5
Grand Total	0	1	1	2	1	4	0	5	0	0	0	0	0	4	0	4	11
Apprch %	0	50	50		20	80	0		0	0	0		0	100	0		
Total %	0	9.1	9.1	18.2	9.1	36.4	0	45.5	0	0	0	0	0	36.4	0	36.4	

	Graeser Road Southbound				Nelson Pit Road Westbound				Graeser Road Northbound				Nelson Pit Road 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	0	0	0	**2**
05:00 PM	0	0	0	0	**1**	0	0	1	0	0	0	0	0	**1**	0	**1**	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Total Volume	0	0	0	0	1	3	0	4	0	0	0	0	0	3	0	3	7
% App. Total	0	0	0		25	75	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.250	.375	.000	.500	.000	.000	.000	.000	.000	.750	.000	.750	.875

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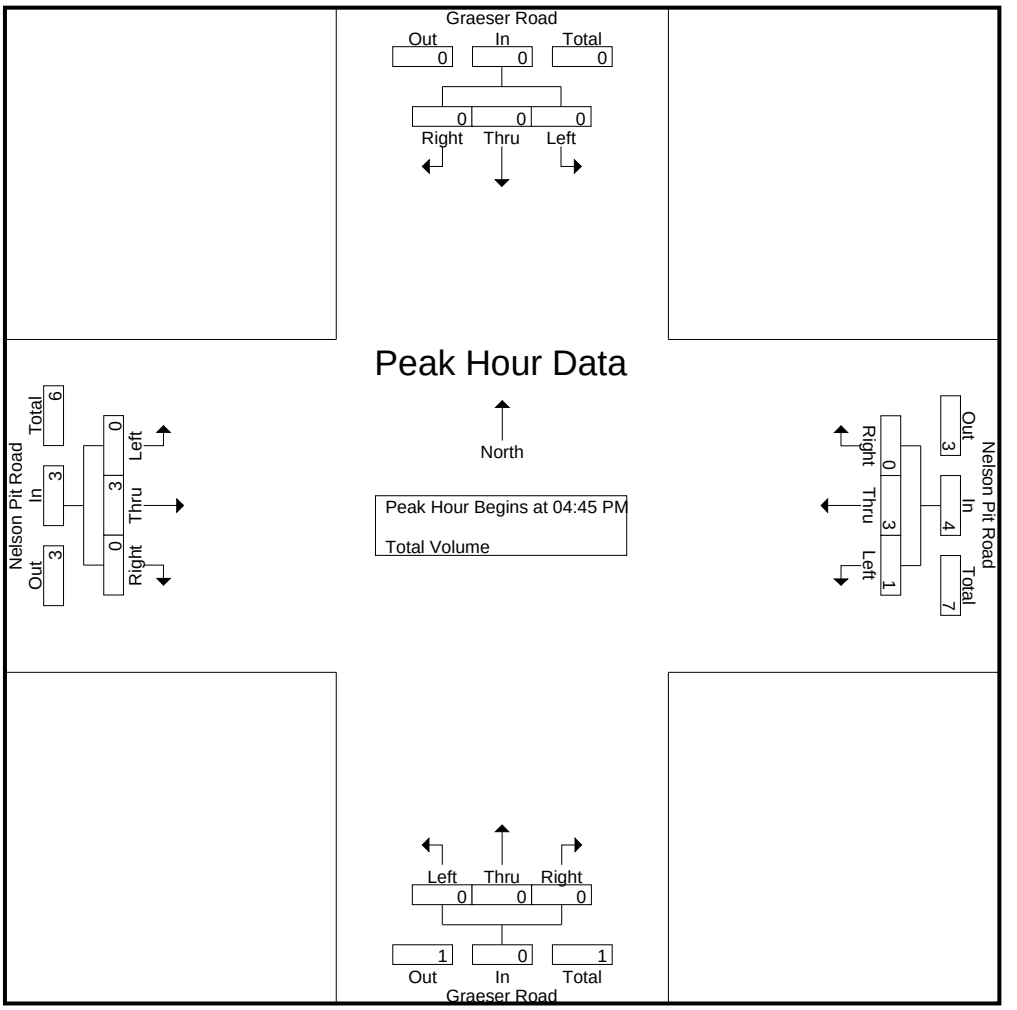
County of Imperial
N/S: Graeser Road
E/W: Nelson Pit Road
Weather: Clear

File Name : 04_CIM_Graeser_Nelson PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:00 PM				04:45 PM			
+0 mins.	0	**1**	**1**	**2**	0	1	0	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**
+30 mins.	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	**1**	0	0	1	0	0	0	0	0	1	0	1
Total Volume	0	1	1	2	1	3	0	4	0	0	0	0	0	3	0	3
% App. Total	0	50	50		25	75	0		0	0	0		0	100	0	
PHF	.000	.250	.250	.250	.250	.375	.000	.500	.000	.000	.000	.000	.000	.750	.000	.750

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County of Imperial
N/S: Snyder Road/Bonds Corner Road
E/W: Walnut Avenue/Ogier Road
Weather: Clear

File Name : 03_CIM_Snyder_Walnut AM
Site Code : 99920467
Start Date : 12/18/2020

Groups Printed- Total Volume

	Snyder Road Southbound				Ogier Road Westbound				Bonds Corner Road Northbound				Walnut Avenue 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
07:00 AM	0	2	0	2	1	0	0	1	2	9	0	11	0	1	4	5	19
07:15 AM	2	2	1	5	0	0	0	0	3	2	0	5	1	0	4	5	15
07:30 AM	1	0	1	2	0	0	0	0	1	6	0	7	0	0	5	5	14
07:45 AM	0	2	1	3	0	0	0	0	1	1	3	5	0	1	4	5	13
Total	3	6	3	12	1	0	0	1	7	18	3	28	1	2	17	20	61
08:00 AM	1	5	1	7	0	2	1	3	4	3	0	7	1	0	2	3	20
08:15 AM	0	2	0	2	0	1	0	1	2	3	0	5	0	1	6	7	15
08:30 AM	0	3	0	3	0	0	0	0	5	4	2	11	0	0	2	2	16
08:45 AM	0	6	0	6	1	1	0	2	3	5	1	9	0	1	4	5	22
Total	1	16	1	18	1	4	1	6	14	15	3	32	1	2	14	17	73
Grand Total	4	22	4	30	2	4	1	7	21	33	6	60	2	4	31	37	134
Apprch %	13.3	73.3	13.3		28.6	57.1	14.3		35	55	10		5.4	10.8	83.8		
Total %	3	16.4	3	22.4	1.5	3	0.7	5.2	15.7	24.6	4.5	44.8	1.5	3	23.1	27.6	

	Snyder Road Southbound				Ogier Road Westbound				Bonds Corner Road Northbound				Walnut Avenue 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	**1**	5	**1**	**7**	0	**2**	**1**	**3**	4	3	0	7	**1**	0	2	3	20
08:15 AM	0	2	0	2	0	1	0	1	2	3	0	5	0	**1**	**6**	**7**	15
08:30 AM	0	3	0	3	0	0	0	0	**5**	4	**2**	**11**	0	0	2	2	16
08:45 AM	0	**6**	0	6	**1**	1	0	2	3	**5**	1	9	0	1	4	5	**22**
Total Volume	1	16	1	18	1	4	1	6	14	15	3	32	1	2	14	17	73
% App. Total	5.6	88.9	5.6		16.7	66.7	16.7		43.8	46.9	9.4		5.9	11.8	82.4		
PHF	.250	.667	.250	.643	.250	.500	.250	.500	.700	.750	.375	.727	.250	.500	.583	.607	.830

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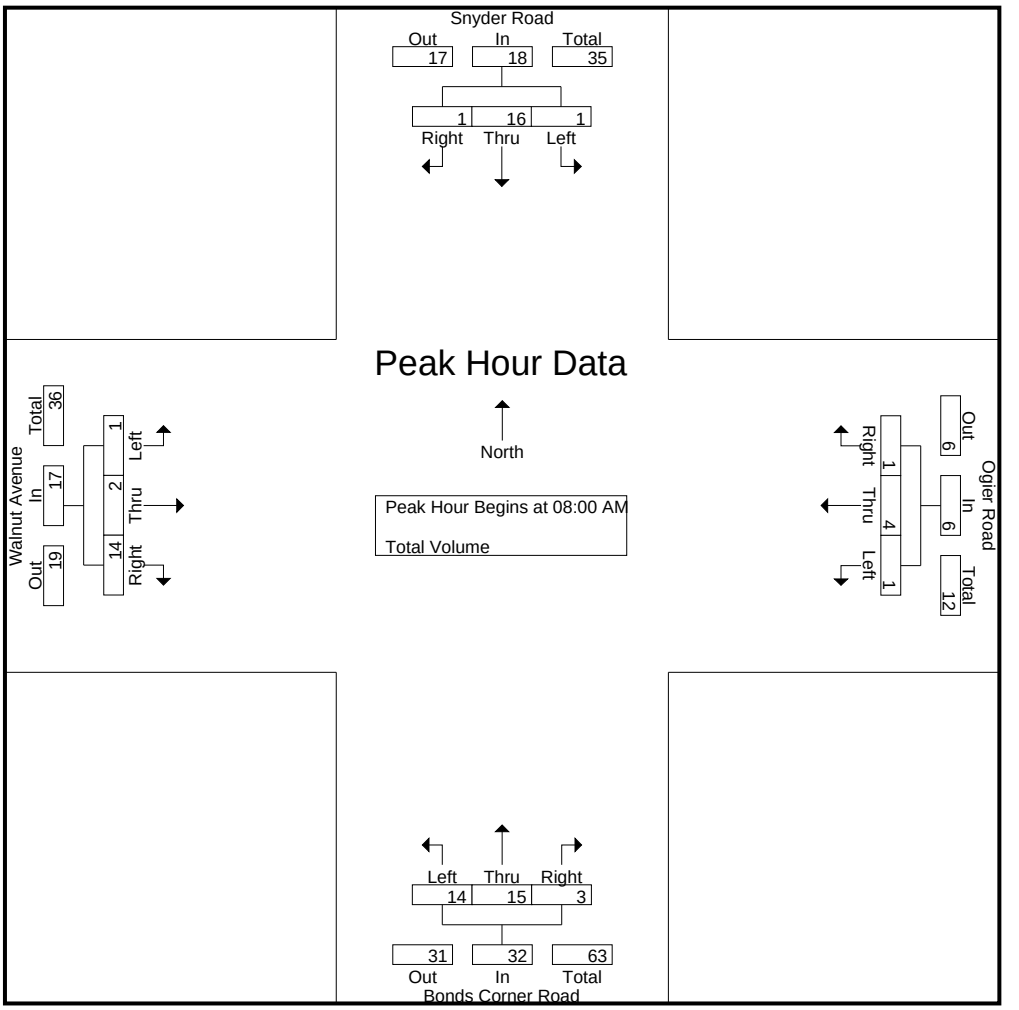
County of Imperial
N/S: Snyder Road/Bonds Corner Road
E/W: Walnut Avenue/Ogier Road
Weather: Clear

File Name : 03_CIM_Snyder_Walnut AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				07:00 AM			
+0 mins.	**1**	5	**1**	**7**	0	**2**	**1**	**3**	4	3	0	7	0	**1**	4	**5**
+15 mins.	0	2	0	2	0	1	0	1	2	3	0	5	**1**	0	4	5
+30 mins.	0	3	0	3	0	0	0	0	**5**	4	**2**	**11**	0	0	**5**	5
+45 mins.	0	**6**	0	6	**1**	1	0	2	3	**5**	1	9	0	1	4	5
Total Volume	1	16	1	18	1	4	1	6	14	15	3	32	1	2	17	20
% App. Total	5.6	88.9	5.6		16.7	66.7	16.7		43.8	46.9	9.4		5	10	85	
PHF	.250	.667	.250	.643	.250	.500	.250	.500	.700	.750	.375	.727	.250	.500	.850	1.000

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County of Imperial
N/S: Snyder Road/Bonds Corner Road
E/W: Walnut Avenue/Ogier Road
Weather: Clear

File Name : 03_CIM_Snyder_Walnut PM
Site Code : 99920467
Start Date : 12/18/2020

Groups Printed- Total Volume

	Snyder Road Southbound				Ogier Road Westbound				Bonds Corner Road Northbound				Walnut Avenue 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
04:00 PM	0	2	0	2	0	4	0	4	10	3	1	14	0	0	1	1	21
04:15 PM	0	1	0	1	1	0	1	2	4	1	0	5	0	1	3	4	12
04:30 PM	0	2	0	2	0	0	0	0	1	2	1	4	1	0	3	4	10
04:45 PM	0	4	1	5	0	0	0	0	4	2	1	7	1	0	4	5	17
Total	0	9	1	10	1	4	1	6	19	8	3	30	2	1	11	14	60
05:00 PM	0	1	0	1	2	0	0	2	0	3	1	4	0	0	0	0	7
05:15 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	1	3	4	10
05:30 PM	0	3	0	3	0	0	0	0	3	2	1	6	0	0	0	0	9
05:45 PM	0	2	0	2	0	0	0	0	0	0	1	1	0	0	0	0	3
Total	0	6	0	6	2	0	0	2	9	5	3	17	0	1	3	4	29
Grand Total	0	15	1	16	3	4	1	8	28	13	6	47	2	2	14	18	89
Apprch %	0	93.8	6.2		37.5	50	12.5		59.6	27.7	12.8		11.1	11.1	77.8		
Total %	0	16.9	1.1	18	3.4	4.5	1.1	9	31.5	14.6	6.7	52.8	2.2	2.2	15.7	20.2	

	Snyder Road Southbound				Ogier Road Westbound				Bonds Corner Road Northbound				Walnut Avenue 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	2	0	2	0	**4**	0	**4**	**10**	**3**	**1**	**14**	0	0	1	1	**21**
04:15 PM	0	1	0	1	**1**	0	**1**	2	4	1	0	5	0	**1**	3	4	12
04:30 PM	0	2	0	2	0	0	0	0	1	2	1	4	**1**	0	3	4	10
04:45 PM	0	**4**	**1**	**5**	0	0	0	0	4	2	1	7	1	0	**4**	**5**	17
Total Volume	0	9	1	10	1	4	1	6	19	8	3	30	2	1	11	14	60
% App. Total	0	90	10		16.7	66.7	16.7		63.3	26.7	10		14.3	7.1	78.6		
PHF	.000	.563	.250	.500	.250	.250	.250	.375	.475	.667	.750	.536	.500	.250	.688	.700	.714

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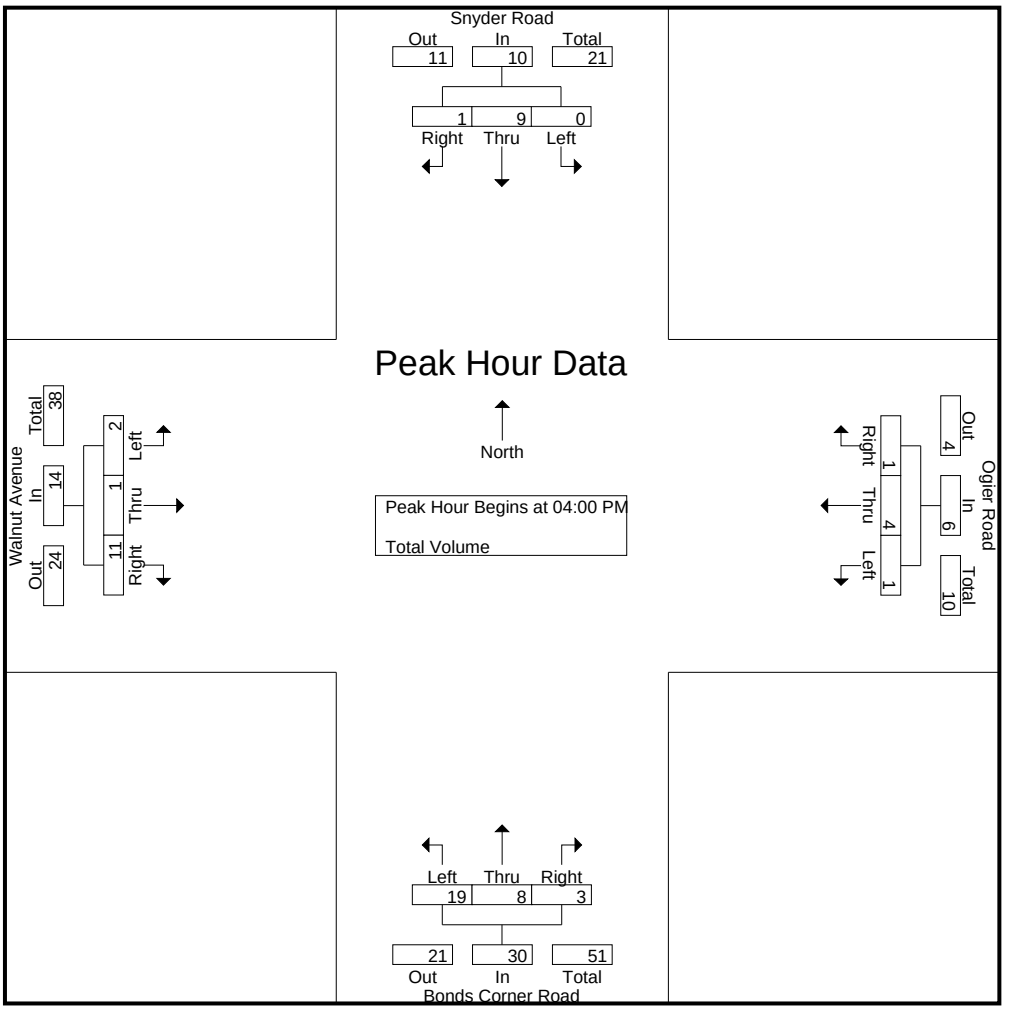
County of Imperial
N/S: Snyder Road/Bonds Corner Road
E/W: Walnut Avenue/Ogier Road
Weather: Clear

File Name : 03_CIM_Snyder_Walnut PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	2	0	2	0	**4**	0	**4**	**10**	**3**	**1**	**14**	0	0	1	1
+15 mins.	0	1	0	1	**1**	0	**1**	2	4	1	0	5	0	**1**	3	4
+30 mins.	0	2	0	2	0	0	0	0	1	2	1	4	**1**	0	3	4
+45 mins.	0	**4**	**1**	**5**	0	0	0	0	4	2	1	7	1	0	**4**	**5**
Total Volume	0	9	1	10	1	4	1	6	19	8	3	30	2	1	11	14
% App. Total	0	90	10		16.7	66.7	16.7		63.3	26.7	10		14.3	7.1	78.6	
PHF	.000	.563	.250	.500	.250	.250	.250	.375	.475	.667	.750	.536	.500	.250	.688	.700

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County of Imperial
N/S: Evan Hewes Highway (SR-115)
E/W: Graeser Road
Weather: Clear

File Name : 06_CIM_Evan_Graeser AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Evan Hewes Highway Southbound				Graeser Road Westbound				Evan Hewes Highway Northbound				Graeser Road 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
07:00 AM	0	2	0	2	0	0	0	0	0	11	0	11	0	0	0	0	13
07:15 AM	0	6	0	6	0	0	0	0	0	13	0	13	0	0	0	0	19
07:30 AM	0	9	0	9	0	0	0	0	0	11	0	11	0	0	0	0	20
07:45 AM	0	9	0	9	0	0	0	0	1	16	0	17	1	0	0	1	27
Total	0	26	0	26	0	0	0	0	1	51	0	52	1	0	0	1	79
08:00 AM	0	10	0	10	0	0	0	0	0	10	0	10	0	0	0	0	20
08:15 AM	1	9	0	10	1	0	0	1	0	8	0	8	0	0	0	0	19
08:30 AM	0	4	0	4	1	0	0	1	0	11	0	11	0	0	1	1	17
08:45 AM	0	6	1	7	0	0	0	0	0	4	0	4	0	0	0	0	11
Total	1	29	1	31	2	0	0	2	0	33	0	33	0	0	1	1	67
Grand Total	1	55	1	57	2	0	0	2	1	84	0	85	1	0	1	2	146
Apprch %	1.8	96.5	1.8		100	0	0		1.2	98.8	0		50	0	50		
Total %	0.7	37.7	0.7	39	1.4	0	0	1.4	0.7	57.5	0	58.2	0.7	0	0.7	1.4	

	Evan Hewes Highway Southbound				Graeser Road Westbound				Evan Hewes Highway Northbound				Graeser Road 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	6	0	6	0	0	0	0	0	13	0	13	0	0	0	0	19
07:30 AM	0	9	0	9	0	0	0	0	0	11	0	11	0	0	0	0	20
07:45 AM	0	9	0	9	0	0	0	0	**1**	**16**	0	**17**	**1**	0	0	**1**	**27**
08:00 AM	0	**10**	0	**10**	0	0	0	0	0	10	0	10	0	0	0	0	20
Total Volume	0	34	0	34	0	0	0	0	1	50	0	51	1	0	0	1	86
% App. Total	0	100	0		0	0	0		2	98	0		100	0	0		
PHF	.000	.850	.000	.850	.000	.000	.000	.000	.250	.781	.000	.750	.250	.000	.000	.250	.796

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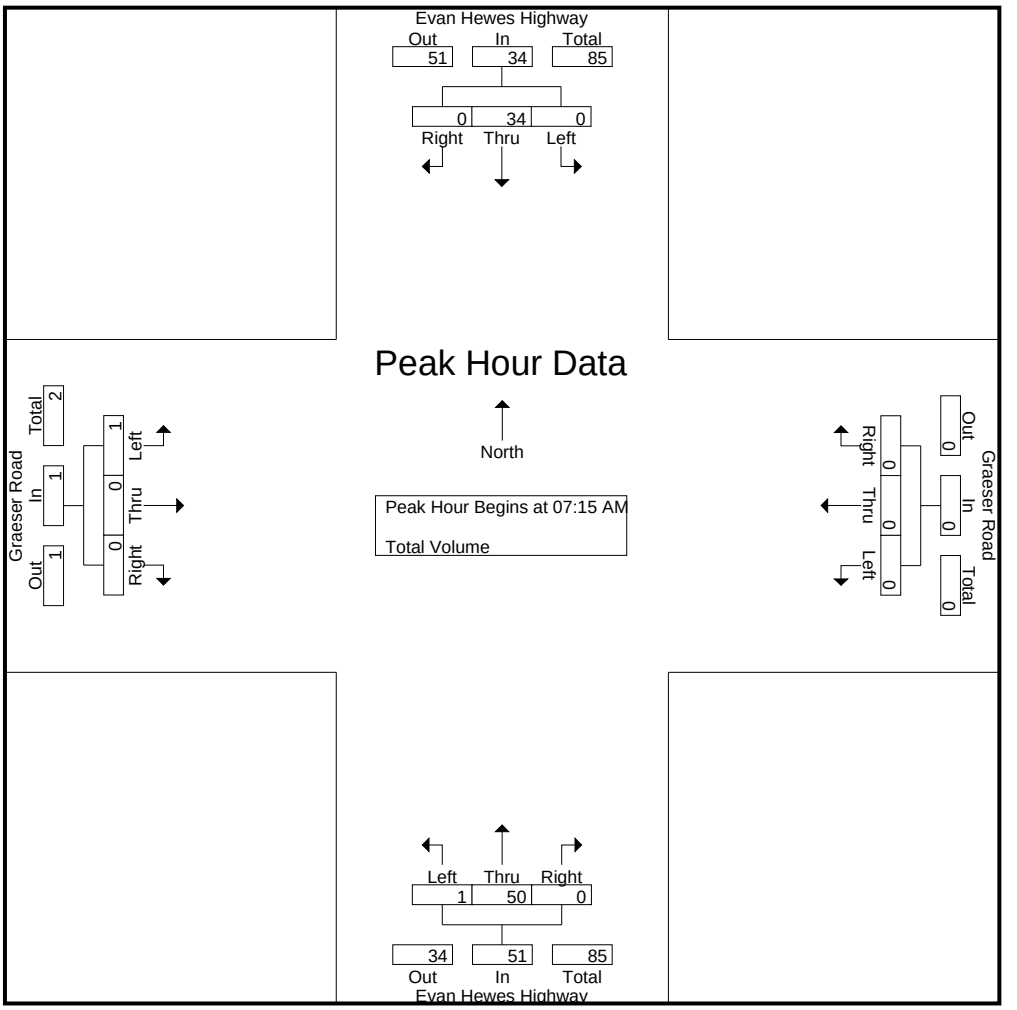
County of Imperial
N/S: Evan Hewes Highway (SR-115)
E/W: Graeser Road
Weather: Clear

File Name : 06_CIM_Evan_Graeser AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:45 AM				07:00 AM				07:45 AM			
+0 mins.	0	9	0	9	0	0	0	0	0	11	0	11	**1**	0	0	**1**
+15 mins.	0	9	0	9	0	0	0	0	0	13	0	13	0	0	0	0
+30 mins.	0	**10**	0	**10**	**1**	0	0	**1**	0	11	0	11	0	0	0	0
+45 mins.	**1**	9	0	10	1	0	0	1	**1**	**16**	0	**17**	0	0	**1**	1
Total Volume	1	37	0	38	2	0	0	2	1	51	0	52	1	0	1	2
% App. Total	2.6	97.4	0		100	0	0		1.9	98.1	0		50	0	50	
PHF	.250	.925	.000	.950	.500	.000	.000	.500	.250	.797	.000	.765	.250	.000	.250	.500

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County of Imperial
N/S: Evan Hewes Highway (SR-115)
E/W: Graeser Road
Weather: Clear

File Name : 06_CIM_Evan_Graeser PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Evan Hewes Highway Southbound				Graeser Road Westbound				Evan Hewes Highway Northbound				Graeser Road 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
04:00 PM	0	18	0	18	0	0	0	0	0	11	0	11	0	0	0	0	29
04:15 PM	0	12	0	12	0	0	0	0	0	9	0	9	0	0	0	0	21
04:30 PM	0	15	0	15	0	0	0	0	0	7	0	7	0	0	0	0	22
04:45 PM	0	15	1	16	0	0	0	0	0	7	0	7	0	0	1	1	24
Total	0	60	1	61	0	0	0	0	0	34	0	34	0	0	1	1	96
05:00 PM	0	9	0	9	0	0	0	0	0	12	0	12	0	0	0	0	21
05:15 PM	0	13	0	13	0	0	0	0	0	11	0	11	0	0	0	0	24
05:30 PM	0	12	0	12	0	0	0	0	0	6	0	6	0	0	0	0	18
05:45 PM	0	1	0	1	0	0	0	0	1	8	0	9	0	0	1	1	11
Total	0	35	0	35	0	0	0	0	1	37	0	38	0	0	1	1	74
Grand Total	0	95	1	96	0	0	0	0	1	71	0	72	0	0	2	2	170
Apprch %	0	99	1		0	0	0		1.4	98.6	0		0	0	100		
Total %	0	55.9	0.6	56.5	0	0	0	0	0.6	41.8	0	42.4	0	0	1.2	1.2	

	Evan Hewes Highway Southbound				Graeser Road Westbound				Evan Hewes Highway Northbound				Graeser Road 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**18**	0	**18**	0	0	0	0	0	**11**	0	**11**	0	0	0	0	**29**
04:15 PM	0	12	0	12	0	0	0	0	0	9	0	9	0	0	0	0	21
04:30 PM	0	15	0	15	0	0	0	0	0	7	0	7	0	0	0	0	22
04:45 PM	0	15	**1**	16	0	0	0	0	0	7	0	7	0	0	**1**	**1**	24
Total Volume	0	60	1	61	0	0	0	0	0	34	0	34	0	0	1	1	96
% App. Total	0	98.4	1.6		0	0	0		0	100	0		0	0	100		
PHF	.000	.833	.250	.847	.000	.000	.000	.000	.000	.773	.000	.773	.000	.000	.250	.250	.828

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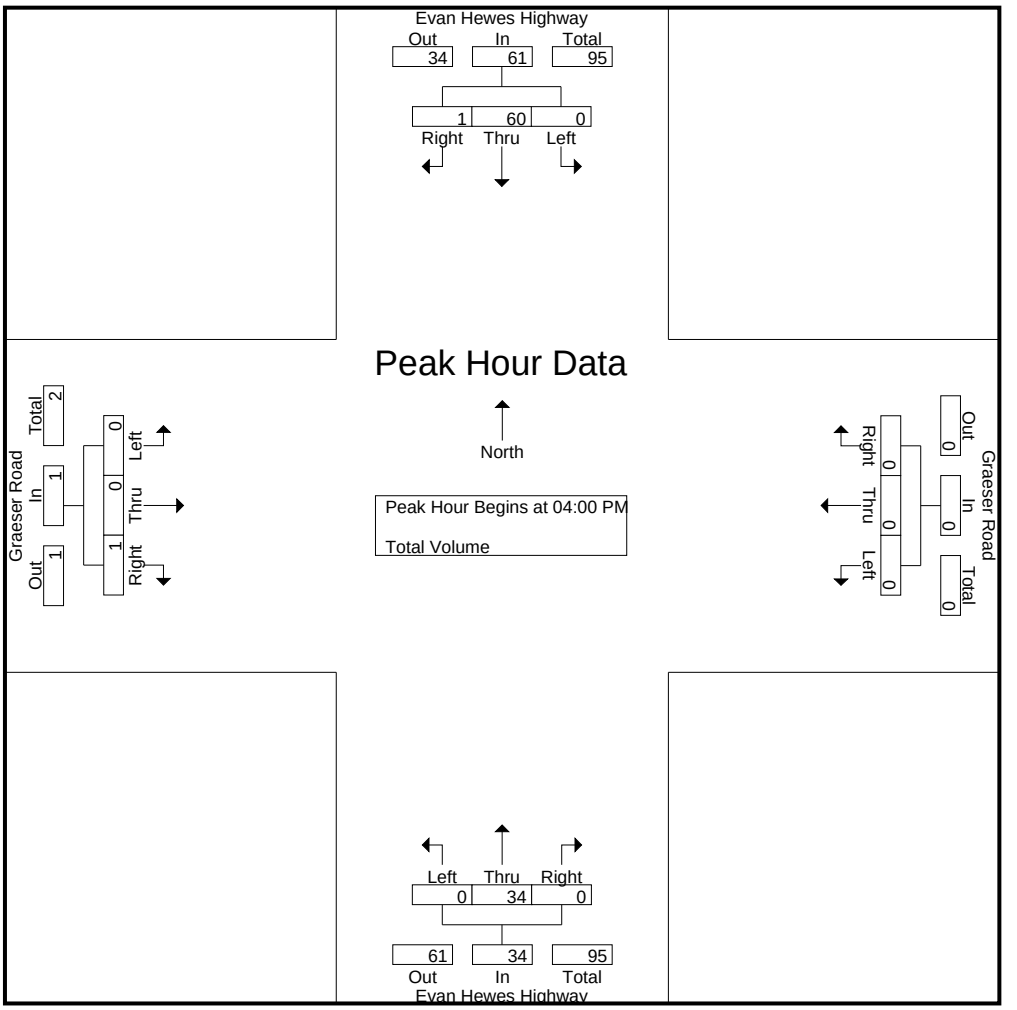
County of Imperial
N/S: Evan Hewes Highway (SR-115)
E/W: Graeser Road
Weather: Clear

File Name : 06_CIM_Evan_Graeser PM
Site Code : 99920467
Start Date : 12/18/2020



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				05:00 PM				04:00 PM			
+0 mins.	0	**18**	0	**18**	0	0	0	0	0	**12**	0	**12**	0	0	0	0
+15 mins.	0	12	0	12	0	0	0	0	0	11	0	11	0	0	0	0
+30 mins.	0	15	0	15	0	0	0	0	0	6	0	6	0	0	0	0
+45 mins.	0	15	**1**	16	0	0	0	0	**1**	8	0	9	0	0	**1**	**1**
Total Volume	0	60	1	61	0	0	0	0	1	37	0	38	0	0	1	1
% App. Total	0	98.4	1.6		0	0	0		2.6	97.4	0		0	0	100	
PHF	.000	.833	.250	.847	.000	.000	.000	.000	.250	.771	.000	.792	.000	.000	.250	.250

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County of Imperial
N/S: Orchard Road (SR-7)
E/W: I-8 Westbound Ramps
Weather: Clear

File Name : 13_CIM_Orchard_8W AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Orchard Road Southbound				I-8 Westbound Ramps Westbound				Orchard Road Northbound				I-8 Westbound On Ramp 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
07:00 AM	0	17	14	31	3	0	3	6	12	33	15	60	0	0	0	0	97
07:15 AM	0	18	14	32	1	0	1	2	3	28	33	64	0	0	0	0	98
07:30 AM	0	20	14	34	1	0	0	1	3	32	40	75	0	0	0	0	110
07:45 AM	0	16	13	29	1	0	0	1	4	28	27	59	0	0	0	0	89
Total	0	71	55	126	6	0	4	10	22	121	115	258	0	0	0	0	394
08:00 AM	0	14	7	21	1	0	1	2	6	26	26	58	0	0	0	0	81
08:15 AM	0	19	5	24	0	0	3	3	5	17	22	44	0	0	0	0	71
08:30 AM	0	14	6	20	0	0	1	1	9	21	24	54	0	0	0	0	75
08:45 AM	0	15	4	19	2	0	3	5	5	12	22	39	0	0	0	0	63
Total	0	62	22	84	3	0	8	11	25	76	94	195	0	0	0	0	290
Grand Total	0	133	77	210	9	0	12	21	47	197	209	453	0	0	0	0	684
Apprch %	0	63.3	36.7		42.9	0	57.1		10.4	43.5	46.1		0	0	0		
Total %	0	19.4	11.3	30.7	1.3	0	1.8	3.1	6.9	28.8	30.6	66.2	0	0	0	0	

	Orchard Road Southbound				I-8 Westbound Ramps Westbound				Orchard Road Northbound				I-8 Westbound On Ramp 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	17	**14**	31	**3**	0	**3**	**6**	**12**	**33**	15	60	0	0	0	0	97
07:15 AM	0	18	14	32	1	0	1	2	3	28	33	64	0	0	0	0	98
07:30 AM	0	**20**	14	**34**	1	0	0	1	3	32	**40**	**75**	0	0	0	0	**110**
07:45 AM	0	16	13	29	1	0	0	1	4	28	27	59	0	0	0	0	89
Total Volume	0	71	55	126	6	0	4	10	22	121	115	258	0	0	0	0	394
% App. Total	0	56.3	43.7		60	0	40		8.5	46.9	44.6		0	0	0		
PHF	.000	.888	.982	.926	.500	.000	.333	.417	.458	.917	.719	.860	.000	.000	.000	.000	.895

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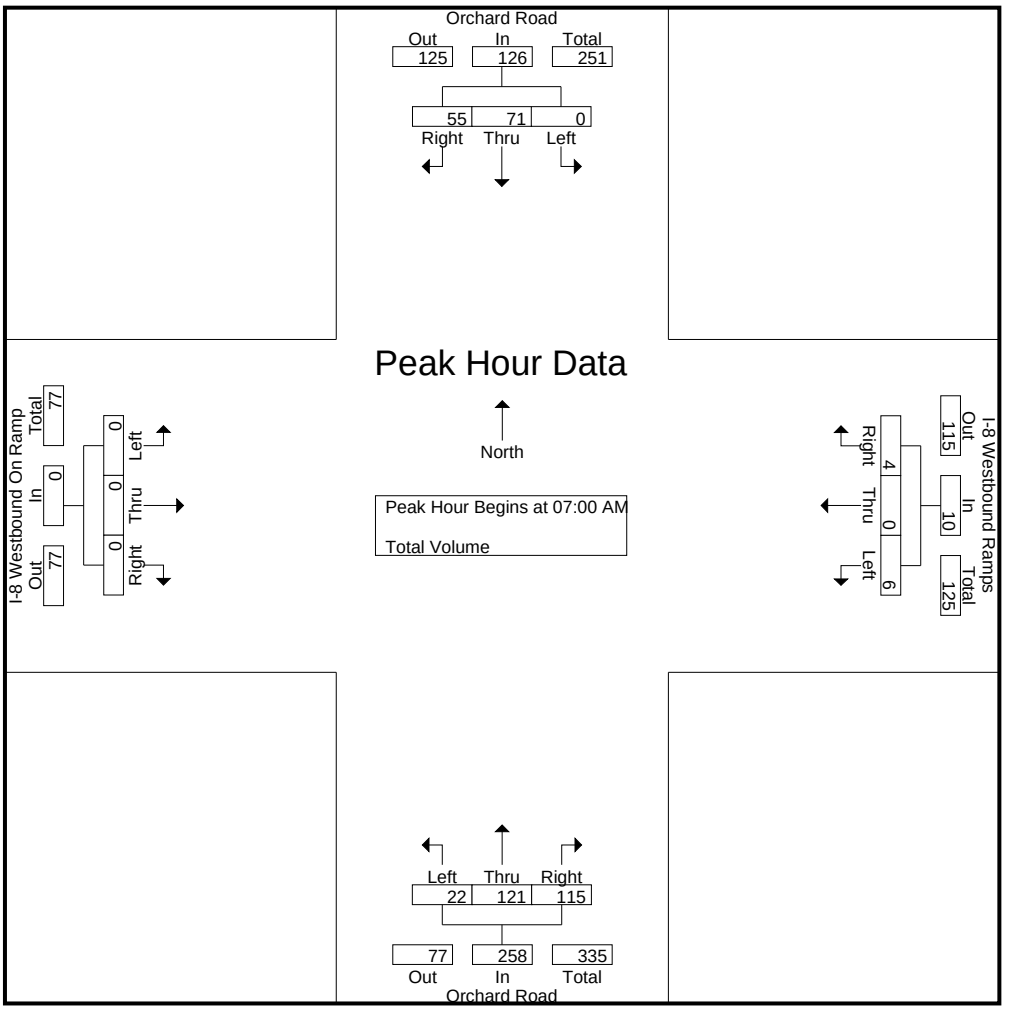
County of Imperial
N/S: Orchard Road (SR-7)
E/W: I-8 Westbound Ramps
Weather: Clear

File Name : 13_CIM_Orchard_8W AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	17	**14**	31	1	0	1	2	**12**	**33**	15	60	0	0	0	0
+15 mins.	0	18	14	32	0	0	**3**	3	3	28	33	64	0	0	0	0
+30 mins.	0	**20**	14	**34**	0	0	1	1	3	32	**40**	**75**	0	0	0	0
+45 mins.	0	16	13	29	**2**	0	3	**5**	4	28	27	59	0	0	0	0
Total Volume	0	71	55	126	3	0	8	11	22	121	115	258	0	0	0	0
% App. Total	0	56.3	43.7		27.3	0	72.7		8.5	46.9	44.6		0	0	0	
PHF	.000	.888	.982	.926	.375	.000	.667	.550	.458	.917	.719	.860	.000	.000	.000	.000

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County of Imperial
N/S: Orchard Road (SR-7)
E/W: I-8 Westbound Ramps
Weather: Clear

File Name : 13_CIM_Orchard_8W PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Orchard Road Southbound				I-8 Westbound Ramps Westbound				Orchard Road Northbound				I-8 Westbound On Ramp 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
04:00 PM	0	35	14	49	4	0	2	6	8	24	20	52	0	0	0	0	107
04:15 PM	0	15	7	22	5	0	2	7	3	23	16	42	0	0	0	0	71
04:30 PM	0	14	12	26	4	0	0	4	4	32	13	49	0	0	0	0	79
04:45 PM	0	14	10	24	3	0	0	3	4	15	10	29	0	0	0	0	56
Total	0	78	43	121	16	0	4	20	19	94	59	172	0	0	0	0	313
05:00 PM	0	17	18	35	4	0	1	5	0	28	10	38	0	0	0	0	78
05:15 PM	0	11	10	21	3	0	1	4	2	31	14	47	0	0	0	0	72
05:30 PM	0	11	10	21	2	2	1	5	2	26	12	40	0	0	0	0	66
05:45 PM	0	14	7	21	7	0	2	9	1	27	16	44	0	0	0	0	74
Total	0	53	45	98	16	2	5	23	5	112	52	169	0	0	0	0	290
Grand Total	0	131	88	219	32	2	9	43	24	206	111	341	0	0	0	0	603
Apprch %	0	59.8	40.2		74.4	4.7	20.9		7	60.4	32.6		0	0	0		
Total %	0	21.7	14.6	36.3	5.3	0.3	1.5	7.1	4	34.2	18.4	56.6	0	0	0	0	

	Orchard Road Southbound				I-8 Westbound Ramps Westbound				Orchard Road Northbound				I-8 Westbound On Ramp 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**35**	**14**	**49**	4	0	**2**	6	**8**	24	**20**	**52**	0	0	0	0	**107**
04:15 PM	0	15	7	22	**5**	0	2	**7**	3	23	16	42	0	0	0	0	71
04:30 PM	0	14	12	26	4	0	0	4	4	**32**	13	49	0	0	0	0	79
04:45 PM	0	14	10	24	3	0	0	3	4	15	10	29	0	0	0	0	56
Total Volume	0	78	43	121	16	0	4	20	19	94	59	172	0	0	0	0	313
% App. Total	0	64.5	35.5		80	0	20		11	54.7	34.3		0	0	0		
PHF	.000	.557	.768	.617	.800	.000	.500	.714	.594	.734	.738	.827	.000	.000	.000	.000	.731

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County of Imperial
N/S: Orchard Road (SR-7)
E/W: I-8 Westbound Ramps
Weather: Clear

File Name : 13_CIM_Orchard_8W PM
Site Code : 99920467
Start Date : 12/18/2020
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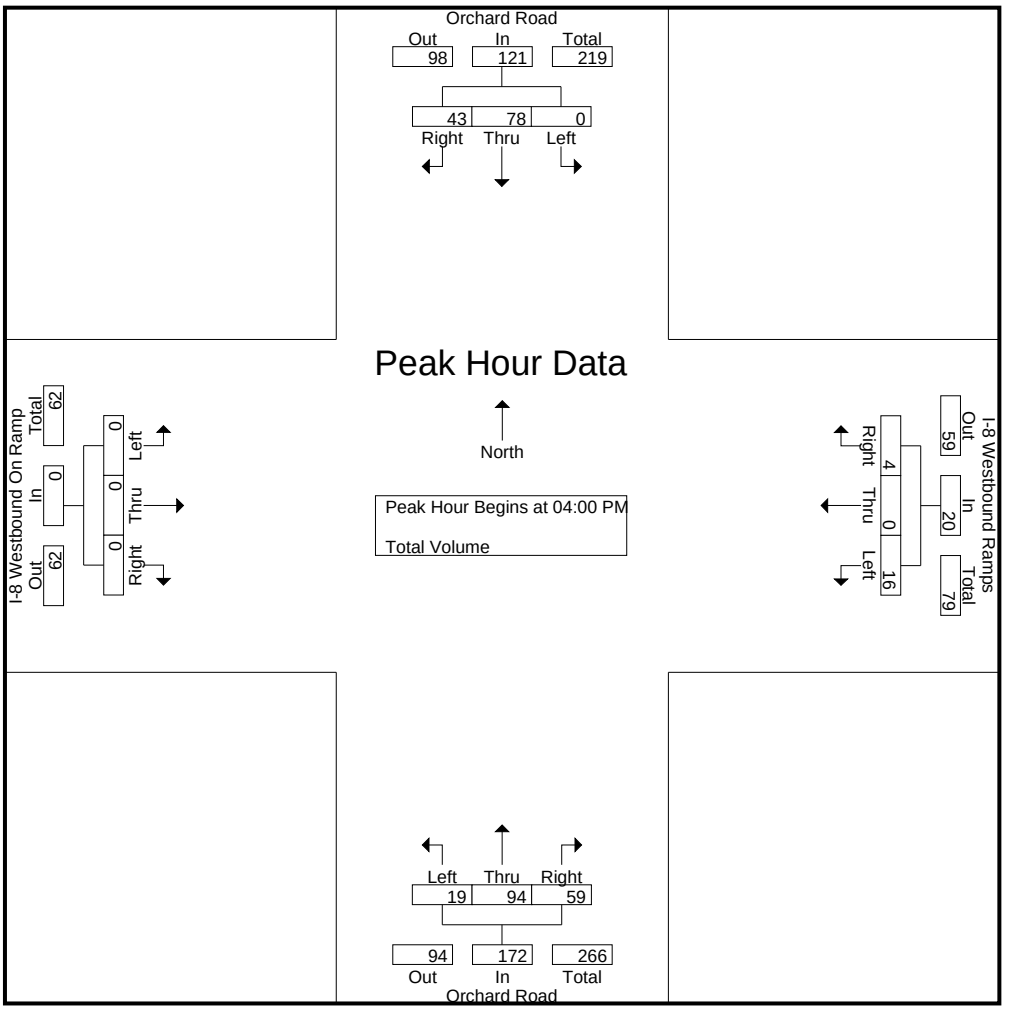

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	**35**	**14**	**49**	4	0	1	5	**8**	24	**20**	**52**	0	0	0	0
+15 mins.	0	15	7	22	3	0	1	4	3	23	16	42	0	0	0	0
+30 mins.	0	14	12	26	2	**2**	1	5	4	**32**	13	49	0	0	0	0
+45 mins.	0	14	10	24	**7**	0	**2**	**9**	4	15	10	29	0	0	0	0
Total Volume	0	78	43	121	16	2	5	23	19	94	59	172	0	0	0	0
% App. Total	0	64.5	35.5		69.6	8.7	21.7		11	54.7	34.3		0	0	0	
PHF	.000	.557	.768	.617	.571	.250	.625	.639	.594	.734	.738	.827	.000	.000	.000	.000

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County of Imperial
N/S: Orchard Road (SR-7)
E/W: I-8 Eastbound Ramps
Weather: Clear

File Name : 14_CIM_Orchard_8E AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Orchard Road Southbound				I-8 Eastbound On Ramp Westbound				Orchard Road Northbound				I-8 Eastbound Ramps 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
07:00 AM	0	12	0	12	0	0	0	0	0	58	4	62	2	1	20	23	97
07:15 AM	0	10	0	10	0	0	0	0	0	62	1	63	4	0	37	41	114
07:30 AM	0	19	1	20	0	0	0	0	0	58	0	58	14	0	21	35	113
07:45 AM	1	20	2	23	0	0	0	0	0	47	2	49	10	0	38	48	120
Total	1	61	3	65	0	0	0	0	0	225	7	232	30	1	116	147	444
08:00 AM	1	14	2	17	0	0	0	0	0	50	1	51	10	0	32	42	110
08:15 AM	0	18	0	18	0	0	0	0	0	39	2	41	5	0	30	35	94
08:30 AM	0	13	1	14	0	0	0	0	0	48	0	48	5	0	36	41	103
08:45 AM	0	15	2	17	0	0	0	0	0	34	1	35	5	1	19	25	77
Total	1	60	5	66	0	0	0	0	0	171	4	175	25	1	117	143	384
Grand Total	2	121	8	131	0	0	0	0	0	396	11	407	55	2	233	290	828
Apprch %	1.5	92.4	6.1		0	0	0		0	97.3	2.7		19	0.7	80.3		
Total %	0.2	14.6	1	15.8	0	0	0	0	0	47.8	1.3	49.2	6.6	0.2	28.1	35	

	Orchard Road Southbound				I-8 Eastbound On Ramp Westbound				Orchard Road Northbound				I-8 Eastbound Ramps 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	10	0	10	0	0	0	0	0	**62**	1	**63**	4	0	37	41	114
07:30 AM	0	19	1	20	0	0	0	0	0	58	0	58	**14**	0	21	35	113
07:45 AM	**1**	**20**	**2**	**23**	0	0	0	0	0	47	**2**	49	10	0	**38**	**48**	**120**
08:00 AM	1	14	2	17	0	0	0	0	0	50	1	51	10	0	32	42	110
Total Volume	2	63	5	70	0	0	0	0	0	217	4	221	38	0	128	166	457
% App. Total	2.9	90	7.1		0	0	0		0	98.2	1.8		22.9	0	77.1		
PHF	.500	.788	.625	.761	.000	.000	.000	.000	.000	.875	.500	.877	.679	.000	.842	.865	.952

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County of Imperial
N/S: Orchard Road (SR-7)
E/W: I-8 Eastbound Ramps
Weather: Clear

File Name : 14_CIM_Orchard_8E AM
Site Code : 99920467
Start Date : 12/18/2020
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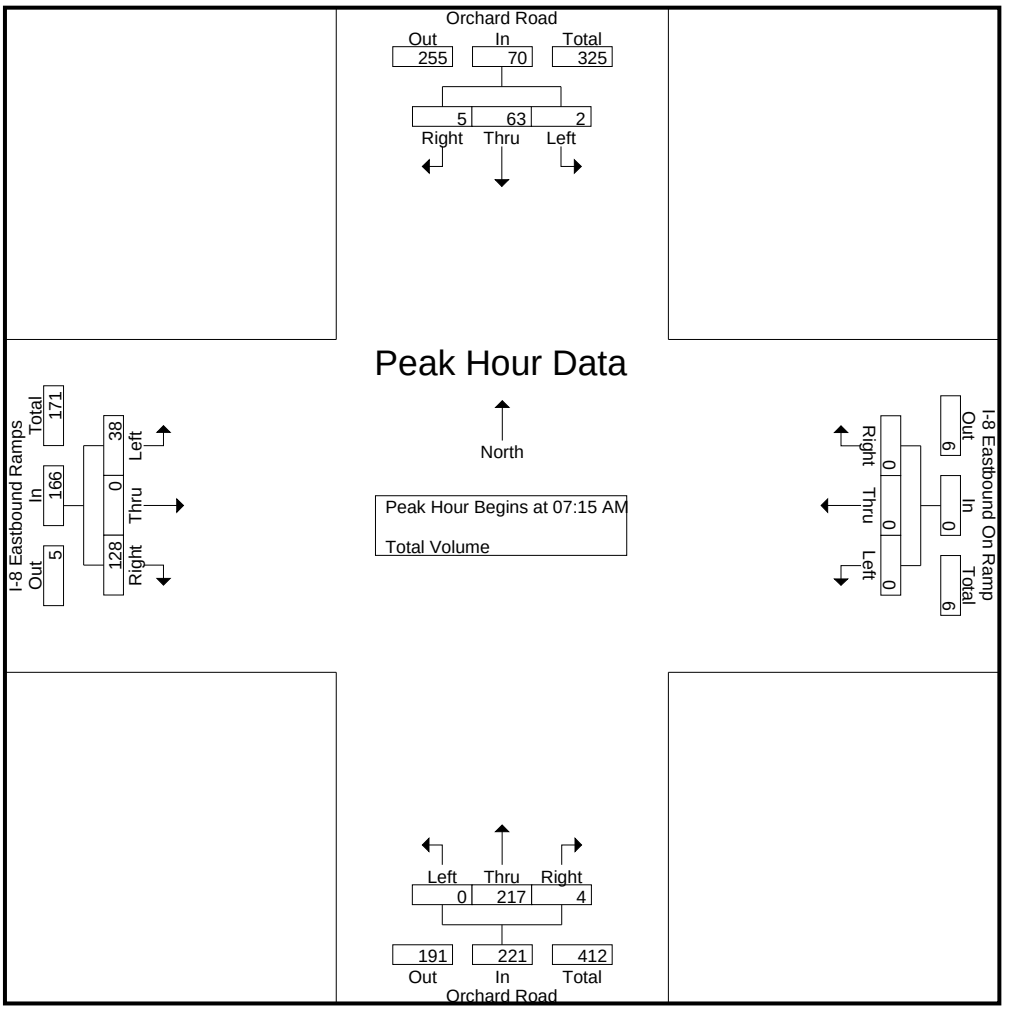

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	0	19	1	20	0	0	0	0	0	58	**4**	62	4	0	37	41
+15 mins.	**1**	**20**	**2**	**23**	0	0	0	0	0	**62**	1	**63**	**14**	0	21	35
+30 mins.	1	14	2	17	0	0	0	0	0	58	0	58	10	0	**38**	**48**
+45 mins.	0	18	0	18	0	0	0	0	0	47	2	49	10	0	32	42
Total Volume	2	71	5	78	0	0	0	0	0	225	7	232	38	0	128	166
% App. Total	2.6	91	6.4		0	0	0		0	97	3		22.9	0	77.1	
PHF	.500	.888	.625	.848	.000	.000	.000	.000	.000	.907	.438	.921	.679	.000	.842	.865

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County of Imperial
N/S: Orchard Road (SR-7)
E/W: I-8 Eastbound Ramps
Weather: Clear

File Name : 14_CIM_Orchard_8E PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Orchard Road Southbound				I-8 Eastbound On Ramp Westbound				Orchard Road Northbound				I-8 Eastbound Ramps 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
04:00 PM	0	32	5	37	0	0	0	0	0	37	0	37	14	1	14	29	103
04:15 PM	0	23	0	23	0	0	0	0	0	26	2	28	17	0	19	36	87
04:30 PM	0	18	1	19	0	0	0	0	0	28	1	29	21	0	7	28	76
04:45 PM	0	18	0	18	0	0	0	0	0	18	3	21	13	0	19	32	71
Total	0	91	6	97	0	0	0	0	0	109	6	115	65	1	59	125	337
05:00 PM	0	15	2	17	0	0	0	0	0	24	4	28	13	0	15	28	73
05:15 PM	0	14	2	16	0	0	0	0	0	33	1	34	19	0	16	35	85
05:30 PM	0	10	1	11	0	0	0	0	0	21	1	22	15	1	14	30	63
05:45 PM	0	22	0	22	0	0	0	0	0	26	2	28	18	0	14	32	82
Total	0	61	5	66	0	0	0	0	0	104	8	112	65	1	59	125	303
Grand Total	0	152	11	163	0	0	0	0	0	213	14	227	130	2	118	250	640
Apprch %	0	93.3	6.7		0	0	0		0	93.8	6.2		52	0.8	47.2		
Total %	0	23.8	1.7	25.5	0	0	0	0	0	33.3	2.2	35.5	20.3	0.3	18.4	39.1	

	Orchard Road Southbound				I-8 Eastbound On Ramp Westbound				Orchard Road Northbound				I-8 Eastbound Ramps 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**32**	**5**	**37**	0	0	0	0	0	**37**	0	**37**	14	**1**	14	29	**103**
04:15 PM	0	23	0	23	0	0	0	0	0	26	2	28	17	0	**19**	**36**	87
04:30 PM	0	18	1	19	0	0	0	0	0	28	1	29	**21**	0	7	28	76
04:45 PM	0	18	0	18	0	0	0	0	0	18	**3**	21	13	0	19	32	71
Total Volume	0	91	6	97	0	0	0	0	0	109	6	115	65	1	59	125	337
% App. Total	0	93.8	6.2		0	0	0		0	94.8	5.2		52	0.8	47.2		
PHF	.000	.711	.300	.655	.000	.000	.000	.000	.000	.736	.500	.777	.774	.250	.776	.868	.818

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County of Imperial
N/S: Orchard Road (SR-7)
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Weather: Clear

File Name : 14_CIM_Orchard_8E PM
Site Code : 99920467
Start Date : 12/18/2020
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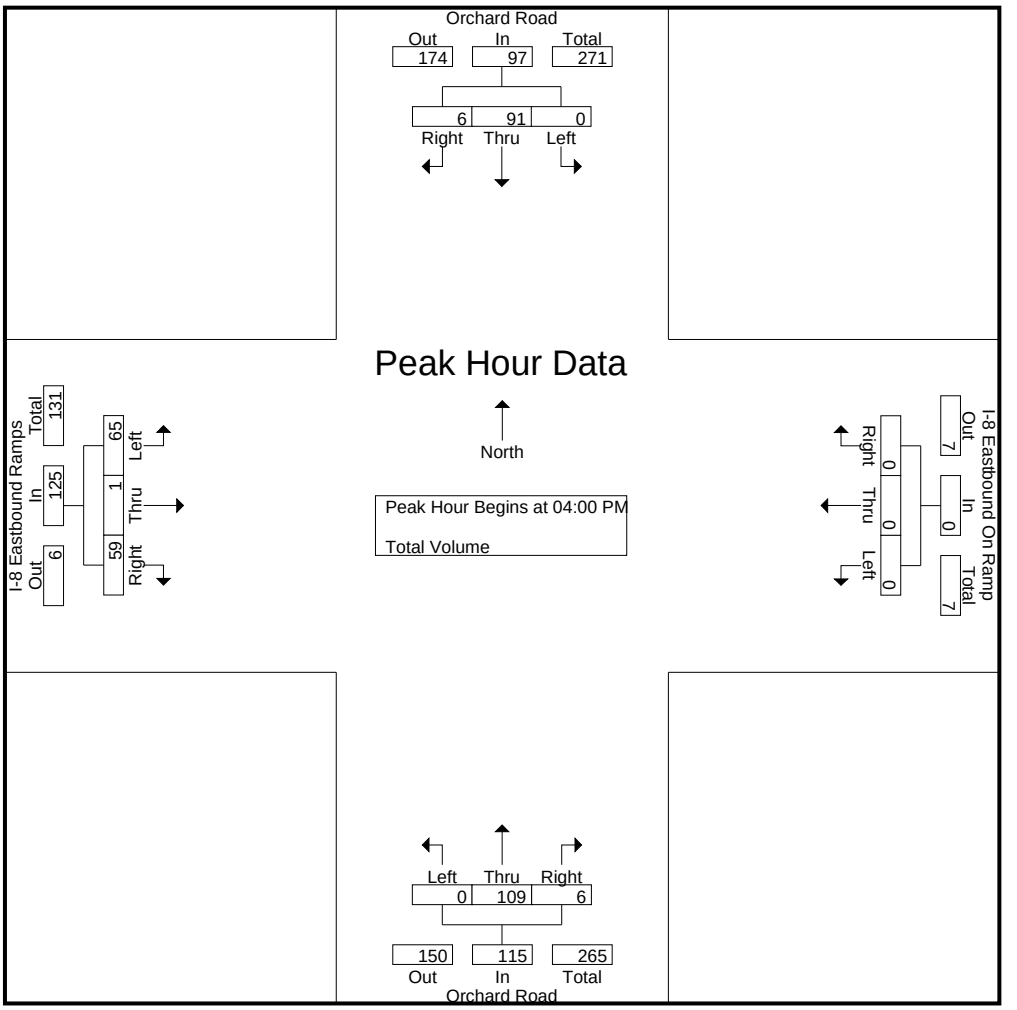

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	**32**	**5**	**37**	0	0	0	0	0	**37**	0	**37**	14	**1**	14	29
+15 mins.	0	23	0	23	0	0	0	0	0	26	2	28	17	0	**19**	**36**
+30 mins.	0	18	1	19	0	0	0	0	0	28	1	29	**21**	0	7	28
+45 mins.	0	18	0	18	0	0	0	0	0	18	**3**	21	13	0	19	32
Total Volume	0	91	6	97	0	0	0	0	0	109	6	115	65	1	59	125
% App. Total	0	93.8	6.2		0	0	0		0	94.8	5.2		52	0.8	47.2	
PHF	.000	.711	.300	.655	.000	.000	.000	.000	.000	.736	.500	.777	.774	.250	.776	.868

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County of Imperial
N/S: Bonds Corner Road
E/W: I-8 Westbound Ramps
Weather: Clear

File Name : 01_CIM_Bonds_8W AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Bonds Corner Road Southbound				I-8 Westbound Off Ramp Westbound				Bonds Corner Road Northbound				I-8 Westbound On Ramp 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
07:00 AM	0	9	0	9	2	0	2	4	0	12	0	12	0	0	0	0	25
07:15 AM	0	4	1	5	0	0	1	1	0	5	0	5	0	0	0	0	11
07:30 AM	0	7	0	7	0	0	0	0	1	9	0	10	0	0	0	0	17
07:45 AM	0	6	0	6	0	0	0	0	2	6	0	8	0	0	0	0	14
Total	0	26	1	27	2	0	3	5	3	32	0	35	0	0	0	0	67
08:00 AM	0	7	0	7	1	0	1	2	1	5	0	6	0	0	0	0	15
08:15 AM	0	6	0	6	2	0	0	2	1	5	0	6	0	0	0	0	14
08:30 AM	0	5	1	6	0	1	1	2	5	10	0	15	0	0	0	0	23
08:45 AM	0	12	0	12	0	0	1	1	1	9	0	10	0	0	0	0	23
Total	0	30	1	31	3	1	3	7	8	29	0	37	0	0	0	0	75
Grand Total	0	56	2	58	5	1	6	12	11	61	0	72	0	0	0	0	142
Apprch %	0	96.6	3.4		41.7	8.3	50		15.3	84.7	0		0	0	0		
Total %	0	39.4	1.4	40.8	3.5	0.7	4.2	8.5	7.7	43	0	50.7	0	0	0	0	

	Bonds Corner Road Southbound				I-8 Westbound Off Ramp Westbound				Bonds Corner Road Northbound				I-8 Westbound On Ramp 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	7	0	7	1	0	**1**	**2**	1	5	0	6	0	0	0	0	15
08:15 AM	0	6	0	6	**2**	0	0	2	1	5	0	6	0	0	0	0	14
08:30 AM	0	5	**1**	6	0	**1**	1	2	**5**	**10**	0	**15**	0	0	0	0	**23**
08:45 AM	0	**12**	0	**12**	0	0	1	1	1	9	0	10	0	0	0	0	23
Total Volume	0	30	1	31	3	1	3	7	8	29	0	37	0	0	0	0	75
% App. Total	0	96.8	3.2		42.9	14.3	42.9		21.6	78.4	0		0	0	0		
PHF	.000	.625	.250	.646	.375	.250	.750	.875	.400	.725	.000	.617	.000	.000	.000	.000	.815

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County of Imperial
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File Name : 01_CIM_Bonds_8W AM
Site Code : 99920467
Start Date : 12/18/2020
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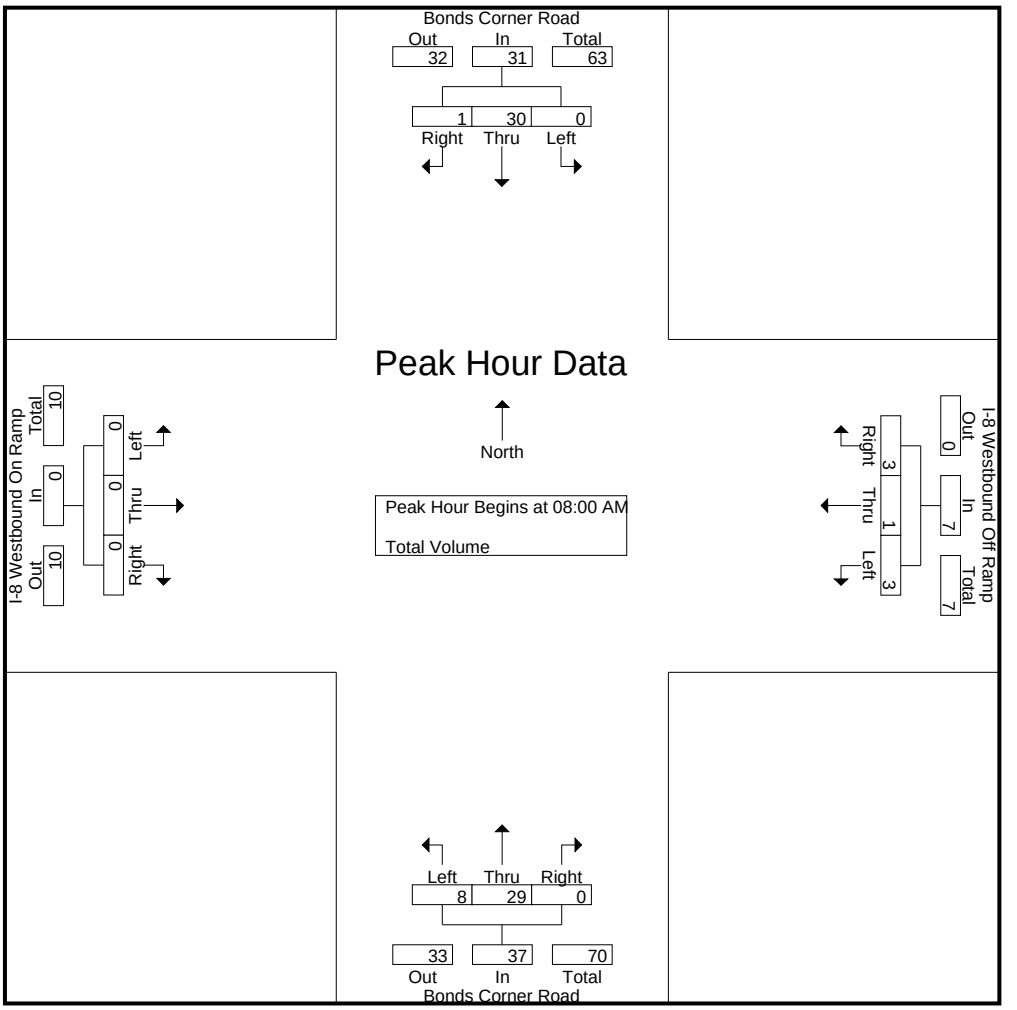

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				07:00 AM			
+0 mins.	0	7	0	7	1	0	**1**	**2**	1	5	0	6	0	0	0	0
+15 mins.	0	6	0	6	**2**	0	0	2	1	5	0	6	0	0	0	0
+30 mins.	0	5	**1**	6	0	**1**	1	2	**5**	**10**	0	**15**	0	0	0	0
+45 mins.	0	**12**	0	**12**	0	0	1	1	1	9	0	10	0	0	0	0
Total Volume	0	30	1	31	3	1	3	7	8	29	0	37	0	0	0	0
% App. Total	0	96.8	3.2		42.9	14.3	42.9		21.6	78.4	0		0	0	0	
PHF	.000	.625	.250	.646	.375	.250	.750	.875	.400	.725	.000	.617	.000	.000	.000	.000

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County of Imperial
N/S: Bonds Corner Road
E/W: I-8 Westbound Ramps
Weather: Clear

File Name : 01_CIM_Bonds_8W PM
Site Code : 99920467
Start Date : 12/18/2020
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Groups Printed- Total Volume

	Bonds Corner Road Southbound				I-8 Westbound Off Ramp Westbound				Bonds Corner Road Northbound				I-8 Westbound On Ramp 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
04:00 PM	0	2	1	3	1	0	1	2	2	10	0	12	0	0	0	0	17
04:15 PM	0	5	1	6	0	0	0	0	7	7	0	14	0	0	0	0	20
04:30 PM	0	5	2	7	0	0	3	3	9	4	0	13	0	0	0	0	23
04:45 PM	0	4	0	4	0	0	1	1	1	6	0	7	0	0	0	0	12
Total	0	16	4	20	1	0	5	6	19	27	0	46	0	0	0	0	72
05:00 PM	0	4	3	7	1	0	1	2	0	4	0	4	0	0	0	0	13
05:15 PM	0	3	0	3	0	0	0	0	5	8	0	13	0	0	0	0	16
05:30 PM	0	4	0	4	0	0	1	1	2	3	0	5	0	0	0	0	10
05:45 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
Total	0	11	3	14	1	0	2	3	7	17	0	24	0	0	0	0	41
Grand Total	0	27	7	34	2	0	7	9	26	44	0	70	0	0	0	0	113
Apprch %	0	79.4	20.6		22.2	0	77.8		37.1	62.9	0		0	0	0		
Total %	0	23.9	6.2	30.1	1.8	0	6.2	8	23	38.9	0	61.9	0	0	0	0	

	Bonds Corner Road Southbound				I-8 Westbound Off Ramp Westbound				Bonds Corner Road Northbound				I-8 Westbound On Ramp 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	2	1	3	**1**	0	1	2	2	**10**	0	12	0	0	0	0	17
04:15 PM	0	**5**	1	6	0	0	0	0	7	7	0	**14**	0	0	0	0	20
04:30 PM	0	5	**2**	**7**	0	0	**3**	**3**	**9**	4	0	13	0	0	0	0	**23**
04:45 PM	0	4	0	4	0	0	1	1	1	6	0	7	0	0	0	0	12
Total Volume	0	16	4	20	1	0	5	6	19	27	0	46	0	0	0	0	72
% App. Total	0	80	20		16.7	0	83.3		41.3	58.7	0		0	0	0		
PHF	.000	.800	.500	.714	.250	.000	.417	.500	.528	.675	.000	.821	.000	.000	.000	.000	.783

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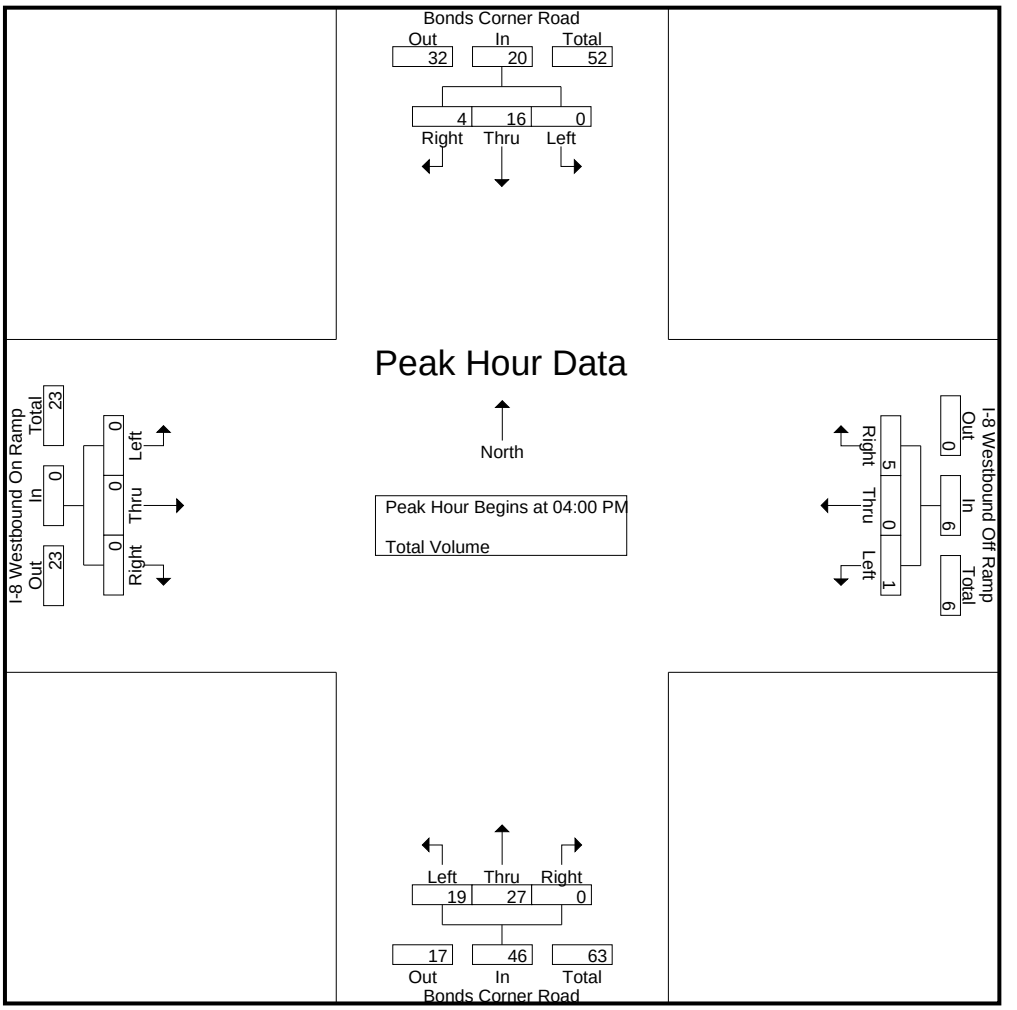
County of Imperial
N/S: Bonds Corner Road
E/W: I-8 Westbound Ramps
Weather: Clear

File Name : 01_CIM_Bonds_8W PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	**5**	1	6	**1**	0	1	2	2	**10**	0	12	0	0	0	0
+15 mins.	0	5	2	**7**	0	0	0	0	7	7	0	**14**	0	0	0	0
+30 mins.	0	4	0	4	0	0	**3**	**3**	**9**	4	0	13	0	0	0	0
+45 mins.	0	4	**3**	7	0	0	1	1	1	6	0	7	0	0	0	0
Total Volume	0	18	6	24	1	0	5	6	19	27	0	46	0	0	0	0
% App. Total	0	75	25		16.7	0	83.3		41.3	58.7	0		0	0	0	
PHF	.000	.900	.500	.857	.250	.000	.417	.500	.528	.675	.000	.821	.000	.000	.000	.000

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County of Imperial
N/S: Bonds Corner Road
E/W: I-8 Eastbound Ramps
Weather: Clear

File Name : 02_CIM_Bonds_8E AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Bonds Corner Road Southbound				I-8 Eastbound On Ramp Westbound				Bonds Corner Road Northbound				I-8 Eastbound Off Ramp 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
07:00 AM	0	12	0	12	0	0	0	0	0	12	0	12	0	1	2	3	27
07:15 AM	0	5	0	5	0	0	0	0	0	3	0	3	0	0	5	5	13
07:30 AM	0	5	0	5	0	0	0	0	0	4	0	4	3	0	3	6	15
07:45 AM	0	5	0	5	0	0	0	0	0	4	0	4	4	1	6	11	20
Total	0	27	0	27	0	0	0	0	0	23	0	23	7	2	16	25	75
08:00 AM	0	7	0	7	0	0	0	0	0	6	0	6	1	0	2	3	16
08:15 AM	1	6	0	7	0	0	0	0	0	5	0	5	2	0	6	8	20
08:30 AM	0	7	0	7	0	0	0	0	0	14	2	16	1	0	4	5	28
08:45 AM	1	10	0	11	0	0	0	0	0	10	0	10	0	0	2	2	23
Total	2	30	0	32	0	0	0	0	0	35	2	37	4	0	14	18	87
Grand Total	2	57	0	59	0	0	0	0	0	58	2	60	11	2	30	43	162
Apprch %	3.4	96.6	0		0	0	0		0	96.7	3.3		25.6	4.7	69.8		
Total %	1.2	35.2	0	36.4	0	0	0	0	0	35.8	1.2	37	6.8	1.2	18.5	26.5	

	Bonds Corner Road Southbound				I-8 Eastbound On Ramp Westbound				Bonds Corner Road Northbound				I-8 Eastbound Off Ramp 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	7	0	7	0	0	0	0	0	6	0	6	1	0	2	3	16
08:15 AM	**1**	6	0	7	0	0	0	0	0	5	0	5	**2**	0	**6**	**8**	20
08:30 AM	0	7	0	7	0	0	0	0	0	**14**	**2**	**16**	1	0	4	5	**28**
08:45 AM	1	**10**	0	**11**	0	0	0	0	0	10	0	10	0	0	2	2	23
Total Volume	2	30	0	32	0	0	0	0	0	35	2	37	4	0	14	18	87
% App. Total	6.2	93.8	0		0	0	0		0	94.6	5.4		22.2	0	77.8		
PHF	.500	.750	.000	.727	.000	.000	.000	.000	.000	.625	.250	.578	.500	.000	.583	.563	.777

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County of Imperial
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File Name : 02_CIM_Bonds_8E AM
Site Code : 99920467
Start Date : 12/18/2020
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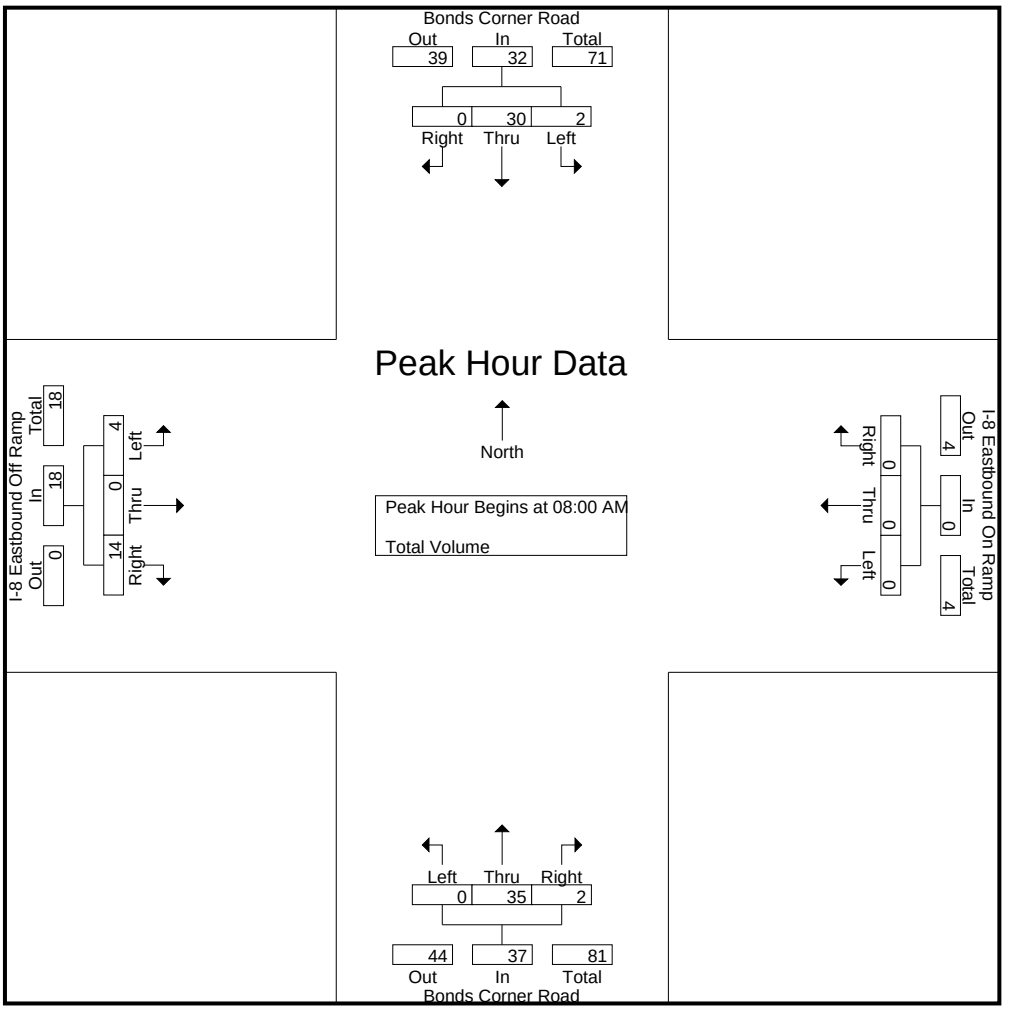

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				08:00 AM				07:30 AM			
+0 mins.	0	7	0	7	0	0	0	0	0	6	0	6	3	0	3	6
+15 mins.	**1**	6	0	7	0	0	0	0	0	5	0	5	**4**	**1**	**6**	**11**
+30 mins.	0	7	0	7	0	0	0	0	0	**14**	**2**	**16**	1	0	2	3
+45 mins.	1	**10**	0	**11**	0	0	0	0	0	10	0	10	2	0	6	8
Total Volume	2	30	0	32	0	0	0	0	0	35	2	37	10	1	17	28
% App. Total	6.2	93.8	0		0	0	0		0	94.6	5.4		35.7	3.6	60.7	
PHF	.500	.750	.000	.727	.000	.000	.000	.000	.000	.625	.250	.578	.625	.250	.708	.636

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File Name : 02_CIM_Bonds_8E PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Bonds Corner Road Southbound				I-8 Eastbound On Ramp Westbound				Bonds Corner Road Northbound				I-8 Eastbound Off Ramp 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
04:00 PM	0	2	0	2	0	0	0	0	0	12	2	14	1	0	1	2	18
04:15 PM	0	4	0	4	0	0	0	0	0	13	0	13	0	1	0	1	18
04:30 PM	0	4	0	4	0	0	0	0	0	8	0	8	1	0	0	1	13
04:45 PM	0	5	0	5	0	0	0	0	0	8	2	10	2	0	1	3	18
Total	0	15	0	15	0	0	0	0	0	41	4	45	4	1	2	7	67
05:00 PM	1	4	0	5	0	0	0	0	0	2	1	3	1	1	1	3	11
05:15 PM	0	3	0	3	0	0	0	0	0	12	1	13	1	0	1	2	18
05:30 PM	0	4	0	4	0	0	0	0	0	7	1	8	0	0	0	0	12
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	1	3	4
Total	1	11	0	12	0	0	0	0	0	22	3	25	2	3	3	8	45
Grand Total	1	26	0	27	0	0	0	0	0	63	7	70	6	4	5	15	112
Apprch %	3.7	96.3	0		0	0	0		0	90	10		40	26.7	33.3		
Total %	0.9	23.2	0	24.1	0	0	0	0	0	56.2	6.2	62.5	5.4	3.6	4.5	13.4	

	Bonds Corner Road Southbound				I-8 Eastbound On Ramp Westbound				Bonds Corner Road Northbound				I-8 Eastbound Off Ramp 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	2	0	2	0	0	0	0	0	12	**2**	**14**	1	0	**1**	2	**18**
04:15 PM	0	4	0	4	0	0	0	0	0	**13**	0	13	0	**1**	0	1	18
04:30 PM	0	4	0	4	0	0	0	0	0	8	0	8	1	0	0	1	13
04:45 PM	0	**5**	0	**5**	0	0	0	0	0	8	2	10	**2**	0	1	**3**	18
Total Volume	0	15	0	15	0	0	0	0	0	41	4	45	4	1	2	7	67
% App. Total	0	100	0		0	0	0		0	91.1	8.9		57.1	14.3	28.6		
PHF	.000	.750	.000	.750	.000	.000	.000	.000	.000	.788	.500	.804	.500	.250	.500	.583	.931

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County of Imperial
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File Name : 02_CIM_Bonds_8E PM
Site Code : 99920467
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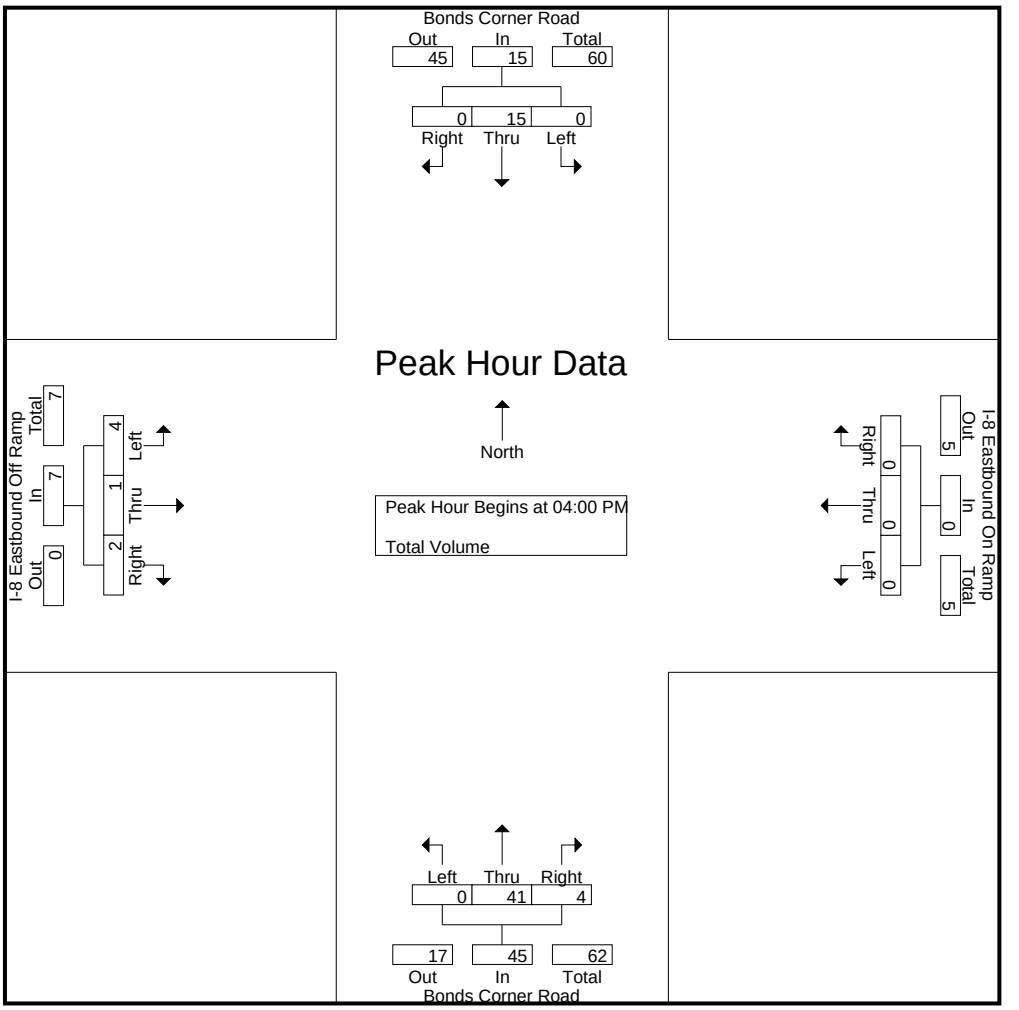

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:00 PM				04:30 PM			
+0 mins.	0	4	0	4	0	0	0	0	0	12	**2**	**14**	1	0	0	1
+15 mins.	0	4	0	4	0	0	0	0	0	**13**	0	13	**2**	0	**1**	**3**
+30 mins.	0	**5**	0	**5**	0	0	0	0	0	8	0	8	1	**1**	1	3
+45 mins.	**1**	4	0	5	0	0	0	0	0	8	2	10	1	0	1	2
Total Volume	1	17	0	18	0	0	0	0	0	41	4	45	5	1	3	9
% App. Total	5.6	94.4	0		0	0	0		0	91.1	8.9		55.6	11.1	33.3	
PHF	.250	.850	.000	.900	.000	.000	.000	.000	.000	.788	.500	.804	.625	.250	.750	.750

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County of Imperial
N/S: Evan Hewes Highway (SR-115)
E/W: I-8 Westbound Ramps
Weather: Clear

File Name : 09_CIM_Evan_8W AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Evan Hewes Highway Southbound				I-8 Westbound Off Ramp Westbound				Evan Hewes Highway Northbound				I-8 Westbound On Ramp 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
07:00 AM	0	4	3	7	0	0	15	15	1	2	0	3	0	0	0	0	25
07:15 AM	0	8	0	8	0	0	8	8	0	0	0	0	0	0	0	0	16
07:30 AM	0	7	2	9	0	0	8	8	0	0	0	0	0	0	0	0	17
07:45 AM	0	8	0	8	0	0	15	15	0	3	0	3	0	0	0	0	26
Total	0	27	5	32	0	0	46	46	1	5	0	6	0	0	0	0	84
08:00 AM	0	7	1	8	1	0	2	3	0	3	1	4	0	0	0	0	15
08:15 AM	0	8	0	8	3	0	7	10	2	2	0	4	0	0	0	0	22
08:30 AM	0	6	0	6	0	0	10	10	0	2	0	2	0	0	0	0	18
08:45 AM	0	7	0	7	0	0	4	4	0	3	0	3	0	0	0	0	14
Total	0	28	1	29	4	0	23	27	2	10	1	13	0	0	0	0	69
Grand Total	0	55	6	61	4	0	69	73	3	15	1	19	0	0	0	0	153
Apprch %	0	90.2	9.8		5.5	0	94.5		15.8	78.9	5.3		0	0	0		
Total %	0	35.9	3.9	39.9	2.6	0	45.1	47.7	2	9.8	0.7	12.4	0	0	0	0	

	Evan Hewes Highway Southbound				I-8 Westbound Off Ramp Westbound				Evan Hewes Highway Northbound				I-8 Westbound On Ramp 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	4	**3**	7	0	0	**15**	**15**	**1**	2	0	**3**	0	0	0	0	25
07:15 AM	0	**8**	0	8	0	0	8	8	0	0	0	0	0	0	0	0	16
07:30 AM	0	7	2	**9**	0	0	8	8	0	0	0	0	0	0	0	0	17
07:45 AM	0	8	0	8	0	0	15	15	0	**3**	0	3	0	0	0	0	**26**
Total Volume	0	27	5	32	0	0	46	46	1	5	0	6	0	0	0	0	84
% App. Total	0	84.4	15.6		0	0	100		16.7	83.3	0		0	0	0		
PHF	.000	.844	.417	.889	.000	.000	.767	.767	.250	.417	.000	.500	.000	.000	.000	.000	.808

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County of Imperial
N/S: Evan Hewes Highway (SR-115)
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Weather: Clear

File Name : 09_CIM_Evan_8W AM
Site Code : 99920467
Start Date : 12/18/2020
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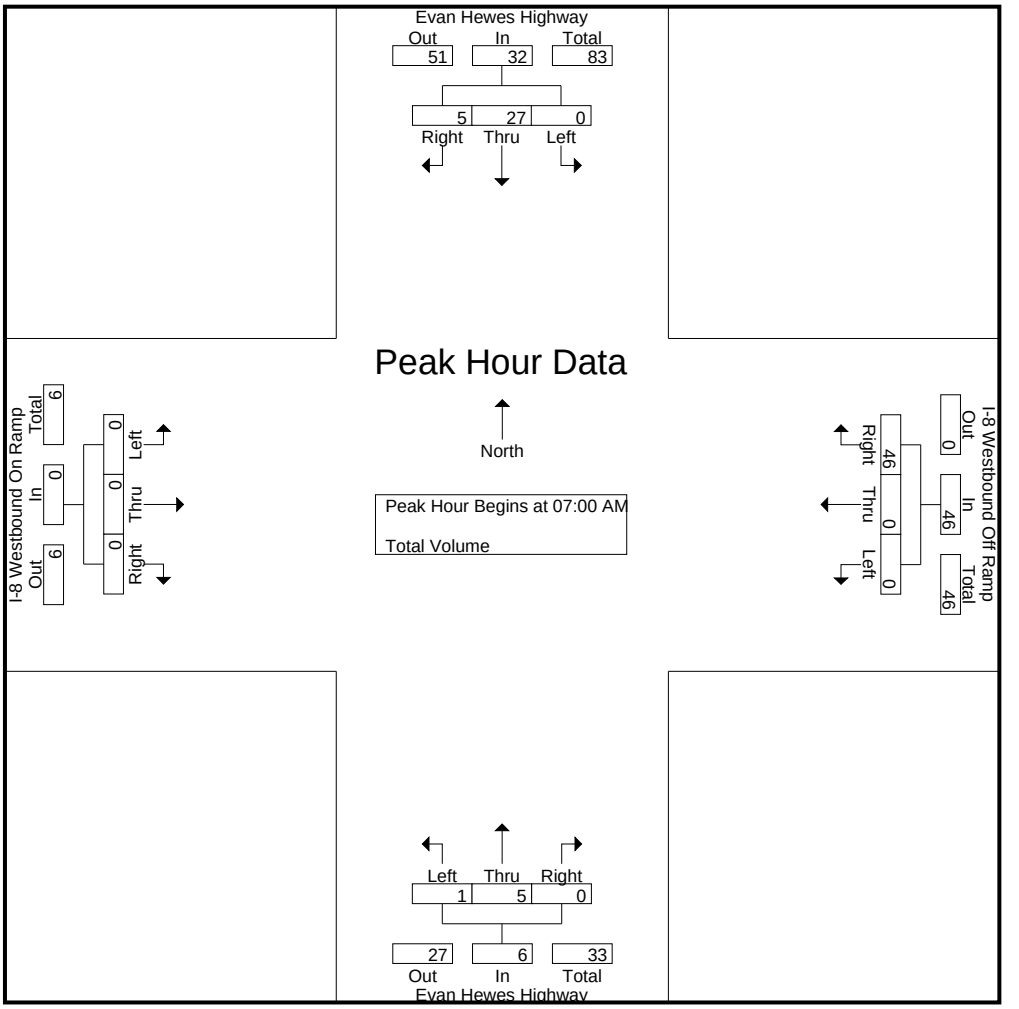

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:45 AM				07:00 AM			
+0 mins.	0	**8**	0	8	0	0	**15**	**15**	0	**3**	0	3	0	0	0	0
+15 mins.	0	7	**2**	**9**	0	0	8	8	0	3	**1**	**4**	0	0	0	0
+30 mins.	0	8	0	8	0	0	8	8	**2**	2	0	4	0	0	0	0
+45 mins.	0	7	1	8	0	0	15	15	0	2	0	2	0	0	0	0
Total Volume	0	30	3	33	0	0	46	46	2	10	1	13	0	0	0	0
% App. Total	0	90.9	9.1		0	0	100		15.4	76.9	7.7		0	0	0	
PHF	.000	.938	.375	.917	.000	.000	.767	.767	.250	.833	.250	.813	.000	.000	.000	.000

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County of Imperial
N/S: Evan Hewes Highway (SR-115)
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Weather: Clear

File Name : 09_CIM_Evan_8W PM
Site Code : 99920467
Start Date : 12/18/2020
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Groups Printed- Total Volume

	Evan Hewes Highway Southbound				I-8 Westbound Off Ramp Westbound				Evan Hewes Highway Northbound				I-8 Westbound On Ramp 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
04:00 PM	0	17	0	17	1	0	8	9	0	1	0	1	0	0	0	0	27
04:15 PM	0	11	1	12	1	0	11	12	1	1	0	2	0	0	0	0	26
04:30 PM	0	12	1	13	0	0	6	6	0	1	0	1	0	0	0	0	20
04:45 PM	0	15	2	17	1	0	5	6	0	2	0	2	0	0	0	0	25
Total	0	55	4	59	3	0	30	33	1	5	0	6	0	0	0	0	98
05:00 PM	0	11	2	13	1	0	13	14	1	2	0	3	0	0	0	0	30
05:15 PM	0	11	1	12	1	0	14	15	0	0	0	0	0	0	0	0	27
05:30 PM	0	9	2	11	1	0	6	7	0	1	0	1	0	0	0	0	19
05:45 PM	0	1	0	1	0	1	11	12	0	0	0	0	0	0	0	0	13
Total	0	32	5	37	3	1	44	48	1	3	0	4	0	0	0	0	89
Grand Total	0	87	9	96	6	1	74	81	2	8	0	10	0	0	0	0	187
Apprch %	0	90.6	9.4		7.4	1.2	91.4		20	80	0		0	0	0		
Total %	0	46.5	4.8	51.3	3.2	0.5	39.6	43.3	1.1	4.3	0	5.3	0	0	0	0	

	Evan Hewes Highway Southbound				I-8 Westbound Off Ramp Westbound				Evan Hewes Highway Northbound				I-8 Westbound On Ramp 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	12	1	13	0	0	6	6	0	1	0	1	0	0	0	0	20
04:45 PM	0	**15**	**2**	**17**	**1**	0	5	6	0	**2**	0	2	0	0	0	0	25
05:00 PM	0	11	2	13	1	0	13	14	**1**	2	0	**3**	0	0	0	0	**30**
05:15 PM	0	11	1	12	1	0	**14**	**15**	0	0	0	0	0	0	0	0	27
Total Volume	0	49	6	55	3	0	38	41	1	5	0	6	0	0	0	0	102
% App. Total	0	89.1	10.9		7.3	0	92.7		16.7	83.3	0		0	0	0		
PHF	.000	.817	.750	.809	.750	.000	.679	.683	.250	.625	.000	.500	.000	.000	.000	.000	.850

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File Name : 09_CIM_Evan_8W PM
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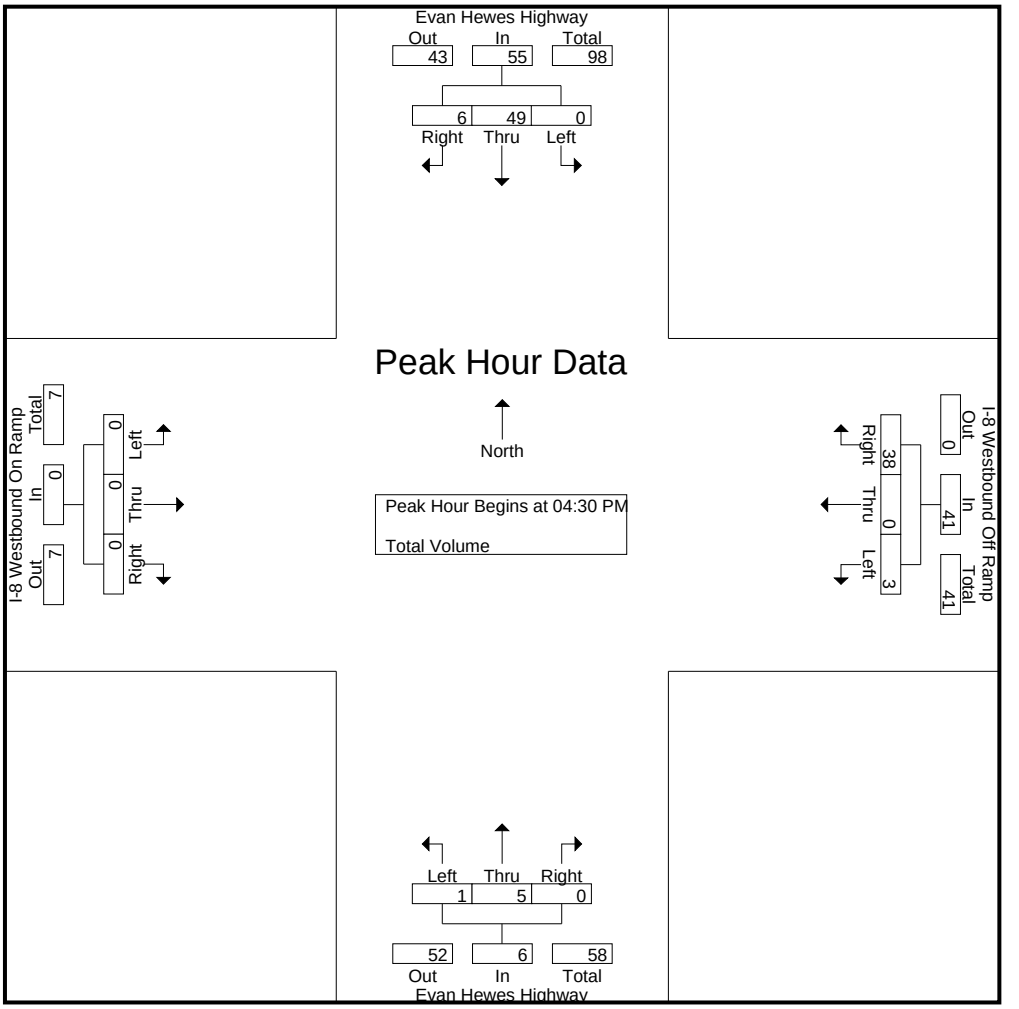

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:15 PM				04:00 PM			
+0 mins.	0	**17**	0	**17**	**1**	0	13	14	**1**	1	0	2	0	0	0	0
+15 mins.	0	11	1	12	1	0	**14**	**15**	0	1	0	1	0	0	0	0
+30 mins.	0	12	1	13	1	0	6	7	0	**2**	0	2	0	0	0	0
+45 mins.	0	15	**2**	17	0	**1**	11	12	1	2	0	**3**	0	0	0	0
Total Volume	0	55	4	59	3	1	44	48	2	6	0	8	0	0	0	0
% App. Total	0	93.2	6.8		6.2	2.1	91.7		25	75	0		0	0	0	
PHF	.000	.809	.500	.868	.750	.250	.786	.800	.500	.750	.000	.667	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

County of Imperial
N/S: Evan Hewes Hwy/Vanderlinden Rd
E/W: I-8 Eastbound Ramps
Weather: Clear

File Name : 10_CIM_Vander_8E AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Evan Hewes Highway Southbound				I-8 Eastbound Off Ramp Westbound				Vanderlinden Road Northbound				I-8 Eastbound Off Ramp 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
07:00 AM	4	0	0	4	0	0	0	0	0	0	0	0	3	0	0	3	7
07:15 AM	7	1	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8
07:30 AM	9	0	0	9	0	0	0	0	0	0	1	1	0	1	1	2	12
07:45 AM	8	0	0	8	0	0	0	0	0	2	0	2	1	0	0	1	11
Total	28	1	0	29	0	0	0	0	0	2	1	3	4	1	1	6	38
08:00 AM	6	1	0	7	0	0	0	0	0	2	0	2	0	0	0	0	9
08:15 AM	5	3	0	8	0	0	0	0	0	2	0	2	2	0	0	2	12
08:30 AM	4	2	0	6	0	0	0	0	0	2	0	2	0	0	1	1	9
08:45 AM	7	0	0	7	0	0	0	0	0	0	0	0	3	0	0	3	10
Total	22	6	0	28	0	0	0	0	0	6	0	6	5	0	1	6	40
Grand Total	50	7	0	57	0	0	0	0	0	8	1	9	9	1	2	12	78
Apprch %	87.7	12.3	0		0	0	0		0	88.9	11.1		75	8.3	16.7		
Total %	64.1	9	0	73.1	0	0	0	0	0	10.3	1.3	11.5	11.5	1.3	2.6	15.4	

	Evan Hewes Highway Southbound				I-8 Eastbound Off Ramp Westbound				Vanderlinden Road Northbound				I-8 Eastbound Off Ramp 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 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**9**	0	0	**9**	0	0	0	0	0	0	**1**	1	0	**1**	**1**	**2**	**12**
07:45 AM	8	0	0	8	0	0	0	0	0	**2**	0	**2**	1	0	0	1	11
08:00 AM	6	1	0	7	0	0	0	0	0	2	0	2	0	0	0	0	9
08:15 AM	5	**3**	0	8	0	0	0	0	0	2	0	2	**2**	0	0	2	12
Total Volume	28	4	0	32	0	0	0	0	0	6	1	7	3	1	1	5	44
% App. Total	87.5	12.5	0		0	0	0		0	85.7	14.3		60	20	20		
PHF	.778	.333	.000	.889	.000	.000	.000	.000	.000	.750	.250	.875	.375	.250	.250	.625	.917

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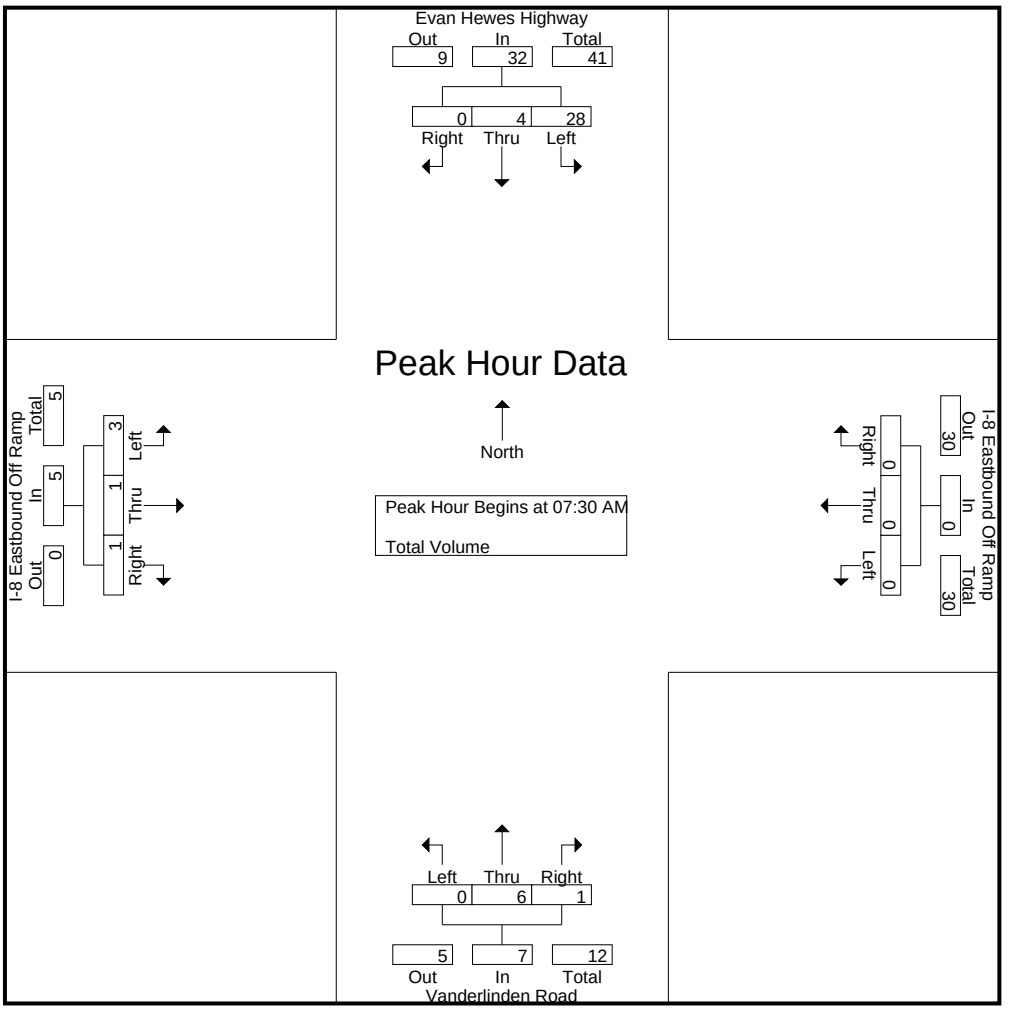
County of Imperial
N/S: Evan Hewes Hwy/Vanderlinden Rd
E/W: I-8 Eastbound Ramps
Weather: Clear

File Name : 10_CIM_Vander_8E AM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:45 AM				07:00 AM			
+0 mins.	7	**1**	0	8	0	0	0	0	0	**2**	0	**2**	**3**	0	0	**3**
+15 mins.	**9**	0	0	**9**	0	0	0	0	0	2	0	2	0	0	0	0
+30 mins.	8	0	0	8	0	0	0	0	0	2	0	2	0	**1**	**1**	2
+45 mins.	6	1	0	7	0	0	0	0	0	2	0	2	1	0	0	1
Total Volume	30	2	0	32	0	0	0	0	0	8	0	8	4	1	1	6
% App. Total	93.8	6.2	0		0	0	0		0	100	0		66.7	16.7	16.7	
PHF	.833	.500	.000	.889	.000	.000	.000	.000	.000	1.000	.000	1.000	.333	.250	.250	.500

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County of Imperial
N/S: Evan Hewes Hwy/Vanderlinden Rd
E/W: I-8 Eastbound Ramps
Weather: Clear

File Name : 10_CIM_Vander_8E PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 1

Groups Printed- Total Volume

	Evan Hewes Highway Southbound				I-8 Eastbound Off Ramp Westbound				Vanderlinden Road Northbound				I-8 Eastbound Off Ramp 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
04:00 PM	14	1	0	15	0	0	0	0	0	1	2	3	0	0	0	0	18
04:15 PM	13	2	0	15	0	0	0	0	0	1	1	2	0	1	0	1	18
04:30 PM	13	1	0	14	0	0	0	0	0	2	0	2	0	0	0	0	16
04:45 PM	12	1	0	13	0	0	0	0	0	0	0	0	3	0	0	3	16
Total	52	5	0	57	0	0	0	0	0	4	3	7	3	1	0	4	68
05:00 PM	11	0	0	11	0	0	0	0	0	1	1	2	1	0	0	1	14
05:15 PM	10	1	0	11	0	0	0	0	0	0	0	0	0	0	0	0	11
05:30 PM	11	1	0	12	0	0	0	0	0	0	1	1	1	0	0	1	14
05:45 PM	1	0	0	1	0	0	0	0	0	0	1	1	1	1	2	4	6
Total	33	2	0	35	0	0	0	0	0	1	3	4	3	1	2	6	45
Grand Total	85	7	0	92	0	0	0	0	0	5	6	11	6	2	2	10	113
Apprch %	92.4	7.6	0		0	0	0		0	45.5	54.5		60	20	20		
Total %	75.2	6.2	0	81.4	0	0	0	0	0	4.4	5.3	9.7	5.3	1.8	1.8	8.8	

	Evan Hewes Highway Southbound				I-8 Eastbound Off Ramp Westbound				Vanderlinden Road Northbound				I-8 Eastbound Off Ramp 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**14**	1	0	**15**	0	0	0	0	0	1	**2**	**3**	0	0	0	0	**18**
04:15 PM	13	**2**	0	15	0	0	0	0	0	1	1	2	0	**1**	0	1	18
04:30 PM	13	1	0	14	0	0	0	0	0	**2**	0	2	0	0	0	0	16
04:45 PM	12	1	0	13	0	0	0	0	0	0	0	0	**3**	0	0	**3**	16
Total Volume	52	5	0	57	0	0	0	0	0	4	3	7	3	1	0	4	68
% App. Total	91.2	8.8	0		0	0	0		0	57.1	42.9		75	25	0		
PHF	.929	.625	.000	.950	.000	.000	.000	.000	.000	.500	.375	.583	.250	.250	.000	.333	.944

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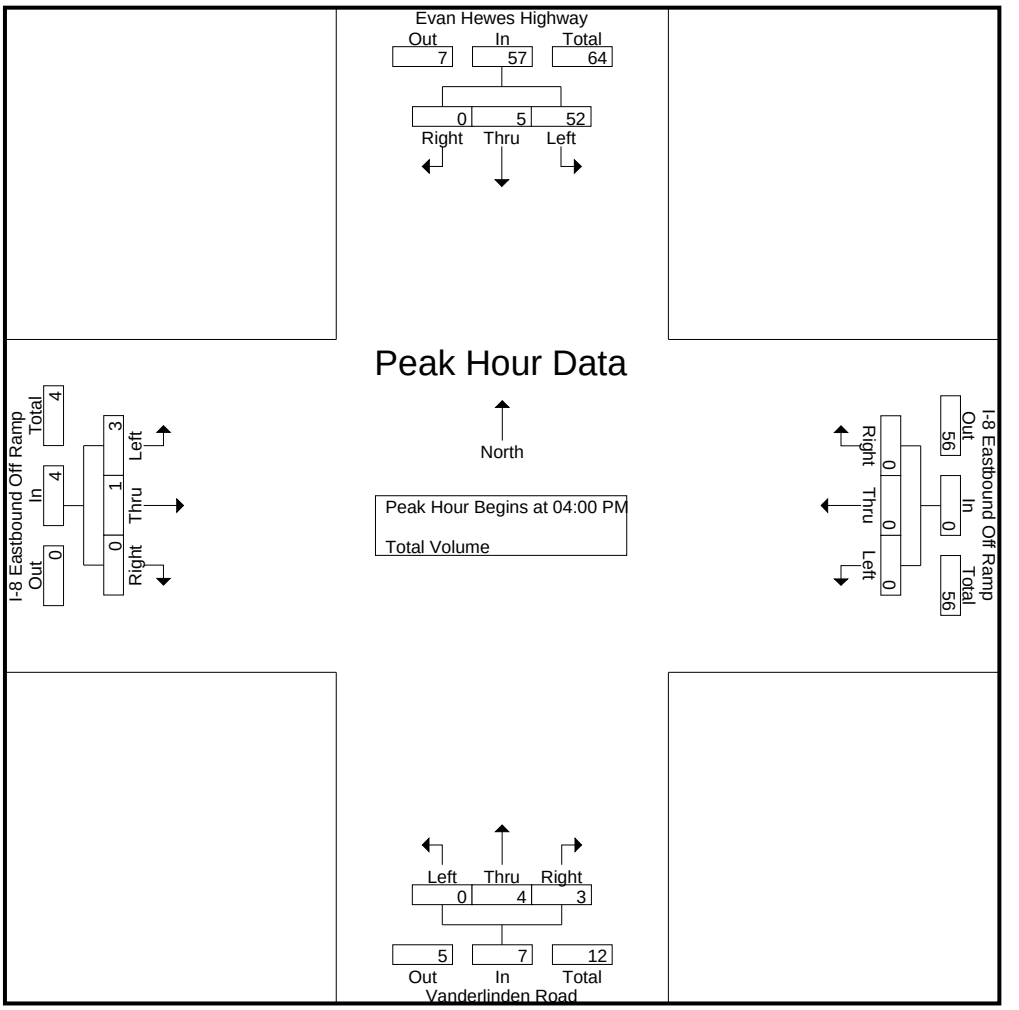
County of Imperial
N/S: Evan Hewes Hwy/Vanderlinden Rd
E/W: I-8 Eastbound Ramps
Weather: Clear

File Name : 10_CIM_Vander_8E PM
Site Code : 99920467
Start Date : 12/18/2020
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				05:00 PM			
+0 mins.	**14**	1	0	**15**	0	0	0	0	0	1	**2**	**3**	**1**	0	0	1
+15 mins.	13	**2**	0	15	0	0	0	0	0	1	1	2	0	0	0	0
+30 mins.	13	1	0	14	0	0	0	0	0	**2**	0	2	1	0	0	1
+45 mins.	12	1	0	13	0	0	0	0	0	0	0	0	1	**1**	**2**	**4**
Total Volume	52	5	0	57	0	0	0	0	0	4	3	7	3	1	2	6
% App. Total	91.2	8.8	0		0	0	0		0	57.1	42.9		50	16.7	33.3	
PHF	.929	.625	.000	.950	.000	.000	.000	.000	.000	.500	.375	.583	.750	.250	.250	.375

Counts Unlimited, Inc.
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County of Imperial
Snyder Road
B/ Hoyt Road - Walnut Avenue / Ogier Road
24 Hour Directional Volume Count

CIM001
Site Code: 999-20467

Start Time	12/18/2020 Fri	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		2	4			0	11				
12:15		2	7			2	8				
12:30		0	6			3	4				
12:45		2	6	6	23	0	12	5	35	11	58
01:00		0	8			0	8				
01:15		0	7			0	7				
01:30		0	4			2	6				
01:45		0	4	0	23	2	6	4	27	4	50
02:00		4	6			0	6				
02:15		1	**7**			0	17				
02:30		0	**8**			0	8				
02:45		2	**25**	7	46	0	**16**	0	47	7	93
03:00		0	**10**			4	**12**				
03:15		3	6			1	**18**				
03:30		0	6			1	**12**				
03:45		4	8	7	30	2	12	8	54	15	84
04:00		3	9			0	2				
04:15		3	4			3	5				
04:30		4	12			0	4				
04:45		3	2	13	27	0	4	3	15	16	42
05:00		2	4			1	0				
05:15		8	2			6	6				
05:30		16	4			9	4				
05:45		17	0	43	10	9	4	25	14	68	24
06:00		7	1			6	0				
06:15		2	2			4	4				
06:30		**18**	1			5	4				
06:45		**14**	3	41	7	3	0	18	8	59	15
07:00		**16**	2			5	5				
07:15		**11**	6			10	5				
07:30		13	3			4	1				
07:45		4	2	44	13	**14**	0	33	11	77	24
08:00		4	2			**10**	2				
08:15		3	0			**11**	4				
08:30		4	4			**8**	0				
08:45		13	1	24	7	9	3	38	9	62	16
09:00		10	2			4	1				
09:15		8	2			8	0				
09:30		12	1			6	4				
09:45		4	2	34	7	4	6	22	11	56	18
10:00		10	0			10	2				
10:15		8	2			7	4				
10:30		8	0			13	0				
10:45		3	0	29	2	4	1	34	7	63	9
11:00		10	1			7	2				
11:15		14	0			6	1				
11:30		12	0			13	4				
11:45		10	0	46	1	12	1	38	8	84	9
Total		294	196	294	196	228	246	228	246	522	442
Combined Total		490		490		474		474		964	
AM Peak	-	06:30	-	-	-	07:45	-	-	-	-	-
Vol.	-	59	-	-	-	43	-	-	-	-	-
P.H.F.		0.819				0.768					
PM Peak	-	-	02:15	-	-	-	02:45	-	-	-	-
Vol.	-	-	50	-	-	-	58	-	-	-	-
P.H.F.			0.500				0.806				
Percentage		60.0%	40.0%			48.1%	51.9%				
ADT/AADT		ADT 964		AADT 964							

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
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City of Holtville
State Route 115
B/ Walnut Avenue - Maple Avenue
24 Hour Directional Volume Count

HVE006
Site Code: 999-20467

Start Time	12/18/2020 Fri	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		5	68			6	66				
12:15		8	61			4	62				
12:30		4	45			4	60				
12:45		4	53	21	227	2	57	16	245	37	472
01:00		4	70			6	42				
01:15		3	54			3	66				
01:30		7	67			1	43				
01:45		4	58	18	249	4	41	14	192	32	441
02:00		3	56			2	41				
02:15		7	51			3	69				
02:30		3	60			2	41				
02:45		3	51	16	218	3	**47**	10	198	26	416
03:00		5	62			4	**65**				
03:15		6	68			7	**65**				
03:30		1	56			2	**69**				
03:45		1	49	13	235	8	44	21	243	34	478
04:00		5	**71**			8	53				
04:15		5	**66**			7	54				
04:30		8	**63**			6	57				
04:45		8	**61**	26	261	20	44	41	208	67	469
05:00		4	70			11	45				
05:15		30	64			15	41				
05:30		28	46			28	36				
05:45		34	40	96	220	30	41	84	163	180	383
06:00		37	54			26	29				
06:15		27	67			31	37				
06:30		31	37			25	32				
06:45		32	47	127	205	16	44	98	142	225	347
07:00		18	39			37	23				
07:15		24	30			33	28				
07:30		29	31			55	23				
07:45		43	32	114	132	52	23	177	97	291	229
08:00		47	24			33	21				
08:15		24	22			41	14				
08:30		33	29			34	18				
08:45		44	18	148	93	41	13	149	66	297	159
09:00		35	25			37	20				
09:15		37	10			29	11				
09:30		32	16			43	12				
09:45		43	19	147	70	52	9	161	52	308	122
10:00		32	12			39	17				
10:15		41	11			45	16				
10:30		41	14			52	13				
10:45		51	13	165	50	47	10	183	56	348	106
11:00		**43**	6			**61**	4				
11:15		**52**	9			**62**	7				
11:30		**56**	12			**53**	9				
11:45		**57**	7	208	34	**48**	4	224	24	432	58
Total		1099	1994	1099	1994	1178	1686	1178	1686	2277	3680
Combined Total		3093		3093		2864		2864		5957	
AM Peak	-	11:00	-	-	-	11:00	-	-	-	-	-
Vol.	-	208	-	-	-	224	-	-	-	-	-
P.H.F.		0.912				0.903					
PM Peak	-	-	04:00	-	-	-	02:45	-	-	-	-
Vol.	-	-	261	-	-	-	246	-	-	-	-
P.H.F.			0.919				0.891				
Percentage		35.5%	64.5%			41.1%	58.9%				
ADT/AADT		ADT 5,957		AADT 5,957							

Counts Unlimited, Inc.
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County of Imperial
Orchard Road
B/ State Route 7 - State Route 115
24 Hour Directional Volume Count

CIM005
Site Code: 999-20467

Start Time	12/18/2020 Fri	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		5	40			4	56				
12:15		6	40			1	55				
12:30		1	45			4	42				
12:45		1	32	13	157	2	37	11	190	24	347
01:00		0	**44**			4	48				
01:15		3	**30**			2	44				
01:30		3	**46**			1	38				
01:45		1	**56**	7	176	2	24	9	154	16	330
02:00		1	40			2	30				
02:15		5	34			1	58				
02:30		2	45			4	41				
02:45		6	28	14	147	2	35	9	164	23	311
03:00		2	34			1	46				
03:15		4	37			2	**41**				
03:30		4	29			3	**42**				
03:45		6	42	16	142	12	**54**	18	183	34	325
04:00		8	44			2	**58**				
04:15		6	34			4	30				
04:30		6	31			6	50				
04:45		8	32	28	141	6	33	18	171	46	312
05:00		8	35			10	36				
05:15		23	44			10	34				
05:30		18	34			29	33				
05:45		26	32	75	145	14	26	63	129	138	274
06:00		20	30			29	24				
06:15		31	22			22	26				
06:30		50	23			29	22				
06:45		28	19	129	94	22	14	102	86	231	180
07:00		44	30			27	30				
07:15		33	20			35	16				
07:30		39	22			49	24				
07:45		**50**	26	166	98	39	15	150	85	316	183
08:00		**47**	26			40	14				
08:15		**35**	16			30	6				
08:30		**40**	20			26	13				
08:45		39	11	161	73	**40**	8	136	41	297	114
09:00		33	16			**30**	8				
09:15		32	12			**51**	8				
09:30		20	12			**44**	8				
09:45		33	14	118	54	30	8	155	32	273	86
10:00		38	8			40	6				
10:15		23	8			33	8				
10:30		32	5			32	6				
10:45		36	12	129	33	45	3	150	23	279	56
11:00		32	6			34	3				
11:15		42	4			36	6				
11:30		29	4			36	2				
11:45		38	6	141	20	51	3	157	14	298	34
Total		997	1280	997	1280	978	1272	978	1272	1975	2552
Combined Total		2277		2277		2250		2250		4527	
AM Peak	-	07:45	-	-	-	08:45	-	-	-	-	-
Vol.	-	172	-	-	-	165	-	-	-	-	-
P.H.F.		0.860				0.809					
PM Peak	-	-	01:00	-	-	-	03:15	-	-	-	-
Vol.	-	-	176	-	-	-	195	-	-	-	-
P.H.F.			0.786				0.841				
Percentage		43.8%	56.2%			43.5%	56.5%				
ADT/AADT		ADT 4,527		AADT 4,527							

Counts Unlimited, Inc.
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County of Imperial
Nelson Pit Road
B/ Project Site - Evan Hewes Highway
24 Hour Directional Volume Count

CIM003
Site Code: 999-20467

Start Time	12/18/2020 Fri	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		0	1			0	2				
12:15		0	0			0	0				
12:30		0	0			1	0				
12:45		0	**2**	0	3	0	0	1	2	1	5
01:00		0	**1**			0	0				
01:15		0	**1**			0	0				
01:30		0	**1**			0	0				
01:45		0	2	0	5	0	3	0	3	0	8
02:00		0	0			0	0				
02:15		0	0			0	0				
02:30		0	2			0	0				
02:45		0	0	0	2	0	2	0	2	0	4
03:00		0	0			0	0				
03:15		0	2			0	0				
03:30		0	0			0	**1**				
03:45		0	0	0	2	0	**1**	0	2	0	4
04:00		0	0			0	**1**				
04:15		0	1			0	**1**				
04:30		0	0			0	0				
04:45		0	1	0	2	0	2	0	4	0	6
05:00		0	0			0	0				
05:15		0	1			0	0				
05:30		0	1			2	1				
05:45		0	0	0	2	0	0	2	1	2	3
06:00		0	0			1	0				
06:15		2	0			1	0				
06:30		0	0			2	0				
06:45		0	0	2	0	0	0	4	0	6	0
07:00		0	0			0	0				
07:15		**2**	0			1	1				
07:30		**0**	0			0	0				
07:45		**3**	0	5	0	0	0	1	1	6	1
08:00		**2**	0			1	0				
08:15		1	0			0	0				
08:30		0	1			**0**	0				
08:45		1	0	4	1	**3**	0	4	0	8	1
09:00		2	0			**1**	0				
09:15		0	0			**1**	0				
09:30		1	0			0	0				
09:45		3	0	6	0	0	0	2	0	8	0
10:00		0	0			0	0				
10:15		1	0			0	0				
10:30		2	0			2	0				
10:45		1	0	4	0	0	1	2	1	6	1
11:00		0	0			1	0				
11:15		1	0			1	0				
11:30		0	0			0	0				
11:45		1	0	2	0	3	0	5	0	7	0
Total		23	17	23	17	21	16	21	16	44	33
Combined Total		40		40		37		37		77	
AM Peak	-	07:15	-	-	-	08:30	-	-	-	-	-
Vol.	-	7	-	-	-	5	-	-	-	-	-
P.H.F.		0.583				0.417					
PM Peak	-	-	00:45	-	-	-	03:30	-	-	-	-
Vol.	-	-	5	-	-	-	4	-	-	-	-
P.H.F.			0.625				0.333				
Percentage		57.5%	42.5%			56.8%	43.2%				
ADT/AADT		ADT 77		AADT 77							

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County of Imperial
Miller Road
B/ Evan Hewes Highway - Nelson Pit Road
24 Hour Directional Volume Count

CIM004
Site Code: 999-20467

Start Time	12/18/2020 Fri	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		5	8			0	2				
12:15		0	2			8	2				
12:30		1	2			1	4				
12:45		2	4	8	16	2	**8**	11	16	19	32
01:00		0	4			0	**10**				
01:15		0	8			2	**4**				
01:30		2	2			4	**8**				
01:45		0	0	2	14	2	4	8	26	10	40
02:00		0	4			2	6				
02:15		0	4			4	0				
02:30		0	**10**			2	2				
02:45		2	**8**	2	26	10	7	18	15	20	41
03:00		0	**6**			2	5				
03:15		3	**6**			1	0				
03:30		0	1			2	2				
03:45		0	2	3	15	2	3	7	10	10	25
04:00		2	2			3	2				
04:15		0	0			0	2				
04:30		0	2			1	4				
04:45		0	4	2	8	0	1	4	9	6	17
05:00		2	0			4	1				
05:15		1	1			0	0				
05:30		0	0			2	2				
05:45		0	1	3	2	0	0	6	3	9	5
06:00		0	1			4	0				
06:15		3	4			3	0				
06:30		7	2			4	1				
06:45		3	1	13	8	0	0	11	1	24	9
07:00		**5**	6			2	0				
07:15		**5**	0			3	4				
07:30		**3**	0			0	2				
07:45		**14**	0	27	6	4	2	9	8	36	14
08:00		4	0			2	0				
08:15		1	0			7	0				
08:30		8	1			2	0				
08:45		2	2	15	3	4	0	15	0	30	3
09:00		5	0			5	2				
09:15		2	0			2	0				
09:30		4	0			4	0				
09:45		2	2	13	2	2	1	13	3	26	5
10:00		4	2			6	8				
10:15		1	0			1	0				
10:30		12	1			2	1				
10:45		4	0	21	3	**5**	2	14	11	35	14
11:00		4	0			**3**	0				
11:15		4	0			**6**	2				
11:30		4	0			**8**	0				
11:45		2	0	14	0	3	0	20	2	34	2
Total		123	103	123	103	136	104	136	104	259	207
Combined Total		226		226		240		240		466	
AM Peak	-	07:00	-	-	-	10:45	-	-	-	-	-
Vol.	-	27	-	-	-	22	-	-	-	-	-
P.H.F.		0.482				0.550					
PM Peak	-	-	02:30	-	-	-	00:45	-	-	-	-
Vol.	-	-	30	-	-	-	30	-	-	-	-
P.H.F.			0.750				0.750				
Percentage		54.4%	45.6%			56.7%	43.3%				
ADT/AADT		ADT 466		AADT 466							

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County of Imperial
Snyder Road
B/ Norrish Road - Evan Hewes Highway
24 Hour Directional Volume Count

CIM007
Site Code: 999-20467

Start Time	12/18/2020 Fri	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		0	4			1	4				
12:15		1	3			2	4				
12:30		0	4			0	7				
12:45		0	0	1	11	0	6	3	21	4	32
01:00		0	5			0	4				
01:15		0	**8**			0	6				
01:30		0	**5**			1	4				
01:45		1	**4**	1	22	0	8	1	22	2	44
02:00		1	**8**			0	4				
02:15		1	8			0	9				
02:30		0	2			0	2				
02:45		1	7	3	25	0	**10**	0	25	3	50
03:00		0	8			0	**10**				
03:15		0	4			0	**10**				
03:30		0	2			0	**11**				
03:45		0	4	0	18	0	5	0	36	0	54
04:00		0	8			0	3				
04:15		0	2			1	2				
04:30		3	2			0	2				
04:45		3	1	6	13	0	2	1	9	7	22
05:00		0	1			0	2				
05:15		1	0			0	1				
05:30		8	2			0	4				
05:45		7	0	16	3	0	1	0	8	16	11
06:00		9	0			4	1				
06:15		8	2			3	1				
06:30		7	0			4	0				
06:45		5	1	29	3	3	2	14	4	43	7
07:00		8	1			6	0				
07:15		3	1			2	2				
07:30		6	1			4	0				
07:45		1	0	18	3	2	1	14	3	32	6
08:00		4	0			5	0				
08:15		4	0			3	5				
08:30		5	4			3	1				
08:45		8	0	21	4	**5**	1	16	7	37	11
09:00		4	0			**4**	1				
09:15		12	0			**12**	0				
09:30		4	1			**6**	0				
09:45		3	0	23	1	1	4	23	5	46	6
10:00		**8**	1			7	0				
10:15		**8**	0			4	2				
10:30		**9**	1			2	0				
10:45		**9**	1	34	3	3	0	16	2	50	5
11:00		4	2			8	0				
11:15		8	0			6	0				
11:30		8	0			5	1				
11:45		4	0	24	2	2	0	21	1	45	3
Total		176	108	176	108	109	143	109	143	285	251
Combined Total		284		284		252		252		536	
AM Peak	-	10:00	-	-	-	08:45	-	-	-	-	-
Vol.	-	34	-	-	-	27	-	-	-	-	-
P.H.F.		0.708				0.563					
PM Peak	-	-	01:15	-	-	-	02:45	-	-	-	-
Vol.	-	-	25	-	-	-	41	-	-	-	-
P.H.F.			0.781				0.932				
Percentage		62.0%	38.0%			43.3%	56.7%				
ADT/AADT		ADT 536		AADT 536							

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County of Imperial
Evan Hewes Highway
B/ Snyder Road - Vanderlinden Road
24 Hour Directional Volume Count

CIM002
Site Code: 999-20467

Start Time	12/18/2020 Fri	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		4	12			2	20				
12:15		6	32			4	12				
12:30		4	21			4	12				
12:45		8	16	22	81	6	16	16	60	38	141
01:00		0	26			1	12				
01:15		4	12			6	20				
01:30		6	20			3	11				
01:45		11	26	21	84	1	10	11	53	32	137
02:00		8	27			4	12				
02:15		1	18			1	18				
02:30		0	**22**			0	**17**				
02:45		2	**26**	11	93	6	**18**	11	65	22	158
03:00		13	**30**			3	**21**				
03:15		2	**28**			11	**30**				
03:30		0	16			1	12				
03:45		4	20	19	94	12	21	27	84	46	178
04:00		2	32			9	15				
04:15		8	16			8	18				
04:30		4	26			12	12				
04:45		6	20	20	94	13	10	42	55	62	149
05:00		8	17			6	26				
05:15		8	16			9	22				
05:30		12	16			7	13				
05:45		10	4	38	53	10	12	32	73	70	126
06:00		18	12			8	18				
06:15		15	23			5	11				
06:30		8	10			10	10				
06:45		12	6	53	51	11	9	34	48	87	99
07:00		10	10			20	8				
07:15		13	9			14	18				
07:30		13	7			14	8				
07:45		20	12	56	38	20	6	68	40	124	78
08:00		16	4			10	6				
08:15		12	4			12	7				
08:30		14	8			12	4				
08:45		6	4	48	20	8	7	42	24	90	44
09:00		26	17			10	7				
09:15		11	1			**20**	10				
09:30		7	6			**14**	4				
09:45		18	10	62	34	**15**	3	59	24	121	58
10:00		18	2			**24**	8				
10:15		24	6			10	10				
10:30		20	10			16	8				
10:45		20	1	82	19	22	8	72	34	154	53
11:00		**33**	12			16	7				
11:15		**8**	6			16	4				
11:30		**29**	6			11	3				
11:45		**34**	3	104	27	16	2	59	16	163	43
Total		536	688	536	688	473	576	473	576	1009	1264
Combined Total		1224		1224		1049		1049		2273	
AM Peak	-	11:00	-	-	-	09:15	-	-	-	-	-
Vol.	-	104	-	-	-	73	-	-	-	-	-
P.H.F.		0.765				0.760					
PM Peak	-	-	02:30	-	-	-	02:30	-	-	-	-
Vol.	-	-	106	-	-	-	86	-	-	-	-
P.H.F.			0.883				0.717				
Percentage		43.8%	56.2%			45.1%	54.9%				
ADT/AADT		ADT 2,273		AADT 2,273							

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APPENDIX B: SYNCHRO REPORT OF EXISTING CONDITIONS

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Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	3	0	7	0	8	2	103	7	4	82	0
Future Vol, veh/h	0	3	0	7	0	8	2	103	7	4	82	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	3	0	8	0	9	2	112	8	4	89	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	222	221	89	219	217	116	89	0	0	120	0	0
Stage 1	97	97	-	120	120	-	-	-	-	-	-	-
Stage 2	125	124	-	99	97	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	734	678	969	737	681	936	1506	-	-	1468	-	-
Stage 1	910	815	-	884	796	-	-	-	-	-	-	-
Stage 2	879	793	-	907	815	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	725	675	969	732	678	936	1506	-	-	1468	-	-
Mov Cap-2 Maneuver	725	675	-	732	678	-	-	-	-	-	-	-
Stage 1	909	813	-	883	795	-	-	-	-	-	-	-
Stage 2	870	792	-	901	813	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.4	9.4	0.1	0.3
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1506	-	-	675	828	1468	-	-
HCM Lane V/C Ratio	0.001	-	-	0.005	0.02	0.003	-	-
HCM Control Delay (s)	7.4	0	-	10.4	9.4	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	1	0	0	2	0	0	0	0	1	0	0
Future Vol, veh/h	0	1	0	0	2	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	50	50	50	50	50	50	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	2	0	0	4	0	0	0	0	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	4	0	0	2	0	0	6	6	2	6	6	4
Stage 1	-	-	-	-	-	-	2	2	-	4	4	-
Stage 2	-	-	-	-	-	-	4	4	-	2	2	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1618	-	-	1620	-	-	1014	889	1082	1014	889	1080
Stage 1	-	-	-	-	-	-	1021	894	-	1018	892	-
Stage 2	-	-	-	-	-	-	1018	892	-	1021	894	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1618	-	-	1620	-	-	1014	889	1082	1014	889	1080
Mov Cap-2 Maneuver	-	-	-	-	-	-	1014	889	-	1014	889	-
Stage 1	-	-	-	-	-	-	1021	894	-	1018	892	-
Stage 2	-	-	-	-	-	-	1018	892	-	1021	894	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	8.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1618	-	-	1620	-	-	1014
HCM Lane V/C Ratio	-	-	-	-	-	-	-	0.002
HCM Control Delay (s)	0	0	-	-	0	-	-	8.6
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	35	2	2	41	7	7	8	2	11	11	2
Future Vol, veh/h	2	35	2	2	41	7	7	8	2	11	11	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	47	3	3	55	9	9	11	3	15	15	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	64	0	0	50	0	0	130	125	49	128	122	60
Stage 1	-	-	-	-	-	-	55	55	-	66	66	-
Stage 2	-	-	-	-	-	-	75	70	-	62	56	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1538	-	-	1557	-	-	843	765	1020	845	768	1005
Stage 1	-	-	-	-	-	-	957	849	-	945	840	-
Stage 2	-	-	-	-	-	-	934	837	-	949	848	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1538	-	-	1557	-	-	826	762	1020	831	765	1005
Mov Cap-2 Maneuver	-	-	-	-	-	-	826	762	-	831	765	-
Stage 1	-	-	-	-	-	-	955	847	-	943	838	-
Stage 2	-	-	-	-	-	-	913	835	-	933	846	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	9.6	9.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	812	1538	-	-	1557	-	-	811
HCM Lane V/C Ratio	0.028	0.002	-	-	0.002	-	-	0.04
HCM Control Delay (s)	9.6	7.3	0	-	7.3	0	-	9.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	1	14	3	2	10
Future Vol, veh/h	4	1	14	3	2	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1	18	4	3	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	39	20	0	0	22	0
Stage 1	20	-	-	-	-	-
Stage 2	19	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	973	1058	-	-	1593	-
Stage 1	1003	-	-	-	-	-
Stage 2	1004	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	971	1058	-	-	1593	-
Mov Cap-2 Maneuver	971	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	1002	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	987	1593	-
HCM Lane V/C Ratio	-	-	0.007	0.002	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	1	1	0	0	0	1	46	0	1	42	0
Future Vol, veh/h	0	1	1	0	0	0	1	46	0	1	42	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	1	0	0	0	1	54	0	1	49	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	107	107	49	108	107	54	49	0	0	54	0	0
Stage 1	51	51	-	56	56	-	-	-	-	-	-	-
Stage 2	56	56	-	52	51	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	872	783	1020	871	783	1013	1558	-	-	1551	-	-
Stage 1	962	852	-	956	848	-	-	-	-	-	-	-
Stage 2	956	848	-	961	852	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	870	781	1020	868	781	1013	1558	-	-	1551	-	-
Mov Cap-2 Maneuver	870	781	-	868	781	-	-	-	-	-	-	-
Stage 1	961	851	-	955	847	-	-	-	-	-	-	-
Stage 2	955	847	-	958	851	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	0	0.2	0.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1558	-	-	885	-	1551	-	-
HCM Lane V/C Ratio	0.001	-	-	0.003	-	0.001	-	-
HCM Control Delay (s)	7.3	0	-	9.1	0	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	2	0	1	1	0	0	0	1	0	0	0
Future Vol, veh/h	1	2	0	1	1	0	0	0	1	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	50	50	50	50	50	50	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	4	0	2	2	0	0	0	2	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	2	0	0	4	0	0	14	14	4	15	14	2
Stage 1	-	-	-	-	-	-	8	8	-	6	6	-
Stage 2	-	-	-	-	-	-	6	6	-	9	8	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1620	-	-	1618	-	-	1002	880	1080	1001	880	1082
Stage 1	-	-	-	-	-	-	1013	889	-	1016	891	-
Stage 2	-	-	-	-	-	-	1016	891	-	1012	889	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1620	-	-	1618	-	-	1000	878	1080	998	878	1082
Mov Cap-2 Maneuver	-	-	-	-	-	-	1000	878	-	998	878	-
Stage 1	-	-	-	-	-	-	1012	888	-	1015	890	-
Stage 2	-	-	-	-	-	-	1015	890	-	1009	888	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	3.6	8.3	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1080	1620	-	-	1618	-	-	-
HCM Lane V/C Ratio	0.002	0.001	-	-	0.001	-	-	-
HCM Control Delay (s)	8.3	7.2	0	-	7.2	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	1	0	1	0	0	0	16	4	1	10	1
Future Vol, veh/h	1	1	0	1	0	0	0	16	4	1	10	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	2	0	2	0	0	0	25	6	2	16	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	49	52	17	50	50	28	18	0	0	31	0	0
Stage 1	21	21	-	28	28	-	-	-	-	-	-	-
Stage 2	28	31	-	22	22	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	951	839	1062	950	841	1047	1599	-	-	1582	-	-
Stage 1	998	878	-	989	872	-	-	-	-	-	-	-
Stage 2	989	869	-	996	877	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	950	838	1062	948	840	1047	1599	-	-	1582	-	-
Mov Cap-2 Maneuver	950	838	-	948	840	-	-	-	-	-	-	-
Stage 1	998	877	-	989	872	-	-	-	-	-	-	-
Stage 2	989	869	-	993	876	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	8.8	0	0.6
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1599	-	-	890	948	1582	-	-
HCM Lane V/C Ratio	-	-	-	0.004	0.002	0.001	-	-
HCM Control Delay (s)	0	-	-	9.1	8.8	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	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	5	0	0	2	0	0	0	0	0	0	0
Future Vol, veh/h	0	5	0	0	2	0	0	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	58	58	58	58	58	58	58	58	58
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	0	0	3	0	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	3	0	0	9	0	0	12	12	9	12	12	3
Stage 1	-	-	-	-	-	-	9	9	-	3	3	-
Stage 2	-	-	-	-	-	-	3	3	-	9	9	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1619	-	-	1611	-	-	1005	883	1073	1005	883	1081
Stage 1	-	-	-	-	-	-	1012	888	-	1020	893	-
Stage 2	-	-	-	-	-	-	1020	893	-	1012	888	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1619	-	-	1611	-	-	1005	883	1073	1005	883	1081
Mov Cap-2 Maneuver	-	-	-	-	-	-	1005	883	-	1005	883	-
Stage 1	-	-	-	-	-	-	1012	888	-	1020	893	-
Stage 2	-	-	-	-	-	-	1020	893	-	1012	888	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1619	-	-	1611	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	2	14	1	4	1	14	15	3	1	16	1
Future Vol, veh/h	1	2	14	1	4	1	14	15	3	1	16	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	17	1	5	1	17	18	4	1	19	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	77	74	20	83	74	18	20	0	-	18	0	0
Stage 1	22	22	-	52	52	-	-	-	-	-	-	-
Stage 2	55	52	-	31	22	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	912	816	1058	904	816	1061	1596	-	0	1599	-	-
Stage 1	996	877	-	961	852	-	-	-	0	-	-	-
Stage 2	957	852	-	986	877	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	898	806	1058	880	806	1061	1596	-	-	1599	-	-
Mov Cap-2 Maneuver	898	806	-	880	806	-	-	-	-	-	-	-
Stage 1	985	876	-	950	843	-	-	-	-	-	-	-
Stage 2	940	843	-	967	876	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	9.3	3.5	0.4
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1596	-	1010	852	1599	-	-
HCM Lane V/C Ratio	0.011	-	0.02	0.008	0.001	-	-
HCM Control Delay (s)	7.3	0	8.6	9.3	7.3	0	-
HCM Lane LOS	A	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	0	0	0	0	1	50	0	0	34	0
Future Vol, veh/h	1	0	0	0	0	0	1	50	0	0	34	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	0	0	0	1	63	0	0	43	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	108	108	43	108	108	63	43	0	0	63	0	0
Stage 1	43	43	-	65	65	-	-	-	-	-	-	-
Stage 2	65	65	-	43	43	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	871	782	1027	871	782	1002	1566	-	-	1540	-	-
Stage 1	971	859	-	946	841	-	-	-	-	-	-	-
Stage 2	946	841	-	971	859	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	870	781	1027	870	781	1002	1566	-	-	1540	-	-
Mov Cap-2 Maneuver	870	781	-	870	781	-	-	-	-	-	-	-
Stage 1	970	859	-	945	840	-	-	-	-	-	-	-
Stage 2	945	840	-	971	859	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	0	0.1	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1566	-	-	870	-	1540	-	-
HCM Lane V/C Ratio	0.001	-	-	0.001	-	-	-	-
HCM Control Delay (s)	7.3	0	-	9.1	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑			↰			↑	↱
Traffic Vol, veh/h	0	0	0	6	0	4	22	121	0	0	71	55
Future Vol, veh/h	0	0	0	6	0	4	22	121	0	0	71	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	4	24	134	0	0	79	61

Major/Minor	Minor1			Major1				Major2		
Conflicting Flow All	261	261	134	79	0	-	-	-	0	
Stage 1	182	182	-	-	-	-	-	-	-	
Stage 2	79	79	-	-	-	-	-	-	-	
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	-	-	-	
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	-	-	-	
Pot Cap-1 Maneuver	728	644	915	1519	-	0	0	-	0	
Stage 1	849	749	-	-	-	0	0	-	0	
Stage 2	944	829	-	-	-	0	0	-	0	
Platoon blocked, %					-			-		
Mov Cap-1 Maneuver	716	0	915	1519	-	-	-	-	-	
Mov Cap-2 Maneuver	716	0	-	-	-	-	-	-	-	
Stage 1	835	0	-	-	-	-	-	-	-	
Stage 2	944	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	9	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT
Capacity (veh/h)	1519	-	915	-
HCM Lane V/C Ratio	0.016	-	0.005	-
HCM Control Delay (s)	7.4	0	9	-
HCM Lane LOS	A	A	A	-
HCM 95th %tile Q(veh)	0	-	0	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑						↑↑	↱		↑	
Traffic Vol, veh/h	38	0	128	0	0	0	0	217	4	2	63	0
Future Vol, veh/h	38	0	128	0	0	0	0	217	4	2	63	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	0	135	0	0	0	0	228	4	2	66	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	184	302	66	-	0	0	232	0	0
Stage 1	70	70	-	-	-	-	-	-	-
Stage 2	114	232	-	-	-	-	-	-	-
Critical Hdwy	6.63	6.53	6.23	-	-	-	4.13	-	-
Critical Hdwy Stg 1	5.43	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.83	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	-	-	-	2.219	-	-
Pot Cap-1 Maneuver	797	610	997	0	-	-	1334	-	0
Stage 1	952	836	-	0	-	-	-	-	0
Stage 2	899	712	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	795	0	997	-	-	-	1334	-	-
Mov Cap-2 Maneuver	795	0	-	-	-	-	-	-	-
Stage 1	952	0	-	-	-	-	-	-	-
Stage 2	897	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	997	1334	-
HCM Lane V/C Ratio	-	-	0.135	0.002	-
HCM Control Delay (s)	-	-	9.2	7.7	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	3	1	3	8	29	0	0	30	1
Future Vol, veh/h	0	0	0	3	1	3	8	29	0	0	30	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	4	1	4	10	35	0	0	37	1

Major/Minor	Minor1			Major1				Major2		
Conflicting Flow All	93	93	35	38	0	-	-	-	0	
Stage 1	55	55	-	-	-	-	-	-	-	
Stage 2	38	38	-	-	-	-	-	-	-	
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	-	-	-	
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	-	-	-	
Pot Cap-1 Maneuver	907	797	1038	1572	-	0	0	-	-	
Stage 1	968	849	-	-	-	0	0	-	-	
Stage 2	984	863	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	902	0	1038	1572	-	-	-	-	-	
Mov Cap-2 Maneuver	902	0	-	-	-	-	-	-	-	
Stage 1	962	0	-	-	-	-	-	-	-	
Stage 2	984	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	8.8	1.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1572	-	902	1038	-	-
HCM Lane V/C Ratio	0.006	-	0.004	0.004	-	-
HCM Control Delay (s)	7.3	0	9	8.5	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	14	0	0	0	0	35	2	2	30	0
Future Vol, veh/h	4	0	14	0	0	0	0	35	2	2	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	18	0	0	0	0	45	3	3	38	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	91	-	38	-	0	0	48	0	0
Stage 1	44	-	-	-	-	-	-	-	-
Stage 2	47	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	-	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	-	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	909	0	1034	0	-	-	1559	-	0
Stage 1	978	0	-	0	-	-	-	-	0
Stage 2	975	0	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	907	0	1034	-	-	-	1559	-	-
Mov Cap-2 Maneuver	907	0	-	-	-	-	-	-	-
Stage 1	978	0	-	-	-	-	-	-	-
Stage 2	973	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	907	1034	1559	-
HCM Lane V/C Ratio	-	-	0.006	0.017	0.002	-
HCM Control Delay (s)	-	-	9	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	0	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	46	1	5	0	0	27	5
Future Vol, veh/h	0	0	0	0	0	46	1	5	0	0	27	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	57	1	6	0	0	33	6

Major/Minor	Minor1		Major1		Major2				
Conflicting Flow All	44	47	6	39	0	-	-	-	0
Stage 1	8	8	-	-	-	-	-	-	-
Stage 2	36	39	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	-	-	-
Pot Cap-1 Maneuver	967	845	1077	1571	-	0	0	-	-
Stage 1	1015	889	-	-	-	0	0	-	-
Stage 2	986	862	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	966	0	1077	1571	-	-	-	-	-
Mov Cap-2 Maneuver	966	0	-	-	-	-	-	-	-
Stage 1	1014	0	-	-	-	-	-	-	-
Stage 2	986	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1571	-	-	1077	-	-
HCM Lane V/C Ratio	0.001	-	-	0.053	-	-
HCM Control Delay (s)	7.3	0	0	8.5	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	1	0	0	0	0	6	1	28	4	0
Future Vol, veh/h	3	1	1	0	0	0	0	6	1	28	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	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	3	1	1	0	0	0	0	7	1	30	4	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	72	72	4	-	0	0	8	0	0
Stage 1	64	64	-	-	-	-	-	-	-
Stage 2	8	8	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	932	818	1080	0	-	-	1612	-	0
Stage 1	959	842	-	0	-	-	-	-	0
Stage 2	1015	889	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	914	0	1080	-	-	-	1612	-	-
Mov Cap-2 Maneuver	914	0	-	-	-	-	-	-	-
Stage 1	959	0	-	-	-	-	-	-	-
Stage 2	996	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	6.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	914	1080	1612	-
HCM Lane V/C Ratio	-	-	0.005	0.001	0.019	-
HCM Control Delay (s)	-	-	9	8.3	7.3	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	0.1	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	2	5	1	8	0	75	1	8	110	1
Future Vol, veh/h	0	0	2	5	1	8	0	75	1	8	110	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	2	6	1	10	0	89	1	10	131	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	247	242	132	243	242	90	132	0	0	90	0	0
Stage 1	152	152	-	90	90	-	-	-	-	-	-	-
Stage 2	95	90	-	153	152	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	707	660	917	711	660	968	1453	-	-	1505	-	-
Stage 1	850	772	-	917	820	-	-	-	-	-	-	-
Stage 2	912	820	-	849	772	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	696	655	917	705	655	968	1453	-	-	1505	-	-
Mov Cap-2 Maneuver	696	655	-	705	655	-	-	-	-	-	-	-
Stage 1	850	767	-	917	820	-	-	-	-	-	-	-
Stage 2	902	820	-	841	767	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.9	9.4	0	0.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1453	-	-	917	829	1505	-	-
HCM Lane V/C Ratio	-	-	-	0.003	0.02	0.006	-	-
HCM Control Delay (s)	0	-	-	8.9	9.4	7.4	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	2	0	0	0	0	1	0	1	0	0	0
Future Vol, veh/h	1	2	0	0	0	0	1	0	1	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	3	0	0	0	0	2	0	2	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	2	0	0	3	0	0	9	9	3	10	9	2
Stage 1	-	-	-	-	-	-	7	7	-	2	2	-
Stage 2	-	-	-	-	-	-	2	2	-	8	7	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1620	-	-	1619	-	-	1010	886	1081	1008	886	1082
Stage 1	-	-	-	-	-	-	1015	890	-	1021	894	-
Stage 2	-	-	-	-	-	-	1021	894	-	1013	890	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1620	-	-	1619	-	-	1009	885	1081	1006	885	1082
Mov Cap-2 Maneuver	-	-	-	-	-	-	1009	885	-	1006	885	-
Stage 1	-	-	-	-	-	-	1014	889	-	1020	894	-
Stage 2	-	-	-	-	-	-	1021	894	-	1011	889	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0	8.5	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1044	1620	-	-	1619	-	-	-
HCM Lane V/C Ratio	0.003	0.001	-	-	-	-	-	-
HCM Control Delay (s)	8.5	7.2	0	-	0	-	-	0
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	7	52	1	0	35	8	4	6	0	5	4	7
Future Vol, veh/h	7	52	1	0	35	8	4	6	0	5	4	7
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	64	1	0	43	10	5	7	0	6	5	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	53	0	0	65	0	0	138	136	65	134	131	48
Stage 1	-	-	-	-	-	-	83	83	-	48	48	-
Stage 2	-	-	-	-	-	-	55	53	-	86	83	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1553	-	-	1537	-	-	833	755	999	838	760	1021
Stage 1	-	-	-	-	-	-	925	826	-	965	855	-
Stage 2	-	-	-	-	-	-	957	851	-	922	826	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1553	-	-	1537	-	-	818	750	999	828	755	1021
Mov Cap-2 Maneuver	-	-	-	-	-	-	818	750	-	828	755	-
Stage 1	-	-	-	-	-	-	919	821	-	959	855	-
Stage 2	-	-	-	-	-	-	943	851	-	908	821	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0	9.7	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	776	1553	-	-	1537	-	-	879
HCM Lane V/C Ratio	0.016	0.006	-	-	-	-	-	0.022
HCM Control Delay (s)	9.7	7.3	0	-	0	-	-	9.2
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	9	2	0	4
Future Vol, veh/h	1	0	9	2	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	67	67	67	67	67	67
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	13	3	0	6

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	21	15	0	0	16	0
Stage 1	15	-	-	-	-	-
Stage 2	6	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	996	1065	-	-	1602	-
Stage 1	1008	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	996	1065	-	-	1602	-
Mov Cap-2 Maneuver	996	-	-	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	1017	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	996	1602	-
HCM Lane V/C Ratio	-	-	0.001	-	-
HCM Control Delay (s)	-	-	8.6	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	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	1	0	0	0	0	0	38	0	0	48	0
Future Vol, veh/h	0	1	0	0	0	0	0	38	0	0	48	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	0	0	0	0	0	44	0	0	55	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	99	99	55	100	99	44	55	0	0	44	0	0
Stage 1	55	55	-	44	44	-	-	-	-	-	-	-
Stage 2	44	44	-	56	55	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	883	791	1012	881	791	1026	1550	-	-	1564	-	-
Stage 1	957	849	-	970	858	-	-	-	-	-	-	-
Stage 2	970	858	-	956	849	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	883	791	1012	880	791	1026	1550	-	-	1564	-	-
Mov Cap-2 Maneuver	883	791	-	880	791	-	-	-	-	-	-	-
Stage 1	957	849	-	970	858	-	-	-	-	-	-	-
Stage 2	970	858	-	955	849	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1550	-	-	791	-	1564	-	-
HCM Lane V/C Ratio	-	-	-	0.001	-	-	-	-
HCM Control Delay (s)	0	-	-	9.6	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	1	0	0	1	0	0	0	1	0	0	0
Future Vol, veh/h	0	1	0	0	1	0	0	0	1	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	0	0	1	0	0	0	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	1	0	0	2	2	1	3	2	1
Stage 1	-	-	-	-	-	-	1	1	-	1	1	-
Stage 2	-	-	-	-	-	-	1	1	-	2	1	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1622	-	-	1622	-	-	1020	894	1084	1019	894	1084
Stage 1	-	-	-	-	-	-	1022	895	-	1022	895	-
Stage 2	-	-	-	-	-	-	1022	895	-	1021	895	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1622	-	-	1622	-	-	1020	894	1084	1018	894	1084
Mov Cap-2 Maneuver	-	-	-	-	-	-	1020	894	-	1018	894	-
Stage 1	-	-	-	-	-	-	1022	895	-	1022	895	-
Stage 2	-	-	-	-	-	-	1022	895	-	1020	895	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	8.3	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1084	1622	-	-	1622	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-	-	-	-
HCM Control Delay (s)	8.3	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	1	0	1	0	3	1	4	0	1	8	0
Future Vol, veh/h	0	1	0	1	0	3	1	4	0	1	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	0	1	0	3	1	4	0	1	8	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	18	16	8	17	16	4	8	0	0	4	0	0
Stage 1	10	10	-	6	6	-	-	-	-	-	-	-
Stage 2	8	6	-	11	10	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	996	878	1074	998	878	1080	1612	-	-	1618	-	-
Stage 1	1011	887	-	1016	891	-	-	-	-	-	-	-
Stage 2	1013	891	-	1010	887	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	992	876	1074	996	876	1080	1612	-	-	1618	-	-
Mov Cap-2 Maneuver	992	876	-	996	876	-	-	-	-	-	-	-
Stage 1	1010	886	-	1015	890	-	-	-	-	-	-	-
Stage 2	1009	890	-	1008	886	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	8.4	1.4	0.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1612	-	-	876	1058	1618	-	-
HCM Lane V/C Ratio	0.001	-	-	0.001	0.004	0.001	-	-
HCM Control Delay (s)	7.2	0	-	9.1	8.4	7.2	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	3	0	1	3	0	0	0	0	0	0	0
Future Vol, veh/h	0	3	0	1	3	0	0	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	3	0	1	3	0	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	3	0	0	3	0	0	8	8	3	8	8	3
Stage 1	-	-	-	-	-	-	3	3	-	5	5	-
Stage 2	-	-	-	-	-	-	5	5	-	3	3	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1619	-	-	1619	-	-	1011	887	1081	1011	887	1081
Stage 1	-	-	-	-	-	-	1020	893	-	1017	892	-
Stage 2	-	-	-	-	-	-	1017	892	-	1020	893	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1619	-	-	1619	-	-	1010	886	1081	1010	886	1081
Mov Cap-2 Maneuver	-	-	-	-	-	-	1010	886	-	1010	886	-
Stage 1	-	-	-	-	-	-	1020	893	-	1017	891	-
Stage 2	-	-	-	-	-	-	1016	891	-	1020	893	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.8	0	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1619	-	-	1619	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.001	-	-	-
HCM Control Delay (s)	0	0	-	-	7.2	0	-	0
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	1	11	1	4	1	19	8	3	0	9	1
Future Vol, veh/h	2	1	11	1	4	1	19	8	3	0	9	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	15	1	6	1	27	11	4	0	13	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	83	79	14	87	79	11	14	0	-	11	0	0
Stage 1	14	14	-	65	65	-	-	-	-	-	-	-
Stage 2	69	65	-	22	14	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	904	811	1066	899	811	1070	1604	-	0	1608	-	-
Stage 1	1006	884	-	946	841	-	-	-	0	-	-	-
Stage 2	941	841	-	996	884	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	886	797	1066	873	797	1070	1604	-	-	1608	-	-
Mov Cap-2 Maneuver	886	797	-	873	797	-	-	-	-	-	-	-
Stage 1	989	884	-	930	827	-	-	-	-	-	-	-
Stage 2	917	827	-	980	884	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	9.3	5.1	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1604	-	1012	845	1608	-	-
HCM Lane V/C Ratio	0.017	-	0.019	0.01	-	-	-
HCM Control Delay (s)	7.3	0	8.6	9.3	0	-	-
HCM Lane LOS	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0	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	1	0	0	0	0	34	0	0	60	1
Future Vol, veh/h	0	0	1	0	0	0	0	34	0	0	60	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	0	0	0	0	41	0	0	72	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	114	114	73	114	114	41	73	0	0	41	0	0
Stage 1	73	73	-	41	41	-	-	-	-	-	-	-
Stage 2	41	41	-	73	73	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	863	776	989	863	776	1030	1527	-	-	1568	-	-
Stage 1	937	834	-	974	861	-	-	-	-	-	-	-
Stage 2	974	861	-	937	834	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	863	776	989	862	776	1030	1527	-	-	1568	-	-
Mov Cap-2 Maneuver	863	776	-	862	776	-	-	-	-	-	-	-
Stage 1	937	834	-	974	861	-	-	-	-	-	-	-
Stage 2	974	861	-	936	834	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1527	-	-	989	-	1568	-	-
HCM Lane V/C Ratio	-	-	-	0.001	-	-	-	-
HCM Control Delay (s)	0	-	-	8.6	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑			↰			↑	↱
Traffic Vol, veh/h	0	0	0	16	0	4	19	94	0	0	78	43
Future Vol, veh/h	0	0	0	16	0	4	19	94	0	0	78	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	22	0	5	26	129	0	0	107	59

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	288	288	129	107	0	-	-	-	0
Stage 1	181	181	-	-	-	-	-	-	-
Stage 2	107	107	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	-	-	-
Pot Cap-1 Maneuver	702	622	921	1484	-	0	0	-	0
Stage 1	850	750	-	-	-	0	0	-	0
Stage 2	917	807	-	-	-	0	0	-	0
Platoon blocked, %					-			-	
Mov Cap-1 Maneuver	689	0	921	1484	-	-	-	-	-
Mov Cap-2 Maneuver	689	0	-	-	-	-	-	-	-
Stage 1	834	0	-	-	-	-	-	-	-
Stage 2	917	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT
Capacity (veh/h)	1484	-	921	-
HCM Lane V/C Ratio	0.018	-	0.006	-
HCM Control Delay (s)	7.5	0	8.9	-
HCM Lane LOS	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	0	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑						↑↑	↱		↰↑	
Traffic Vol, veh/h	65	1	59	0	0	0	0	109	6	0	91	0
Future Vol, veh/h	65	1	59	0	0	0	0	109	6	0	91	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	79	1	72	0	0	0	0	133	7	0	111	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	178	251	111	-	0	0	140	0	0
Stage 1	111	111	-	-	-	-	-	-	-
Stage 2	67	140	-	-	-	-	-	-	-
Critical Hdwy	6.63	6.53	6.23	-	-	-	4.13	-	-
Critical Hdwy Stg 1	5.43	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.83	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	-	-	-	2.219	-	-
Pot Cap-1 Maneuver	803	651	942	0	-	-	1442	-	0
Stage 1	913	803	-	0	-	-	-	-	0
Stage 2	948	780	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	803	0	942	-	-	-	1442	-	-
Mov Cap-2 Maneuver	803	0	-	-	-	-	-	-	-
Stage 1	913	0	-	-	-	-	-	-	-
Stage 2	948	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	942	1442	-
HCM Lane V/C Ratio	-	-	0.078	-	-
HCM Control Delay (s)	-	-	9.1	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	5	19	27	0	0	16	4
Future Vol, veh/h	0	0	0	1	0	5	19	27	0	0	16	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	1	0	6	24	35	0	0	21	5

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	107	-	35	26	0	-	-	-	0	
Stage 1	83	-	-	-	-	-	-	-	-	
Stage 2	24	-	-	-	-	-	-	-	-	
Critical Hdwy	6.42	-	6.22	4.12	-	-	-	-	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	-	3.318	2.218	-	-	-	-	-	
Pot Cap-1 Maneuver	891	0	1038	1588	-	0	0	-	-	
Stage 1	940	0	-	-	-	0	0	-	-	
Stage 2	999	0	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	878	0	1038	1588	-	-	-	-	-	
Mov Cap-2 Maneuver	878	0	-	-	-	-	-	-	-	
Stage 1	926	0	-	-	-	-	-	-	-	
Stage 2	999	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	8.6	3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1588	-	878	1038	-	-
HCM Lane V/C Ratio	0.015	-	0.001	0.006	-	-
HCM Control Delay (s)	7.3	0	9.1	8.5	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	1	2	0	0	0	0	41	4	0	15	0
Future Vol, veh/h	4	1	2	0	0	0	0	41	4	0	15	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	1	2	0	0	0	0	44	4	0	16	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	62	64	16	-	0	0	48	0	0
Stage 1	16	16	-	-	-	-	-	-	-
Stage 2	46	48	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	944	827	1063	0	-	-	1559	-	0
Stage 1	1007	882	-	0	-	-	-	-	0
Stage 2	976	855	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	944	0	1063	-	-	-	1559	-	-
Mov Cap-2 Maneuver	944	0	-	-	-	-	-	-	-
Stage 1	1007	0	-	-	-	-	-	-	-
Stage 2	976	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	944	1063	1559	-
HCM Lane V/C Ratio	-	-	0.005	0.002	-	-
HCM Control Delay (s)	-	-	8.8	8.4	0	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	3	0	38	1	5	0	0	49	6
Future Vol, veh/h	0	0	0	3	0	38	1	5	0	0	49	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	4	0	45	1	6	0	0	58	7

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	70	73	6	65	0	-	-	-	0
Stage 1	8	8	-	-	-	-	-	-	-
Stage 2	62	65	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	-	-	-
Pot Cap-1 Maneuver	934	817	1077	1537	-	0	0	-	-
Stage 1	1015	889	-	-	-	0	0	-	-
Stage 2	961	841	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	933	0	1077	1537	-	-	-	-	-
Mov Cap-2 Maneuver	933	0	-	-	-	-	-	-	-
Stage 1	1014	0	-	-	-	-	-	-	-
Stage 2	961	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1537	-	933	1077	-	-
HCM Lane V/C Ratio	0.001	-	0.004	0.042	-	-
HCM Control Delay (s)	7.3	0	8.9	8.5	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	0	0	0	0	0	4	3	52	5	0
Future Vol, veh/h	3	1	0	0	0	0	0	4	3	52	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	1	0	0	0	0	0	4	3	55	5	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	121	122	5	-	0	0	7	0	0
Stage 1	115	115	-	-	-	-	-	-	-
Stage 2	6	7	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	874	768	1078	0	-	-	1614	-	0
Stage 1	910	800	-	0	-	-	-	-	0
Stage 2	1017	890	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	844	0	1078	-	-	-	1614	-	-
Mov Cap-2 Maneuver	844	0	-	-	-	-	-	-	-
Stage 1	910	0	-	-	-	-	-	-	-
Stage 2	982	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0	6.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	844	-	1614	-
HCM Lane V/C Ratio	-	-	0.005	-	0.034	-
HCM Control Delay (s)	-	-	9.3	0	7.3	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	0	-	0.1	-

APPENDIX C: SYNCHRO REPORT OF EXISTING PLUS PROJECT CONSTRUCTION CONDITIONS

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Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	3	0	7	0	8	2	103	7	31	82	0
Future Vol, veh/h	0	3	0	7	0	8	2	103	7	31	82	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	3	0	8	0	9	2	112	8	34	89	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	282	281	89	279	277	116	89	0	0	120	0	0
Stage 1	157	157	-	120	120	-	-	-	-	-	-	-
Stage 2	125	124	-	159	157	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	670	627	969	673	631	936	1506	-	-	1468	-	-
Stage 1	845	768	-	884	796	-	-	-	-	-	-	-
Stage 2	879	793	-	843	768	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	651	611	969	658	615	936	1506	-	-	1468	-	-
Mov Cap-2 Maneuver	651	611	-	658	615	-	-	-	-	-	-	-
Stage 1	844	750	-	883	795	-	-	-	-	-	-	-
Stage 2	870	792	-	819	750	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.9	9.7	0.1	2.1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1506	-	-	611	782	1468	-	-
HCM Lane V/C Ratio	0.001	-	-	0.005	0.021	0.023	-	-
HCM Control Delay (s)	7.4	0	-	10.9	9.7	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	19	0	0	2	0	0	0	0	1	0	0
Future Vol, veh/h	0	19	0	0	2	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	50	50	50	50	50	50	50	50	50
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	38	0	0	4	0	0	0	0	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	4	0	0	38	0	0	42	42	38	42	42	4
Stage 1	-	-	-	-	-	-	38	38	-	4	4	-
Stage 2	-	-	-	-	-	-	4	4	-	38	38	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1631	-	-	1585	-	-	966	854	1040	966	854	1085
Stage 1	-	-	-	-	-	-	982	867	-	1024	897	-
Stage 2	-	-	-	-	-	-	1024	897	-	982	867	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1631	-	-	1585	-	-	966	854	1040	966	854	1085
Mov Cap-2 Maneuver	-	-	-	-	-	-	966	854	-	966	854	-
Stage 1	-	-	-	-	-	-	982	867	-	1024	897	-
Stage 2	-	-	-	-	-	-	1024	897	-	982	867	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	8.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1631	-	-	1585	-	-	966
HCM Lane V/C Ratio	-	-	-	-	-	-	-	0.002
HCM Control Delay (s)	0	0	-	-	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	71	2	2	41	7	7	8	2	11	20	2
Future Vol, veh/h	2	71	2	2	41	7	7	8	2	11	20	2
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	96	3	3	55	9	9	11	3	15	27	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	64	0	0	99	0	0	185	174	98	177	171	60
Stage 1	-	-	-	-	-	-	104	104	-	66	66	-
Stage 2	-	-	-	-	-	-	81	70	-	111	105	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1538	-	-	1494	-	-	776	719	958	785	722	1005
Stage 1	-	-	-	-	-	-	902	809	-	945	840	-
Stage 2	-	-	-	-	-	-	927	837	-	894	808	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1538	-	-	1494	-	-	750	716	958	772	719	1005
Mov Cap-2 Maneuver	-	-	-	-	-	-	750	716	-	772	719	-
Stage 1	-	-	-	-	-	-	900	807	-	943	838	-
Stage 2	-	-	-	-	-	-	893	835	-	878	806	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	9.9	10.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	752	1538	-	-	1494	-	-	749
HCM Lane V/C Ratio	0.031	0.002	-	-	0.002	-	-	0.06
HCM Control Delay (s)	9.9	7.3	0	-	7.4	0	-	10.1
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	1	14	39	11	10
Future Vol, veh/h	4	1	14	39	11	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1	18	51	14	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	85	44	0	0	69	0
Stage 1	44	-	-	-	-	-
Stage 2	41	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	916	1026	-	-	1532	-
Stage 1	978	-	-	-	-	-
Stage 2	981	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	908	1026	-	-	1532	-
Mov Cap-2 Maneuver	908	-	-	-	-	-
Stage 1	978	-	-	-	-	-
Stage 2	972	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	3.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	929	1532	-
HCM Lane V/C Ratio	-	-	0.007	0.009	-
HCM Control Delay (s)	-	-	8.9	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	46	1	0	0	0	1	46	0	37	42	0
Future Vol, veh/h	0	46	1	0	0	0	1	46	0	37	42	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	54	1	0	0	0	1	54	0	44	49	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	193	193	49	221	193	54	49	0	0	54	0	0
Stage 1	137	137	-	56	56	-	-	-	-	-	-	-
Stage 2	56	56	-	165	137	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	767	702	1020	735	702	1013	1558	-	-	1551	-	-
Stage 1	866	783	-	956	848	-	-	-	-	-	-	-
Stage 2	956	848	-	837	783	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	749	681	1020	674	681	1013	1558	-	-	1551	-	-
Mov Cap-2 Maneuver	749	681	-	674	681	-	-	-	-	-	-	-
Stage 1	865	760	-	955	847	-	-	-	-	-	-	-
Stage 2	955	847	-	754	760	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	0	0.2	3.5
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1558	-	-	686	-	1551	-	-
HCM Lane V/C Ratio	0.001	-	-	0.081	-	0.028	-	-
HCM Control Delay (s)	7.3	0	-	10.7	0	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	-	0.1	-	-

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	1	83	0	1	1	0	0	0	1	0	0	0
Future Vol, veh/h	1	83	0	1	1	0	0	0	1	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	50	50	50	50	50	50	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	166	0	2	2	0	0	0	2	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	2	0	0	166	0	0	176	176	166	177	176	2
Stage 1	-	-	-	-	-	-	170	170	-	6	6	-
Stage 2	-	-	-	-	-	-	6	6	-	171	170	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1620	-	-	1412	-	-	786	717	878	785	717	1082
Stage 1	-	-	-	-	-	-	832	758	-	1016	891	-
Stage 2	-	-	-	-	-	-	1016	891	-	831	758	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1620	-	-	1412	-	-	784	716	878	782	716	1082
Mov Cap-2 Maneuver	-	-	-	-	-	-	784	716	-	782	716	-
Stage 1	-	-	-	-	-	-	831	757	-	1015	890	-
Stage 2	-	-	-	-	-	-	1015	890	-	828	757	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.8	9.1	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	878	1620	-	-	1412	-	-	-
HCM Lane V/C Ratio	0.002	0.001	-	-	0.001	-	-	-
HCM Control Delay (s)	9.1	7.2	0	-	7.6	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	82	0	1	0	0	0	16	85	1	10	1
Future Vol, veh/h	1	82	0	1	0	0	0	16	85	1	10	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	130	0	2	0	0	0	25	135	2	16	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	114	181	17	179	115	93	18	0	0	160	0	0
Stage 1	21	21	-	93	93	-	-	-	-	-	-	-
Stage 2	93	160	-	86	22	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	863	713	1062	783	775	964	1599	-	-	1419	-	-
Stage 1	998	878	-	914	818	-	-	-	-	-	-	-
Stage 2	914	766	-	922	877	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	862	712	1062	673	774	964	1599	-	-	1419	-	-
Mov Cap-2 Maneuver	862	712	-	673	774	-	-	-	-	-	-	-
Stage 1	998	877	-	914	818	-	-	-	-	-	-	-
Stage 2	914	766	-	784	876	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	10.4	0	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1599	-	-	713	673	1419	-	-
HCM Lane V/C Ratio	-	-	-	0.185	0.002	0.001	-	-
HCM Control Delay (s)	0	-	-	11.2	10.4	7.5	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	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	167	0	0	2	0	0	0	0	0	0	0
Future Vol, veh/h	0	167	0	0	2	0	0	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	58	58	58	58	58	58	58	58	58	58	58	58
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	288	0	0	3	0	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	3	0	0	288	0	0	291	291	288	291	291	3
Stage 1	-	-	-	-	-	-	288	288	-	3	3	-
Stage 2	-	-	-	-	-	-	3	3	-	288	288	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1632	-	-	1286	-	-	665	623	756	665	623	1087
Stage 1	-	-	-	-	-	-	724	677	-	1025	897	-
Stage 2	-	-	-	-	-	-	1025	897	-	724	677	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1632	-	-	1286	-	-	665	623	756	665	623	1087
Mov Cap-2 Maneuver	-	-	-	-	-	-	665	623	-	665	623	-
Stage 1	-	-	-	-	-	-	724	677	-	1025	897	-
Stage 2	-	-	-	-	-	-	1025	897	-	724	677	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1632	-	-	1286	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	2	14	1	4	1	14	51	84	1	16	1
Future Vol, veh/h	1	2	14	1	4	1	14	51	84	1	16	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	17	1	5	1	17	61	101	1	19	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	120	117	20	126	117	61	20	0	-	61	0	0
Stage 1	22	22	-	95	95	-	-	-	-	-	-	-
Stage 2	98	95	-	31	22	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	855	773	1058	848	773	1004	1596	-	0	1542	-	-
Stage 1	996	877	-	912	816	-	-	-	0	-	-	-
Stage 2	908	816	-	986	877	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	842	764	1058	825	764	1004	1596	-	-	1542	-	-
Mov Cap-2 Maneuver	842	764	-	825	764	-	-	-	-	-	-	-
Stage 1	985	876	-	902	807	-	-	-	-	-	-	-
Stage 2	892	807	-	967	876	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	9.5	1.6	0.4
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1596	-	998	806	1542	-	-
HCM Lane V/C Ratio	0.011	-	0.021	0.009	0.001	-	-
HCM Control Delay (s)	7.3	0	8.7	9.5	7.3	0	-
HCM Lane LOS	A	A	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	0	0	0	0	1	50	0	0	34	0
Future Vol, veh/h	1	0	0	0	0	0	1	50	0	0	34	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	0	0	0	0	1	63	0	0	43	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	108	108	43	108	108	63	43	0	0	63	0	0
Stage 1	43	43	-	65	65	-	-	-	-	-	-	-
Stage 2	65	65	-	43	43	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	871	782	1027	871	782	1002	1566	-	-	1540	-	-
Stage 1	971	859	-	946	841	-	-	-	-	-	-	-
Stage 2	946	841	-	971	859	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	870	781	1027	870	781	1002	1566	-	-	1540	-	-
Mov Cap-2 Maneuver	870	781	-	870	781	-	-	-	-	-	-	-
Stage 1	970	859	-	945	840	-	-	-	-	-	-	-
Stage 2	945	840	-	971	859	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	0	0.1	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1566	-	-	870	-	1540	-	-
HCM Lane V/C Ratio	0.001	-	-	0.001	-	-	-	-
HCM Control Delay (s)	7.3	0	-	9.1	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑			↱			↑	↱
Traffic Vol, veh/h	0	0	0	6	0	4	22	121	0	0	71	55
Future Vol, veh/h	0	0	0	6	0	4	22	121	0	0	71	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	4	24	134	0	0	79	61

Major/Minor	Minor1			Major1				Major2		
Conflicting Flow All	261	261	134	79	0	-	-	-	0	
Stage 1	182	182	-	-	-	-	-	-	-	
Stage 2	79	79	-	-	-	-	-	-	-	
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	-	-	-	
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	-	-	-	
Pot Cap-1 Maneuver	728	644	915	1519	-	0	0	-	0	
Stage 1	849	749	-	-	-	0	0	-	0	
Stage 2	944	829	-	-	-	0	0	-	0	
Platoon blocked, %					-			-		
Mov Cap-1 Maneuver	716	0	915	1519	-	-	-	-	-	
Mov Cap-2 Maneuver	716	0	-	-	-	-	-	-	-	
Stage 1	835	0	-	-	-	-	-	-	-	
Stage 2	944	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	9	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT
Capacity (veh/h)	1519	-	915	-
HCM Lane V/C Ratio	0.016	-	0.005	-
HCM Control Delay (s)	7.4	0	9	-
HCM Lane LOS	A	A	A	-
HCM 95th %tile Q(veh)	0	-	0	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑						↑↑	↱		↑	
Traffic Vol, veh/h	38	0	128	0	0	0	0	217	13	2	63	0
Future Vol, veh/h	38	0	128	0	0	0	0	217	13	2	63	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	0	135	0	0	0	0	228	14	2	66	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	184	312	66	-	0	0	242	0	0
Stage 1	70	70	-	-	-	-	-	-	-
Stage 2	114	242	-	-	-	-	-	-	-
Critical Hdwy	6.63	6.53	6.23	-	-	-	4.13	-	-
Critical Hdwy Stg 1	5.43	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.83	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	-	-	-	2.219	-	-
Pot Cap-1 Maneuver	797	602	997	0	-	-	1323	-	0
Stage 1	952	836	-	0	-	-	-	-	0
Stage 2	899	705	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	795	0	997	-	-	-	1323	-	-
Mov Cap-2 Maneuver	795	0	-	-	-	-	-	-	-
Stage 1	952	0	-	-	-	-	-	-	-
Stage 2	897	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	997	1323	-
HCM Lane V/C Ratio	-	-	0.135	0.002	-
HCM Control Delay (s)	-	-	9.2	7.7	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	3	1	3	8	146	0	0	30	1
Future Vol, veh/h	0	0	0	3	1	3	8	146	0	0	30	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	4	1	4	10	178	0	0	37	1

Major/Minor	Minor1			Major1				Major2		
Conflicting Flow All	236	236	178	38	0	-	-	-	0	
Stage 1	198	198	-	-	-	-	-	-	-	
Stage 2	38	38	-	-	-	-	-	-	-	
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	-	-	-	
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	-	-	-	
Pot Cap-1 Maneuver	752	665	865	1572	-	0	0	-	-	
Stage 1	835	737	-	-	-	0	0	-	-	
Stage 2	984	863	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	747	0	865	1572	-	-	-	-	-	
Mov Cap-2 Maneuver	747	0	-	-	-	-	-	-	-	
Stage 1	829	0	-	-	-	-	-	-	-	
Stage 2	984	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1572	-	747	865	-	-
HCM Lane V/C Ratio	0.006	-	0.005	0.004	-	-
HCM Control Delay (s)	7.3	0	9.8	9.2	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	121	0	14	0	0	0	0	35	2	2	30	0
Future Vol, veh/h	121	0	14	0	0	0	0	35	2	2	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	155	0	18	0	0	0	0	45	3	3	38	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	91	-	38	-	0	0	48	0	0
Stage 1	44	-	-	-	-	-	-	-	-
Stage 2	47	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	-	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	-	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	909	0	1034	0	-	-	1559	-	0
Stage 1	978	0	-	0	-	-	-	-	0
Stage 2	975	0	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	907	0	1034	-	-	-	1559	-	-
Mov Cap-2 Maneuver	907	0	-	-	-	-	-	-	-
Stage 1	978	0	-	-	-	-	-	-	-
Stage 2	973	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	907	1034	1559	-
HCM Lane V/C Ratio	-	-	0.171	0.017	0.002	-
HCM Control Delay (s)	-	-	9.8	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	0	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	46	1	5	0	0	27	5
Future Vol, veh/h	0	0	0	0	0	46	1	5	0	0	27	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	57	1	6	0	0	33	6

Major/Minor	Minor1		Major1			Major2			
Conflicting Flow All	44	47	6	39	0	-	-	-	0
Stage 1	8	8	-	-	-	-	-	-	-
Stage 2	36	39	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	-	-	-
Pot Cap-1 Maneuver	967	845	1077	1571	-	0	0	-	-
Stage 1	1015	889	-	-	-	0	0	-	-
Stage 2	986	862	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	966	0	1077	1571	-	-	-	-	-
Mov Cap-2 Maneuver	966	0	-	-	-	-	-	-	-
Stage 1	1014	0	-	-	-	-	-	-	-
Stage 2	986	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1571	-	-	1077	-	-
HCM Lane V/C Ratio	0.001	-	-	0.053	-	-
HCM Control Delay (s)	7.3	0	0	8.5	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	1	0	0	0	0	6	1	28	4	0
Future Vol, veh/h	3	1	1	0	0	0	0	6	1	28	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	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	3	1	1	0	0	0	0	7	1	30	4	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	72	72	4	-	0	0	8	0	0
Stage 1	64	64	-	-	-	-	-	-	-
Stage 2	8	8	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	932	818	1080	0	-	-	1612	-	0
Stage 1	959	842	-	0	-	-	-	-	0
Stage 2	1015	889	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	914	0	1080	-	-	-	1612	-	-
Mov Cap-2 Maneuver	914	0	-	-	-	-	-	-	-
Stage 1	959	0	-	-	-	-	-	-	-
Stage 2	996	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	6.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	914	1080	1612	-
HCM Lane V/C Ratio	-	-	0.005	0.001	0.019	-
HCM Control Delay (s)	-	-	9	8.3	7.3	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	0.1	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	2	5	28	8	0	75	1	8	110	1
Future Vol, veh/h	0	0	2	5	28	8	0	75	1	8	110	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	2	6	33	10	0	89	1	10	131	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	263	242	132	243	242	90	132	0	0	90	0	0
Stage 1	152	152	-	90	90	-	-	-	-	-	-	-
Stage 2	111	90	-	153	152	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	694	663	923	715	663	973	1466	-	-	1518	-	-
Stage 1	855	775	-	922	824	-	-	-	-	-	-	-
Stage 2	899	824	-	854	775	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	657	658	923	709	658	973	1466	-	-	1518	-	-
Mov Cap-2 Maneuver	657	658	-	709	658	-	-	-	-	-	-	-
Stage 1	855	770	-	922	824	-	-	-	-	-	-	-
Stage 2	854	824	-	846	770	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.9	10.5	0	0.5
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1466	-	-	923	709	1518	-	-
HCM Lane V/C Ratio	-	-	-	0.003	0.069	0.006	-	-
HCM Control Delay (s)	0	-	-	8.9	10.5	7.4	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	4	0	0	20	0	1	0	1	0	0	0
Future Vol, veh/h	1	4	0	0	20	0	1	0	1	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	63	63	63	63	63	63	63	63	63
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	6	0	0	32	0	2	0	2	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	32	0	0	6	0	0	42	42	6	43	42	32
Stage 1	-	-	-	-	-	-	10	10	-	32	32	-
Stage 2	-	-	-	-	-	-	32	32	-	11	10	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1593	-	-	1628	-	-	966	854	1083	965	854	1048
Stage 1	-	-	-	-	-	-	1016	891	-	990	872	-
Stage 2	-	-	-	-	-	-	990	872	-	1015	891	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1593	-	-	1628	-	-	965	853	1083	963	853	1048
Mov Cap-2 Maneuver	-	-	-	-	-	-	965	853	-	963	853	-
Stage 1	-	-	-	-	-	-	1015	890	-	989	872	-
Stage 2	-	-	-	-	-	-	990	872	-	1012	890	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0	8.5	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1021	1593	-	-	1628	-	-	-
HCM Lane V/C Ratio	0.003	0.001	-	-	-	-	-	-
HCM Control Delay (s)	8.5	7.3	0	-	0	-	-	0
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	7	52	1	0	71	8	4	17	0	5	6	7
Future Vol, veh/h	7	52	1	0	71	8	4	17	0	5	6	7
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	9	64	1	0	88	10	5	21	0	6	7	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	98	0	0	65	0	0	184	181	65	186	176	93
Stage 1	-	-	-	-	-	-	83	83	-	93	93	-
Stage 2	-	-	-	-	-	-	101	98	-	93	83	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1508	-	-	1550	-	-	781	717	1005	779	721	970
Stage 1	-	-	-	-	-	-	930	830	-	919	822	-
Stage 2	-	-	-	-	-	-	910	818	-	919	830	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1508	-	-	1550	-	-	765	713	1005	758	717	970
Mov Cap-2 Maneuver	-	-	-	-	-	-	765	713	-	758	717	-
Stage 1	-	-	-	-	-	-	924	825	-	913	822	-
Stage 2	-	-	-	-	-	-	894	818	-	890	825	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0	10.2	9.6
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	722	1508	-	-	1550	-	-	812
HCM Lane V/C Ratio	0.036	0.006	-	-	-	-	-	0.027
HCM Control Delay (s)	10.2	7.4	0	-	0	-	-	9.6
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	9	11	2	0	6
Future Vol, veh/h	1	9	11	2	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	1	13	16	3	0	9

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	27	18	0	0	19	0
Stage 1	18	-	-	-	-	-
Stage 2	9	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	993	1066	-	-	1611	-
Stage 1	1010	-	-	-	-	-
Stage 2	1019	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	993	1066	-	-	1611	-
Mov Cap-2 Maneuver	993	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	1019	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1058	1611	-
HCM Lane V/C Ratio	-	-	0.014	-	-
HCM Control Delay (s)	-	-	8.5	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	1	0	0	9	36	0	38	0	0	48	0
Future Vol, veh/h	0	1	0	0	9	36	0	38	0	0	48	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1	0	0	10	41	0	44	0	0	55	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	125	99	55	100	99	44	55	0	0	44	0	0
Stage 1	55	55	-	44	44	-	-	-	-	-	-	-
Stage 2	70	44	-	56	55	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	854	795	1018	886	795	1032	1563	-	-	1577	-	-
Stage 1	962	853	-	975	862	-	-	-	-	-	-	-
Stage 2	945	862	-	961	853	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	811	795	1018	885	795	1032	1563	-	-	1577	-	-
Mov Cap-2 Maneuver	811	795	-	885	795	-	-	-	-	-	-	-
Stage 1	962	853	-	975	862	-	-	-	-	-	-	-
Stage 2	896	862	-	960	853	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	8.9	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1563	-	-	795	974	1577	-	-
HCM Lane V/C Ratio	-	-	-	0.001	0.053	-	-	-
HCM Control Delay (s)	0	-	-	9.5	8.9	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	1	0	0	46	0	0	0	1	0	0	0
Future Vol, veh/h	0	1	0	0	46	0	0	0	1	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1	0	0	61	0	0	0	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	1	0	0	62	62	1	63	62	61
Stage 1	-	-	-	-	-	-	1	1	-	61	61	-
Stage 2	-	-	-	-	-	-	61	61	-	2	1	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1555	-	-	1635	-	-	938	833	1090	936	833	1010
Stage 1	-	-	-	-	-	-	1027	899	-	955	848	-
Stage 2	-	-	-	-	-	-	955	848	-	1026	899	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1555	-	-	1635	-	-	938	833	1090	935	833	1010
Mov Cap-2 Maneuver	-	-	-	-	-	-	938	833	-	935	833	-
Stage 1	-	-	-	-	-	-	1027	899	-	955	848	-
Stage 2	-	-	-	-	-	-	955	848	-	1025	899	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	8.3	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1090	1555	-	-	1635	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-	-	-	-
HCM Control Delay (s)	8.3	0	-	-	0	-	-	0
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	8.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	1	0	118	45	3	1	4	0	1	8	0
Future Vol, veh/h	0	1	0	118	45	3	1	4	0	1	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	1	0	124	47	3	1	4	0	1	8	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	41	16	8	17	16	4	8	0	0	4	0	0
Stage 1	10	10	-	6	6	-	-	-	-	-	-	-
Stage 2	31	6	-	11	10	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	968	882	1080	1003	882	1085	1625	-	-	1631	-	-
Stage 1	1016	891	-	1021	895	-	-	-	-	-	-	-
Stage 2	991	895	-	1015	891	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	924	880	1080	1001	880	1085	1625	-	-	1631	-	-
Mov Cap-2 Maneuver	924	880	-	1001	880	-	-	-	-	-	-	-
Stage 1	1015	890	-	1020	894	-	-	-	-	-	-	-
Stage 2	935	894	-	1013	890	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	9.5	1.4	0.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1625	-	-	880	966	1631	-	-
HCM Lane V/C Ratio	0.001	-	-	0.001	0.181	0.001	-	-
HCM Control Delay (s)	7.2	0	-	9.1	9.5	7.2	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.7	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	3	0	1	165	0	0	0	0	0	0	0
Future Vol, veh/h	0	3	0	1	165	0	0	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	3	0	1	188	0	0	0	0	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	188	0	0	3	0	0	193	193	3	193	193	188
Stage 1	-	-	-	-	-	-	3	3	-	190	190	-
Stage 2	-	-	-	-	-	-	190	190	-	3	3	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1398	-	-	1632	-	-	771	706	1087	771	706	859
Stage 1	-	-	-	-	-	-	1025	897	-	816	747	-
Stage 2	-	-	-	-	-	-	816	747	-	1025	897	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1398	-	-	1632	-	-	770	705	1087	770	705	859
Mov Cap-2 Maneuver	-	-	-	-	-	-	770	705	-	770	705	-
Stage 1	-	-	-	-	-	-	1025	897	-	816	746	-
Stage 2	-	-	-	-	-	-	815	746	-	1025	897	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1398	-	-	1632	-	-	-
HCM Lane V/C Ratio	-	-	-	-	0.001	-	-	-
HCM Control Delay (s)	0	0	-	-	7.2	0	-	0
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	1	11	1	4	1	19	10	3	0	11	1
Future Vol, veh/h	2	1	11	1	4	1	19	10	3	0	11	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	1	15	1	6	1	27	14	4	0	15	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	88	84	16	92	84	14	16	0	-	14	0	0
Stage 1	16	16	-	68	68	-	-	-	-	-	-	-
Stage 2	72	68	-	24	16	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	902	810	1069	897	810	1072	1615	-	0	1617	-	-
Stage 1	1009	886	-	947	842	-	-	-	0	-	-	-
Stage 2	943	842	-	999	886	-	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	884	796	1069	871	796	1072	1615	-	-	1617	-	-
Mov Cap-2 Maneuver	884	796	-	871	796	-	-	-	-	-	-	-
Stage 1	992	886	-	931	828	-	-	-	-	-	-	-
Stage 2	919	828	-	983	886	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	9.3	4.8	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1615	-	1014	844	1617	-	-
HCM Lane V/C Ratio	0.017	-	0.019	0.01	-	-	-
HCM Control Delay (s)	7.3	0	8.6	9.3	0	-	-
HCM Lane LOS	A	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	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	0	1	0	0	0	0	34	0	0	177	1
Future Vol, veh/h	0	0	1	0	0	0	0	34	0	0	177	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	1	0	0	0	0	41	0	0	213	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	255	255	214	255	255	41	214	0	0	41	0	0
Stage 1	214	214	-	41	41	-	-	-	-	-	-	-
Stage 2	41	41	-	214	214	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	702	652	831	702	652	1036	1368	-	-	1581	-	-
Stage 1	793	729	-	979	865	-	-	-	-	-	-	-
Stage 2	979	865	-	793	729	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	702	652	831	701	652	1036	1368	-	-	1581	-	-
Mov Cap-2 Maneuver	702	652	-	701	652	-	-	-	-	-	-	-
Stage 1	793	729	-	979	865	-	-	-	-	-	-	-
Stage 2	979	865	-	792	729	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1368	-	-	831	-	1581	-	-
HCM Lane V/C Ratio	-	-	-	0.001	-	-	-	-
HCM Control Delay (s)	0	-	-	9.3	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑			↱			↑	↱
Traffic Vol, veh/h	0	0	0	25	0	4	19	94	59	0	78	43
Future Vol, veh/h	0	0	0	25	0	4	19	94	59	0	78	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	34	0	5	26	129	81	0	107	59

Major/Minor	Minor1		Major1		Major2				
Conflicting Flow All	329	329	170	107	0	0	-	-	0
Stage 1	222	222	-	-	-	-	-	-	-
Stage 2	107	107	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	-	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	670	593	879	1497	-	-	0	-	0
Stage 1	820	723	-	-	-	-	0	-	0
Stage 2	922	811	-	-	-	-	0	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	657	0	879	1497	-	-	-	-	-
Mov Cap-2 Maneuver	657	0	-	-	-	-	-	-	-
Stage 1	804	0	-	-	-	-	-	-	-
Stage 2	922	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	1497	-	-	879	-
HCM Lane V/C Ratio	0.017	-	-	0.006	-
HCM Control Delay (s)	7.4	0	-	9.1	-
HCM Lane LOS	A	A	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑						↑↑	↱		↰↑	
Traffic Vol, veh/h	65	1	59	0	0	0	0	109	6	0	91	6
Future Vol, veh/h	65	1	59	0	0	0	0	109	6	0	91	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	79	1	72	0	0	0	0	133	7	0	111	7

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	182	255	115	-	0	0	140	0	0
Stage 1	115	115	-	-	-	-	-	-	-
Stage 2	67	140	-	-	-	-	-	-	-
Critical Hdwy	6.6	6.5	6.2	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	804	652	943	0	-	-	1456	-	-
Stage 1	915	804	-	0	-	-	-	-	-
Stage 2	954	785	-	0	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	804	0	943	-	-	-	1456	-	-
Mov Cap-2 Maneuver	804	0	-	-	-	-	-	-	-
Stage 1	915	0	-	-	-	-	-	-	-
Stage 2	954	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	943	1456	-	-
HCM Lane V/C Ratio	-	-	0.078	-	-	-
HCM Control Delay (s)	-	-	9.1	0	-	-
HCM Lane LOS	-	-	A	A	-	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	5	19	29	0	0	16	6
Future Vol, veh/h	0	0	0	1	0	5	19	29	0	0	16	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	1	0	6	24	37	0	0	21	8

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	110	-	37	29	0	-	-	-	0	
Stage 1	85	-	-	-	-	-	-	-	-	
Stage 2	25	-	-	-	-	-	-	-	-	
Critical Hdwy	6.4	-	6.2	4.1	-	-	-	-	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	-	-	-	-	
Follow-up Hdwy	3.5	-	3.3	2.2	-	-	-	-	-	
Pot Cap-1 Maneuver	892	0	1041	1597	-	0	0	-	-	
Stage 1	943	0	-	-	-	0	0	-	-	
Stage 2	1003	0	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	879	0	1041	1597	-	-	-	-	-	
Mov Cap-2 Maneuver	879	0	-	-	-	-	-	-	-	
Stage 1	929	0	-	-	-	-	-	-	-	
Stage 2	1003	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	8.6	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1597	-	879	1041	-	-
HCM Lane V/C Ratio	0.015	-	0.001	0.006	-	-
HCM Control Delay (s)	7.3	0	9.1	8.5	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1	2	0	0	0	0	41	4	0	15	0
Future Vol, veh/h	6	1	2	0	0	0	0	41	4	0	15	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	6	1	2	0	0	0	0	44	4	0	16	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	62	64	16	-	0	0	48	0	0
Stage 1	16	16	-	-	-	-	-	-	-
Stage 2	46	48	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	949	831	1069	0	-	-	1572	-	0
Stage 1	1012	886	-	0	-	-	-	-	0
Stage 2	982	859	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	949	0	1069	-	-	-	1572	-	-
Mov Cap-2 Maneuver	949	0	-	-	-	-	-	-	-
Stage 1	1012	0	-	-	-	-	-	-	-
Stage 2	982	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	949	1069	1572	-
HCM Lane V/C Ratio	-	-	0.007	0.002	-	-
HCM Control Delay (s)	-	-	8.8	8.4	0	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	3	0	38	1	7	0	0	49	123
Future Vol, veh/h	0	0	0	3	0	38	1	7	0	0	49	123
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	4	0	45	1	8	0	0	58	145

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	141	213	8	203	0	-	-	-	0	
Stage 1	10	10	-	-	-	-	-	-	-	
Stage 2	131	203	-	-	-	-	-	-	-	
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	-	-	-	
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-	
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	-	-	-	
Pot Cap-1 Maneuver	857	688	1080	1381	-	0	0	-	-	
Stage 1	1018	891	-	-	-	0	0	-	-	
Stage 2	900	737	-	-	-	0	0	-	-	
Platoon blocked, %					-			-	-	
Mov Cap-1 Maneuver	856	0	1080	1381	-	-	-	-	-	
Mov Cap-2 Maneuver	856	0	-	-	-	-	-	-	-	
Stage 1	1017	0	-	-	-	-	-	-	-	
Stage 2	900	0	-	-	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	8.6	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1381	-	856	1080	-	-
HCM Lane V/C Ratio	0.001	-	0.004	0.041	-	-
HCM Control Delay (s)	7.6	0	9.2	8.5	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	0	0	0	0	0	4	3	52	5	0
Future Vol, veh/h	3	1	0	0	0	0	0	4	3	52	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	3	1	0	0	0	0	0	4	3	55	5	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	121	122	5	-	0	0	7	0	0
Stage 1	115	115	-	-	-	-	-	-	-
Stage 2	6	7	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	879	772	1084	0	-	-	1627	-	0
Stage 1	915	804	-	0	-	-	-	-	0
Stage 2	1022	894	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	849	0	1084	-	-	-	1627	-	-
Mov Cap-2 Maneuver	849	0	-	-	-	-	-	-	-
Stage 1	915	0	-	-	-	-	-	-	-
Stage 2	987	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0	6.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	EBLn2	SBL	SBT
Capacity (veh/h)	-	-	849	-	1627	-
HCM Lane V/C Ratio	-	-	0.005	-	0.034	-
HCM Control Delay (s)	-	-	9.3	0	7.3	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	0	-	0.1	-

N

Preliminary Drainage Report

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RFE ENGINEERING, INC

PRELIMINARY HYDROLOGY & DRAINAGE STUDY

For

Vikings Energy Farm

APNs: 050-070-018, 019, & 021
3000 E Nelson Pit Road
Holtville, CA
Unincorporated Imperial County

November 18, 2021

Prepared by,
RFE Engineering, Inc.
2260 Douglas Blvd., Suite 160
Roseville, CA 95661
Ph 916-772-7800
RFE Project No. 21-088

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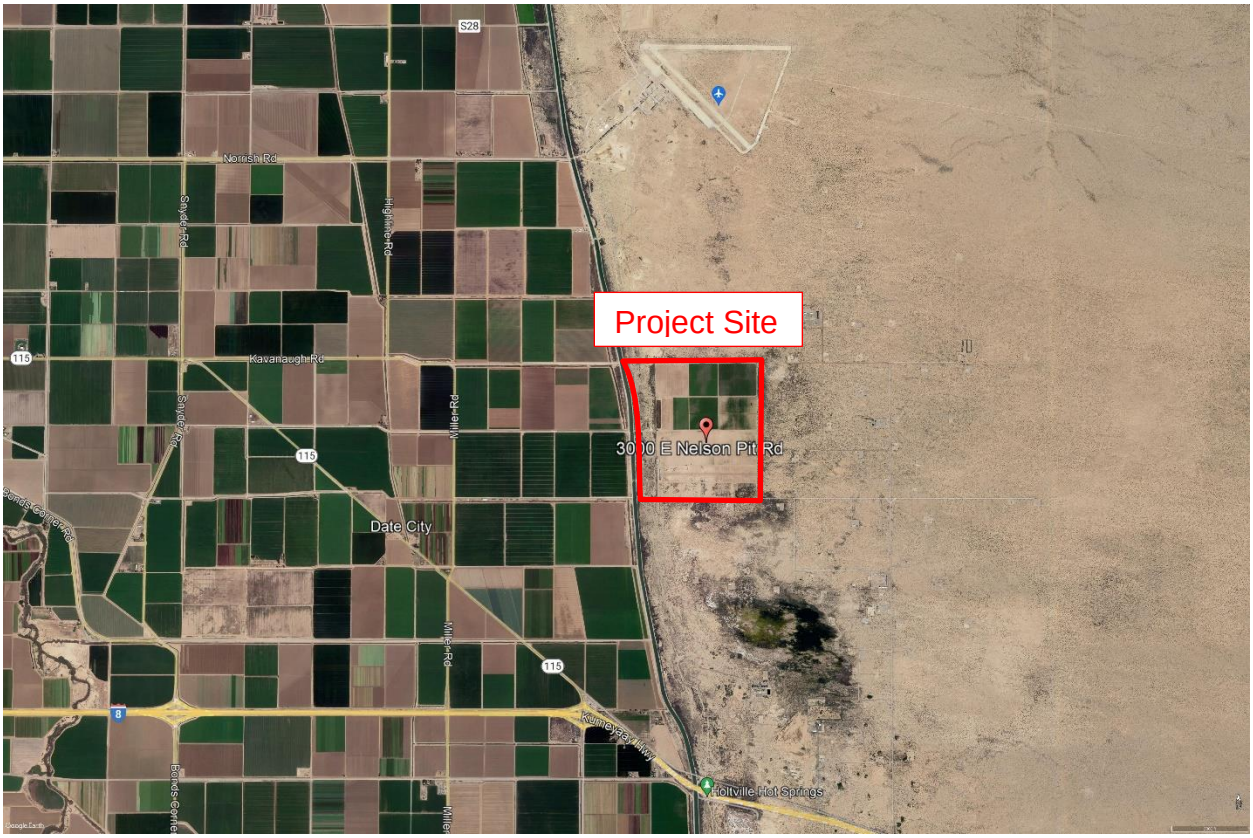
APPENDIX C ..... SUPPORTING CALCULATIONS

APPENDIX D ..... SITE SOIL SURVEY AND NOAA ATLAS 14 RAINFALL DATA

A. PROJECT LOCATION

The proposed project will be constructed on three existing parcels totaling approximately 600 acres. The project is located in the city of Holtville, CA, as a part of Unincorporated Imperial County. It is approximately at latitude 32°48'13.25" N and longitude 115°16'12.46" W. The project site is bordered to the west by the East Highline Canal and surrounded by undeveloped land to the north, south, and east. The project site is roughly 1.5 miles to the south of Holtville Airport, and 2 miles to the north of Interstate 8. Figure 1 below shows an aerial image of the proposed project site.

Figure 1: Aerial Image of Project Site



B. EXISTING SITE CONDITIONS

The project site consists of three existing parcels with APNs: 050-070-018, 019, and 021. These parcels are roughly 480, 80, and 44 acres respectively, making the total project site about 604 acres. Most of the site is undeveloped agricultural land. The land is relatively flat, with a minimal slope across the entire site allowing most of the runoff to sheet flow. There are several areas, particularly in the southeast corner and along the western side of the site, where there is dense vegetation that obstructs the runoff from sheet flowing. There is an existing house and shed in

very poor condition on site. There are two retention ponds towards between the agricultural land and the dense vegetation to the west. To the west of the project site is the East Highline Canal that runs through the City of Holtville. On site, there are two concrete canals that run alongside the retention ponds that are believed to keep the retention ponds filled to water the crops that used to exist on the site.

C. PROJECT DESCRIPTION

The project will consist of the construction and installation of solar panels, along with a battery storage area in the northwest section of the site. There is minimal grading that will not change the runoff patterns. The western and southeastern areas will have the dense vegetation removed and will be graded to a consistent slope while keeping the runoff patterns consistent with the existing patterns.

D. PRE-CONSTRUCTION HYDROLOGY

The existing surfaces on site are relatively flat which means the slope throughout the site is minimal. The existing site is divided into four watershed areas, A-X1, A-X2, A-X3, and A-X4. The size of these watershed areas are 220.8 acres, 160.3 acres, 126.2 acres, and 98.3 acres respectively. A-X1 sheet flows to the west through the dense vegetation and into the East Highline Canal. A-X2 sheet flows directly to the east onto the adjacent undeveloped property. A-X3 sheet flows throughout the area, but runoff exits to the south at a single discharge point rather than sheet flowing out like the other areas. A-X4 sheet flows and weaves through dense vegetation before sheet flowing to the undeveloped land to the south. The only parts of existing site that would count as impervious surface are the house, shed, and concrete canals. These add up to such a negligible percentage of the total site area, they are being ignored regarding calculations. The Imperial County Hydrology Manual titled *The Engineering Design Guidelines Manual for the Preparation and Checking of Street Improvement, Drainage and Grading Plans within "The Gateway of the Americas Specific Plan Area"* by the Department of Public Works states to use the rational method when calculating peak flow for watersheds that are less than 0.5 square miles (or 320 acres) in size. The peak flows in cfs for the 10-year, 25-year, and 100-year event for each watershed are shown in the table below.

Table 1: Pre-Construction Peak Flow Runoff

Drainage Area (DA)	Area (AC)	Pervious Area (AC)	Impervious Area (AC)	% Imp	Runoff Coefficient[1]	Peak Flow Runoff (cfs)		
						10Yr	25Yr	100Yr
A-X1	220.8	220.8	0	0.00%	0.20	9.63	12.81	18.55
A-X2	160.3	160.3	0	0.00%	0.20	6.99	9.30	13.47
A-X3	126.2	126.2	0	0.00%	0.20	5.50	7.32	10.60
A-X4	98.3	98.3	0	0.00%	0.20	4.29	5.70	8.26

E. POST-CONSTRUCTION HYDROLOGY

With the additions of the solar panels and the battery storage area, there is an increase in impervious surfaces. The foundations of the solar panels and concrete pads in the battery storage area are the main elements of impervious surfaces being added, however the increase is not nearly enough to have any discernible impact on the existing drainage patterns. The proposed grading will have minimal to no impact on the existing drainage patterns as well. The grading that is occurring on the west end will remove the dense vegetation and smooth out the slope, but the drainage patterns will stay the same. Therefore, watershed areas A-X1 and A-X2 are remaining the same in the post-construction stages, becoming watershed areas A-01 and A-02 respectively. The grading that is occurring in the southeast corner will remove the dense vegetation and smooth out the slope. The change in grade will direct the runoff slightly to the west towards the discharge location of A-X3 rather than sheet flowing directly south. Post-construction, watersheds A-X3 and A-X4 will combine to become watershed A-03. The peak flows in cfs for the 10-year, 25-year, and 100-year peak flows for each watershed will be determined in the future using the percentage of impervious material being added to the project site and will be tabulated in the table below.

Table 2: Post-Construction Peak Flow Runoff

Drainage Area (DA)	Area (AC)	Pervious Area (AC)	Impervious Area (AC)	% Imp	Runoff Coefficient[1]	Peak Flow Runoff (cfs)		
						10Yr	25Yr	100Yr
A-01	220.8							
A-02	160.3							
A-03	224.5							

F. RETENTION BASINS

The Imperial County Hydrology Manual states that retention basins must have a total volume capacity for a 3-inch minimum precipitation covering the entire site with no C reduction factors. While there are no retention basins being proposed for the project site, the proposed onsite roads will be built up to a finish grade elevation above the existing ground and act as berms to allow onsite ponding and make the project site a "retention basin". The proposed roads and approximate elevations that they will be built up to can be found on the Post-Construction Shed Map in Appendix B. The inundation limits that show where each shed area would retain the runoff from a 3-inch rainfall storm can also be found on the Post-Construction Shed Map in Appendix B. The table below shows the required retention volume for each Drainage Area resulting from a 3-in rainfall spread throughout the Drainage Area.

Table 3: Post-Construction Retention Basins

Drainage Area (DA)	Area (AC)	Rainfall Depth (in)	Required Retention Volume (acre-ft)	Required Area to Infiltrate in 72 Hours (acres)	Volume Provided (acre-ft)	Approximate Area Provided (acres)
A-01	220.8	3.0	55.20	18.40	56.71	67.80
A-02	160.3	3.0	40.08	13.36	13.47	17.95
A-03	224.5	3.0	56.13	18.71	60	58.33

The Imperial County Hydrology Manual requires that ponding water collected in a retention basin be infiltration no faster than 24 hours but no longer than 72 hours. It is assumed that the 24-hour minimum applies to basins connecting into public storm drainage facilities as a means to attenuate flows, which is not applicable to this project since it will not connect into any public drainage facilities. Table 3, above, provides the minimum area required to infiltrate the Drainage Area retention volume in less than 72 hours assuming an infiltration rate of 0.5 in/hr. Based on the NCRS web soil survey, the majority of the project site is consistent with hydrologic soil type A, indicating good-draining soils. The assumed infiltration rate of 0.5 in./hr. is most likely a conservative assumption based on the hydrologic soil type. See Appendix D for the results of the NRCS web soil survey. Table 3 also shows the inundation area as a result of the 3-inch storm, as shown on the Post-Construction Shed Map. In all three cases, the project will provide more ponding area than required to infiltrate the 3-inch storm, meaning that the ponded water will infiltrate in less than 72 hours.

G. CONCLUSION

The solar equipment and proposed grading will have a minimal effect on existing drainage patterns and peak flow. While the solar equipment will slightly increase the percentage of impervious surfaces, the total area being added compared to the sheer size of the project site is insignificant.

The stormwater runoff retention requirement set forth by the Imperial County Hydrology Manual will be satisfied by elevating the onsite roads to create berms around the solar arrays. By doing so, the project will utilize the project site area with the constructed solar arrays as the ponding area for the captured stormwater. As a result, dedicated retention basins will not be required to be constructed.

H. REFERENCES

- *Engineering Design Guidelines Manual for the Street Preparation and Checking of Street Improvement, Drainage, and Grading Plans Within Imperial County.* County of Imperial Department of Public Works. September 2004 (Revised September 15, 2008)

APPENDIX A

VICINITY MAP AND SITE PLAN

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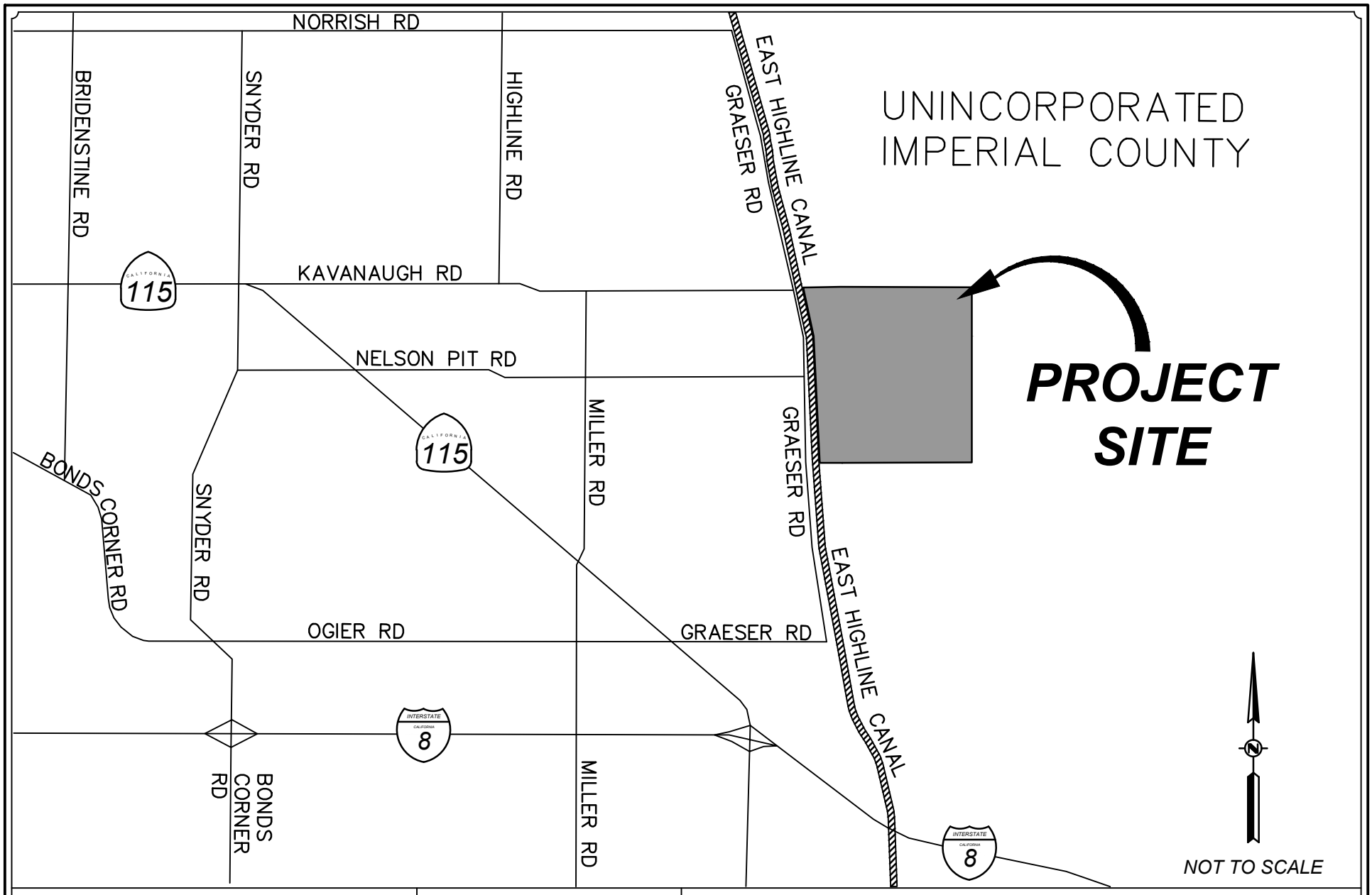

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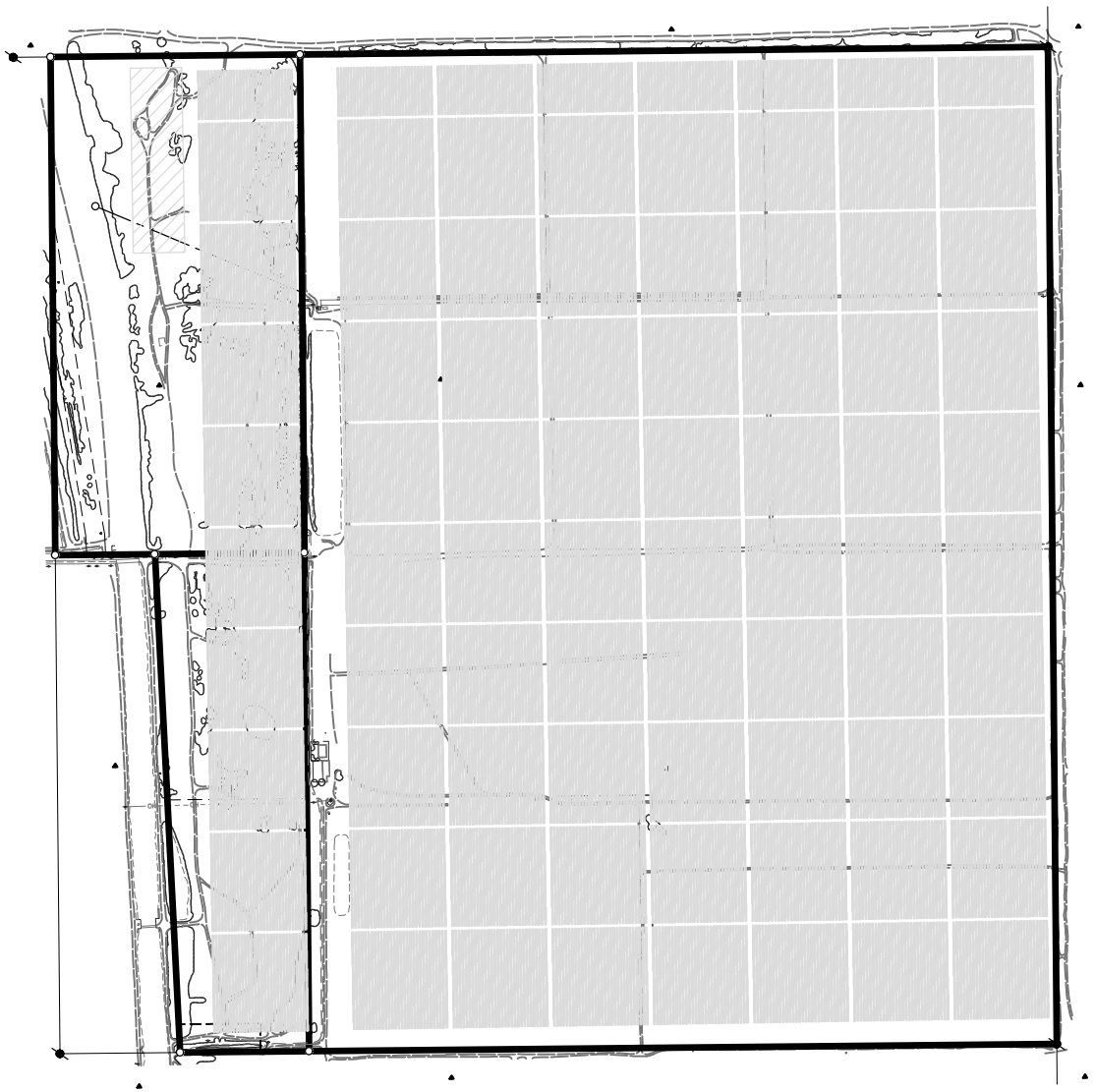
VICINITY MAP

VIKINGS ENERY FARM

3000 EAST NELSON PIT ROAD
IMPERIAL COUNTY, CA 92250



SCALE: 1"=1000'

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SITE PLAN

VIKINGS ENERGY FARM

3000 EAST NELSON PIT ROAD
IMPERIAL COUNTY, CA 92250

APPENDIX B

PROJECT SITE SHED MAPS

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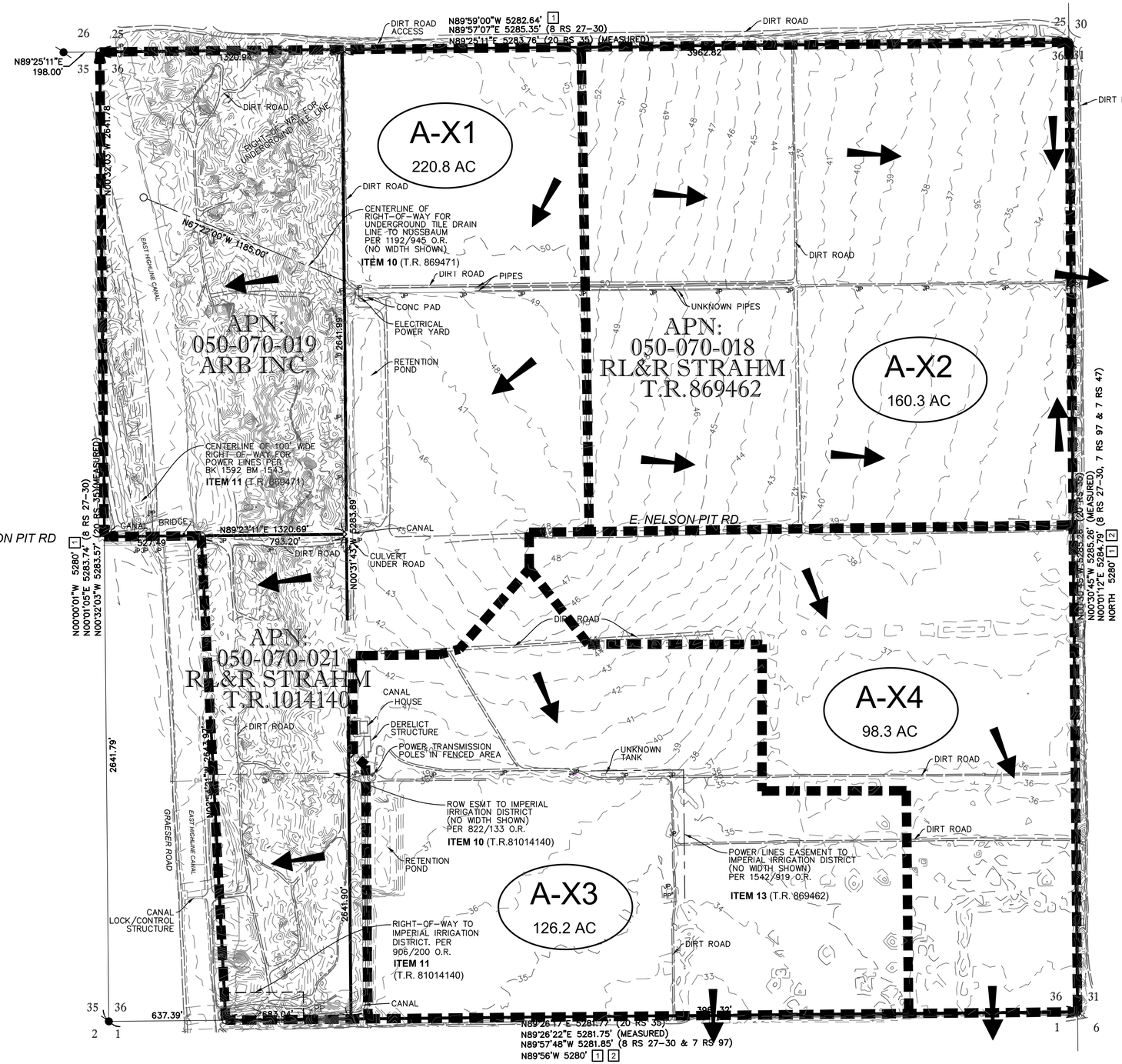
LEGEND

DRAINAGE AREA DESIGNATIONS AND AREA — A-X1, 1.42 AC

DRAINAGE AREA BOUNDARY

OVERLAND RELEASE



3000 E. NELSON PIT ROAD
HOLTVILLE, CA. 92250

300 0 300 600
SCALE: 1"=300'

NO.	REVISION	DATE	BY	APPRV'D

NOT FOR CONSTRUCTION

	BY	CHECK
DESIGN	AEB	TSM
DRAWN	AEB	TSM
QUANT.		

ORIGINAL SCALE IS IN INCHES 0 1 2

REGISTERED PROFESSIONAL ENGINEER — ANTHONY S. MCCRARY — No. C90888 — CIVIL — STATE OF CALIF.

PRELIMINARY
NOT FOR CONSTRUCTION

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VIKINGS ENERGY FARM
IMPERIAL COUNTY, CA
APN: 050-070-018, 019, & 021
PRE-CONSTRUCTION SHED MAP

Sheet
SM1
1 of 2
10/27/2021

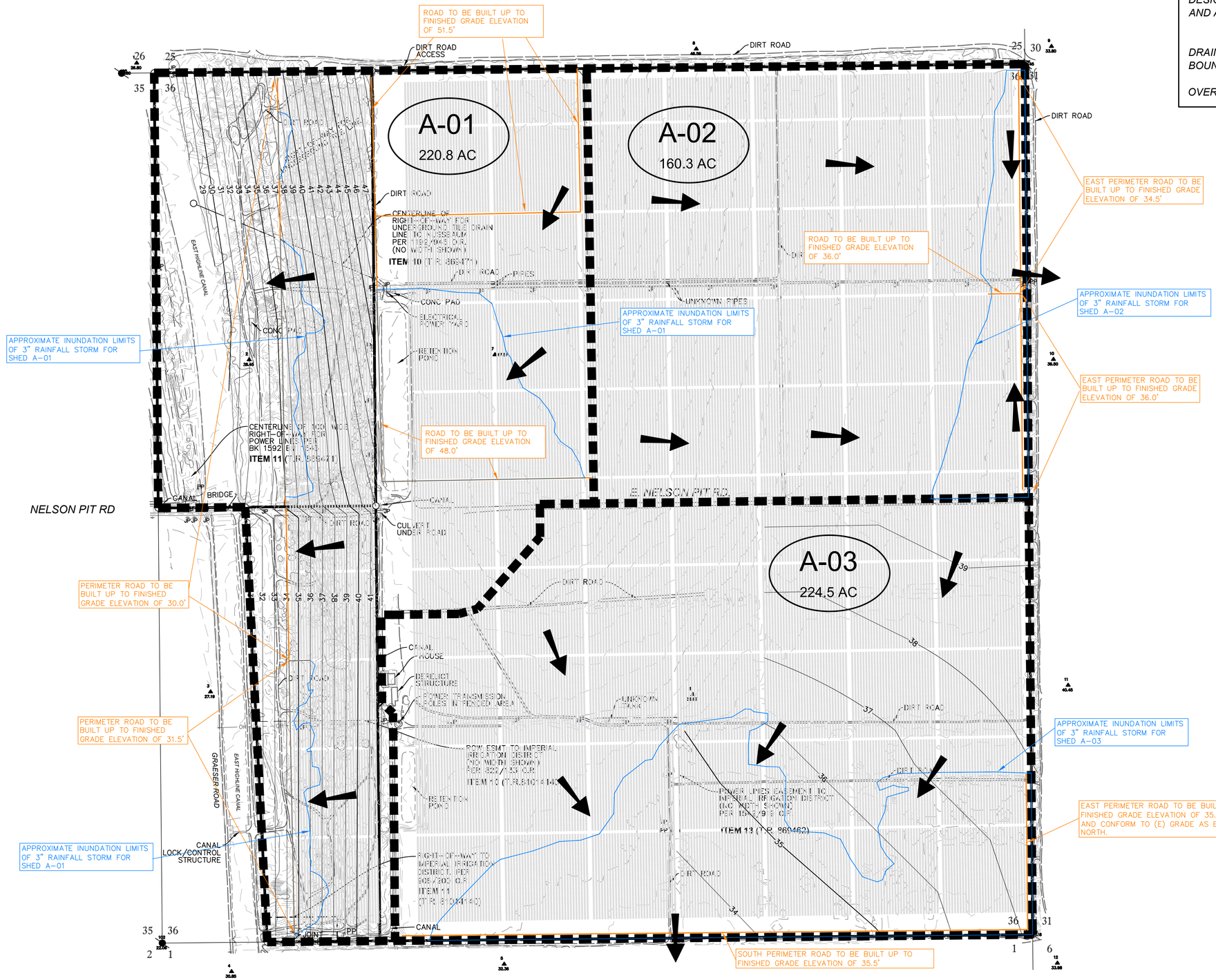
RFE PROJECT 21-088 – VIKINGS ENERGY FARM; IMPERIAL COUNTY, CA 92250

LEGEND

DRAINAGE AREA DESIGNATIONS AND AREA — A-01, 1.42 AC

DRAINAGE AREA BOUNDARY

OVERLAND RELEASE



NOT FOR CONSTRUCTION

NO.	REVISION	DATE	BY	APPRVD

BY	CHECK
DESIGN AEB	TSM
DRAWN AEB	TSM
QUANT.	

ORIGINAL SCALE IS IN INCHES 0 1 2

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VIKINGS ENERGY FARM
IMPERIAL COUNTY, CA
APN: 050-070-018, 019, & 021

POST-CONSTRUCTION SHED MAP

Sheet
SM2
2 of 2
10/27/2021

RFE PROJECT 21-088 – VIKINGS ENERGY FARM; IMPERIAL COUNTY, CA 92250

APPENDIX C

SUPPORTING CALCULATIONS

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RFE ENGINEERING, INC

Peak Flow Calculations

Date: 10/19/2021
Project: Viking Energy Farm
Location: Imperial County, CA
Designer: TSM

Find: Determine the peak flow runoff for a 10, 25, and 100-year frequency, six-hour storm event.

Given: Per Imperial County Procedures Manual, Section III - Drainage Improvements, the methodology for calculating peak flow runoff from a watershed is the rational method.

Section III.A.2 specifies calculation peak flow runoff for a six-hour duration storm.

Assumptions: Runoff Coefficient (C)

Pervious Land Coverage:	0.2
Impervious Land Coverage:	0.9

Calculations:

Per NOAA Atlas 14

10Yr, 6Hr Storm:	0.218	in/hr
25Yr, 6Hr Storm:	0.29	in/hr
100Yr, 6Hr Storm:	0.42	in/hr

Pre-Development

Drainage Area (DA)	Area (AC)	Pervious Area (AC)	Impervious Area (AC)	% Imp	Runoff Coefficient[(1)]	Peak Flow Runoff (cfs)		
						10Yr	25Yr	100Yr
A-X1	220.8	220.8	0	0.00%	0.20	9.63	12.81	18.55
A-X2	160.3	160.3	0	0.00%	0.20	6.99	9.30	13.47
A-X3	126.2	126.2	0	0.00%	0.20	5.50	7.32	10.60
A-X4	98.3	98.3	0	0.00%	0.20	4.29	5.70	8.26

RFE ENGINEERING, INC

Peak Flow Calculations

Date: 10/19/2021
Project: Viking Energy Farm
Location: Imperial County, CA
Designer: TSM

Post-Development

Drainage Area (DA)	Area (AC)	Pervious Area (AC)	Impervious Area (AC)	% Imp	Runoff Coefficient[(1)]	Peak Flow Runoff (cfs)		
						10Yr	25Yr	100Yr
A-01	220.8							
A-02	160.3							
A-03	224.5							

[(1)] Runoff coefficient calculated based on the following equation:

$$C = 0.858 * i^3 - 0.78 * i^2 + 0.774 * i + 0.04$$

RFE ENGINEERING, INC

Retention Basin Calculations

Date: 10/19/2021
Project: Viking Energy Farm
Location: Imperial County, CA
Designer: TSM

Find: Determine the retention volume required and size retention basin.

Given: Per Imperial County Procedures Manual, Section III - Retention volumne on retention or detention basins should have a total capacity for a three (3) inch minimum precipitation covering the entire site with no C reduction factors.

Per Section III, retention basins should empty within 72 hours.

Per web soils survey of the site, soil type is Hydrologic Soil Type "A", characteristic of good infiltrating soil.

Assumptions: Infiltration Rate: 0.5 in/hr (Hydrologic Soil Type "A")

Calculations:

Retention Calulations for Each Shed Area

Drainage Area (DA)	Area (AC)	Rainfall Depth (in)	Required Retention Volume (acre-ft)		Required Area to Infiltrate in 72 Hours (acres)[2]	Volume Provided (acre-ft)	Approximate Area Provided (acres)[1,3]
A-01	220.8	3.0	55.20		18.40	56.71	67.80
A-02	160.3	3.0	40.08		13.36	13.47	17.95
A-03	224.5	3.0	56.13		18.71	60	58.33

Notes:

1 See Post-Construction Shed Map SM2 for Approximate Inundation Boundary.

2 Assuming a ponding depth of 36-inches. (0.5 in/hr x 72hr = 36 in)

3 Ponding depth across retention area varies from 0-in. to 36-in.

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APPENDIX D

SITE SOIL SURVEY AND NOAA ATLAS 14 RAINFALL DATA

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Hydrologic Soil Group—Imperial County, California, Imperial Valley Area
(Viking Energy Farm)

Map Scale: 1:11,200 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Imperial County, California, Imperial Valley Area
Survey Area Data: Version 13, Sep 15, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 25, 2015—Nov 3, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
103	Carsitas gravelly sand, 0 to 5 percent slopes	A	7.7	1.2%
107	Glenbar complex	C	3.8	0.6%
108	Holtville loam	D	0.6	0.1%
122	Meloland very fine sandy loam, wet	D	24.7	3.9%
123	Meloland and Holtville loams, wet	D	3.5	0.6%
125	Niland gravelly sand, wet	C	11.7	1.9%
129	Pits		18.3	2.9%
130	Rositas sand, 0 to 2 percent slopes	A	2.8	0.5%
132	Rositas fine sand, 0 to 2 percent slopes	A	10.2	1.6%
133	Rositas fine sand, 2 to 9 percent slopes	A	49.2	7.8%
135	Rositas fine sand, wet, 0 to 2 percent slopes	A	448.9	71.7%
137	Rositas silt loam, 0 to 2 percent slopes	B	1.4	0.2%
139	Superstition loamy fine sand	A	12.9	2.1%
141	Torriorthents and Orthids, 5 to 30 percent slopes		2.9	0.5%
142	Vint loamy very fine sand, wet	A	24.2	3.9%
145	Water		3.5	0.6%
Totals for Area of Interest			**626.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

NOAA Atlas 14, Volume 6, Version 2
Location name: Imperial, California, USA*
Latitude: 32.8489°, Longitude: -115.5667°
Elevation: -60.58 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.876** (0.744-1.04)	**1.39** (1.18-1.66)	**2.14** (1.80-2.57)	**2.82** (2.35-3.42)	**3.86** (3.12-4.85)	**4.78** (3.76-6.12)	**5.80** (4.44-7.62)	**6.96** (5.18-9.44)	**8.76** (6.24-12.4)	**10.4** (7.12-15.2)
10-min	**0.630** (0.534-0.750)	**0.996** (0.840-1.19)	**1.54** (1.29-1.84)	**2.02** (1.69-2.45)	**2.77** (2.23-3.47)	**3.42** (2.69-4.39)	**4.15** (3.19-5.47)	**4.99** (3.71-6.77)	**6.28** (4.48-8.90)	**7.42** (5.10-10.9)
15-min	**0.508** (0.428-0.604)	**0.804** (0.680-0.960)	**1.24** (1.04-1.48)	**1.63** (1.36-1.98)	**2.23** (1.80-2.80)	**2.76** (2.17-3.54)	**3.35** (2.57-4.40)	**4.02** (3.00-5.46)	**5.06** (3.61-7.18)	**5.98** (4.11-8.80)
30-min	**0.348** (0.294-0.416)	**0.550** (0.466-0.658)	**0.848** (0.714-1.02)	**1.12** (0.934-1.35)	**1.53** (1.23-1.92)	**1.89** (1.49-2.42)	**2.30** (1.76-3.02)	**2.76** (2.05-3.74)	**3.47** (2.47-4.92)	**4.10** (2.82-6.04)
60-min	**0.244** (0.206-0.291)	**0.385** (0.325-0.461)	**0.594** (0.500-0.712)	**0.783** (0.653-0.947)	**1.07** (0.864-1.34)	**1.32** (1.04-1.70)	**1.61** (1.23-2.11)	**1.93** (1.44-2.62)	**2.43** (1.73-3.45)	**2.87** (1.97-4.22)
2-hr	**0.166** (0.140-0.198)	**0.252** (0.213-0.302)	**0.376** (0.317-0.452)	**0.488** (0.408-0.591)	**0.658** (0.530-0.824)	**0.802** (0.632-1.03)	**0.965** (0.740-1.27)	**1.15** (0.857-1.56)	**1.44** (1.02-2.03)	**1.69** (1.16-2.48)
3-hr	**0.128** (0.108-0.153)	**0.191** (0.161-0.228)	**0.282** (0.238-0.339)	**0.364** (0.304-0.440)	**0.487** (0.392-0.610)	**0.592** (0.466-0.759)	**0.710** (0.544-0.934)	**0.844** (0.628-1.14)	**1.05** (0.747-1.49)	**1.23** (0.844-1.81)
6-hr	**0.078** (0.066-0.094)	**0.116** (0.098-0.139)	**0.170** (0.143-0.204)	**0.218** (0.182-0.264)	**0.290** (0.234-0.364)	**0.352** (0.277-0.451)	**0.420** (0.322-0.553)	**0.497** (0.370-0.674)	**0.615** (0.438-0.871)	**0.717** (0.493-1.06)
12-hr	**0.043** (0.036-0.051)	**0.064** (0.054-0.077)	**0.095** (0.080-0.114)	**0.122** (0.102-0.148)	**0.163** (0.131-0.205)	**0.198** (0.156-0.254)	**0.237** (0.182-0.312)	**0.281** (0.209-0.381)	**0.348** (0.248-0.493)	**0.405** (0.278-0.596)
24-hr	**0.027** (0.024-0.031)	**0.041** (0.036-0.047)	**0.061** (0.053-0.070)	**0.079** (0.069-0.092)	**0.106** (0.090-0.128)	**0.130** (0.108-0.159)	**0.156** (0.127-0.196)	**0.186** (0.147-0.239)	**0.231** (0.176-0.309)	**0.270** (0.199-0.374)
2-day	**0.015** (0.013-0.018)	**0.023** (0.020-0.027)	**0.034** (0.030-0.040)	**0.045** (0.039-0.052)	**0.060** (0.051-0.073)	**0.074** (0.061-0.091)	**0.089** (0.072-0.112)	**0.106** (0.084-0.136)	**0.131** (0.100-0.176)	**0.154** (0.113-0.212)
3-day	**0.011** (0.010-0.012)	**0.016** (0.014-0.019)	**0.024** (0.022-0.028)	**0.032** (0.028-0.037)	**0.043** (0.036-0.052)	**0.052** (0.043-0.064)	**0.063** (0.051-0.079)	**0.075** (0.059-0.096)	**0.093** (0.071-0.124)	**0.108** (0.080-0.150)
4-day	**0.008** (0.007-0.010)	**0.013** (0.011-0.015)	**0.019** (0.017-0.022)	**0.025** (0.022-0.029)	**0.033** (0.028-0.040)	**0.040** (0.034-0.050)	**0.048** (0.039-0.061)	**0.058** (0.046-0.074)	**0.071** (0.054-0.095)	**0.083** (0.061-0.115)
7-day	**0.005** (0.005-0.006)	**0.008** (0.007-0.009)	**0.011** (0.010-0.013)	**0.015** (0.013-0.017)	**0.020** (0.017-0.024)	**0.024** (0.020-0.030)	**0.029** (0.023-0.036)	**0.034** (0.027-0.044)	**0.042** (0.032-0.057)	**0.049** (0.036-0.068)
10-day	**0.004** (0.003-0.004)	**0.006** (0.005-0.006)	**0.008** (0.007-0.010)	**0.011** (0.009-0.012)	**0.014** (0.012-0.017)	**0.017** (0.014-0.021)	**0.021** (0.017-0.026)	**0.024** (0.019-0.031)	**0.030** (0.023-0.040)	**0.035** (0.026-0.048)
20-day	**0.002** (0.002-0.002)	**0.003** (0.003-0.004)	**0.005** (0.004-0.005)	**0.006** (0.005-0.007)	**0.008** (0.007-0.009)	**0.009** (0.008-0.011)	**0.011** (0.009-0.014)	**0.013** (0.010-0.017)	**0.016** (0.012-0.021)	**0.018** (0.013-0.025)
30-day	**0.001** (0.001-0.002)	**0.002** (0.002-0.003)	**0.003** (0.003-0.004)	**0.004** (0.004-0.005)	**0.005** (0.005-0.007)	**0.006** (0.005-0.008)	**0.008** (0.006-0.010)	**0.009** (0.007-0.011)	**0.011** (0.008-0.014)	**0.012** (0.009-0.017)
45-day	**0.001** (0.001-0.001)	**0.002** (0.001-0.002)	**0.002** (0.002-0.003)	**0.003** (0.003-0.003)	**0.004** (0.003-0.005)	**0.005** (0.004-0.006)	**0.005** (0.004-0.007)	**0.006** (0.005-0.008)	**0.007** (0.006-0.010)	**0.008** (0.006-0.012)
60-day	**0.001** (0.001-0.001)	**0.001** (0.001-0.002)	**0.002** (0.002-0.002)	**0.002** (0.002-0.003)	**0.003** (0.003-0.004)	**0.004** (0.003-0.005)	**0.004** (0.003-0.005)	**0.005** (0.004-0.006)	**0.006** (0.004-0.008)	**0.007** (0.005-0.009)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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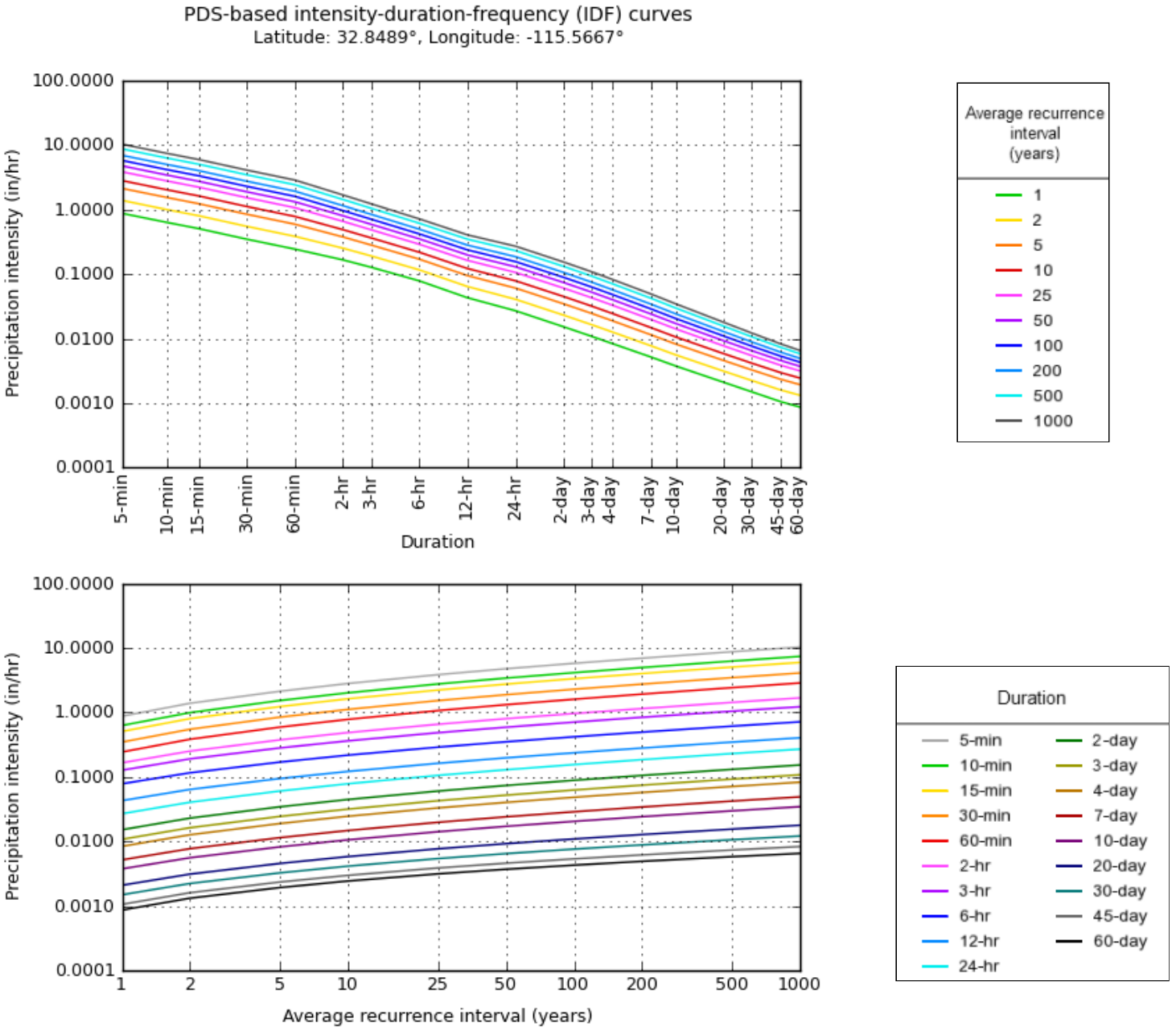
PF graphical



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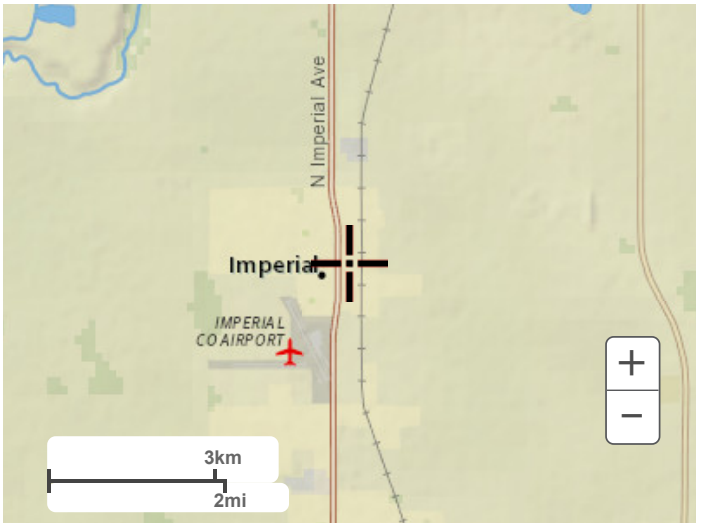
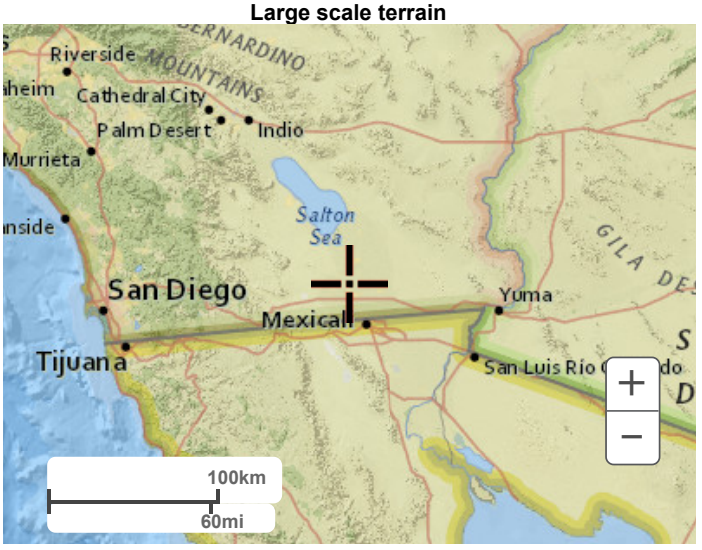
Maps & aerials

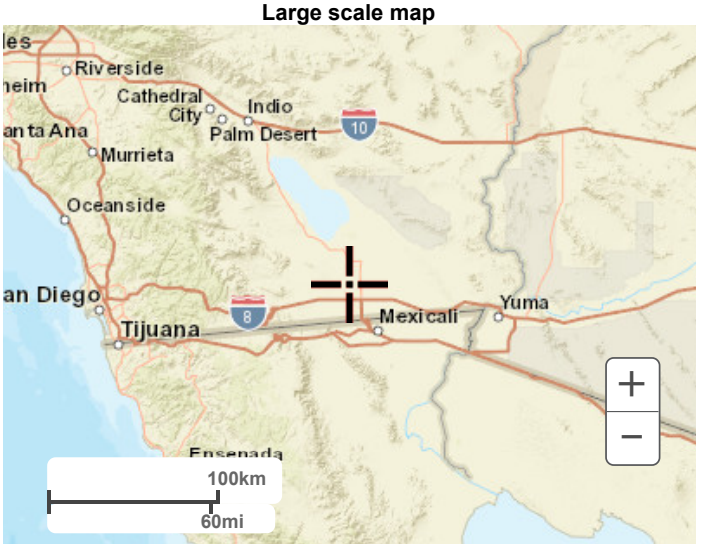
Small scale terrain



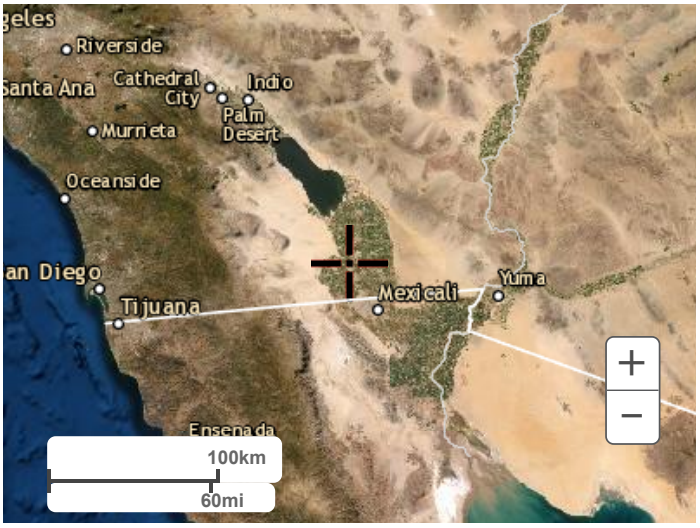
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

O Noise Technical Report

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Noise Technical Report
Vikings Solar Energy Storage Project
Imperial County, California

January 2022

PREPARED FOR

Vikings Energy Farm, LLC

PREPARED BY

SWCA Environmental Consultants

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NOISE TECHNICAL REPORT
VIKINGS SOLAR ENERGY STORAGE PROJECT

Prepared for

Vikings Energy Farm, LLC

Prepared by

SWCA Environmental Consultants

January 2022

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EXECUTIVE SUMMARY

Vikings Energy Farm, LLC (Applicant), retained SWCA Environmental Consultants (SWCA) to prepare a noise technical report in support of the proposed Vikings Solar Energy Storage Project (project) in Imperial County, California (county). The purpose of this report is to explain the methodologies used to evaluate the noise impacts of the proposed installation of a solar photovoltaic (PV) energy generation project on nearby noise sensitive areas (NSAs). The objective of the impact assessment was to calculate the cumulative noise levels at identified NSAs in the vicinity of the project and compare them applicable noise regulations. Since no other local, county, or state thresholds were identified, an L_{dn} of 55 dBA has been used to determine if the project would adversely affect public health and welfare at identified NSAs.

The assessment predicts the noise levels at identified NSAs located in the vicinity of the project. Based on those analyses and predictions;

- The construction of the project would not result in a substantial permanent increase in ambient noise levels at identified NSAs. Potential impacts from construction activities would be temporary and intermittent in nature, as construction is transient and would last approximately 3 to 5 weeks at any given location.
- Projected operation sound levels from the project are less than 55 dBA day-night average noise level (L_{dn}) at all NSAs with the highest projected sound level (L_{dn}) at a residential NSA of 42.0 dBA. Therefore, the potential sound levels from the operation of the project at residential NSAs would not exceed the 55 dBA L_{dn} U.S. Environmental Protection Agency–recommended levels.

This technical report contains the following sections detailing the results of the noise impacts assessment:

- Section 1.0 provides a general introduction to the project.
- Section 2.0 presents a brief description of the project and study area.
- Section 3.0 provides a basic introduction to the noise fundamentals and descriptors of time averaged noise levels, and a summary of the applicable noise regulations.
- Section 4.0 contains a brief description of the existing conditions at the project area.
- Section 5.0 provides a summary of the specialized techniques and assumptions used to estimate project noise impacts and a discussion of the results of the impact assessment.
- Appendix A includes detailed construction noise impact calculations.
- Appendix B provides a description of the stationary noise-generating sources.
- Appendix C includes contour maps of the project noise impacts.

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1 INTRODUCTION

The Vikings Solar Energy Storage Project proposes to install solar photovoltaic (PV technology modules mounted on fixed frames or horizontal single-axis tracker (HSAT) systems. The fixed-frame PV module arrays would be mounted on racks that would be supported by driven piles, arranged in arrays spaced up to 30 feet apart (pile to pile) to maximize performance and to allow access for panel cleaning. These arrays would be separated from each other and the perimeter security fence by up to 30-foot-wide interior roads to provide access to all areas for maintenance and emergency vehicles.

Electricity generated by the PV modules would be collected by a direct current (DC) collection system routed underground in trenches. This DC power would be delivered to one of the pad-mounted inverters in weatherproof enclosures located within the arrays. Underground or overhead 12.5-kilovolt (kV) or 34.5-kV collection lines would transmit the electricity to the new on-site substation. A new interconnection switching station would be constructed immediately adjacent to the project substation.

To connect to the project's interconnection facilities, the medium voltage power produced by the project would be conveyed underground, or above ground where necessary, to cross over any sensitive site features. Distribution from the site would be via an overhead connection. The electrical energy produced by the project would be conducted through the project interconnection facilities to the proposed 230-kV generator intertie (gentie) line and delivered to the existing Imperial Irrigation District (IID) approved point of interconnection (POI) on the 230-kV KN & KS Line. The proposed battery energy storage system (BESS or ESS) would be constructed adjacent to the project's solar facilities and would consist of either lithium ion (Li-ion) or flow batteries. Inverters would be used to convert the PV-produced DC power to alternating current power.

As part of the project, a proposed battery energy storage system (BESS or ESS) would be constructed adjacent to the project's solar facilities and would consist of either lithium ion (Li-ion) or flow batteries. These batteries will either be housed in storage containers or buildings fitted with heating, ventilation, and air conditioning (HVAC) and fire suppression systems as necessary, depending on the final selection of battery technology.

2 PROJECT AND STUDY DESCRIPTION

The project site is located at the intersection of E. Nelson Pit Road and Graeser Road, approximately 5.5 miles east of the city of Holtville and 15 miles east of the city of El Centro in Section 36 of Township 15 South and Range 16 East of the San Bernardino Base and Meridian of the Holtville East U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.

The project area generally consists of rangeland on flat terrain with pockets of center pivot-irrigated cropland and low-density, single-family residences associated with these agricultural uses and existing roads. The closest NSA, such as residences, places of worship, schools, or hospitals, is located within 1.7 miles of the nearest inverter, which is the closest noise source associated with the project to any NSA.

Predicted construction-generated noise levels at nearby NSAs were calculated using the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM). The RCNM is FHWA's national model for the prediction of construction noise. The predicted noise levels presented at various distances from the source are based on a roster of likely construction equipment operating during the construction of the project. The noise impact evaluation for the operation of the project, provided herein, consists of computer noise modeling using SoundPLAN Essential Version 5.1 and assessment of the outputs as they pertain to the sound (noise) standards and nearest NSAs (i.e., nearest residence).

Potential noise impacts from construction and operation of the project were evaluated by determining the projected increases over an assumed ambient condition and potential exposure of sensitive receptors to excessive noise.

3 NOISE FUNDAMENTALS – BACKGROUND

This section provides a brief overview of noise fundamentals, noise assessment components, examples of sound levels from a variety of sources, and the regulatory setting regarding applicable noise level standards.

3.1 Definition of Acoustical Terms

The following acoustical terms are used throughout this analysis:

- Ambient or background sound level is defined as the composite of noise from all sources near and far, the normal or existing level of environmental noise at a given location.
- Decibel (dB) is the physical unit commonly used to measure sound levels. Technically, a dB is a unit of measurement that describes the amplitude of sound equal to 20 times the base 10 logarithm of the ratio of the reference pressure to the sound of pressure, which is 20 micropascals (μPa). For example, on the decibel scale, the quietest audible sound (perceived near total silence) is 0 dB. A sound 10 times more powerful is 10 dB. A sound 100 times more powerful than near total silence is 20 dB. In acoustics, sound levels represented in dB express the true unweighted noise level.
- Sound measurement is further refined by using a decibel "A-weighted" sound level (dBA) scale that more closely measures how a person perceives different frequencies of sound; the A-weighting reflects the sensitivity of the ear to low or moderate sound levels.
- Equivalent noise level (L_{eq}) is the energy average A-weighted noise level during the measurement period.
- The root-mean-squared maximum noise level (L_{max}) characterizes the maximum noise level as defined by the loudest single noise event over the measurement period.
- Day-night sound level (L_{dn}) is the A-weighted equivalent sound level for a 24-hour period with an additional 10 dB weighting imposed on the equivalent sound levels occurring during night-time hours (10 p.m. to 7 a.m.).

3.2 Sound Levels of Representative Sounds and Noises

The U.S. Environmental Protection Agency (EPA) has developed an index to assess noise impacts from a variety of sources using residential receptors. If L_{dn} values exceed 65 dBA, residential development is not recommended (EPA 1974). Noise levels in a quiet rural area at night are typically between 32 and 35 dBA. Quiet urban night-time noise levels range from 40 to 50 dBA. Noise levels during the day in a noisy urban area are frequently as high as 70 to 80 dBA. Noise levels above 110 dBA become intolerable; levels higher than 80 dBA over continuous periods can result in hearing loss. Levels above 70 dBA tend to be associated with task interference. Levels between 50 and 55 dBA are associated with raised voices in a normal conversation. Constant noises tend to be less noticeable than irregular or periodic noises.

Table 1 provides criteria that have been used to estimate an individual's perception to increases in sound. In general, an average person perceives an increase of 3 dBA or less as barely perceptible. An increase of 10 dBA is perceived as a doubling of the sound.

Table 1. Average Human Ability to Perceive Changes in Sound Levels

Increase in Sound Level (dBA)	Human Perception of Sound
2–3	Barely perceptible
5	Readily noticeable
10	Doubling of the sound
20	Dramatic change

Source: Bolt Beranek and Newman, Inc. (1973)

Table 2 lists sound levels for some common noise sources and the human response to those decibel levels.

Table 2. Sound Levels of Representative Sounds and Noises

Source and Distance	Sound Level (dBA)	Human Response
Jet takeoff (nearby)	150	
Jet takeoff (15 meters [m]/50 feet)	140	
50-hp siren (30 m/100 feet)	130	
Loud rock concert (near stage)	120	Pain threshold
Construction noise (3 m/10 feet)	110	Intolerable
Jet takeoff (610 m/2,000 feet)	100	
Heavy truck (8 m/25 feet)	90	
Garbage disposal (0.6 m/2 feet)	80	Constant exposure endangers hearing
Busy traffic	70	
Normal conversation	60	
Light traffic (30 m/100 feet)	50	Quiet
Library	40	
Soft whisper (4.5 m/15 feet)	30	Very quiet
Rustling leaves	20	
Normal breathing	10	Barely audible
Threshold of hearing	0	

Source: Beranek (1988)

3.3 Regulatory Setting

In 1974 the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin on Safety*. In this publication, the EPA evaluated the effects of environmental noise with respect to health and safety and determined an L_{dn} of 55 dBA (equivalent to a continuous noise level of 48.6 dBA) to be the maximum sound level that will not adversely affect public health and welfare by interfering with speech or other activities in outdoor areas.

Since no other local, county, or state thresholds were identified, an L_{dn} of 55 dBA has been used to determine if the project would adversely affect public health and welfare at identified NSAs.

4 EXISTING CONDITIONS

A characterization of the landscape features, existing roads, and land use of the project area and vicinity are provided in Section 2 above. A total of 13 residential NSAs within 2 miles from the project boundary was included in this analysis. Additionally, using satellite imagery from Google Earth, 35 temporary NSAs (i.e., recreational vehicles) were identified and included in the analysis. A map of the general location of project and of the identified NSAs is provided in Figure 1.

Background noise and noise attenuation rates are subject to variation from differences in ambient conditions, such as air temperature, wind, rain, and snow. Yearly average highs reach the high 80s (degrees Fahrenheit [°F]), and yearly average lows reach the mid to upper 50s°F (U.S. Climate Data 2021). Monthly weather conditions are listed in Table 3.

Table 3. Weather Conditions

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
Average High Temperature (°F)	71	74	80	86	94	103	107	106	101	91	78	69	88
Average Low Temperature (°F)	43	47	51	56	63	68	78	79	72	61	50	42	59
Average Precipitation	0.49	0.46	0.30	0.05	0.02	0.00	0.06	0.27	0.28	0.34	0.17	0.41	2.85

Source: U.S. Climate Data 2021

Local conditions such as topography and winds characteristic of the region can alter background noise conditions. The American National Standards Institute (ANSI) has published a standard with estimates of general ambient noise levels (L_{eq} and L_{dn}) based on detailed descriptions of land use categories (ANSI 2013). The ANSI document organizes the land use based on six categories. The descriptions and estimated daytime and nighttime L_{eq} ambient noise levels for each category are provided in Table 4.

Table 4. Representative Existing Conditions Based on Land Use

Land Use Category	Typical L_{dn} (dBA)	Day Level, L_d (dBA)	Night Level, L_n (dBA)
1. Very noisy urban residential	67	66	58
2. Noisy urban residential	62	61	54
3. Urban and noisy suburban residential	57	55	49
4. Quite urban and normal suburban residential	52	50	44
5. Quite suburban residential	47	45	39
6. Very quiet suburban and rural residential	42	40	34

Source: ANSI S12.9-2013/Part 3

Because there are very few nearby sources of sound in the area surrounding the project, the residential noise receptors can be defined as a sparse suburban or rural area; therefore, background sound levels are conservatively represented by those of *Category 6: Very quiet suburban and rural residential*.

Since a noise assessment was not performed to measure the actual background noise levels at and near the project area, the L_{eq} night and day noise levels were assumed to be 34 dBA and 40 dBA respectively at the neighboring NSAs. Section 5 (below) assesses potential increases in ambient noise levels associated with planned construction and operational activities in the immediate vicinity of the project in relation to existing baseline noise levels.

5 NOISE IMPACTS

The following section provides results and interpretation of potential impacts from noise generated by the project during construction and operation based on the criteria described in Section 3.4.

5.1 Construction Noise

The noise levels generated by construction equipment would vary significantly and depend on several different parameters, such as the type, model, size, and condition of the equipment; the operation schedule; and the condition of the area being worked. Additionally, construction projects are accomplished in several different stages. Each stage has a specific equipment mix, depending on the work to be completed. The following sections estimated noise levels related to the construction of the project.

5.1.1 *Equipment and Machinery*

It is anticipated that construction activities start in the first quarter of 2022 and would last approximately 12 months with the Project operation commencing in 2023. Construction is expected to include six phases, which have the potential to overlap with one another.

Noise levels for typical construction equipment that would likely be used at the project are approximately in the 70 to 90 dBA range at a distance of 50 feet (15 m), as shown in Table 5.

Construction noise levels were estimated using the FHWA RCNM. The RCNM is FHWA's national model for the prediction of construction noise. This software is based on actual sound level measurements from various equipment types taken during the Central Artery/Tunnel Project conducted in Boston, Massachusetts, during the early 1990s (FWHA 2011).

Estimates of noise from the construction of the project are based on a roster of the maximum number of construction equipment types used on a given day. Table 5 lists of typical construction equipment and the noise level at 50 feet. The RCNM has noise levels for various types of equipment preprogrammed into the software; therefore, the noise level associated with the equipment is typical for the equipment type and not based on any specific make or model.

The RCNM assumes that the maximum sound level for the project (L_{max}) is the maximum sound level for the loudest piece of equipment. The approximate noise generated by the construction equipment used at the facility has been conservatively calculated based on an estimated project construction equipment roster to be used at the project area at one time, and not considering further attenuation due to atmospheric interference or intervening structures.

The equipment and activities on-site would vary throughout the project, depending on various stages of construction. The predicted noise from construction activity is presented as a worst case (highest noise level) scenario, where it is assumed, all equipment is present and operating simultaneously on-site for each stage of construction. Results of the RCNM construction noise calculations are presented in Table 6, with calculations shown in Appendix A.

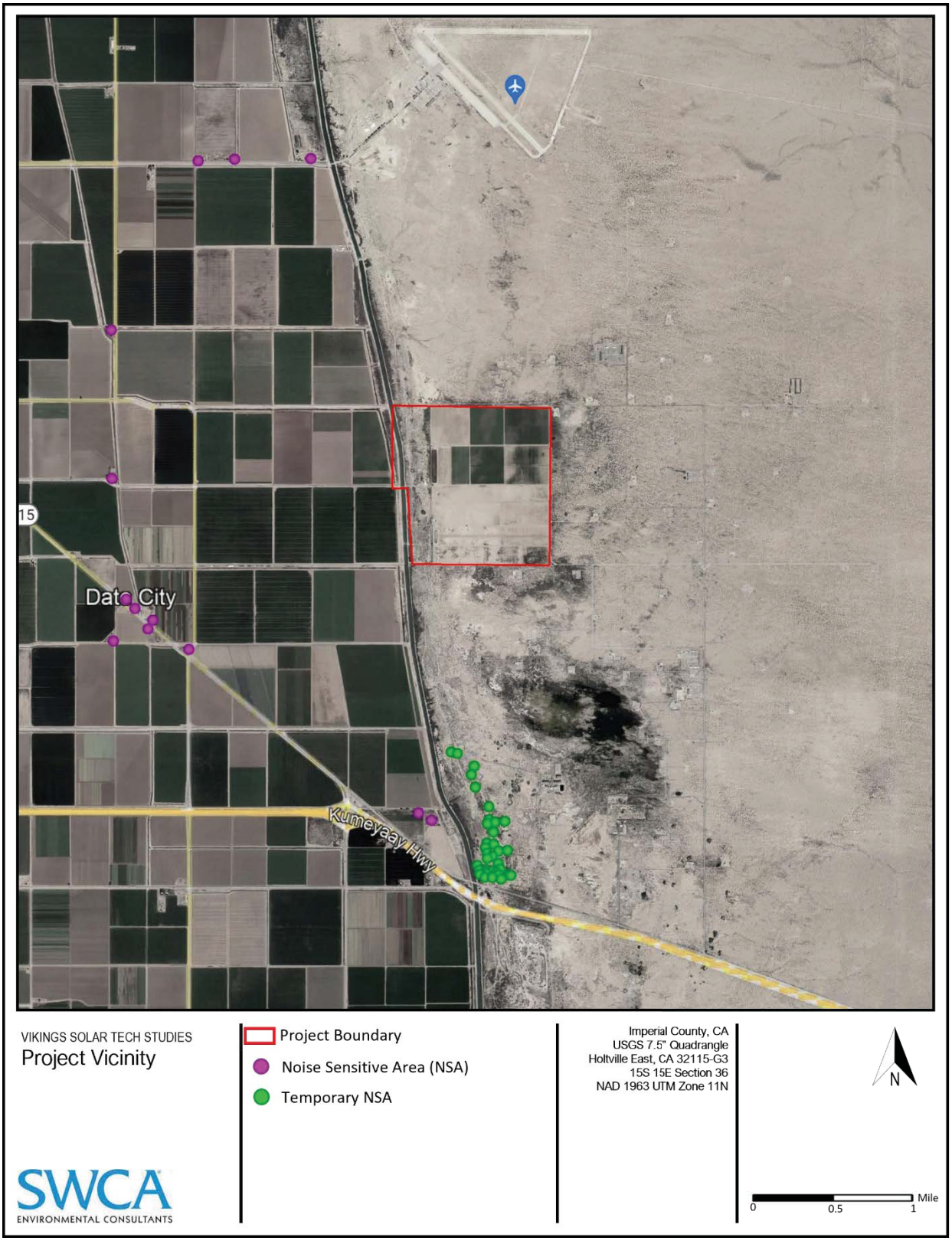

Figure 1. Project area map.

Table 5. Noise Levels for Common Construction Equipment

Equipment Type	Typical Maximum Noise Levels at 50 Feet (dBA)
Crane	81
Dozer	82
Drill Rig Truck	79
Excavator	81
Flat Bed Truck	74
Front End Loader	79
Generator	81
Grader	85
Man Lift	75
Scraper	84
Tractor	84
Trencher	80
Welder/Torch	74
Other Equipment > 5 HP	85

Source: FHWA RCNM Software Version 1.1 (2011). Table based on EPA report and measured data.

Table 6. Predicted Construction Noise Levels

Phase	Equipment	Distance (feet)	Construction 1-hr L_{eq} (dBA)	Construction L_{max} [a] (dBA)	Combined Ambient + Calculated Noise Level, 1-hr L_{eq} [b,c] (dBA)
Site Preparation	Rubber Tired Dozers Scrapers Skid Steer Loaders Tractors/Loaders/Backhoes	25	92.6	93.0	89.6
		50	86.6	87.0	83.6
		100	80.6	81.0	77.6
		200	74.6	75.0	71.6
		250	72.6	73.0	69.6
		500	66.6	67.0	63.6
		1,000	60.6	61.0	57.7
		2,000	54.6	55.0	51.8
		4,000	48.6	48.9	46.3
		5,000	46.6	47.0	44.8
Grading	Excavators Graders Off-Highway Trucks Rubber Tired Dozers Scrapers Tractors/Loaders/Backhoes	25	93.6	94.0	90.6
		50	87.6	88.0	84.6
		100	81.6	82.0	78.6
		200	75.6	76.0	72.6
		250	73.6	74.0	70.6
		500	67.6	68.0	64.6
		1,000	61.6	62.0	58.6
		2,000	55.6	56.0	52.7
		4,000	49.6	49.9	47.2
		5,000	47.6	48.0	45.6

Trenching	Cranes Forklifts Trenchers Skid Steer Loaders Generator Sets Other General Industrial Equipment Tractors/Loaders/Backhoes Welders	25	94.1	91.0	91.1
		50	88.1	85.0	85.1
		100	82.1	79.0	79.0
		200	76.0	73.0	73.0
		250	74.1	71.0	71.1
		500	68.1	65.0	65.1
		1,000	62.1	59.0	59.1
		2,000	56.0	53.0	53.2
		4,000	50.0	46.9	47.6
		5,000	48.1	45.0	45.9
Interconnection Connection	Cranes Forklifts Generator Sets Other General Industrial Equipment Aerial Lifts Tractors/Loaders/Backhoes Welders	25	92.9	93.0	89.9
		50	86.9	87.0	83.9
		100	80.9	81.0	77.9
		200	74.9	75.0	71.9
		250	72.9	73.0	69.9
		500	66.9	67.0	63.9
		1,000	60.9	61.0	57.9
		2,000	54.9	55.0	52.1
		4,000	48.8	48.9	46.6
		5,000	46.9	47.0	45.0
Solar Array Installation	Cranes Pile Driver Forklifts Bore/Drill Rigs Skid Steer Loaders Generator Sets Off-Highway Trucks Tractors/Loaders/Backhoes Welders	25	94.2	94.8	91.2
		50	88.2	88.8	85.2
		100	82.2	82.8	79.2
		200	76.1	76.7	73.1
		250	74.2	74.8	71.2
		500	68.2	68.8	65.2
		1,000	62.2	62.8	59.2
		2,000	56.1	56.7	53.3
		4,000	50.1	50.7	47.7
		5,000	48.2	48.8	46.0

[a] Calculated L_{max} is the loudest individual value.

[b] Assumes existing daytime and nighttime noise levels of 40 dBA and 32 dBA.

[c] Assumes daytime construction only.

As indicated above, noise emitted from operation of construction equipment was estimated based on construction equipment noise data published by the United States Federal Highway Administration and the FTA (FWHA 2011). The closest residential NSA is located approximately 6,512 feet from a proposed area where construction activities are expected to occur; maximum 1-hr L_{eq} noise levels at this distance are estimated at 44.3 dBA. Construction is transient in nature and noise levels vary depending on the activity in progress. Noise impacts to residents due to the construction of the project would be temporary and intermittent.

5.2 Operational Noise

The noise levels at the identified NSAs in the vicinity of the project from the operation of the representative inverters, battery energy storage system (BESS or ESS) and transformers have been predicted, and compared with the relevant noise criteria, including the EPA's L_{dn} of 55 dBA at residential NSAs.

5.2.1 *Operational Activities*

The modeled sound sources from the project would include up to 31 inverters, 1 Generator step-up transformers (GSU) and a BESS. There would be a small amount of transportation of equipment and traffic to the project during the operation and maintenance of the facility. Estimated 1-hr L_{eq} noise levels from the operation and maintenance traffic was estimated to be no more than 64.4 dBA at a distance of 50 feet.

5.2.2 *Assessment Methodology*

This facility design consists of approximately 31 inverters, 1 GSU transformer and a BESS. The proposed inverters will be Sun Grow SG3600UD-MV model. Table 7 below, is a summary of the noise sources to be onsite during operation and their respective sound power as provided by Vikings Energy Farm, LLC.

Table 7. Noise Model Parameters

Project Component	Type of Source	Sound Power Level at Octave Band Center Frequency (Hz)									Total Sound Power Level (dB)
		31.5	63	125	250	500	1,000	2,000	4,000	8,000	
Inverter	Point	91	92	93	92	97	88	87	83	80	100.9
GSU [a]	Point	-	-	-	-	-	-	-	-	-	85
BESS [a]	Point	-	-	-	-	-	-	-	-	-	96

[a] Sound power spectrum at octave band center frequency was not provided for this source.

Based on the sound power levels input for each inverter, transformer, or BESS, SoundPLAN estimates noise contours of the overall project in accordance with the International Standards Organization (ISO) 9613-2:1996 Acoustics standards for noise propagation calculations. All sound propagation losses, such as geometric spreading, air absorption, ground absorption, and barrier shielding, are calculated in accordance with those recognized standards. The SoundPlan model accounts for reflection (i.e., from adjacent structures and the ground). The SoundPlan model uses industry-accepted propagation algorithms and accepts as inputs sound power levels (in dB) provided by the manufacturer and other sources. The calculations account for classical sound wave divergence, plus attenuation factors resulting from air absorption, basic ground effects, and barrier/shielding. SoundPLAN does not account for noise modulation or refraction.

The sound propagation model considers the following influences:

- sound power levels and locations of noise sources;
- distance between noise sources and receivers;
- topography of the area;
- influence of the absorption provided by the ground;
- shielding from structures or vegetation;
- air absorption; and,
- meteorological conditions.

The ISO 9613-2 methodology provides tables and equations for estimating the atmospheric absorption coefficient corresponding to various temperatures and humidity levels. For estimating noise levels at the NSAs the annual average temperature of 74°F for the City of El Centro, California, a relative humidity of

37%, and an air pressure of 1013 mbar were used as model inputs. Topographic inputs were also included in the model. Calculations were performed using octave band sound power spectra as inputs for each noise source.

The ISO 9613-2 standard estimates sound pressure levels at a specified distance by subtracting the attenuation factors from the source sound power level for each source in octave frequency bands. Attenuation factors include geometrical divergence, atmospheric attenuation, ground effect, and barrier attenuation. These terms are defined as follows:

- Geometrical divergence occurs as the source sound power is spread out over an increasing surface area (i.e., as the distance from the source increases). The estimated loss rate is the same for all frequencies. This is considered the most significant loss associated with propagation. Attenuation due to geometrical divergence is highly dependent on the distance between the source and the receiver. Direction also affects the noise level; (0°) direct line of sight noise level will be higher than (90°) direction line of sight to a stack emission point. Therefore, the differences in ground elevation and receiver height and hub height (source height) are important parameters. Losses due to atmospheric attenuation occur as the energy in the sound wave is transformed to heat. As this attenuation is frequency-dependent and high frequencies are more readily attenuated than low frequencies, these losses are highly influenced by humidity and temperature. Ground effect is described according to the parameter Ground Factor (G), which varies between 0 for surfaces with low porosity ("hard" ground) and 1 for "soft" ground (surfaces including loose dirt, grass, crops, and other vegetation). This factor describes the effect of sound waves reflected off the ground. Parameters influencing the ground effect are the source height, receiver height, and propagation distance between the source and receiver and the ground conditions. Barrier attenuation describes the effect of sound waves refracted around an imperforate element or barrier. A barrier could include man-made objects such as structures, buildings, and fences, as well as topographical features. Therefore, the differences in ground elevation, source height, receiver height, dimension, and location absorption and reflection coefficients of man-made structures and topographic features are important parameters when estimating barrier attenuation in SoundPLAN.

The following assumptions were made when running SoundPLAN:

- Noise impact calculations were performed using octave band data from 10 Hz to 10 kHz.
- Noise impacts at the NSA depicted in the isopleths, were estimated assuming a receiver height of 1.5 m above ground level.
- Elevations of the sources and of the receptors examined in the modeling were determined from U.S. Geological Survey Digital Elevation Map (DEM) and are based on North American Datum of 1927. The DEM files each had a 30-m resolution (7.5-minute DEM providing coverage of 7.5 × 7.5-minute blocks).
- Atmospheric attenuation was modeled using annual average conditions for El Centro, California (i.e., temperature of 74°F and 37% humidity).
- To better represent the actual conditions of the proposed project and to ensure that both hard and soft ground absorption were considered, acoustically hard sites including surfaces such as pavement, bare hard ground, were assumed to have high reflectivity properties and a ground absorption coefficient of 0.0 was used. Ground cover in the vicinity of the project was analyzed using satellite imagery from Google Earth. A higher ground factor of 1.0 was defined for more absorptive ground, such as vegetation and loose soil. Semi-hard materials were assumed to have a ground absorption coefficient of 0.6.

- The project was assumed to operate 24 hours per day. The noise attenuation model was set up to represent "worst-case" noise conditions. The proposed inverter has a maximum sound power level of 95.9 dBA. This sound level and its corresponding sound spectra were used to represent operational conditions. A complete list of noise-emitting source included in the model are presented in Appendix B.

5.2.3 *Operational Noise Impacts*

Calculations were performed using linear octave band power levels as inputs from each noise source. Summaries of the sound propagation model results are presented in the following section.

5.2.3.1 RESIDENTIAL NOISE SENSITIVE AREAS

The calculated noise levels emitted by the project would be below EPA's 55 dBA L_{dn} noise standard at all identified residential NSAs. Noise contributions from the project are low and well below the stated noise limits; therefore, the project noise would remain at or below the specified noise standard. Since noise contribution from the project at the closest NSA was estimated at 14.3 dBA L_{eq}, the L_{dn} at the NSA was estimated to be 42.0 dBA, which is below the EPA recommendation of 55 dBA for residential land use. Table 8 lists the overall noise levels (background, contributions, total noise levels) at the closest impacted residential and temporary NSAs in A-weighted sound levels.

Table 8. Summary of Estimated Noise Levels from Project Operation

Description	Project Contribution	Background Noise Levels*		Total Calculated Noise Levels	
	L_{eq} (dBA)	L_{eq} (dBA)	L_{dn} (dBA)	L_{eq} (dBA)	L_{dn} (dBA)
Closest Residential NSA	11.9	38.6	42.0	38.6	42.0
Temporary Residential NSA	14.3	38.6	42.0	38.6	42.0

* ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

A noise contour grid maps map was generated by SoundPlan software and is presented in Appendix C. The map depicts the extent of noise propagation from the SoundPlan models that were developed for the noise impact assessment. The noise contour map illustrates the extent of noise associated with the proposed development. It is important to note that the extent of the impacts depicted in these figures does not include the contribution of the existing background noise.

5.2.4 *Maintenance Activities*

Maintenance activities would include periodic site visits to solar panels, inverters, transformers, transmission lines, substations, and auxiliary structures. These activities would involve vehicle traffic with relatively low noise levels. Infrequent maintenance activities would be anticipated, such as road maintenance work, or repair or replacement of equipment. However, anticipated noise levels from maintenance activities would be lower than those of construction activities.

5.2.5 *Transmission Lines*

Operation noise outputs of transmission lines are minimal and generally limited to corona noise and the occasional maintenance vehicle surveying the transmission line. It is anticipated that transmission line

operational noise sources would not permanently increase ambient noise levels above the baseline conditions at the nearest sensitive receptor.

5.3 Decommissioning

Estimated noise levels from decommissioning activities would be comparable to but less than those associated with the construction of the project, because the activity type and level would be similar but shorter in duration. It is anticipated that the decommissioning activities for the project can be completed over a two-year period. The estimated schedule length for decommissioning is tied to assumptions about the number of equipment types mobilized, crew sizes, weather and climate conditions, and overall productivity, and, accordingly, the potential impacts would be temporary and intermittent in nature.

5.4 Vibration Impacts

The loudest noise-generating operational equipment will consist of inverters, trackers, and transformers. No operational components of the project include significant ground borne noise or vibration sources, and no significant vibrations sources currently exist, or are planned, in the area. Thus, no significant ground borne vibration impacts would occur with operation of the project.

6 LITERATURE CITED

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APPENDIX A

Roadway Construction Noise Model (RCNM)
Construction Noise Calculations

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Vikings Solar Energy Storage Project
Site Preparation - Construction
Noise Impact Assessment

Project Land Use:	Industrial

Baseline Noise

Baselines (Representative Existing Conditions)[1]			
LAeq	**Ldn**	**Day**	**Night**
(dBA)	**(dBA)**	**(dBA)**	**(dBA)**
38.6	42.0	40	34

ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

Sources

Description	**Modeled As**	**Quantity**	**Acoustical Usage Factor[1]**	**Noise Level Reference Distance [1]**	**Sound Pressure Level @ reference distance [1]**
			%/hr.	**(feet)**	**(dBA)**
Rubber Tired Dozers	Dozer	2	40	50	82
Scrapers	scraper	1	40	50	84
Skid Steer Loaders	Front End Loader	1	40	50	79
Tractors/Loaders/Backhoes	Tractor	2	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results @ 25 feet

Equipment	**Construction Levels**	
	Leq (dBA)	**L_{Max} (dBA)**
Dozer	87.1	91.0
scraper	86.0	90.0
Front End Loader	81.0	85.0
Tractor	89.1	93.0
Total [1]	**92.6**	**93.0**

[1] Noise Level assumes all equipment is operating simultaneously.

Distance (ft)	**Construction Leq**	**Construction Lmax [1]**	**Combined Ambient + Calculated Noise Level, LAeq**	**Daytime Noise Level, Lday**	**Nighttime Noise Level, Lnight [2]**	**Combined Ambient + Calculated Noise Level, Ldn**	**Potential Noise Increase, Ldn**	**Potential Noise Increase, Leq**
	(dBA)	**(dBA)**	**(dBA)**	**(dBA)**	**(dBA)**	**(dBA)**	**(dBA)**	**(dBA)**
25	92.6	93.0	89.6	92.0	34.0	89.6	47.6	51.0
50	86.6	87.0	83.6	86.0	34.0	83.6	41.6	45.0
100	80.6	81.0	77.6	79.9	34.0	77.6	35.6	39.0
200	74.6	75.0	71.6	73.9	34.0	71.6	29.6	33.0
250	72.6	73.0	69.6	72.0	34.0	69.6	27.6	31.0
500	66.6	67.0	63.6	66.0	34.0	63.6	21.6	25.0
1000	60.6	61.0	57.7	60.0	34.0	57.7	15.7	19.1
2000	54.6	55.0	51.8	54.1	34.0	52.0	10.0	13.2
4000	48.6	48.9	46.3	48.6	34.0	47.1	5.1	7.7
5000	46.6	47.0	44.8	46.9	34.0	45.9	3.9	6.2

[1] Calculated Lmax is the loudest individual value.

[2] Assumes daytime construction only

Vikings Solar Energy Storage Project
Grading - Construction
Noise Impact Assessment

Project Land Use:	Industrial

Baseline Noise

Baselines (Representative Existing Conditions)[1]			
LAeq	Ldn	Day	Night
(dBA)	(dBA)	(dBA)	(dBA)
38.6	42.0	40	34

ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

Sources

Description	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
			%/hr.	(feet)	(dBA)
Excavators	Excavator	1	40	50	81
Graders	Grader	2	40	50	85
Off-Highway Trucks	Flat Bed Truck	1	40	50	74
Rubber Tired Dozers	Dozer	1	40	50	82
Scrapers	Scraper	1	40	50	84
Tractors/Loaders/Backhoes	Tractor	1	40	50	84

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results @ 25 feet

Equipment	Construction Levels	
	Leq (dBA)	L_{Max} (dBA)
Excavator	83.0	87.0
Grader	90.1	94.0
Flat Bed Truck	76.0	80.0
Dozer	84.0	88.0
Scraper	86.0	90.0
Tractor	86.0	90.0
Total [1]	**93.6**	**94.0**

[1] Noise Level assumes all equipment is operating simultaneously.

Distance (ft)	Construction Leq	Construction Lmax [1]	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight [2]	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Potential Noise Increase, Leq
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
25	93.6	94.0	90.6	93.0	34.0	90.6	48.6	52.0
50	87.6	88.0	84.6	86.9	34.0	84.6	42.6	46.0
100	81.6	82.0	78.6	80.9	34.0	78.6	36.6	40.0
200	75.6	76.0	72.6	74.9	34.0	72.6	30.6	34.0
250	73.6	74.0	70.6	73.0	34.0	70.6	28.6	32.0
500	67.6	68.0	64.6	67.0	34.0	64.6	22.6	26.0
1000	61.6	62.0	58.6	61.0	34.0	58.7	16.7	20.0
2000	55.6	56.0	52.7	55.0	34.0	52.9	10.9	14.1
4000	49.6	49.9	47.2	49.4	34.0	47.8	5.8	8.6
5000	47.6	48.0	45.6	47.7	34.0	46.5	4.5	7.0

[1] Calculated Lmax is the loudest individual value.

[2] Assumes daytime construction only

Vikings Solar Energy Storage Project
Trenching - Construction
Noise Impact Assessment

Project Land Use:	Industrial

Baseline Noise

Baselines (Representative Existing Conditions)[1]			
LAeq	Ldn	Day	Night
(dBA)	(dBA)	(dBA)	(dBA)
38.6	42.0	40	34

ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

Sources

Description	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
			%/hr.	(feet)	(dBA)
Cranes	Crane	1	16	50	81
Forklifts	Front End Loader	3	40	50	79
Trenchers	Trencher	2	50	50	80
Skid Steer Loaders	Front End Loader	1	40	50	79
Generator Sets	Generator	2	50	50	81
Other General Industrial Equipment	All Other Equipment > 5 HP	1	50	50	85
Tractors/Loaders/Backhoes	Tractor	1	40	50	84
Welders	Welder/Torch	1	40	50	74

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results @ 25 feet

Equipment	Construction Levels	
	Leq (dBA)	L_{Max} (dBA)
Crane	79.1	87.0
Front End Loader	85.8	89.8
Trencher	86.0	89.0
Front End Loader	81.0	85.0
Generator	87.0	90.0
All Other Equipment > 5 HP	88.0	91.0
Tractor	86.0	90.0
Welder/Torch	76.0	80.0
Total[1]	**94.1**	**91.0**

[1] Noise Level assumes all equipment is operating simultaneously.

Distance (ft)	Construction Leq	Construction Lmax [1]	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight [2]	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Potential Noise Increase, Leq
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
25	94.1	91.0	91.1	93.4	34.0	91.1	49.1	52.5
50	88.1	85.0	85.1	87.4	34.0	85.1	43.1	46.5
100	82.1	79.0	79.0	81.4	34.0	79.0	37.0	40.4
200	76.0	73.0	73.0	75.4	34.0	73.0	31.0	34.4
250	74.1	71.0	71.1	73.4	34.0	71.1	29.1	32.5
500	68.1	65.0	65.1	67.4	34.0	65.1	23.1	26.5
1000	62.1	59.0	59.1	61.4	34.0	59.1	17.1	20.5
2000	56.0	53.0	53.2	55.5	34.0	53.3	11.3	14.6
4000	50.0	46.9	47.6	49.8	34.0	48.2	6.2	9.0
5000	48.1	45.0	45.9	48.1	34.0	46.8	4.8	7.3

[1] Calculated Lmax is the loudest individual value.

[2] Assumes daytime construction only

Vikings Solar Energy Storage Project
Interconnection - Construction
Noise Impact Assessment

Project Land Use:	Industrial

Baseline Noise

Baselines (Representative Existing Conditions)[1]			
LAeq	Ldn	Day	Night
(dBA)	(dBA)	(dBA)	(dBA)
38.6	42.0	40	34

ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

Sources

Description	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
			%/hr.	(feet)	(dBA)
Cranes	Crane	1	16	50	81
Forklifts	Front End Loader	1	40	50	79
Generator Sets	Generator	1	50	50	81
Other General Industrial Equipment	All Other Equipment > 5 HP	1	50	50	85
Aerial Lifts	Man Lift	1	20	50	75
Tractors/Loaders/Backhoes	Tractor	2	40	50	84
Welders	Welder/Torch	1	40	50	74

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results @ 25 feet

Equipment	Construction Levels	
	Leq (dBA)	L_{Max} (dBA)
Crane	79.1	87.0
Front End Loader	81.0	85.0
Generator	84.0	87.0
All Other Equipment > 5 HP	88.0	91.0
Man Lift	74.0	81.0
Tractor	89.1	93.0
Welder/Torch	76.0	80.0
Total [1]	**92.9**	**93.0**

[1] Noise Level assumes all equipment is operating simultaneously.

Distance (ft)	Construction Leq	Construction Lmax [1]	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight [2]	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Potential Noise Increase, Leq
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
25	92.9	93.0	89.9	92.3	34.0	89.9	47.9	51.3
50	86.9	87.0	83.9	86.2	34.0	83.9	41.9	45.3
100	80.9	81.0	77.9	80.2	34.0	77.9	35.9	39.3
200	74.9	75.0	71.9	74.2	34.0	71.9	29.9	33.3
250	72.9	73.0	69.9	72.3	34.0	69.9	27.9	31.3
500	66.9	67.0	63.9	66.2	34.0	63.9	21.9	25.3
1000	60.9	61.0	57.9	60.3	34.0	58.0	16.0	19.3
2000	54.9	55.0	52.1	54.4	34.0	52.3	10.3	13.5
4000	48.8	48.9	46.6	48.8	34.0	47.3	5.3	8.0
5000	46.9	47.0	45.0	47.2	34.0	46.0	4.0	6.4

[1] Calculated Lmax is the loudest individual value.

[2] Assumes daytime construction only

Vikings Solar Energy Storage Project
Solar Array Installation - Construction
Noise Impact Assessment

Project Land Use:	Industrial

Baseline Noise

Baselines (Representative Existing Conditions)[1]			
LAeq	Ldn	Day	Night
(dBA)	(dBA)	(dBA)	(dBA)
38.6	42.0	40	34

ANSI S12.9-1993/Part 3 - Representative Existing Conditions Based on Land Use for Very Quiet, Sparse Suburban or Rural Areas.

Sources

Description	Modeled As	Quantity	Acoustical Usage Factor[1]	Noise Level Reference Distance [1]	Sound Pressure Level @ reference distance [1]
			%/hr.	(feet)	(dBA)
Cranes	Crane	1	16	50	81
Forklifts	Front End Loader	5	40	50	79
Bore/Drill Rigs	Drill Rig Truck	2	20	50	79
Skid Steer Loaders	Front End Loader	2	40	50	79
Generator Sets	Generator	1	50	50	81
Off-Highway Trucks	Flat Bed Truck	1	40	50	74
Tractors/Loaders/Backhoes	Tractor	3	40	50	84
Welders	Welder/Torch	1	40	50	74

[1] FHWA -Construction Noise Handbook - Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

Results @ 25 feet

Equipment	Construction Levels	
	Leq (dBA)	L_{Max} (dBA)
Crane	79.1	87.0
Front End Loader	88.0	92.0
Drill Rig Truck	81.0	88.0
Front End Loader	84.1	88.0
Generator	84.0	87.0
Flat Bed Truck	76.0	80.0
Tractor	90.8	94.8
Welder/Torch	76.0	80.0
Total [1]	**94.2**	**94.8**

[1] Noise Level assumes all equipment is operating simultaneously.

Distance (ft)	Construction Leq	Construction Lmax [1]	Combined Ambient + Calculated Noise Level, LAeq	Daytime Noise Level, Lday	Nighttime Noise Level, Lnight [2]	Combined Ambient + Calculated Noise Level, Ldn	Potential Noise Increase, Ldn	Potential Noise Increase, Leq
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)
25	94.2	94.8	91.2	93.5	34.0	91.2	49.2	52.6
50	88.2	88.8	85.2	87.5	34.0	85.2	43.2	46.6
100	82.2	82.8	79.2	81.5	34.0	79.2	37.2	40.6
200	76.1	76.7	73.1	75.5	34.0	73.1	31.1	34.5
250	74.2	74.8	71.2	73.5	34.0	71.2	29.2	32.6
500	68.2	68.8	65.2	67.5	34.0	65.2	23.2	26.6
1000	62.2	62.8	59.2	61.5	34.0	59.2	17.2	20.6
2000	56.1	56.7	53.3	55.6	34.0	53.5	11.5	14.7
4000	50.1	50.7	47.7	49.9	34.0	48.3	6.3	9.1
6512	45.9	46.5	44.3	46.4	34.0	45.5	3.5	5.7

[1] Calculated Lmax is the loudest individual value.

[2] Assumes daytime construction only

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APPENDIX B

Noise-emitting Sources

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Source name	Reference	dB(A)	Frequency spectrum [dB(A)]																									
			25	31	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1	1.3	1.6	2	2.5	3.2	4	5	6.3	8	10
			Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz
Inverter 1	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.6	74.1	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 2	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 3	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 4	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 5	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 6	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 7	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 8	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 9	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 10	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 11	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 12	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 13	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 14	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 15	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 16	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 17	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 18	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 19	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 20	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 21	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 22	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 23	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 24	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 25	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 26	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 27	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 28	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 29	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 30	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
Inverter 31	Lw/unit	95.8	41.3	46.6	50.4	55.8	60.8	64.5	66.9	74.9	72.7	74.2	77.4	82.4	89.2	88.8	84.1	85.2	83	81.6	81	84.2	83.3	81.2	74	80.6	75.9	72.9	71.5
GSU	Lw/unit	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BESS	Lw/unit	96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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APPENDIX C

Operation Impacts Isopleths

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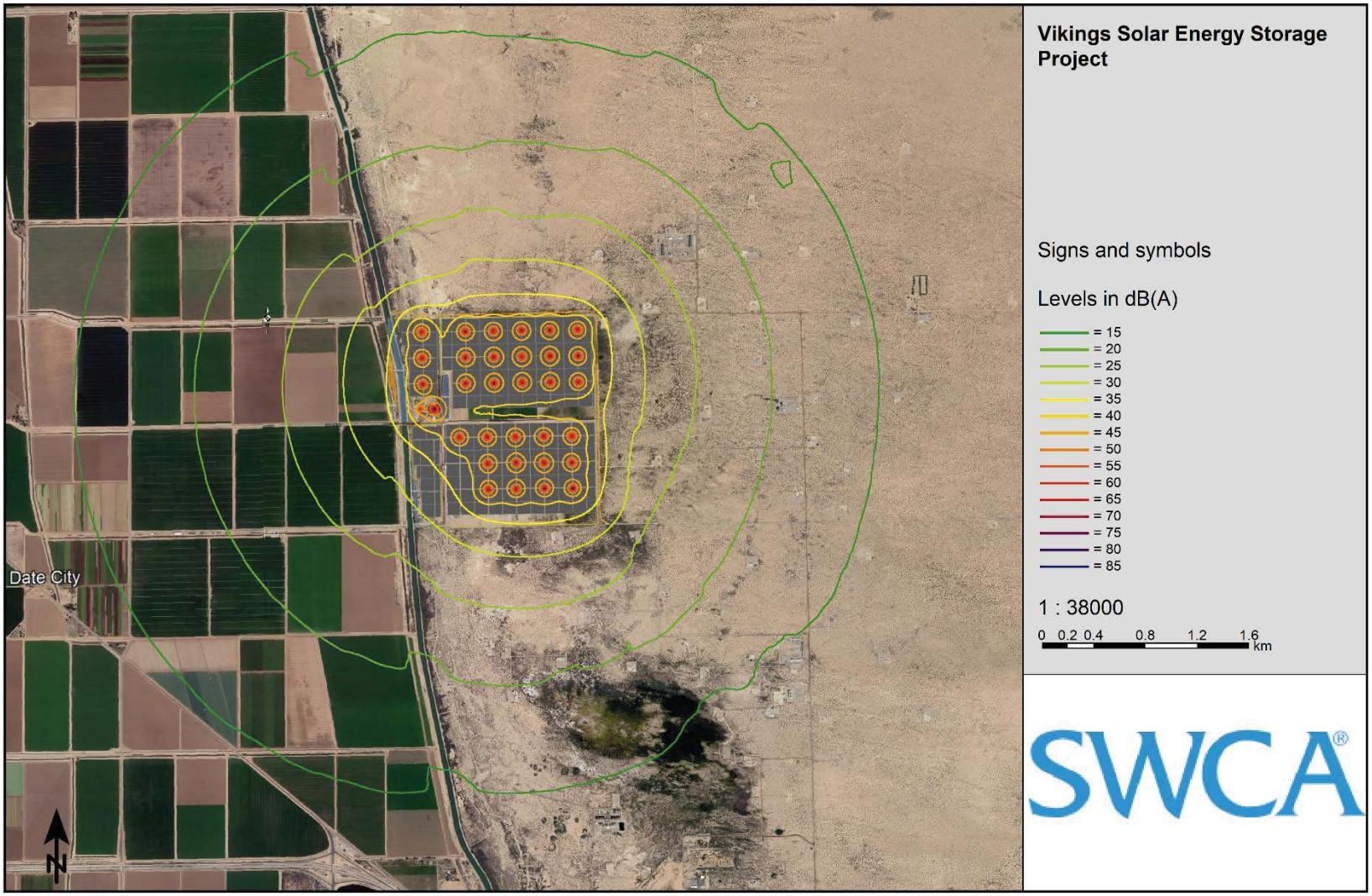

Figure C-1. Operational Impacts – contour map.

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